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LANGUAGES OF VISION: GYORGY KEPES
AND THE “NEW LANDSCAPE” OF ART AND SCIENCE

by

ELIZABETH FINCH

A dissertation submitted to the Graduate Faculty in Art History
in partial fulfillment of the requirements for the degree of Doctor of Philosophy,
The City University of New York

2005

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This manuscript has been read and accepted for the
Graduate Faculty in Art History in satisfaction of the
dissertation requirements for the degree of Doctor of Philosophy.

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ABSTRACT

LANGUAGES OF VISION: GYORGY KEPES
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by

Elizabeth Finch

Advisor: Professor Geoffrey Batchen

Relying on archival and published sources, this study of the Hungarian-American artist Gyorgy Kepes (1906–2001) analyzes how his belief in the social role of the artist—a belief he came to embrace prior to his arrival in the United States—figured in his post-World War II practice as an artist, teacher, and cultural theorist. In particular, it demonstrates that, like other modernists, Kepes responded to the challenges of his epoch by conceiving of various paths to “wholeness” and “order.” Principal among these paths was the desire to enact an interdisciplinary “ethic” that would lead to the “union of the arts and sciences.” It shows how Kepes pursued these stated ideals—which resonated with emerging postwar concepts of universal structures evident in the Unity of Science movement and linguistics—by advocating for collaborations between artists and scientists at the Massachusetts Institute of Technology, where he taught from 1946 to 1974, and by integrating scientific photographs into his books and exhibitions. While I acknowledge Kepes’s indebtedness to the Hungarian artist László Moholy-Nagy, with whom he has traditionally been associated, I have sought to focus on the social and intellectual

currents that induced Kepes to expand Moholy-Nagy's general interest in technology and science into an all-encompassing aesthetic credo. Kepes took the modernist ideal of a social and technological utopia into the late twentieth century, where its biases toward "modern man" eventually came under attack.

The dissertation is divided into an Introduction and four chapters. The Introduction outlines the topic in relation to the extant literature on Kepes. Chapter One demonstrates the significance of Kepes's early career in Budapest, Berlin, and London to his postwar activities in the United States. Chapter Two discusses his experiences in Chicago, where he taught photography, graphic design, and advertising at the New Bauhaus. Chapter Three analyzes Kepes's teaching, exhibition, and publication initiatives at MIT. Chapter Four documents the founding of the Center for Advanced Visual Studies at MIT in 1967, where Kepes pursued art projects on a "civic scale" in an effort to encourage a sense of community during a period of tumultuous social unrest.

ACKNOWLEDGEMENTS

While it is true that every dissertation is the last stage of a long process, this is particularly true of mine. Much of my time at CUNY has been spent while concurrently working elsewhere in the arts. This work was both personally and professionally formative and constitutes part of the foundation that finally brought this dissertation to fruition. Another part, equally important, was my teachers. First and foremost, I thank the members of my committee. This study would not have been completed without the guidance and good will of my advisor, Geoffrey Batchen. Prof. Batchen's commitment to critically engaged scholarship and to the process of writing and learning has been an abiding inspiration that I will continue to aspire to in my future work. I also offer my sincere thanks to Rose-Carol Long, the second reader of this dissertation, whose classes were the genesis of my interest in the Bauhaus and its cultural legacy. Likewise, Rosemarie Bletter's courses in architectural history were invaluable resources as I contemplated Kepes's years as a professor at the School of Architecture and Planning at MIT. And insights gained from Romy Golan's course on postwar European art contributed to my decision to pursue a research project dedicated to Kepes, an artist who retained significant ties to his country and continent of origin. Beyond the members of my dissertation committee, I thank Sally Webster for crucial support and advocacy at the beginning stage of this study. And I will always remember Carol Armstrong's inspiring courses on photography and Manet. Years ago, Rolf Meyerson, in the Department of Sociology, encouraged me to apply

to the Graduate Center, initiating the rewarding period of intellectual inquiry that has been my experience at CUNY, and for this I am sincerely grateful.

Although I never had the honor of meeting Gyorgy Kepes, who died in 2001, I wish to convey my profound thanks to those members of his family, friends, and colleagues who generously shared with me their recollections of his life and career. In particular, I thank Juliet Kepes Stone for her thoughtful insights and for the access she granted me to her father's papers. In addition, I have had the pleasure of getting to know the artist Otto Piene, director emeritus of the Center for Advanced Visual Studies (CAVS) at MIT, and his wife, the artist Elizabeth Goldring. Their intimate knowledge of Kepes and his mission as the founder of CAVS has been invaluable. For initiating my contacts at MIT, I am indebted to John Hanhardt at the Guggenheim Museum. Joan Brigham, Antonio Muntadas, and Keiko Prince generously relayed their experiences as former resident fellows at CAVS. Although the written result of my research could never match the vibrant memories of Kepes's family members and associates, I have endeavored for it to contribute to the growing understanding of his historical import. I thank CAVS's current director, Krzysztof Wodiczko, and associate director, Larissa Harris, for allowing me to spend time at the Center, contemplating its past while they shaped its future. My research affiliation at MIT would not have been possible without the support of Dean Adèle Naudé Santos and Diane McLaughlin, Assistant Dean for Finance and Administration, of the School of Architecture and Planning.

In the early stages of writing I benefited from participating in a dissertation workshop at the Getty Research Institute that was conducted by Roberta Panzanelli

and facilitated by Martha Ward and Jonathan Weinberg. Joy Wiener aided my research at the New York office of the Archives of American Art. At MIT, Nora Murphy of the Institute Archives and Special Collections was unfailing helpful, as was Jenny O'Neill of the MIT Museum. At the University of Illinois at Chicago, Mary Diaz and Doug Bicknese ably guided my access to the Institute of Design Collection.

I first came across Gyorgy Kepes's books while working in the office/studio of Hendel Teicher and Terry Winters. I deeply appreciate Hendel and Terry's friendship and their encouragement as this project developed. In addition, I have drawn on the support and advice of many other colleagues and friends, especially Anastasia Aukeman, Cecilia Clarke, Mary Ann Costa, David Crocker, Claire Daigle, Jean Dykstra, Christopher de Fay, Max Goldfarb, Lise Kjaer, Craig Houser, Donald Langmead, Ingrid Schaffner, Doriennne Sorter, Allyson Strafella, Richard Tsao, Kathryn Tuma, Elizabeth Watson, Lydia Yee, and Mirko Zardini.

My deepest thanks are offered to Bruce Dow, who has been the most steadfast and patient advocate of this project, while also reminding me, in ways gentle and wondrous, that much of life is extracurricular.

This work is dedicated to my mother, Margaret Reed Finch, and to the memory of my father, Robert C. Finch.

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INTRODUCTION

We live in history and we live in society. Yet even though we may recognize that our lives are secured by the combined efforts of the social body, our explosive, unresolved mid-twentieth-century life compels us, as individuals, to return again and again to the basic questions: What am I? Where have I been? Where am I going?

Gyorgy Kepes, 1965¹

In late 1937, the Hungarian artist Gyorgy Kepes (1906–2001) boarded a boat in England bound for the United States.² Upon arrival in New York, he continued on to his intended destination, the Midwest and specifically Chicago. Kepes had been invited to teach at the New Bauhaus, which had been recently founded by his fellow countryman, the artist László Moholy-Nagy, under the aegis of a group of Chicago

¹ Gyorgy Kepes, “The Visual Arts and the Sciences: A Proposal for Collaboration,” *Dædalus*, “Science and Culture” issue, 94, no. 1 (Winter 1965): 117.

² Gyorgy Kepes embarked on this voyage with his wife, Juliet Kepes (1919–1979), formerly Juliet Appleby. The couple had met in London and were wed just prior to leaving for the United States. Juliet Kepes attended the New Bauhaus and became an artist and illustrator. She is primarily known for her children’s-book illustrations, including those for a book of poems edited by Herbert Read, *This Way, Delight: A Book of Poetry for the Young* (New York: Pantheon Books, 1956).

businesspeople. This was Kepes's third relocation to a new city in a new country in seven years, his first move having taken place in 1930, when he left Budapest to work in Moholy-Nagy's Berlin-based design practice. I will return in this introduction and in Chapters One and Two to the years of Kepes's westward passage and to the nature of his long and close association with Moholy-Nagy. But I have sketched these few biographical details in order to introduce the principal thematic guiding this study. A few more details will round out the picture. In 1937 Kepes's English was limited, so too was his knowledge of photography, one of the subjects Moholy-Nagy, as the New Bauhaus's director, had assigned him to teach. In fact, Kepes had never taught, nor had he attended the Bauhaus. And he had yet to establish his name as an artist, as had Moholy-Nagy when Walter Gropius recruited him to teach at the Bauhaus in 1923. What recommended Kepes for a position as one of the founding instructors of the New Bauhaus was his conviction regarding the role of the artist in society. Like Moholy-Nagy, Kepes believed that the artist was a guiding social force, able to interpret and render newly intelligible what both artists and many of their peers characterized as the expanding scale and speed of modern life.³

This dissertation seeks to understand how Kepes's belief in the social role of the artist—a belief he came to embrace prior to his arrival in the United States—figured in his post World War II practice as an artist, teacher, and cultural theorist.

³ Moholy-Nagy most famously expressed this belief in his posthumously issued book, *Vision in Motion*. "The new artist is deeply concerned with moral obligations toward the entire society of which he feels himself a part.... However the artist is not a propagandist but *more than any other person*, a seismograph of his time and its direction, who consciously or unconsciously expresses its substance." László Moholy-Nagy, *Vision in Motion* (Chicago: Paul Theobald and Company, 1947), 352. Emphasis added.

Prior to his emigration to the United States, Kepes developed associations with Lajos Kassák and then Moholy-Nagy, artists who transformed constructivism, distancing it from its specific involvement in Soviet Russia and redefining it in terms of their contribution to the “universal” drive for human progress. This was the “spirit of construction”⁴ that Kepes encountered in Budapest in the 1920s and Berlin in the early 1930s. In the United States, Kepes, like Moholy-Nagy, increasingly emphasized the need for the artist to be attuned to contemporaneous developments in science and technology. In this respect, Kepes clearly learned from Moholy-Nagy’s experience as an instructor at the German Bauhaus from 1923 to 1928, first in Weimar and then in Dessau. Upon its founding in 1919, the Bauhaus constituted one of the sites where the collaborative reality of the workshop experience eclipsed the tradition of the artist working in isolation in his studio. Moholy-Nagy joined the Bauhaus in order to participate in the rededication of the school’s workshops, enacting a shift away from craft and towards the needs of industry. In 1937, the year of the New Bauhaus’s founding, he defined its workshops as “laboratories” manned by “art-engineers.”⁵

From the mid-1940s onward, Kepes endeavored to interact and, ideally, to collaborate with scientists and engineers. This was because he believed that under optimal (utopic) conditions, the artist was their complement. The scientist made discoveries that fed that engineer’s development of new technologies. And the artist

⁴ Briony Fer, “The Language of Construction,” in *Realism, Rationalism, Surrealism: Art between the Wars*, ed. Briony Fer, David Batchelor, and Paul Wood (New Haven: Yale University Press in association with the Open University, 1993), 88.

⁵ László Moholy-Nagy, “Outlines of an Education Program,” excerpt from a lecture given at the Knickerbocker Hotel in Chicago, 23 September 1937, in Hans M. Wingler, *The Bauhaus: Weimar, Dessau, Berlin, Chicago* (Cambridge, Mass.: MIT Press, 1969), 196.

(or the designer—the interrelation of these terms will be addressed in Chapter Three) integrated these discoveries and developments into artworks (or designs) that communicated newly recognizable embodiments of modern life.

Therefore, despite numerous parallels, Kepes's career did not mirror Moholy-Nagy's—indeed this dissertation will indicate ways that the practices of the two artists differed. Nonetheless, they both imported the same constructivist- and Bauhaus-influenced strains of European modernism into the United States. Most significant to the purposes of this study, Kepes lived the experience of the artist-emissary of European descent well into the late twentieth century. And, within a general tendency amongst artists who endeavored to work outside the traditional boundaries of the visual arts—a tendency we now commonly characterize as “interdisciplinary”—Kepes was a particularly avid collector and synthesizer of contemporaneous intellectual trends, particularly in the fields of psychology, linguistics, and the physical sciences.

This dissertation demonstrates that Kepes's conviction regarding the artist's social role became increasingly linked in the postwar years to ways of thinking about how society could be guided by an assemblage of “values” regarding the relationship of humankind to, on the one hand, nature, and, on the other hand, technology. These values were not new—he had been exposed to them in various contexts in Europe. And by mid-century he was not alone in seeing an art-and-science union as coterminous with the manifestation of Western humanism within the American context. But with the rise of the cold war, the desire to demonstrate the potential for a

benevolent society came to be charged with renewed relevance and even urgency. It was this potential that Kepes sought to envision in his postwar practice.

As we shall see, Kepes expressed this desire in terms of the search for “wholeness” and “order.” Both terms can be understood in relation to the international dissemination of constructivism—“wholeness” in this context was synonymous with the artist’s efforts to integrate his practice into the world at large; and “order” represented the rationalist/utilitarian legacy of constructive art. Yet in postwar United States, “order” became specifically associated with the ambition to facilitate *social* order, an ambition most prominently embodied in the emergence of cybernetics and systems theory in the late 1940s. With characteristic idealism, Kepes was swept up in the language of these efforts, despite the fact that his activities remained, as he acknowledged in 1969, limited to the “theoretical dimension.”⁶

Kepes’s most direct engagement with scientists and engineers took place at MIT, where he was a professor in the School of Architecture and Planning from 1946 to 1974.⁷ This study therefore provides a useful view back to a particular phase in the twentieth-century development of “higher education” in the United States. Kepes was an especially active participant in the broadening, interdisciplinary trend in education

⁶ Gyorgy Kepes, “The Center for Advanced Visual Studies,” *MIT Bulletin*, Report of the President issue, 1969, vol. 105, no. 3 (December 1969): 436.

⁷ Kepes officially retired in 1972 (at the time, MIT required retirement at the age of sixty-five), but he remained as the director of the Center for Advanced Visual Studies into 1974. Therefore his retirement was announced both in 1972 and 1974. See “Gyorgy Kepes to Retire, Will Remain at Institute,” *MIT Tech Talk*, 24 May 1972, p. 3. Paul Dinger, “‘21st Century Artist’ Quits MIT,” *Christian Science Monitor*, 28 June 1974; and William T. Struble, “Kepes to Spend Year at American Academy,” *MIT Tech Talk*, vol. 19, no. 2, 10 July 1974, p. 2.

in the United States that began to be increasingly noted, worried over, celebrated, and administered in the post-World War II years.⁸ Indeed, during this period increased demand for interdisciplinary studies emerged concomitant with awareness of growing disciplinary *specialization*, particularly in the sciences. In contemporary scholarship “interdisciplinarity” is often seen as the vanguard of intellectual inquiry—open to the full spectrum of human experience, freed for the most part from academic convention and from the class-bound hierarchies associated with labeling a given cultural expression “high” or “low.” Gaining a better understanding of how we came to this belief in the superiority of the interdisciplinary approach, I contend, can help to make us more circumspect, and therefore more productively critical.

* * *

As Kepes is a lesser-known associate of the Bauhaus, it is advisable from the outset to augment the biographical facts that have been relayed so far, providing the reader with a foundation from which to consider his interrelated pursuits as an artist and teacher. Like a number of European artists in the early twentieth century, Kepes, who had trained at the Budapest Academy of Art, gave up painting for the technological allure of photography and film. He made this decision in 1928 for two reasons that were occasionally at odds.⁹ First, Kepes came to believe that light-

⁸ Although it is beyond the bounds of this study, it would be possible to consider similar interdisciplinary developments in education outside the United States.

⁹ Kepes retrospectively discusses his decision to stop painting around 1928 and resume painting around 1950 in the introduction to an issue of the journal *Dædalus* that he edited on the subject of “The Visual Arts Today.” See Gyorgy Kepes, ed., “Introduction,” *Dædalus*, “The Visual Arts Today” issue, 89, no. 1 (Winter 1960): 5. The issue was published as a book in 1963. See Gyorgy Kepes, ed., *The Visual Arts Today* (Middletown: Wesleyan University Press, 1963).

dependent media offered the most direct address to what was generally understood to be the increased speed and scale of modern, and specifically urban, life. Second, he was compelled by the notion that any artwork that was constituted by light—whether it was a photograph or a light sculpture—inevitably retained a connection to nature.

As has been stated, Kepes moved from Budapest to Berlin in 1930 to assist another Hungarian painter-turned-photographer, László Moholy-Nagy. The two worked together on Moholy-Nagy's commercial enterprise—designing books, advertisements, and stage-sets—and, occasionally, on his independently generated films. In 1935 Moholy-Nagy moved to London after a year spent working in Amsterdam. Kepes joined him in London in 1936, where the two resumed their professional association under the aegis of Moholy-Nagy's design practice. And as has also been noted, Kepes began teaching at the New Bauhaus in 1937. In 1944 he published his first book, *Language of Vision*, based on the curriculum he had developed in Chicago.¹⁰ The success of this publication gained Kepes a position at MIT in the School of Architecture and Planning. At MIT he was recognized for his “Visual Fundamentals” course and, in the mid- to late-1950s, for his work on the perception of the city (with the urban planner Kevin Lynch). In 1956 Kepes published his second book, *The New Landscape in Art and Science*, which became the model for a group of books he edited on the subject of art and science known as the Vision +

¹⁰ Gyorgy Kepes, *Language of Vision* (Chicago: Paul Theobald, 1944).

Values series.¹¹ In 1967, a few years before his retirement, Kepes founded the Center for Advanced Visual Studies at MIT, a residency program for “advanced” artists (we will meet them in Chapter Four) whose use of non-traditional media such as kinetic elements and light suggested the potential utility of their close proximity to engineers and scientists.

In addition to providing a formal platform for Kepes’s curriculum, *Language of Vision* also documented and illustrated his conceptualization of two terms—the first is *light* (which has already been mentioned) and the second is *vision*. For the remainder of his career these paired terms functioned as metaphors for the search to know nature and human nature through scientific discoveries and artistic expression. Although Kepes and his associates (most prominently Moholy-Nagy) shared a belief in the viability of non-traditional media and these media often utilized light, their pairings of light and vision can be understood as a defense of traditional humanist values. Light was enlightenment; vision coeval with the human capacity to envision.

Light and vision were also deployed by Kepes to exemplify what he saw as the value of the artist’s immersion in society, a value that had numerous early twentieth-century permutations and visualizations, from Russian constructivism and the Bauhaus in Europe, to the Ashcan school in the United States. After World War II, Kepes increasingly emphasized what he saw as the urgency of this art-and-life principal, taking steps to project his identity as an artist in society farther and farther into the “environment,” so far, in fact, that it was effectively dispersed, becoming

¹¹ Gyorgy Kepes, *The New Landscape in Art and Science* (Chicago: Paul Theobald, 1956). The Vision + Value series, which appeared in 1965 and 1966, was published by George Braziller, New York. The series is discussed in Chapter Four.

boundless. As we shall see, he did this by first abandoning his hold on photographic authorship and then by disavowing the agency of photography itself. Yet far from relinquishing a belief in the modern subject, these moves sought to reassert a sense of an integrious Self that was nonetheless integrally linked to society at large.

It is important to note from the outset that Kepes was an interpreter rather than an inventor or experimenter. His struggle to understand and come to terms with the maturation of “big science” on the American university campus is woven into his artworks and books. He is of interest precisely because he was *not* a prodigy, like his MIT colleague, the mathematician Norbert Wiener, or even a theorist of boldly innovative proclamations, such as his acquaintance Marshall McLuhan. The accomplishments of Wiener and McLuhan and those of their peers, some of whom we will meet in these pages, were prodigious, but they fail, for the most part, to capture a sense of the period’s indeterminacies, its troublesome doubts. Even during the cold war, when anxieties about the unchecked power of science seemed to mount day-by-day, Kepes maintained his belief in human progress and the possibility of a new and better future. In this respect he was of like-mind with Naum Gabo. But the world around them began to question their optimism. This is how Martin Hammer and Christina Lodder have characterized Gabo’s postwar experience in the United States:

The events [of World War II and the onset of the cold war] hardly seemed conducive to a sense of optimism about science and the human condition. Among younger intellectuals in both Europe and America, the war and its aftermath provoked widespread disenchantment with utopian thinking... Gabo continued to view the disintegration of values in contemporary life as a necessary prelude to the emergence, at some unspecified point in the future, of a better world.¹²

¹² Martin Hammer and Christina Lodder, *Constructing Modernity: The Art and Career of Naum Gabo* (New Haven: Yale University Press, 2000), 318. Gabo arrived

We are perhaps overly familiar with the present-day technological outcomes of the research that Kepes witnessed in formation at MIT, albeit from the vantage point of a self-acknowledged amateur. In the everyday these outcomes—products mostly—are at once deeply personal and profoundly mundane, ranging from the laptop computer, to the mobile phone, to the stickered barcodes that identify us at the local blood bank. Familiarity, coupled with a tendency, in both specialized and popular contexts, to be smitten with media and technology as *contemporary* realities, often cause us to overlook the institutional and disciplinary vestiges of instructive modernist precedents.¹³ Thoughts about and visualizations of what contemporaneous technological developments (such as the computer) might mean for society can be found in Kepes's eclectic practice. Moreover, echoes of his belief in the compatibility of art and science remain, as we shall see, literally inscribed in MIT's buildings as well as sections of its curriculum, especially in the areas of art history and art practice. This study therefore asks whether the example of a particular artist (Gyorgy Kepes) in a particular place (Cambridge, Massachusetts) at a particular moment (the

in the United States in 1946, the year that Kepes was hired by MIT. The two artists were in contact, particularly during Gabo's years in the United States. Gabo contributed to two of Kepes's editorial projects. See Naum Gabo, "Art and Science," *The New Landscape in Art and Science*, 21-28; and idem, "Statements and Documents," *Dædalus*, "The Visual Arts Today" issue, ed. Gyorgy Kepes (vol. 89, no. 1, winter 1960), 79-126.

¹³ My thinking on this issue of a contemporary blindness to the technological past has benefited from the writings of Geoffrey Batchen. See, for instance, Geoffrey Batchen, "Obedient Numbers, Soft Delight," in *Each Wild Idea: Writing, Photography, History* (Cambridge, Mass: MIT Press, 2001), 165-74; idem, "Ectoplasm: Photography in the Digital Age," in *Over Exposed: Essays on Contemporary Photography*, ed. Carol Squiers (New York: New Press, 1999), 9-23.

United States from the mid-1940s into the early 1970s) can illuminate the past in a way that is relevant to the present.

* * *

In 1965 Susan Sontag published an essay describing the characteristics of a “new sensibility.”¹⁴ This phrase, in fact, formed the second half of the essay’s title. The first half was another two-word phrase—“one culture”—posited in begrudging acknowledgement of C. P. Snow’s infamous lecture on the “two cultures.”¹⁵ The lecture appeared as a small book in 1959, but what this volume lacked in heft it made up for in audacity.¹⁶ The main idea was not new: there had developed, Snow wished to point out, a deep chasm between sciences and the humanities.¹⁷ The writer made a

¹⁴ Susan Sontag, “One Culture and the New Sensibility” (1965), in *Against Interpretation and Other Essays*, rev. ed. (New York: Picador, 2001), 293-304. This essay first appeared in *Mademoiselle*.

¹⁵ The Rede Lecture at Cambridge University, 1959.

¹⁶ Audacity was good for book sales. There were three re-printings of *The Two Cultures* in 1959, the same year that the first edition appeared—a fair showing for what was essentially a pamphlet coming out of Cambridge University. These printings were followed by three more in 1960, two in 1961, and two again 1962. C. P. Snow, *The Two Cultures* (Cambridge: Cambridge University Press, 1959). In 1998 *The Two Cultures* was republished with an informative introduction by Stefan Collini. C. P. Snow, *The Two Cultures* (1959), introduction by Stefan Collini (vii-lxxiii), rev. ed. (Cambridge: Cambridge University Press, 1998). My citations of *The Two Cultures* are from this edition, whose pagination nonetheless duplicates the original edition.

¹⁷ Historians generally date the conceptualization of the art and science dyad to the seventeenth century, but it did not constitute an “anxiety” until the nineteenth century. See Caroline Jones and Peter Galison, eds., “Introduction,” *Picturing Science, Producing Art* (New York: Routledge, 1998), 2; and Stephen Jay Gould, *The Hedgehog, the Fox, and the Magister’s Pox: Mending the Gap between Science and the Humanities* (New York: Harmony Books, 2003), especially 11-20, 34-112. See also Collini’s introduction to the reissue of *The Two Cultures*, ix-xvii.

halfhearted attempt at the appearance of impartiality, but his allegiance was clearly with the scientists. This was because, as he saw it, those responsible for the rift were the “intellectuals”—writers and artists principally—who were too selfish, too nihilistic, too unconcerned with the woes of the world. The scientists, in contrast, possessed all the constructive qualities that the intellectuals lacked—can-do optimism, analytic and technical skills for the amelioration of social ills. Snow compared the chasm to “the kind of joke which has gone sour,” a description that does a fair job at capturing his tone as a writer.¹⁸

While Sontag could dismiss Snow’s description of this “purported chasm” as “crude and philistine,” she was less cavalier when it came to what she saw as the concerns of “20th century intellectuals who talk of modern society as being in some new way incomprehensible, ‘alienated.’”¹⁹ Or so it would seem, until we arrive at the author’s direct address to the intellectually disenfranchised: “Outraged humanists, please note. There is no need for alarm.”²⁰ This is because, she says, “The conflict between ‘the two cultures’ is in fact an illusion, a temporary phenomenon born of a period of profound and bewildering historical change. What we are witnessing is not so much a conflict of cultures as the creation of a new (potentially unitary) kind of

¹⁸ Snow, *The Two Cultures*, 11.

¹⁹ Sontag, “One Culture and the New Sensibility,” 293, 294. While Sontag acknowledges T. S. Eliot’s tracing of the two-cultures rift back to the seventeenth century, she (like Stefan Collini, see n. 17) is more inclined to consider “the connection of the problem with the Industrial Revolution.”

²⁰ *Ibid.*, 300.

sensibility.”²¹ Like Snow and the outraged humanists, Sontag saw signs of the two cultures, too, but she did not believe in them; they were little more than phantom shadows hovering over a (potential) new existence.

Nonetheless, she goes on to detail the very real manifestations of change that generated the controversy: speed and mobility (of images, of modes of transport); population growth and consumerism; and the impressive “pan-cultural perspective on the arts that is possible through the mass reproduction of art objects.”²² In support of this assessment of potential unity in the face of change, Sontag’s essay “One Culture and the New Sensibility” includes a list of individuals (from diverse disciplines but uniformly male), who the writer identifies as being representatives of this “new cultural alignment.” It is here that we find the name of Gyorgy Kepes, whose activities as an artist, educator, and social theorist are the focus of the present study.²³

It is tempting to speculate how Sontag, who unapologetically maintained the right to reconsider and revise her opinions, would have returned, in time, to her characterization of “one culture.” How, moreover, would she have viewed Kepes’s inclusion on her list of those shaping the “new sensibility” had she returned repeatedly to his writings or immersed herself in the books he edited that appeared

²¹ Ibid., 296.

²² Ibid.

²³ Ibid., 298. The other members of this idiosyncratic list are Nietzsche, Wittgenstein, Antonin Artaud, C. S. Sherrington, Buckminster Fuller, Marshall McLuhan, John Cage, André Breton, Roland Barthes, Claude Lévi-Strauss, Sigfried Giedion, and Norman O. Brown.

after the publication date of her essay?²⁴ It is my belief that Sontag would have eventually concluded that Kepes's essays, in congress with many of his photographic images (either made or collected by him), contributed to what she characterized (in a disparaging reference to the disenfranchised constituents of the "literary-artistic" realm) as the "ever vaguer ideology of 'humanism.'"²⁵

This speculation effectively describes the outcome of my own conceptual trajectory as I grappled to understand the cultural productions of an artist who, I maintain, had a career of considerable historical significance. To put it a different way, my wonder at the images contained in Kepes's books remains undiminished, but alongside this wonder has grown equal degrees of circumspection and puzzlement. Explaining why this is so is the underlying motivation of this study. My purpose is neither to diminish nor to buoy up Kepes's stature, but to see him as an artist and thinker who attempted to make sense of what Sontag so aptly characterized as "a period of profound and bewildering historical change."²⁶

²⁴ The first books in Kepes's Vision + Value series began to appear in 1965, but Sontag's reference to Kepes is more likely based on the special issue of the journal *Dædalus* (vol. 89, no. 1, winter 1960) that he edited on "The Visual Arts Today." In 1996, Sontag wrote a brief reassessment of *Against Interpretation*, which was published as the afterword "Thirty Years Later" in a Spanish translation of the essay collection in 1996 that appeared in English in 2001. Although she does not refer specifically to "One Culture and the New Sensibility," she does mention her use of lists. "What I don't like are those passages in which my pedagogic impulse got in the way of my prose. Those lists, those recommendations! I suppose they are useful, but they annoy me now." Susan Sontag, "Thirty Years Later," in *Against Interpretation* (1966), rev. ed. (New York: Picador, 2001), 309.

²⁵ Sontag, "One Culture and the New Sensibility," 294.

²⁶ *Ibid.*, 296.

* * *

Today Kepes is remembered as a constituent of what I will conditionally designate as the “second-wave” of the Bauhaus. Within this scheme, the first-wave consists of those individuals who established, taught at, and ran the Bauhaus in Germany between 1919 and 1933. A partial list of the key figures includes the Bauhaus’s founder Walter Gropius, as well as the teachers and apprentice teachers Johannes Itten, Paul Klee, Wassily Kandinsky, Lyonel Feininger, Oskar Schlemmer, Josef Albers, Marcel Breuer, Moholy-Nagy, Herbert Bayer, and Gunta Stözl, and the directors who succeeded Gropius—Hannes Meyer in 1928, and Ludwig Mies van der Rohe in 1930. A number of individuals on this list left Germany for the United States before the outbreak of World War II.²⁷ Anni and Josef Albers arrived at Black Mountain College in 1933. Gropius and Breuer established themselves at Harvard University in 1937, the same year that Moholy-Nagy founded the New Bauhaus in Chicago. At the Museum of Modern Art, the designer Bayer, who relocated to New York in 1938, introduced an immersive and didactic approach to exhibition design that often included photographs enlarged to a scale that equaled and even dwarfed the viewer. Other Bauhäuslers, such as the painters Kandinsky and Klee, who remained in Europe, saw their works become central to the American entry into the

²⁷ My focus on the Bauhaus legacy in the United States stems from the obvious reason that Kepes spent the majority of his career in Cambridge, Massachusetts. Nonetheless, the German exodus set off by World War II confirmed the Bauhaus’s status as an international concept. For accounts of the greater Bauhaus diaspora, see Eckhard Neumann, *Bauhaus and Bauhaus People* (New York: Van Nostrand Reinhold, 1970); and Alan Bartram, *Bauhaus, Modernism and the Illustrated Book* (London: British Library, 2004).

museological presentation of modern art. The members of the first-wave, therefore, had a profound impact on how the Bauhaus came to be understood in the United States, a process of cultural exchange that began to occur, as Margret Kentgens-Craig has shown, well before the wartime emigrations.²⁸

By distinguishing between the Bauhaus's first- and second-waves, I do not wish to suggest that the German years of the Bauhaus can be embodied by a single individual, program, philosophy, or style. On the contrary, I agree with Kentgens-Craig and other Bauhaus scholars that there was no single Bauhaus identity despite the present-day tendency of Dessau-period designs—such as the lighting fixtures of Marianne Brandt and the tubular steel chairs of Marcel Breuer—to shine in auction-house catalogues and to multiply in more commonly available facsimile editions. This is the Bauhaus style that can be traced back to Gropius's lecture "Art and Technology—A New Unity," which he delivered in Weimar in the summer of 1923.²⁹ Between 1930 and 1942 Kepes had, as we know, a professional association with Moholy-Nagy, the symbolic embodiment of this "new unity." This would suggest that Kepes held a greater affinity with the Dessau Bauhaus. But as we shall see in Chapter

²⁸ See Margret Kentgens-Craig, *The Bauhaus and America: First Contact 1919-1936* (Cambridge, Mass.: MIT Press, 1999), 37-103. Another source for information about the early impact of the Bauhaus is Jeannine Fiedler, ed., *Social Utopias of the Twenties: Bauhaus, Kibbutz, and the Dream of the New Man* (Wuppertal, Germany: Müller und Busmann for the Bauhaus Dessau Foundation; Tel Aviv: Friedrich-Ebert Foundation, 1995).

²⁹ Wingler, *The Bauhaus*, 5. Gropius reiterated this shift from craft to technology in 1924. "Art and technology—a new unity! Technology does not need art, but art very much needs technology—example: architecture!" Walter Gropius, "Breviary for Bauhaus Members (draft)," in Wingler, *Bauhaus*, 76.

One, his Bauhaus affinities were also shaped by earlier allegiances that tied him as much if not more so to the Weimar Bauhaus (and its pre-histories) as to the technologically infatuated Dessau years.

With these provisos in mind, I would suggest that Kepes belongs to the second-wave of the Bauhaus for two reasons that will be significant to the development of this study. First, is the simple fact that he was born in 1906 and was therefore ten to twenty years younger than many of the artists, architects, and designers who stewarded the Bauhaus in Germany. This is particularly the case if we consider that, after Moholy-Nagy (1895–1946), the Bauhaus representative with whom Kepes had the most contact, both in Europe and in the United States, was Gropius (1883–1969).³⁰ Second, Kepes, as I have previously mentioned, never attended the German Bauhaus, and his initial foray into teaching was at the New Bauhaus in Chicago. Having assisted Moholy-Nagy on commercial projects, Kepes had a close and, as will become evident, frequently contentious connection to this prominent exemplar of the Bauhaus experience. Therefore, in contrast to the Bauhaus's first-wave, Kepes's demonstrable conception of the German school matured in the United States. He learned about the Bauhaus by figuring out how to teach its educative ideals, which he had garnered primarily from Moholy-Nagy, in a distinctly different cultural context—the American Midwest.

³⁰ Marcel Breuer, who was only four years Kepes's senior, was the third close pre- and post-emigration Bauhaus contact. Compared to Kepes's relationship to Moholy-Nagy and Gropius, his relationship with Breuer was more equitably collegial, less a matter of mentor to mentee.

Kepes is a compelling figure to study if we wish to understand what became of the Bauhaus in the United States from the post-World War II years into the Vietnam era. He was there. Yet if we consider an overview of his experience—coming from Europe with a tangential understanding of the Bauhaus, settling in the United States as a New Bauhaus instructor—his particular circumstances are remarkably unusual. He is somewhere between an undeniably central figure of the first-wave such as Moholy-Nagy, and an artist born in the United States, such as Robert Preusser, an undeniable member of the Bauhaus’s second-wave whose education at the New Bauhaus in Chicago inspired him to use aspects of its teaching methods for the remainder of his career, much of which was spent at MIT working with Kepes.

The second-wave of the Bauhaus has been less studied for reasons that make such perfect sense that they are ripe for reconsideration. By definition, the second-wave is tainted by a perceived lack of originality and uniqueness; it fails to possess the marketable quality of being “first.” Moreover, it suggests several states of being, all derogatory—second-best, second-tier, second-hand. This effect is compounded when the artist in question never gained significant domestic or international recognition as a producer of marketable, unique art objects.³¹ As has already been noted, much of Kepes’s career was spent teaching and making books, hardly the types

³¹ Despite a low-profile elsewhere, Kepes did begin to present his work regularly in Boston galleries beginning in the early 1950s, first at the Margaret Brown Gallery and later at the Swetoff and Alpha galleries. And between 1960 and 1972 he had occasional one-artist exhibitions at the Sainenburg Gallery in New York. But his work had never been the subject of a museum show in New York prior to the exhibition *Gyorgy Kepes: Light Graphics* at the International Center of Photography in 1984.

of activities that send art dealers and collectors into overdrive. And in the 1960s, he increasingly committed himself to making artworks that were not only “environmental”—i.e., outside the realm of the gallery or museum—but also collaboratively made, eschewing the market-bound tradition of individual authorship.

When Kepes’s career was established enough to attract interviewers—this took place from the 1960s onward—he made a concerted effort to disassociate himself from the Bauhaus. Perhaps he foresaw what has in fact transpired: on the infrequent occasions when he is mentioned in Bauhaus scholarship, it is as the offspring of a more potent source. He is identified as an artist who was “influenced” by the Bauhaus, rather than one who sought out the Bauhaus, responded to and transformed its ideas, and carried them into the late twentieth century. The latter approach seems, to my mind, infinitely more compelling and true to the ways that people and their ideas interact.

Nonetheless, because Kepes arrived late to the Bauhaus table, he receives only glancing notice in even the most comprehensive and inclusive studies of the school. This is his fate in Hans Wingler’s *Bauhaus: Weimar, Dessau, Berlin, Chicago*, and particularly in Jeannine Fiedler and Peter Feierabend’s *Bauhaus*. Kepes and his works receive slightly more coverage in the exhibition catalogue *Taken by Design: Photographs from the Institute of Design, 1937-1971* (the New Bauhaus became the School of Design in 1939 and the Institute of Design in 1944), but this publication understandably remains focused on his years in Chicago, 1937 to 1943. Perhaps most surprisingly, Kepes is never mentioned in Kentgens-Craig’s *The Bauhaus in America*. Admittedly this study is primarily concerned with “first contacts”—contacts before

1933—but it also details how these contacts manifested themselves in later years, particularly in regard to the Bauhaus’s legacy in education.³² One indirect result of the present study is that it offers an alternative to Kentgens-Craig’s assessment of the Bauhaus’s reception in the United States as having tended “to reduce a complex and multifaceted phenomenon to a simple formula, most often couched in architectural examples.”³³

Monographic sources on Kepes’s art are restricted to a handful of exhibition catalogues, most of which appeared in the 1970s and 1980s. One of the earliest, *Gyorgy Kepes: Works in Review*, was published in 1973 by the Museum of Science, Boston.³⁴ This slim publication contains a condensed, illustrated overview of Kepes’s artworks and commercial designs (photographs, photograms, paintings, light sculptures, advertisements, and exhibition installations) and brief essays by an impressive roster of writers (psychoanalyst Erik H. Erikson, art historian Rudolf Arnheim, poet Matthias Goeritz, and artist Otto Piene). Yet on the whole the texts are personal ruminations on the artist and his accomplishments (the title of Erikson’s essay is “For Gyorgy Kepes”), congenial accompaniments to a show presented around the time of his retirement from MIT. What is intriguing about this catalogue is that it was intended to document the first comprehensive survey of Kepes’s career, a rite of passage that took place, not in an art museum, but in a museum of science.

³² Kentgens-Craig, *Bauhaus and America*, 224-31.

³³ *Ibid.*, xi.

³⁴ *Gyorgy Kepes: Works in Review*, with essays by Rudolf Arnheim, Erik H. Erikson, Matthias Goeritz, and Otto Piene, exh. cat. (Boston: Museum of Science, 1973).

Nonetheless the catalogue's austere white cover—it includes only the exhibition's title, set in black type—effectively masks any significance implied by the exhibition's scientific affiliation.³⁵

A historically comprehensive account comprises the catalogue *Gyorgy Kepes: The MIT Years, 1945-1977*, which was produced by MIT's Hayden and Margaret Hutchinson Compton galleries and published in 1978 in association with MIT Press.³⁶ This catalogue includes a detailed, although largely biographic, essay on Kepes by the art historian Judith Wechsler. Indeed, this essay closely coincides with the standard life story that the artist shaped and reiterated in the last years of his career. Recently a very different approach to the analysis of selected aspects of Kepes's practice has manifested itself in the scholarship of the architectural historian Reinhold Martin. I will return to Martin's work in this introduction, but it is important to note here one of its principal distinctions: It succeeds in de-mythologizing Kepes, contextualizing his stated motivations so as to reveal the thematic dimensions of the autobiographical narrative he repeated in his late career.³⁷

³⁵ The cover of the 1973 Museum of Science catalogue compares to the brochure published by the Center for Advanced Visual Studies to coincide with its dedication in 1968, but the earlier publication, also white except for the title text, included an embossed image—an interlocking form, like a blocky rather than sinuous version of the yin-yang symbol. *Center for Advanced Visual Studies*, brochure (Cambridge, Mass.: Massachusetts Institute of Technology, ca. 1968). The same form later appeared as a black-and-white image, rather than an embossment, on the cover of Kepes's last book, *Arts of the Environment* (New York: George Braziller, 1972).

³⁶ *Gyorgy Kepes, The MIT Years: 1945-1977*, with essays by Judith Wechsler and Jan van der Marck, exh. cat. (Cambridge, Mass.: MIT Press, 1978). This catalogue also includes brief excerpts from Kepes's writings.

³⁷ Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, Mass.: MIT Press, 2003). This book is based on

Although I have sought out Kepes's appearances in the Bauhaus literature, consulted the handful of monographs, and addressed scholarship emerging out of the field of architectural history, my research has principally relied on the artist's papers, artworks, published writings, and his publishing ventures, namely his work as an editor and designer of books. With the exception of the rare photograph or drawing, most of these materials date from after his 1937 arrival in the United States. The bulk of Kepes's papers are held by the Archives of American Art in Washington, D. C. In addition I consulted the Institute of Design archive at the University of Illinois at Chicago and several repositories at MIT—the Institute Archives and Special Collections, the MIT Museum, and the Center for Advanced Visual Studies. In each of the archives that possess records pertaining to Kepes's professional life I have also learned from the traces left behind by his peers and associates. Such informative encounters doubtlessly contribute to any monographic study, but this is particularly true in the case of Gyorgy Kepes. As will become evident, Kepes was a consummate “networker,” and tracing his network of colleagues and acquaintances, including those who contributed to his publications, was a tangential interest that developed into an informative necessity.

Another necessity was bibliographic—consulting the books that Kepes cited in interviews and in his writings as being important to his art and pedagogy. Many of these books belong to the domains of the sciences (principally physics, biology, psychology); others are works of philosophy; some are hybrids of science,

Martin's dissertation. Idem, “Architecture and Organization: USA, c. 1956” (Ph.D. diss., Princeton University, 1999). See also, idem, “Organicism's Other,” *Grey Room* 4 (Summer 2001): 35-51.

philosophy, and art, such as Susanne Langer's masterful *Philosophy in a New Key* (1942); and still others are popular and polemical treatments of the art-and-science debate, such as Charles Biedermann's *Art as the Evolution of Visual Knowledge* (1948).³⁸ In keeping with his Bauhaus roots, Kepes was more inclined to reference books on architecture and urban planning than art. One of the books of art history that he made note of was Kenneth Clark's *Landscape Painting* (1950), which, as will be made evident in Chapter Three, figured in Kepes's discussion of nature in his book *The New Landscape in Art and Science*.

In addition to the books Kepes cited were the many contributors—by my count there were 116, representing more than thirty fields—to his editorial endeavors. It would be impossible within the boundaries of this study to do justice to the accomplishments of each member of this eclectic association, which ranged from the geneticist C. H. Waddington, the systems theorist Ludwig von Bertalanffy, and the anthropologist Edmund Carpenter, to the poet Richard Wilbur and the artist Naum Gabo. (As this list is intended to suggest, Kepes's human panoply only occasionally included women.) To better understand Kepes's intellectual pursuits, I established the types of contributors he approached (some of his requests for submissions went

³⁸ Susanne K. Langer, *Philosophy in a New Key* (Cambridge, Mass.: Harvard University Press, 1942). Charles Biedermann, *Art as the Evolution of Visual Knowledge* (Red Wing, Minn: C. Biedermann, 1948). Martin Hammer and Christina Lodder have described Biedermann's book as "a monumental summation of many of the ideas which had been integral to pre-war Constructivism, especially those concerning correspondences between artistic abstraction and the modern scientific world view." Hammer and Lodder, *Constructing Modernity*, 319.

unfulfilled).³⁹ In general these types paralleled his bibliographic interests. This study addresses a few of the contributions to Kepes's books in depth, while others generally inform or reinforce its themes. And, lastly, to better grasp the ideas that engaged Kepes during his lifetime, I have relied on secondary historical treatments in related fields. These books were among this researcher's most felicitous "discoveries" and references to them will appear throughout this study.

There is one more point to make here about Kepes's books. It was through writing, editing, and graphic design that he emphatically outlined—in words and images—his artistic and intellectual alliances and, with equal purpose, found ways to express his divergences from them. Bookmaking forced Kepes to juggle thematically organized visual and textual content, not to mention the intellectual and artistic agendas of contributors drawn from his life before and after his emigration to the United States. While the foundation of Kepes's interdisciplinary ethic was established in Europe before World War II, its intellectual and artistic scope was manifested in print in the United States of the mid-to-late twentieth-century.

* * *

My initial intention when I embarked on this study was to trace Kepes's shifting conceptions of "wholeness" and to show, in particular, how this term shaped his postwar activities as a writer, artist, teacher, and editor of books on art and science. References to "wholeness" can be found throughout Kepes's writings over the full stretch of his career. This term, therefore, suggested the possibility of a

³⁹ Kenneth Clark, for instance, declined to contribute to *The New Landscape in Art and Science*.

conceptual umbrella, seemingly overarching the artist's most persistent and universalizing references, most notably two I have already designated—vision and light—but also “organicism,” which will be provisionally addressed below. I therefore set out to analyze Kepes's deployment of “wholeness”—to discover why he used it, how its use did and did not shift with time, and how he sought to represent it visually. Far from abandoning this approach, which seemed at the outset relatively straightforward, I have steadily gained an appreciation of the historical complexities and potential pitfalls of the word Kepes found so representative of his aspirations.

Kepes invoked “wholeness,” I came to understand, in a variety of contexts and, ostensibly, for a variety of reasons. Although he always utilized this word in the singular, “wholeness,” to my mind, became “wholenesses.” Of course, Kepes did not invent or even reinvent the word he found so recommendable.⁴⁰ But he repeatedly made it his own, if only by expounding its contemporary relevance. At this juncture, a few representative examples of Kepes's use of this term (and its etymological relations) will suffice. These examples, as well as others, will be returned to and developed in each of the chapters that follow.

As has been noted, Kepes often spoke of or wrote about his conviction that the artist should not separate himself from society. (The gender used to describe the possessor of this conviction adopts Kepes's usage, which was and is, for the most part, in keeping with convention.) When expressing his belief in the artist's social

⁴⁰ The Oxford English Dictionary specifies that the word “whole” is derived from the Old English *hál* (with cognates in Old Frisian, Old Saxon, Middle Dutch, Middle Low German, Old Norse, etc.). Its earliest use signified the health of a person (or animal) or the completeness of a thing.

responsibility, Kepes maintained that the goal of “wholeness” or a “whole society” was a reality that was simply in need of revelation. To paraphrase, society looked at the world the wrong way, or in a way that once had been effective but was now out of date. The disjuncture between past and present had led to the “chaos”—this is another oft-used word by Kepes—of world wars, poverty, racism, alienation from technology, etc. The artist was uniquely capable of showing society how to see the world differently. Once this task had been achieved, the changes necessary to abandon chaos—to envision order—would fall into place. Kepes repeatedly referred to this revelatory goal when he sought to characterize the purpose of his practice as a photographer, as a collector of photographs and, late in his career, as an environmental sculptor. And his advocacy for the “union of art and science” ultimately stems from his utopic belief in a “whole society.”⁴¹ Thus in *Language of Vision* Kepes calls for a world in which, “knowledge and technological possessions may function unhindered as a whole.”⁴² Of course such a notion was far from new,

⁴¹ The booklet published on the occasion of the Center for Advanced Visual Studies provides a useful summary of the ways in which Kepes evoked this union. He believed in the “interdependence, even the basic unity, of science and the arts.” And he advocated for “collaborative work relationships” between artists and scientists whose roles he characterized as “complementary.” Gyorgy Kepes, *The Center for Advanced Visual Studies* (Cambridge, Mass.: MIT Press, c. 1968), n.p. That the union implied a gendered subtext is evident in a critic’s paraphrase of Otto Piene’s comments at the symposium that marked the Center’s dedication (Piene was one of the first artists to accept a fellowship at the Center). “[Piene] expressed pleasure at having been invited to the wedding [of art and science], but wondered which was the bride and which was the groom.” Grace Marmor Spruch, “A Report on a Symposium on Art and Science Held at the Massachusetts Institute of Technology, March 20-22, 1968,” part two of “Two Contributions to the Art and Science Muddle,” *Artforum*, vol. 7, no. 1 (January 1969): 28.

⁴² Kepes, *Language of Vision*, 12.

and, as I demonstrate in Chapter One, it was particularly prevalent in the 1920s when Kepes embarked on his career. But the singularity with which he pursued this elusive idea over the course of a lifetime is nonetheless distinctive.

By the late 1930s and early 1940s, Kepes had conceived of an approach to teaching artists and designers what he called “visual fundamentals,” and defined as “the elements: point, line, shape, value, form, texture.”⁴³ He developed this curriculum by relying on Gestalt psychology, to a greater degree, I argue in Chapter Two, than other Bauhaus teachers. Gestalt psychology, which emerged in the 1920s, characterized the perception of forms in terms of the perception of wholes and their constituent parts. In the now classic adage of this branch of perceptual theory, the whole is defined as “greater than the sum of its parts.” (The apparent originator of this phrase, the philosopher Christian von Ehrenfels, will be discussed in Chapter Two.) But it should be noted here that Gestalt psychology was seen as an alternative to associationism, a branch of experimental psychology that was itself an alternative to, or a reassessment of, the Kantian belief that psychology could never be a science. On the contrary, the associationists maintained that the secrets of the mind could be revealed by analyzing human reflexes mathematically. Indeed, such an approach promised immutability on par with physical law.⁴⁴ In contrast to the Gestaltists, the

⁴³ *MIT Bulletin*, Catalogue Issue, 81, no. 4 (June 1946): 99.

⁴⁴ The science historians Anne Harrington and Edward S. Reed trace the emergence of this “machinic” approach, and the reaction against it, to Germany in the 1890s. As Harrington writes, “For many in the generation of the 1890s, the conclusion... was clear: the Machine in German culture had many faces, but the machine-like rationality of the natural sciences was the engine that drove the entire monster.” Anne

associationists approached empiricism as an unproblematic mechanistic endeavor. They believed, in the words of Louis Menand, “that the reflex arc—sensation, idea, action—was the basic structure of all mental activity. It was...perfectly Newtonian, a straightforward causal model—the billiard-ball picture of the mind.”⁴⁵

When the Gestalt psychologists took issue with the analysis of the mind in terms of physical laws, they positioned themselves against not only what they saw as the encroachment of the machine into the domains of the human sciences, but also what the historian of psychology Mitchell Ash has described as the “increasing ‘atomizing’ effects of industrial society.”⁴⁶ At the height of Gestalt psychology’s impact, its defining statement regarding the “greater whole” took on the quality of an infectious refrain amongst its adherents, as if it possessed apotropaic powers capable of warding off mechanistic thinking.

Nonetheless, Gestalt theorists did not want their work to be confused with vitalism or metaphysics. On the contrary, like the associationists the Gestaltists placed great stock in empiricism, which they held to be the route to a theory of knowledge. Yet in an important shift in perspective, the Gestaltists evidenced the seen

Harrington, *Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler* (Princeton: Princeton University Press, 1996), 25. On the Kantian conception of psychology as the “impossible science” see Edward S. Reed, *From Soul to Mind: The Emergence of Psychology, from Erasmus Darwin to William James* (New Haven: Yale University Press, 1997), 22-37.

⁴⁵ Louis Menand, *The Metaphysical Club* (New York: Farrar Straus Giroux, 2001), 324.

⁴⁶ Mitchell G. Ash, “Gestalt Psychology: Origins in Germany and Reception in the United States,” in *Points of View in the Modern History of Psychology*, ed. Claude E. Buxton (New York: Academic Press, 1985), 323.

over the “real.” Specifically, they described the perceptual tendency to create wholes out of parts. Consciousness, they concluded, was prone to “characteristic togetherness.”⁴⁷ It should not surprise us that Ash has also characterized Gestalt theory as “more than a point of view within psychology; it was also a worldview and a philosophy of science.”⁴⁸ By attempting to achieve a Gestalt on any given sheet of paper, Kepes was effectively demonstrating, at the level of the particular, his belief in far more general and interrelated concepts—that people intuitively made and recognized “wholes” and, further, that the world itself was ultimately a “whole.” This was his reality in search of revelation.

As I navigated Kepes’s conceptions of “wholeness” it became increasingly clear to me that they all derived from the same underlying source: a desire to express and, by expressing, to propagate a belief in man’s essential goodness and rationality. In the post-World War II years, this belief was particularly in need of shoring up. In fact, any number of realities from the recent past (the Holocaust, the use of nuclear weapons) and the emerging present (the arms race) indicated very different conclusions.

⁴⁷ Ash, “Gestalt Psychology,” 308. Ash writes that Max Wertheimer, one of the founders of Gestalt psychology, made this assertion in his lectures in the summer of 1913.

⁴⁸ Ibid., 295. Anatol Rapoport has put this differently. “The whole is greater than the sum of its parts. There are various ways of interpreting this apparent challenge to one of Euclid’s axioms [that the whole is the *sum* of its parts] but...the slogan can hardly serve as anything but a battle cry.” Anatol Rapoport, *General System Theory: Essential Concepts and Applications*, Cybernetics and Systems Series (Turnbridge Wells, Kent: Abacus Press, 1986), 10.

Having arrived at an understanding of the underlying motivation of Kepes's deployments of "wholeness," I began to suspect my own investment in this term. At the most practical, procedural level, I came to question the readiness with which I saw it in the pages of his books, perhaps privileging it above others. To apply Sontag's telling phrase, this tendency was my own investment in an "ever vaguer ideology of 'humanism.'"⁴⁹ The plurality of Kepes's use of "wholeness" initially led me to believe that I could avoid the trap of essentialism, when, in fact, it was the "natural" functioning of this plurality (its ability to describe forms on a sheet of paper or the workings of the world at large) that made it such a useful, universally multi-dexterous term. I came, therefore, to understand "wholeness" as a component part of an *ideology*. This is a concept that has attracted its fair share of commentators.⁵⁰ I have chosen to rely on T. J. Clark's definition. "Ideology is a kind of inertness in discourse: a fixed pattern of imagery and belief, a syntax which seems obligatory, a set of permitted modes of seeing and saying; each with its own structure of closure and disclosure, its own horizons, its way of providing certain perceptions and rendering others unthinkable, aberrant, or extreme."⁵¹

⁴⁹ Sontag, "One Culture and the New Sensibility," 294.

⁵⁰ Louis Althusser, himself a theoretician of ideology, included capsule histories of theories of ideology in his influential essay "Ideology and Ideological State Apparatuses." Louis Althusser, "Ideology and Ideological State Apparatuses" (1970), in *Lenin and Philosophy and Other Essays*, trans. Ben Brewster, rev. ed. (New York: Monthly Review Press, 2001), 106-26.

⁵¹ T. J. Clark, *The Painting of Modern Life: Paris in the Art of Manet and His Followers* (Princeton: Princeton University Press, 1984), 8.

Although “wholeness” was a particularly important term for Kepes, it was nonetheless one of many that he used to express the matrix of “values” describing the shape of humanism in the mid-twentieth century. Relinquishing my singular hold on Kepes’s “wholenesses,” I began to understand his writings, which are thematically repetitive, in terms of a lexicon that encompassed words such as “organization,” “integration,” “communication,” “structure,” “balance,” “pattern,” “order.” Moreover, these terms, I realized, often appeared in Kepes’s writings in the proximity of their opposites: such as “fragmentation,” “chaos,” “segregation,” “imbalance,” “entropy,” “disorder.” Having compiled this heap of dualities, I came to sympathize with Marcel Breuer, who wrote to Kepes in 1962 to congratulate him on the publication of one of his books, only to admit, “I am getting deeper and deeper in your depth.... I have, of course, some reservations because many of the thoughts I read [in the book] are moody, confused and confusing.”⁵²

Help came from Michael Leja’s *Reframing Abstract Expressionism: Subjectivity and Painting in the 1940s*. To one familiar with Kepes’s writings, the source of this assistance might seem unlikely. This is because Kepes was notoriously dismissive of Abstract Expressionism. In fact, when enlisted to edit the winter 1960 issue of *Dædalus* on the subject of “The Visual Arts Today,” he used the opportunity

⁵² Marcel Breuer to Gyorgy Kepes, 27 March 1962. Gyorgy Kepes Papers, Archives of American Art, Smithsonian Institution, Washington, D. C. [Hereafter: Kepes Papers, AAA], reel 1211, frame 1087. Breuer does not specify which of Kepes’s books he is referring to, but he does mention Le Corbusier as a contributor. Corbusier wrote an essay for the special issue of *Dædalus* on “The Visual Arts Today.” Le Corbusier, “Architecture and the Arts,” *Dædalus*, ed. Gyorgy Kepes, “The Visual Arts Today” issue, 89, no. 1 (Winter 1960): 46-51.

to make a case against what he judged to be the excessive “inwardness” of the Abstract Expressionists who, he believed, constricted “space and meaning,” reducing artistic experience to “the kinesthetic pleasure of the act of painting.”⁵³ Kepes tries to put his point gently, like an elder counseling youths, but he ultimately wants the reader to understand that an overly inward artist is a selfish and cowardly artist. As Kepes states,

It takes a special courage today to face the heavy odds of a blighted landscape; the vulgar faces of cities; the hard, mechanical rhythm of the industrial scene, so out of time with our heartbeats, our desires, our hopes; and the fantastic expanse of cosmological pattern, from ultramicroscopic to superastronomical, unrolling from the looms of science. It takes still more courage to take this whole as a whole.⁵⁴

This passage is demonstrative of the holistically couched reasons why Kepes found most contemporary artists to be neglectful of their duties as active interpreters of contemporary existence, but the Abstract Expressionists received his most pointed criticism in this regard. To complicate matters, Kepes returned to painting around 1950, after a hiatus of more than two decades, and his painting style was not without similarities to the painters he criticized. He partially resolved this contradiction by maintaining a distinction between his private practice as a painter and his public practice as a teacher, writer, and editor of books promoting the importance of the “union of art and science.” Only when the world was set right, Kepes implied, would the two halves of his practice be united. This will occur, as he writes, when, “We can

⁵³ Kepes, ed., “Introduction,” *Dædalus*, “The Visual Arts Today,” 11.

⁵⁴ Ibid.

move once more with confidence through the world.”⁵⁵ And this confidence can only be attained if society, through the help of artists, comes to terms with its new *scale*. The scale shift (from the very small, to the very large) was “unrolling from the looms of science,” and proof of its existence could be found, not on canvases, but in the photographic evidence garnered from laboratories.

Despite Kepes’s ambivalent relationship to the contemporary painters that constitute the focus of Leja’s study, *Reframing Abstract Expressionism* presents a way to think about the belief system that Kepes made such a prominent part of his practice. Specifically, Leja demonstrates that the success of the Abstract Expressionists—their ability to strike a chord even amongst their contemporaneous detractors—occurred simultaneously with the rise in the 1930s and 1940s of “Modern Man literature,” an eclectic genre of writing he identifies with “a refurbishing of the culture’s prevailing model of self as essentially autonomous, integral, rational, and effectual which was faltering under pressure from historical cataclysm and social conflict and change.”⁵⁶ Modern Man literature could be scholarly or popular, but its underlying concern was “human nature,” and its societal prescriptions were generally delivered with a degree of urgency and gravity that can appear to a present-day reader as naïve. As Leja writes,

It is important to note that Modern Man texts mobilized information of varying credibility from diverse sources—received ideas and prevailing assumptions merged with data imported from the social and natural sciences,

⁵⁵ Ibid., 12.

⁵⁶ Michael Leja, *Reframing Abstract Expressionism: Subjectivity and Painting in the 1940s* (New Haven: Yale University Press, 1993), 8-9.

especially anthropology and psychology—in an effort to understand or construct “human nature” and “the human condition.” Where texts of such sweeping breadth are concerned, every writer is an amateur to some degree, and those most willing to navigate the waters are often those least cognizant of the rapids downstream.⁵⁷

One of the writers Leja cites most frequently is Lewis Mumford, whose concern over the state of modern man closely compares to Kepes’s. The epigraph to this Introduction cites Kepes asking, “What am I? Where have I been? Where am I going?” in the context of “our explosive, unresolved mid-twentieth-century life.”⁵⁸ In 1944 Mumford wrote, “What is man? What meaning has his life? What is his origin, his condition, his destiny? To what extent is he a creature of forces beyond his knowledge and control.... To what extent is he a creator...who refashions the world to which nature has bound him?”⁵⁹

Leja is most concerned with those aspects of “Modern Man literature” in which “the problem-solving potential of concepts of the primitive and the unconscious...was being worked out.”⁶⁰ A central theme of his research is therefore the cultural dispersal and popular interpretation of psychoanalysis. Kepes’s writings make occasional references to psychoanalysis, but his grounding in Gestalt theory, paired with a reluctance to go too far into what he called “the caves and jungles of the unconscious,” distinguish him, to some degree, from the specific branch of Modern

⁵⁷ Ibid., 57.

⁵⁸ Kepes, “The Visual Arts and the Sciences,” 117.

⁵⁹ Lewis Mumford, *Condition of Man* (New York: Harcourt, Brace, 1944), 3, quoted in Leja, *Reframing Abstract Expressionism*, 205.

⁶⁰ Leja, *Reframing Abstract Expressionism*, 7.

Man literature that Leja defines.⁶¹ Nonetheless, as should be evident by now, Kepes was deeply preoccupied with the state of modern man, which he envisioned both in his writings and in his visual practice. And he was not alone. In 1947 Kepes participated in a symposium entitled “Building Modern Man” at Princeton University, where sixty men (mostly architects and urban planners) gave papers on the specified topic. Kepes spoke on “The Importance of Order in Vision,” which opened with the statement, “The dynamic basis of human beings is to form whatever situation they face into an integrated whole.”⁶² Off stage Kepes operated at MIT by finding ways for his ideas to infiltrate the language of the school’s administrators while they, too, as modern men, contemplated curricular amendments aimed at no less than the future of humanity.

This last point suggests a proviso that should be established before we accept Kepes as a contributor to and an illustrator of Modern Man literature. This condition concerns the fact that he assumed these roles from the staging-ground of the university. Like Leja’s subjects, Kepes’s “key preoccupations were general within the culture,”⁶³ but his platform was comparatively removed from the commercial fray generated by Jackson Pollock and his New York School compatriots. Instead, Kepes

⁶¹ Kepes, ed., “Introduction,” *Dædalus*, “The Visual Arts Today,” 10.

⁶² Gyorgy Kepes, “The Importance of Order in Vision,” in *Building Modern Man: A Symposium*, ed. Thomas H. Creighton (Princeton, N.J.: Princeton University Press, 1949), 88. It is tempting to speculate that this symposium was titled after Otto Neurath’s book *Modern Man in the Making* (London: A. A. Knopf, 1939). Neurath was a leading figure in the Unity of Science movement.

⁶³ Leja, *Reframing Abstract Expressionism*, 7.

constituted his platform within the equally complex educational system that is the modern university. If the reader can be persuaded in the course of this study that Kepes was seeking to shore up the modern man subject, then this account may also succeed in reflecting on a specific moment in the history of the American university, a moment when man's fate seemed balanced between the polarized values attributed to the arts and sciences.

Lastly, Leja's scholarship also seemed to offer an alternative to those aspects of Reinhold Martin's work that I found problematic. As stated above, Martin has succeeded in demythologizing Kepes, in denaturalizing his dedication to the stalwart and resilient modern man. His approach is therefore not without similarities to Leja's. Yet there are also significant differences between their projects. As I have already indicated, my sympathies lie with Leja's endeavor. As this preference has had an impact on how I have approached Kepes as a historical figure, it is important at this juncture to explain my reasons for this bias.

Martin's book *The Organizational Complex: Architecture, Media, and Corporate Space* analyzes Kepes's practice as one of two "case studies."⁶⁴ Each of these studies presents what Martin identifies as a post-World War II fixation on *organicism* that is ultimately allied with the military industrial complex and with modular corporate architecture (particularly the glass and metal curtain wall). Central to Martin's account is the field of cybernetics, an approach to control and communication based on feedback loops that was developed by Norbert Wiener

⁶⁴ Martin, *The Organizational Complex*, 4, 9. The other "case study" being the corporate architecture of Eero Saarinen.

during the war and christened by him in 1946.⁶⁵ Although we will want to return to the subject of cybernetics and Kepes's interactions with Wiener in Chapter Three, for now it is sufficient to specify that, for Martin, Kepes is one of the "ghosts"⁶⁶ of the organizational complex and this complex was specifically concerned with social control.

Martin is careful to indicate that there is a theoretical foundation for his argument, but his cursory account of this foundation assumes his readers' familiarity with its tenets. Therefore he cites the significance of Theodor Adorno and Max Horkheimer's conceptualization of the "culture industry," which he links, in the same sentence, to Deleuze's "control society," without providing even the most abbreviated encapsulation of either philosophical concept.⁶⁷ Nonetheless, the proximity of these thinkers is important to Martin because he wishes to eliminate from his work the "interiority of the Enlightenment subject" assumed by Adorno and Horkheimer or, in other words, the "negative dialectics that prevents their account from collapsing into the totalizing perspective they attribute to the culture industry itself."⁶⁸ What this

⁶⁵ Norbert Wiener, *Cybernetics, or Control and Communication in the Animal and the Machine* (Cambridge, Mass.: MIT Press, 1948).

⁶⁶ Martin, *The Organizational Complex*, 7.

⁶⁷ The only reference provided for the industrious reader in the entire paragraph devoted to organizational complex's theoretical foundation is to Horkheimer and Adorno. See Max Horkheimer and Theodor Adorno, "The Culture Industry: Enlightenment as Mass Deception," in *Dialectic of Enlightenment*, trans. John Cumming (New York: Continuum, 1972), 120-67, quoted in Martin, *The Organizational Complex*, n. 3, p. 232.

⁶⁸ Martin, *The Organizational Complex*, 5.

elimination makes room for is the “epistemological rupture” described by Deleuze after, Martin informs us, the writings of Michel Foucault. The reader is then advised that the “inside-outside relation of reflective subject to society is itself reformulated,” but she is left to figure out how this reformation manifests itself, albeit with a dawning awareness that it will have everything to do with “a ‘posthuman’ subject, a subject immersed in and constructed by data flows and patterns.”⁶⁹

For Foucault, the *episteme* of an age is “the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems” of knowledge.⁷⁰ In other words, these are “the great silent, motionless bases that traditional history has covered with a thick layer of events.”⁷¹ Foucault’s project was to demonstrate the ideological workings of “epistemological ruptures,” or “discontinuities.” An epistemological rupture occurs when “a culture, imperceptibly deviating from the empirical orders prescribed for it by its primary codes, instituting an initial separation from them, causes them to lose their original transparency.”⁷² In this moment culture “frees itself sufficiently to discover that these orders are perhaps not the only possible ones or the best ones...in

⁶⁹ Ibid., 5, 12.

⁷⁰ Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (New York: Pantheon, 1972), 191.

⁷¹ Ibid., 3.

⁷² Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences*, reprint (New York: Vintage Books, 1973), xx.

short, that order *exists*.”⁷³ The rupture that brought about the modern age, which Foucault dates to the turn of the nineteenth century, occurred, as he states, “when natural history becomes biology, when the analysis of wealth becomes economics, when, above all, reflection upon language becomes philology.” This is when “man appears in his ambiguous position as an object of knowledge and as a subject who knows.”⁷⁴ This is also, I believe, what Martin is referring to when he writes of the reformulation of the “inside-outside relation of reflective subject to society.”⁷⁵ Bereft of the certainty associated with the centered (Cartesian) subject, modern man desires to reassert a sense of Self grounded in Western humanism as an essential and immutable truth.

What is left for us to understand about Martin’s theoretical foundation is what it means to replace “dialectical negation” (“dialectical negation” being integrally linked to the emergence of meaning through difference⁷⁶) with a critical analysis of

⁷³ Ibid.

⁷⁴ Ibid., 312.

⁷⁵ Martin, *The Organizational Complex*, 5.

⁷⁶ The generation of meaning through difference is a concept attributed to the Swiss linguist Ferdinand de Saussure. “Whatever distinguishes one sign from another constitutes it.” This means that, “in language there are only differences *without positive terms*.” This idea was recorded in *Cours de Linguistique Générale*, a book compiled by two of Saussure’s colleagues from notes taken by his students from a series of lectures he gave in Geneva between 1906 and 1911 and published posthumously in 1915. Ferdinand de Saussure, *Course in General Linguistics* (1915), ed. Charles Bally and Albert Sechehaye with Albert Reidlinger, trans. Wade Baskin (London: Fontana, 1974), 118-21. For a discussion of the typically unacknowledged complexities surrounding the authorship of this work see Vicki Kirby, *Telling Flesh* (London: Routledge, 1997), 7-8.

the “a priori seamlessness” of the organizational complex, to replace dialectical thinking, that is, with Deleuze’s concept of “positive difference.”⁷⁷ To grasp this concept I have relied on Clare Colebrook’s summary:

Difference is not a set of relations. Difference is neither the relation between one identical thing and another (as in common sense), nor is difference the general system that creates a world of objects (as in structuralism). For Deleuze, difference is itself different in each of its affirmations.... Life itself is difference, and this difference is in each case different.⁷⁸

Moreover, difference is positive, Clarebrook states,

because there is not an undifferentiated life that then needs to be structured by difference....[and it] is singular because each event of life differentiates itself differently. There are linguistic differences, but there are also genetic differences, sensible differences (such as those of colour, tone, timbre and texture), chemical differences, animal differences and imperceptible differences.”⁷⁹

Therefore Deleuze disassociates difference from its origin in language, severing the binary mechanism of dialectical thinking. Accordingly, following Deleuze, Martin suggests that non-dialectical thinking, or positive difference, can be utilized to think critically about the unbounded phenomena of media. What Martin wishes to achieve is a confrontation of “the apparent seamlessness of the culture industry...with noise in its own channels.”⁸⁰ This is an admirable goal that he seeks to accomplish by means of an “analysis in which repetition replaces opposition as a

⁷⁷ Martin, *The Organizational Complex*, 5.

⁷⁸ Clare Colebrook, *Understanding Deleuze*, Cultural Studies Series (Crows Nest, Australia: Allen & Unwin, 2002), 27.

⁷⁹ Ibid., 28.

⁸⁰ Martin, *The Organizational Complex*, 6.

critical tool, relentlessly articulating the circuitries of control implied by the modular, patterned cascade, as well as the networks of power and knowledge that make it possible.”⁸¹ While I sympathize with the aims of this practice, I am unconvinced that relentlessness is a particularly efficacious critical tool. I worry as well that not only relentlessness but also repetition constitute their own traps. Therefore, while Martin avoids the totalizations he demythologizes—most prominently Kepes’s seemingly infinite capacity for utopic thinking—he nonetheless appears to be the willing captive of the dystopic “network of networks” he describes. This is so much the case that he considers *all* of Kepes’s activities and interests as “always already” collapsed into this network’s embrace. Was, for instance, Kepes’s conception of organicism *only*, as Martin believes, (an unconscious) front for repressive forces, for the new means of surveillance and control embodied by cybernetics? This is what Martin seems to be saying, but he says it without analyzing what Kepes’s organicism actually looked like in the photographs he made, collected, displayed, and published.⁸² It was photography, I contend, that presented Kepes’s belief in organicism in its most concentrated form. At least in this instance, the terms of Martin’s theoretical foundation do not facilitate close looking. (In contrast are his exemplary visual

⁸¹ Ibid.

⁸² In a note Martin specifies that he “will refer only to Kepes’s writing and pedagogy. In addition to a career as a distinguished teacher and a painter of some note, Kepes engaged in a number of collaborations with architects.... [He] also worked on exhibition designs from the 1940s through the 1960s.” Martin does not mention that Kepes was a photographer. Aside from his books, it is through his photographs that Kepes is best known today. Martin, *The Organizational Complex*, 240, n. 4.

analyses of the curtain wall and architectural modularity, analyses that achieve the “attention to media specificities” that he acknowledges as key to his approach.)⁸³

* * *

At the risk of becoming “covered with a thick layer of events” I have sought to write a history of Gyorgy Kepes and his times.⁸⁴ This has entailed immersing myself in his heap of dualities and his dialectical thinking, immersions that evaporate when Kepes’s organicism is treated as a streaming continuum. This does not mean that I end up agreeing with his polarities and their defining inequities. In fact, as we shall see, Kepes’s conceptualization of his desire for order was often integrally linked to the status quo. By the 1960s the nation he had emigrated to in 1937 at a moment of worldwide strife was entering another crisis, this time on both national and domestic fronts. The latter crisis would come to question the legitimacy of a liberal humanism that had advocated for peace and harmony while knowingly or unknowingly maintaining repressive hierarchies essential to the growth of capitalism.

This dissertation is divided into four chapters. Chapter One, “Before the New Bauhaus,” sketches Kepes’s emergence out of the Hungarian avant-garde and his professional alliance with Moholy-Nagy in Berlin between 1930 and 1935. I then address the period that Kepes spent in London between 1935 and 1937. It was in London, as Kepes retrospectively informed his interviewers, that he began to actively explore his interest in science, developing friendships with a number of scientists,

⁸³ For Martin’s discussion of the necessity of media specificity, see *ibid.*, 6. His description of the curtain wall and modular architecture can be found throughout *The Organizational Complex*, especially 145, 148, 202-11.

⁸⁴ Foucault, *The Archaeology of Knowledge*, 3.

some of who reappear as contributors to his postwar book projects. The work of these acquaintances suggested to Kepes that nature could provide a model for the collective comportment of culture. Most importantly this chapter seeks to understand how Kepes chose to represent his career as he reached its end. When he spoke about his early career the names privileged were not Moholy-Nagy and Walter Gropius, as we might expect, but Lajos Kassák and Georg Lukács. Kepes's tendency in retrospective statements was to express conditional nostalgia for his origins as a member of the Hungarian bourgeoisie coupled with an unconditional idealization of the Hungarian peasantry. This idealization manifested itself as a social consciousness grounded in a largely suppressed debt to Marxism. The few extant artworks that survived Kepes's westward moves reflect these themes. Yet Kepes's account of his early life perhaps has most to tell us—indirectly—about the political climate of the United States in the mid-twentieth century.

Chapter Two, "Structures," analyzes Kepes's years in Chicago, 1937 to 1943, and his first book, *Language of Vision*. It was in Chicago that Kepes and his colleagues shaped a program that interpreted Bauhaus teaching practices for an American context. For Kepes this meant developing, by as early as 1938, a theory of vision as a "language." This ambition, I suggest, reflected a contemporaneous preoccupation with language as a structure and, more widely, with the emergence of structuralism as an intellectual trend. I argue that Kepes gained a sense of the new significance of language through his interactions with the Unity of Science movement. Yet I also demonstrate that Kepes incorporated an admittedly superficial but nonetheless highly useful knowledge of Gestalt psychology into his burgeoning

visual “lexicon.” Almost miraculously, Kepes could resolve the significant philosophic and procedural differences between the Unity of Science movement and Gestalt psychology within his accommodating belief in wholeness. Further, I address how his “language of vision” functioned in his first book not as a linguistically interpretable means of communication, but as a collection of ways of categorizing the two-dimensional page in terms of order and balance. And I show that the same tendencies are evident in Kepes’s photographs, his principal art practice during his Chicago years. Finally the chapter addresses relevant aspects of the New Bauhaus’s founding, its rebuilding as the School of Design, and the classes Kepes taught at both of the school’s embodiments. During these years Kepes began to have an increasingly contentious relationship with Moholy-Nagy, which is evident in his letters from the period. This contentiousness ultimately helped him to conceptualize his differences from Moholy-Nagy and to gain his first solid sense of independence.

Chapter Three, “Systems,” is devoted to Kepes’s first decade in Cambridge, from 1946 to the publication of his second book, *The New Landscape in Art and Science*, in 1956. Its primary theme concerns the postwar shift from thinking about structures to thinking about systems. This shift, which was set into motion by World War II, had an impact on how Kepes began to actively represent his belief that nature could be a model for culture. At MIT this belief was most concretely materialized in the 1951 exhibition *The New Landscape* and in the publication *The New Landscape in Art and Science* that appeared five years later under Kepes’s editorial guidance. Both the exhibition and the book demonstrated that Kepes had become increasingly convinced that culture could learn from nature’s ordered patterns, an idea that

suggested to him and his likeminded peers a return to social harmony. This belief had been a quiet subtext of Kepes's practice in Chicago. In Cambridge it rises to the surface with new urgency. Central to this chapter is the history of how MIT and its School of Architecture—the oldest architectural program in the United States—have variously defined their educational missions over the years. Moreover, the Bauhaus's focus on technology, I endeavor to show, was grounded in the desire for modern industriousness that can be traced to the nineteenth-century phenomenon of the polytechnic.

Chapter Four, ““Art in Civic Scale,”” addresses the founding of the Center for Advanced Visual Studies at MIT in 1967. As this chapter demonstrates, Kepes's Center had historical precedents in terms of its identity as an independent research facility within an academic setting. But it was distinctly innovative in its emphasis on new media and on methods of art production that encouraged viewer participation. The Center arose alongside contemporaneous efforts outside of the academy to facilitate collaborations between artists and engineers, and between artists and industry. These include Experiments in Art and Technology (E.A.T.), established in 1966, and exhibitions such as “Art and Technology” at the Los Angeles Country Museum of Art in 1971. But the Center for Advanced Visual Studies was unique in its academic affiliation and, I argue, well ahead of its time in this regard. To date the Center is largely unacknowledged as a precursor to such institutions as Ars Electronica in Linz, Austria (founded as a new-media festival in 1979 to which was later added a research component known as “Futurelab”) and MIT's own Media Lab (established in 1980).

Chapter Four also documents the difficulties that can arise in collaborative situations that necessarily take artists into the world at large. Inseparable from the history of the founding of the Center for Advanced Visual Studies is the period of domestic social crisis symbolized by the events of 1968. While this crisis served to confirm to Kepes the urgency of his utopic project and the necessity of his Center, it also irrevocably complicated their enactments. Finally, this concluding chapter seeks to understand why Kepes, in the last years of his academic career, distanced himself from photography while nonetheless continuing to use it as an invaluable documentary tool. I show that photography became essential to Kepes at the same time that he rethought its enduring importance to his practice. This was because he was concurrently attempting to make artworks of such “environmentally” monumental sizes that many of them remained at the proposal stage. Their fullest materialization, therefore, was often in the photographic print. I conclude this study by returning to and critically questioning Kepes’s oft-stated desire for the “union of art and science.” This was the desire that we will recognize as being so central to his many “wholenesses.”

CHAPTER ONE

BEFORE THE NEW BAUHAUS

“From the oldest comes the newest,”
commented Béla Bartók, an authentic spirit of
our time.

Gyorgy Kepes citing Bartók in 1965¹

In a 1972 interview Gyorgy Kepes declared that writing and designing his first book, *Language of Vision*, caused him to “structure whatever I knew into legible form.”²

Kepes embarked upon this task in Chicago in 1940 and completed it while teaching in the art department at North Texas State College, Denton, where he accepted a position following his departure from the Institute of Design in 1943. Most of what Kepes knew about art education in the early 1940s he had absorbed in the years following his arrival in the United States in 1937. It was during this relatively brief stretch of time that he was charged with implementing aspects of the Bauhaus

¹ Béla Bartók, quoted in Gyorgy Kepes, “The Visual Arts and the Sciences: A Proposal for Collaboration,” *Dædalus*, “Science and Culture” issue, 94, no. 1 (Winter 1965): 120.

² Gyorgy Kepes, interview by Robert F. Brown, 11 January 1973, transcript, p. 20. Gyorgy Kepes Papers, Archives of American Art, Smithsonian Institution, Washington, D.C. [hereafter Kepes Papers, AAA].

curriculum that László Moholy-Nagy had adapted for an American context. The painting skills Kepes had acquired in the mid-1920s as a student at the Academy of Fine Arts in Budapest were of negligible use in this task. In Chicago he was responsible for instructing students in the arrangement of forms, textures, and light effects using an array of commonly available materials, such as paper, wood, and plastic. In the tradition of the German Bauhaus, these assignments were intended to release innate creativity and increase sensorial awareness. And in a nod to practicality, he developed a course in advertising design that sought to put the school's visual experiments to commercial use. Kepes also, by his own retrospective admission, gained an education in photography from Henry Holmes Smith, a Chicago-based photographer with whom he team-taught a course on "Light and Color."³

Given the swift and comprehensive changes that Kepes's professional life underwent upon his arrival in the United States, it would be logical to assume that what he sought to structure in *Language of Vision* can be confined to his New Bauhaus years. Indeed, this assessment is reinforced by the tendency for Kepes to be

³ "Every day was for learning something new about photography," Kepes, interview by Brown, 30 August 1972, transcript, p. 17. Kepes Papers, AAA. Interestingly Henry Holmes Smith fails to mention Kepes in an essay he wrote on his teaching experience at the New Bauhaus, an omission that supports the idea that their co-teaching arrangement was less than an equal match, at least on the subject of photography. Henry Holmes Smith, "In Light: The New Bauhaus and Nathan Lerner" (1973), essay based on a lecture, in *Henry Holmes Smith, Collective Writings 1935-1985* (Tucson: Center for Creative Photography, University of Arizona, 1986), 106-08.

seen as a supporting character in Moholy-Nagy's encompassing ambitions.⁴ The purpose of this chapter is to identify those aspects of Kepes's early career that contributed to the ideas he formulated in *Language of Vision* and later adapted to the context he found at MIT. Some of these ideas can be traced to Kepes's interactions with Moholy-Nagy, but an equal and perhaps greater number lead to other sources.

It is important to note that this picture of Kepes's early career is almost entirely dependent on his late recollections, most of which he recounted in the interviews he gave from the late 1960s through the 1980s. When Kepes spoke in these interviews about his past, he inevitably shaped it to fit the overall narrative he had developed to describe his career. Given that the primary task of this study is to interpret Kepes's work after World War II, the picture he eventually drew of his past is immensely instructive. What could, in another context, be considered the flaws of this picture—its tendency toward idealization and nostalgia, its highlighting of certain sources at the expense of others—are taken here as interpretive assets. Indeed, this chapter is primarily concerned with the picture that Kepes tended to be the most nostalgic about—his years in Hungary. It also addresses how he sought to apply his belief in the role of the artist as an interpreter of modern life to his work in

⁴ This tendency, of course, is an understandable byproduct of what is generally a prominent subject of New Bauhaus scholarship—László Moholy-Nagy. See, for instance, Lloyd C. Engelbrecht, "Educating the Eye: Photography and the Founding Generation at the Institute of Design, 1937-46," in *Taken by Design: Photographs from the Institute of Design, 1937-1971*, ed. David Travis and Elizabeth Siegel, exh. cat. (Chicago: Art Institute of Chicago in association with the University of Chicago Press, 2002), 34-67. Engelbrecht's detailed scholarship on the New Bauhaus has made a significant contribution to understanding the context out of which the school emerged. See idem, "The Association of Arts and Industries: Background and Origins of the Bauhaus Movement in Chicago" (Ph.D. diss., University of Chicago, 1973).

commercial design. These design projects initially took place in Berlin and then briefly in London and Chicago, where Kepes eventually abandoned the effort. Parallel with his design endeavors he also began to pursue an interest in science and its relevance to his art. This pursuit, the subject of Chapters Three and Four, proved to be the more fruitful one for him and his career. Yet this did not mean that Kepes abandoned his design training; he simply reapplied it to a new purpose—his advocacy for the “union of art and science.”

By providing an account of Kepes’s early career I am not interested in rescuing him from the long shadow cast by Moholy. Late in his career Kepes attempted such reputational interventions, alternately diverting or deflecting questions that might link him to his former employer.⁵ In fact, it is Kepes’s interactions with Moholy, among others, that constitute a sizeable component of his accomplishment. To use terms that Kepes himself frequently employed, he took quite seriously the “value” of “communication” within his own field and beyond it. It was through the activation of such terms that he participated in his times. His was always a composite endeavor. In 1944, at an early and perhaps more candid moment in his career, Kepes described his goals forthrightly when he stated that he wanted “to put earlier demands into concrete terms and on a still wider plane.”⁶ For reasons that will become evident as this chapter proceeds, Kepes identified strongly with the two generations that

⁵ See Kepes, interview by Brown, 11 January 1973, transcript, p. 12. Kepes Papers, AAA; and idem, “Gyorgy Kepes: Searcher in a New Landscape,” interview by Douglas M. Davis, *Art in America* 56, no. 1 (January-February 1968): 40.

⁶ Gyorgy Kepes quoted in Sigfried Giedion, “Art Means Reality,” in Kepes, *Language of Vision* (Chicago: Paul Theobald, 1944), 6.

preceded his own; and, as we shall see in subsequent chapters, his career consisted of choosing from their ideas/ideals and (sometimes quite literally) expanding upon them.

Sources

In the early 1940s Kepes composed, in words and images, an interweaving of the pedagogical approach he had acquired in Chicago with a set of convictions and ideas he had developed during time spent in a succession of cities—Budapest, Berlin, and London. Kepes’s path from Eastern Europe to the American Midwest was inexorably tied to historical events, most prominently World War II. And, as we shall see, the war and the cultural and intellectual migrations it set in motion had a lifelong impact on his work as an artist and educator.⁷ Yet while I concede the inevitable dominance of Kepes’s American career, I have endeavored to restore a presence, however fragmentary, to the years that steadily brought him westward. By proceeding chronologically, city-by-city, I do not wish to suggest that Kepes’s artistic and intellectual development was particularly linear. On the contrary, he tended to circle back to past ideas, knitting them into an ever-expanding polymathic outlook that embodied an interdisciplinary “ethic.” Therefore my intention is to proceed by means of a loose chronology—a chronology that will be intermittingly broken in order to

⁷ There are two informative essay collections dedicated to the influx of European intellectuals to the United States in the 1930s. See Franz L. Neumann, ed., *The Cultural Migration: The European Scholar in American* (Philadelphia: University of Pennsylvania Press, 1953); and Ronald Fleming and Bernard Bailyn, eds., *The Intellectual Migration* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1969). See also Stephanie Barron, ed., *Exiles and Émigrés: The Flight of European Artists from Hitler*, exh. cat. (Los Angeles: Los Angeles County Museum of Art; New York: Abrams, 1997).

look back or forward in time—so as to reveal, rather than to diminish, the thematic refrains to be found in his work.

In contrast to the archival abundance devoted to Kepes's years in the United States is the scarcity of primary sources prior to his emigration. Like many individuals who left Europe in the 1930s, Kepes largely abandoned the physical records of his personal history—papers, books, artworks. And prior to his emigration to the United States he had never published his writings or exhibited extensively. While in Berlin from 1930 to 1935, and then in London from 1935 to 1937, he worked mostly on commercial projects—advertisements for corporate clients, such as the Jena glassware company or Imperial Airways, and occasional stage designs for popular productions. Through his association with Moholy-Nagy and, more generally, with the avant-garde, he was witness to, but not actively engaged in, the maturation of an immersive approach to exhibition design in which photography was often a prominent component. All of these experiences—about which I will have more to say—figured in Kepes's awareness that he was, as he put it, “shopping for a task in life.”⁸ The fullness of Kepes's presence in the United States—his propensity for documentation and theorization, his interest in organizing exhibitions and producing books, and, ultimately, his mission to found the Center for Advanced Visual Studies—was born out of a comparative void that is, in its own way, meaningful.

My research into Kepes's early history has been aided by the publication in the last two decades of exemplary English-language scholarship on Eastern European

⁸ Gyorgy Kepes, interview by C. Breuer, 29 August 1983, transcript. Marcel Breuer Papers, AAA.

modernism, although little of it addresses him directly.⁹ In addition I have benefited from recent English translations of early twentieth-century Hungarian writings on art and society.¹⁰ Along with these sources I have consulted the Hungarian periodicals *Ma* (Today) and *Munka* (Work), which were edited and published by Lajos Kassák (1887-1967), as well as the facsimile edition of the *Buch neuer Künstler* (*Book of the New Artists*), a joint venture between Kassák and Moholy-Nagy that was originally published in 1922 in Vienna.¹¹

⁹ For recent scholarship on Eastern European modernism, see Timothy O. Benson, ed., *Central European Avant-Gardes: Exchange and Transformation, 1910-1930*, exh. cat. (Los Angeles: Los Angeles County Museum of Art; Cambridge, Mass.: MIT Press, 2002) and, in particular, the essay by Éva Forgács, "Between Cultures: Hungarian Concepts of Constructivism," 146-64. See also S. A. Mansbach, *Modern Art in Eastern Europe: From the Baltic to the Balkans, ca. 1890-1939* (Cambridge: Cambridge University Press, 1999). Mansbach has also published extensively on Hungarian art. See S. A. Mansbach, "Confrontation and Accommodation in the Hungarian Avant-Garde," *Art Journal* 49, no. 1 (Spring 1990): 9-20; and S. A. Mansbach, ed., *Standing in the Tempest: Painters in the Hungarian Avant-Garde, 1908-1930*, exh. cat. (Santa Barbara, Calif.: Santa Barbara Museum of Art; Cambridge, Mass.: MIT Press, 1991). Other informative essays include Esther Levinger, "The Theory of Hungarian Constructivism," *The Art Bulletin* 69, no. 3 (September 1987): 455-66; idem, "Lajos Kassák, *MA* and the New Artist, 1916-1925," *Structurist* 25/26 (1985-86): 78-84; and Éva Forgács, "The Bauhaus in Budapest," *The New Hungarian Quarterly* 29, no. 111 (1988): 185-87.

¹⁰ The most extensive collection of primary texts can be found in *Between Worlds: A Sourcebook of Central European Avant-Gardes, 1910-1930*, ed. Timothy O. Benson and Éva Forgács (Los Angeles: Los Angeles County Museum of Art; and Cambridge, Mass.: MIT Press, 2002).

¹¹ *Ma*, facsimile edition (Budapest: Akadémiai, 1969). One issue (vol. 10, no. 2, 1925) was omitted from this publication. It was reissued by Pesi Muhely (Budapest) in 1983. The Special Collections of the Getty Research Institute Library has a number of issues of *Munka*. I consulted nos. 1-2 (1928); vol. 4, no. 6 (1929); vol. 2, nos. 11, 12, 16 (1930). Ludwig [Lajos] Kassák and László Moholy-Nagy, *Buch neuer Künstler* (1922), postscript by Éva Körner (Budapest: Corvina Verlag/Magyar Helikon, 1977).

Budapest: Turning the Pages of Modernism

On 29 August 1948, Sibyl Moholy-Nagy wrote to Kepes requesting that he “jot down a few points outlining your work in visual design as far as it differed or added with respect to the old Bauhaus program.”¹² Moholy-Nagy’s widow was writing a book on the life and work of her late husband that would include occasional references to his associates.¹³ The letter to Kepes was written in the interest of gathering information for this project. Kepes replied on 8 September 1948. In this letter he made a point of informing his correspondent of the significance of his early years. He did this by reminding her that, “As you know, I never studied at the Bauhaus, and my bones were almost set in the fashion in which I now think when I came to Berlin.”¹⁴ On the one hand, this statement can be interpreted as Kepes’s attempt to distinguish himself from Moholy-Nagy, to whom he was by then so closely connected. On the other hand, it serves to represent a distinctly tangible difference between the two artists. This would be the decade-long separation between their respective arrivals in Berlin. Moholy-

¹² Sibyl Moholy-Nagy to Gyorgy Kepes, 29 August 1948. Kepes Papers, AAA, reel 5303, frame 213.

¹³ Sibyl Moholy-Nagy, *Moholy-Nagy: Experiment in Totality* (1950), repr. (Cambridge, Mass.: MIT Press, 1969).

¹⁴ Gyorgy Kepes to Sibyl Moholy-Nagy, 8 September 1948, reel 5303, frame 220. Kepes Papers, AAA.

Nagy moved to Berlin in 1920, Kepes in 1930. Moholy-Nagy arrived at the beginning of the Weimar Republic, Kepes in its waning years.¹⁵

The sense of dimmed opportunity likewise confronted Kepes as a young artist in Budapest. To compare him to the intellectuals and artists who are credited with shaping Hungarian modernism is to confront a simple detail—the year of his birth. This year—1906—suggests an assessment that warrants consideration, if only to be disproved: Kepes, it could be said, was born too late. Supporting this view is the English scholarship on modern Hungarian cultural history, which has focused primarily on the first two decades of the twentieth century. Within the discipline of art history, books and articles on Hungarian modernism generally address artists who emerged in the 1910s or the first years of the 1920s, years that coincided with Kepes’s childhood and adolescence.¹⁶ The art historian Esther Levinger, for instance, has designated “two distinct phases...in the history of Hungarian avant-garde art: the first in Budapest, during the War years, and the second in Vienna, in the early twenties.”¹⁷

As Levinger’s two-part designation suggests, there are political and social reasons for this focus, not only in Hungary, but also throughout Europe. The turn of the century was an abrupt temporal divide that took substantive cultural form both

¹⁵ The Weimar Republic ratified its constitution on 10 February 1919. The first indisputable indication of the republic’s decline occurred in 1930, when the National Socialists won a major parliamentary victory, gaining 107 seats.

¹⁶ For a listing of some of these books and articles see n. 9.

¹⁷ Levinger, “The Theory of Hungarian Constructivism,” 456.

before and after newly synchronized clocks rung in the year 1900. In contrast, the date on the far side of this scholarly concentration—the end of those first two decades—is precisely delineated in Hungary’s history: on 16 November 1919 Admiral Miklós Horthy took control of the country, crushing a Bolshevik revolution that had begun in March of that year. Horthy was a Hungarian nationalist and anti-Semite who brought an end not only to the newly emerged communist government but also to the religious and ethnic tolerance that had been the hallmark of the late-nineteenth and early twentieth-century Hungarian monarchy.¹⁸

The historian István Deák has written that when Horthy took power he vowed a “well-deserved” punishment for Budapest, the “sinful city.”¹⁹ By this time the Kepes family was living in Budapest, a move that coincided with Gyorgy Kepes’s entry into the gymnasium. After taking power Horthy instigated a “White Terror,” persecuting those deemed “non-Hungarian.” Kepes never indicated whether his family suffered directly from the violence that accompanied this takeover.²⁰ Nevertheless the majority of the intelligentsia went into exile. In the space of a few

¹⁸ The historian Mary Gluck provides a thorough account of the response of Hungarian artists and intellectuals to shifts in political power in the late nineteenth and early twentieth centuries. See Mary Gluck, *Georg Lukács and His Generation, 1900-1918* (Cambridge, Mass.: Harvard University Press, 1985), 48-75. See also István Deák, “Hungary: A Brief Political and Cultural History,” in *Standing in the Tempest*, 24-27.

¹⁹ Deák, “Hungary: A Brief Political and Cultural History,” 27.

²⁰ It is estimated that five thousand Hungarians were killed in the days after Horthy took power. *Ibid.*

days Budapest was left largely bereft of artistic and intellectual vitality.²¹ Many Hungarian exiles ended up in Vienna, including three individuals who would have a defining impact on Kepes's early career: the poet, artist, and editor Lajos Kassák, the equally enterprising Moholy-Nagy (who soon moved to Berlin), and the literary critic and Marxist Georg Lukács (1885-1971), whose writings the young Kepes had yet to encounter.

It was in *this* Budapest that Kepes's aspiration to be an artist arose alongside an as yet ill-defined commitment to, as he described it in a later interview, "the world around me."²² After the flight of the avant-garde Kepes was left behind to discover modernism in books and magazines. In a 1972 interview he described the effect Budapest's post-1919 cultural limits had on him as a young man:

Hungary was a semi-Fascist country and the cultural life had a certain semi-freedom, but we didn't have any modern exhibitions in this country, hardly anything. We were looking at modern art in foreign magazines we could get hold of. You may know the *Cahiers d'Art* in France, and we had the books of Ozenfant and Corbusier, whatever we could get as a window to see what happens in this search for new meaning.... And so we had a very intense look at contemporary art and through this looking at second-hand books, because *we never saw anything in the real*.²³

²¹ In the months following the Hungarian communist revolution Lajos Kassák wrote of the sense of artistic community during World War I that, unbeknownst to him, was soon to disperse. "In spite of all our isolation we *were* here and lived our lives, magnetized by our communion with the world around us, that is, contemporary culture." Lajos Kassák, "For the Comprehensive *Ma* Exhibition," in *Between Worlds*, 167. Originally published as "A *Ma* demonstratív kiállításához," *Ma* 2, no. 8-9 (15 September 1918).

²² Kepes, interview by Brown, 7 March 1972, transcript, p. 3. Kepes Papers, AAA.

²³ Ibid. Emphasis added. By the "books of Ozenfant and Corbusier" Kepes is referring to Amédée Ozenfant and Charles-Edouard Jeanneret, *Après le cubisme* (Paris: 1918), and idem, *La Peinture moderne* (Paris: 1927). The periodical *Cahiers d'Art* (Paris) was initiated in 1926.

Given this early dependence on printed reproductions—this awareness of an “intense” focus on the printed page—it is not surprising that Kepes spent so much of his mature career making photo-illustrated books. Because as a young man printed matter was his lifeline to the world outside Budapest, he came to understand, quite concretely, its value.²⁴ Kepes, of course, was not alone in this estimation. One can cite an array of publication projects, from Charles-Edouard Jeanneret and Amédée Ozenfant’s magazine *L’Esprit Nouveau* (The New Spirit) (1920-1924) to Kassák and Moholy-Nagy’s *Book of the New Artists* (1922), to the ambitious Bauhausbücher series (1925-1929). All of these publications benefited from, and were indeed constituted by, the photomechanical image, which had likewise spread into the popular press with equal if not greater abandon.²⁵ Yet unlike artists who had garnered the means to utilize such technology, Kepes consumed it from the periphery. When,

²⁴ In an undated letter to the artist Robert Preusser that Kepes wrote at the end of his time in Chicago (therefore in late 1942 or early 1943) he remarked, “Writing is not an easy task, I prefer painting canvases to writing one page. But a book publication can be quite a valuable enterprise—and therefore I am keeping on suffering.” Gyorgy Kepes to Robert Preusser, n.d. Institute of Design Collection, University of Illinois at Chicago, The University Library, Department of Special Collections [hereafter Institute of Design Collection, U. of Ill.], Box 7, folder 197. *Language of Vision* was a small publishing sensation, with thirteen printings in English that definitively established Kepes’s reputation outside of Chicago and Cambridge. In 1969 it was translated into Spanish, followed by German (1970), Italian (1971), and Hungarian (1979).

²⁵ Maud Lavin writes of the proliferation in Germany of the *Illustrierte*, or illustrated newspapers and photo weeklies, in her *Cut with the Kitchen Knife: The Weimar Photomontages of Hannah Höch* (New Haven: Yale University Press, 1993), 47-51. See also Wolf von Eckhart and Sander L. Gilman, *Bertold Brecht’s Berlin: A Scrapbook of the Twenties* (New York: Doubleday, 1975), chapter 5.

in the foreword to *Language of Vision*, Sigfried Giedion remarked upon Kepes's interest in "continuity" with the previous generation, he was taking note of a tendency that grew out of an imposed *discontinuity*.²⁶ Giedion observed this proclivity in Kepes without speculating on why it arose; he simply chalked it up to "a period of consolidation."²⁷ Yet it is possible to understand Kepes's desire for consolidation as a response to a politically inflicted separation that had a tangible impact on his early adulthood and subsequent career.

Among the magazines that made it to Budapest, Kepes and his peers at the Academy were perhaps most familiar with Kassák's *Ma*.²⁸ Kassák founded this periodical in 1916, after the suppression of his first, more overtly political magazine, *A Tett* (The Deed).²⁹ *Ma* was published in Budapest between 1916 and 1919, and in Vienna between 1920 and 1925. In both cities it functioned as the key site of

²⁶ Sigfried Giedion, "Art Means Reality," introductory essay in Kepes, *Language of Vision*, 6.

²⁷ "It is not the rule in the nineteenth century for younger generations to consciously continue the work of their predecessors. To do so is new; it means that we are in a period of consolidation." Ibid.

²⁸ Kepes cites Kassák as an early influence in the letter to Sibyl Moholy-Nagy. Kepes to Sibyl Moholy-Nagy, 8 September 1948. Kepes Papers, AAA. And Kepes remained true to this assessment in later years. This is particularly the case in an interview he gave in 1968. Gyorgy Kepes, interview by Dorothy Seckler, 18 August 1968, tape recording. Kepes Papers, AAA.

²⁹ Kassák described the art and literature focus of *Ma* "more difficult to police." Lajos Kassák, "A Tett et Ma," in *L'activisme hongrois*, ed. Charles Dautrey and Jean-Claude Guerlain (Montrouge, France: Editions Goutal-Darly, 1979), 155.

interaction between the Hungarian and international avant-gardes.³⁰ In fact Kepes intermittingly benefited from direct access to *Ma*: During Kassák's exile, his wife, the artist Jolán Simon, smuggled copies of the magazine into Budapest.³¹ Kepes later recalled visiting factories with Simon, where they recited Kassák's poetry.³²

The shifts in *Ma*'s editorial content during the nine years of its existence demonstrate the range of artists, images, and ideas that Kepes came in contact with, at least on the printed page. Initially the magazine's emphasis was on literature, albeit with a constant if minor role reserved for the visual arts.³³ Early issues usually featured an illustration of a drawing or print on the cover and one or two similar illustrations in the interior. With some divergences, stylistic choices tended toward Art Nouveau and Expressionism. In the magazine's first few years the Hungarian János Máttis Teutsch was one of the most frequently illustrated artists, occupying the cover of several issues (fig. 1). Beginning in the fall of 1918, the content of the magazine became more overtly concerned with the artist's role in society.³⁴ In

³⁰ The Hungarian Minister of Culture, Béla Kun, suppressed *Ma* in the summer of 1919. After the fall of the Hungarian Soviet Republic, Kassák was imprisoned for several months. When released he went into exile in Vienna.

³¹ Simon's clandestine importation of *Ma* to Hungary is described in Forgács, "Between Cultures: Hungarian Concepts of Constructivism," in *Central European Avant-Gardes*, 163, n. 6.

³² Judith Wechsler recounts this experience in her essay "Gyorgy Kepes," in *Gyorgy Kepes, the MIT Years: 1945-1977*, exh. cat. (Cambridge, Mass.: MIT Press, 1978), 9.

³³ All references to *Ma* are taken from the facsimile edition. *Ma* (Budapest: Akadémiai, 1969).

³⁴ This shift coincided with political developments following the collapse of the Austro-Hungarian Empire during World War I. On 31 October 1918 Count Mihály

February 1919 the masthead displayed a new subtitle, “Aktivista Művészeti Folyóívat” (Activist Art Periodical). A drawing by Franz Marc depicting a scene of apocalyptic redemption was the cover image for the April 1919 issue (fig. 2). And by 1921 *Ma*’s pages were increasingly dedicated to an array of international developments in the visual arts including Futurism, Cubism, Dada, Constructivism, and de Stijl.

This interest in greater international coverage coincided with Moholy-Nagy’s participation in *Ma* and Kassák’s own explorations of painting. The first work by Moholy-Nagy in the magazine—a jumbled constructivist-style drawing of overlapping triangles, circles outfitted with spokes, and lines that resemble telephone poles—appeared in March 1921 (fig. 3). By the April issue he was listed as the magazine’s German correspondent.³⁵ And his paintings are illustrated throughout the September issue, which reproduces his Francis Picabia-inspired work, *Peace Machine Devours Itself* (1921), on the cover (fig. 4).³⁶ As this cover demonstrates, Moholy-Nagy’s input in the magazine occurred concomitant with its redesign. Out went the *Ma* logotype that retained an aspect of the hand-drawn; in came a new

Károlyi declared Hungary an independent republic and named himself Prime Minister. His government lasted until 21 March 1919, when the communists assumed power. Lajos Kassák’s “Proclamation for Art!,” which originally appeared as “Kiáltvány a művészetért!,” in *Ma* 3, no. 11 (20 November 1918), is indicative of the magazine’s increasingly political focus. See *Between Worlds*, 213-14.

³⁵ Moholy-Nagy held this position through July 1922.

³⁶ *Ma* 6, no. 5 (March 1921): 61. The majority of the September 1921 issue was dedicated to Moholy-Nagy’s paintings. See *Ma* 6, no. 9 (September 1921).

monumentality—severe yet elegantly shaped letters, bold edifices that advertised the new authority of geometric forms and the machine-made aesthetic.

Like Moholy, Kassák also adopted a constructivist-style, creating images that transferred forcefully to *Ma*'s black type and rough paper.³⁷ Both artists, therefore, enthusiastically adopted what Christina Lodder has identified as the “export of constructivism” from Russia.³⁸ The first work by Kassák that was reproduced in the magazine was a linocut depicting an arrangement of geometric forms (fig. 5). It appeared on the cover of the March 1921 issue, the same month that Moholy-Nagy's

³⁷ Krisztina Passuth has demonstrated that Kassák had knowledge of developments in Russian art prior to the “Erste Russische Kunstausstellung” (“First Russian Exhibition”) held at the Galerie Van Diemen in Berlin in October 1922. See Krisztina Passuth, “Contacts between the Hungarian and Russian Avant-Gardes in the 1920s,” in *The First Russian Show*, exh. cat. (London: Annely Juda Fine Art, 1983).

³⁸ Lodder dates the initiation of this export to Western Europe to 1922, specifying the significance of El Lissitzky's presence in Berlin, where he arrived in December 1921. Further, she designates Lissitzky as a “key figure in the initial formulation of what is now commonly called *international constructivism*.” Emphasis in original. I return to this issue in my discussion of *Book of the New Artists*. Lodder also makes a careful distinction between the “broadly based tradition [of constructivism] in twentieth-century art”—citing the example of George Rickey's *Constructivism: Origins and Evolution* (New York: George Braziller, 1967)—and the specific emergence of Russian Constructivism in March 1921, when the Working Group of Constructivists (Rabochaia gruppa konstruktivistov) came into existence in Moscow. “The [Russian] constructivists rejected the traditional notion of the work of art as a product of individual genius and a marketable commodity.... Traditional experiments with modern materials and construction methods were undertaken by the artists not as aesthetic ends in themselves but rather as a means to the ultimate goal of designing everyday objects for mass production and use.” Christina Lodder, “El Lissitzky and the Export of Constructivism,” in *Situating El Lissitzky: Vitebsk, Berlin, Moscow*, ed. Nancy Perloff and Brian Reed, Issues and Debates series (Los Angeles: Getty Research Institute, 2003), 27-28. See also idem, *Russian Constructivism* (New Haven: Yale University Press, 1983), 94-101.

work debuted in the magazine.³⁹ Kassák's foray into visual art was immediately and unswervingly geometric. Moholy-Nagy created pointedly machine-like images as well as geometric compositions that were suggestive rather than specifically industrial. In contrast, Kassák tended to rely solely on geometric shapes as compositional building blocks, occasionally assembling forms that suggested architecture or machinery, but more often steering clear of a specific context.

Kassák's aesthetic strategy was in keeping with his ideas about the proper approach to Constructivism. He may have been visually inspired by the Russian model, but he nonetheless developed a theory of art that varied significantly from that of his visual source. The discrepancy between Kassák's position and that of the Russians was evident in his magazine several months before his art occupied its cover. The November 1920 issue of *Ma* published the response of the Activists—the politicized artist group associated with the magazine—to a questionnaire submitted to them by the Provisional International Moscow Bureau of Creative Artists. They were asked, "What are the theoretical and practical circumstances of the community of artists that the Hungarian Activists' group intends to establish?" To this question the Russian artists attached possible responses, which ranged from organizing the "economic basis of the artists' trade union" to "Art and state." The Activists (most

³⁹ Therefore Kassák's linocut appeared in the same month that the First Working Group of Constructivists (*Rabochaia gruppa konstruktivistov*) formed in Moscow (see n. 38). Esther Levinger has traced Kassák's complicated relationship to Russian Constructivism stating, "Kassák called himself a Constructivist only once, in a poster for a projected exhibition in Vienna in 1926." Instead, Kassák referred to himself and his like-minded associates as the Activists. Nonetheless, beginning in 1924 Kassák referred to "constructive art" and to the "constructive world concept." Levinger, "The Theory of Hungarian Constructivism," 454, n. 2.

likely Kassák himself) replied defiantly. The community of artists *Ma* cultivated was dedicated to “universal human art.” The goal was to create “a free human community.” This meant that “art, as the primary register and indicator of the collective human longing for betterment can never lower its sights to represent merely the struggles of any one individual, group, gender, or race.”⁴⁰ In another answer the Activists state, “We would be hard put to find two more diametrically opposed notions than art and the state.”⁴¹ Needless to say, Kassák and his group were against art in the service of a specific regime, despite their avowed allegiance to communism. Art, they countered, would be revolutionary only if artists function “Beyond the irresponsible poses of demagogues, priests, lawyers, and judges.”⁴² The Activists’ reply to the Russians solidified their differences. And Kassák eventually became directly critical of his rivals. In early 1927, he dismissed Russian Constructivism as an “art school” that had produced “naïve, pompous, and futile trash.”⁴³

Kassák’s position vis-à-vis the Russian avant-garde was not simply a matter of competitive posturing, although this, we can surmise, was a factor. Rather, as the

⁴⁰ “The Provisional International Moscow Bureau of Creative Artists, Questions to the Hungarian Activists, and the Hungarian Activists Reply,” trans. John Bátki, in *Between Worlds*, 420-21. Originally published as “Az alkotó művészek provizorikus, moszkvai internacionális irodájának a magyarországi aktivista művészekhez,” *Ma* 6, nos. 1-2 (1 November 1920).

⁴¹ *Ibid.*, 423.

⁴² *Ibid.*, 421.

⁴³ Lajos Kassák, “Új orosz művészet” (New Russian Art), *Dokumentum* 2 (January 1927), quoted in English translation in Levinger, “The Theory of Hungarian Constructivism,” 458. Kassák felt the Russians’ primary misstep had been in trying to make art directly useful.

reply to the Russian questionnaire demonstrates, Kassák advocated art as a universalizing force that promoted international connections. He believed in the ability of art to reveal, as he described it, a “worldview” that would “come from a source deep down, and cannot be discouraged by mere political failures.”⁴⁴ In practice this rendered Kassák wary of alliances with any political group (except of course his own). By a “source deep down” he was not advocating the position of the aesthete who removes himself from society. On the contrary, he promoted the idea of a social totality forged through the artist’s interaction with both nature *and* culture. This nature, moreover, was a “new” nature revealed by science. “Art,” Kassák declared in *Book of the New Artists*, “is unconditionally dedicated to itself and yet at one with the universe.... It is based on the laws of potentiality, its power rooted in the cosmos, and every tiny atom of it proves that it could have been produced only now and this way.”⁴⁵

In Kassák’s art practice he utilized geometric forms to express what he saw as the common ground of nature and culture. As Levinger has demonstrated:

Kassák considered geometry the underlying structure of the extra-human universe, the world being a conglomerate of geometrical parts.... Thus, although Kassák believed that everything in the world existed in itself and for itself and had its own laws, things did not exist outside the totality. On the contrary, every object was a microcosm, and its components were identical to those of the world as a whole.⁴⁶

⁴⁴ “Questions to the Hungarian Activists, and the Hungarian Activists Reply,” in *Between Worlds*, 421.

⁴⁵ Kassák, *Buch neuer Künstler* (1922), repr. (Baden: Lars Müller, 1991), n.p.

⁴⁶ Levinger, “The Theory of Hungarian Constructivism,” 458.

Within this totality geometry could represent the “elemental” forces of nature as well as the human-made world of industrial machines and emerging technologies. Given this desire to link nature and culture, it is not surprising that Kassák tended to express his ideas by evoking the authoritative language of science. “Life,” Kassák decreed in an essay ostensibly on the theater that also had other, more far-reaching, ambitions, “is an organic unity; art is an organized unity.”⁴⁷ The following section, which addresses Kassák’s collaboration with Moholy-Nagy in the creation of *Book of the New Artists*, will provide us with a fuller understanding of what “constructive art” meant for both artists and what they hoped to achieve through its propagation.⁴⁸

Book of the New Artists

Published in German and Hungarian, *Book of the New Artists* was prominently advertised in *Ma* and was filled with illustrations, chosen and arranged by Moholy-Nagy, that had appeared in *Ma* as well as in *Der Sturm*, *L’Esprit Nouveau*, and *Veshch’/Gegenstand/Objet*.⁴⁹ Kepes would have had access to *Book of the New Artists* in Berlin if not in Budapest. Despite the fact that the authors chose many of their images from contemporaneous art magazines, Eleanor Hight has written of the novelty of Moholy-Nagy and Kassák’s joint venture. “*Buch neuer Künstler* predated

⁴⁷ Lajos Kassák, “On the New Theatrical Art,” in *Between Worlds*, 444. Originally published as Lajos Kassák, “Über neue Theaterkunst,” *Ma* 9, nos. 8-9 (15 September 1924).

⁴⁸ For a clarification of Kassák’s use of this phrase see n. 39.

⁴⁹ Eleanor Hight, *Picturing Modernism: Moholy-Nagy and Photography in Weimar Germany* (Cambridge, Mass.: MIT Press, 1995), 45.

other anthologies of modern artistic movements by several years and is particularly distinguished by its focus, by the predominance of illustrations over text, and by the manner in which the authors intended to educate their public visually.”⁵⁰ Hight also indicates that the main visual emphasis in *Book of the New Artists* is on Russian Constructivism.⁵¹ Yet recent scholarship on El Lissitzky offers a fuller understanding of the international dissemination of this influential art movement and how it came to be registered within and transformed by contexts outside of Russia. Before turning to this phenomenon and its scholarly analysis, it will be useful to gain an understanding of the book’s visual organization.

Following a manifesto-like introduction written by Kassák, part of which has been cited above, *Book of the New Artists* proceeds with what functions as a photographic “introduction.” This brief section, four pages in all, features a photograph of power lines, followed in succession by a film projector, an aerial view of the New York Public Library, and a racecar (fig. 6, fig. 7, fig. 8, fig. 9). All of the images are documentary in style and derived from non-art sources. The first painting illustrated, Umberto Boccioni’s *States of Mind I: The Farewells*, 1911 (MoMA, New York), shares the page with a photograph of a dynamo, or generator (fig. 10). Both images are accompanied by a single-word caption—“Boccioni” and “Dynamo.” The painting’s identification is, as Thomas Crow writes, “The simplest act of

⁵⁰ Ibid., 44.

⁵¹ Ibid.

substitution,” in which “the name of a maker [is] a paraphrase in itself.”⁵² In contrast, the generator, or “Dynamo,” is valued for its identity as an anonymous manufactured object, albeit one with a functional design that had come to be recognized as an aesthetic in its own right.

After this visual introduction, the book then gradually, almost surreptitiously, “advances” from Futurism and Expressionism to Cubism, Dada, and Surrealism, without any definitive segues from one movement to another. At the same time, photographic interventions continue—with machines, industrial structures, aerial views, and, increasingly, modernist buildings popping up next to artworks and vice versa. These visual interactions hint at the book’s final visual shift, which begins on a page-spread that compares an undated photograph of an American airplane hangar under construction with Vladimir Tatlin’s *Monument to the Third International*, 1920 (fig. 11, fig. 12).

Following this comparison, the book progresses in a hopscotch manner through Suprematism, de Stijl, and Russian Constructivism. And artworks continue to be intermixed with photographs of buildings, bridges, and, finally, airplanes (implying an improvement upon the earlier racecar). The final artwork in the book is a double-page spread for an abstract film scenario by Viking Eggeling, an illustration that reinforces Moholy-Nagy’s new commitment to light-based media (fig. 13). Like the best propaganda, *Book of the New Artists* ingeniously induces the viewer to

⁵² Thomas Crow, *The Intelligence of Art*, Bettie Allison Rand Lectures in Art History (Chapel Hill: University of North Carolina Press, 1999), 1.

compose the narrative of progress. In this instance, all roads lead inexorably to the international expansion of constructivist tendencies.

In “The Language of Construction,” Briony Fer has described the eclectic but intentioned arrangement of art and non-art imagery in *L'Esprit nouveau* in terms of the primacy of *construction*, a term, as she writes, that “pervaded the language of art in the inter-war period.” “The art works and industrial products illustrated in the magazine...expressed the ‘constructive’ as the ideal form of the modern; their formal similarities were more significant and of greater value than the differences in the material and ideological conditions in which they were made.”⁵³ Fer is describing an aspect of what is often referred to as “international constructivism.”⁵⁴ In the recent essay “El Lissitzky and the Export of Constructivism,” Christina Lodder has persuasively argued that Lissitzky was the key figure in this internationalization of Constructivism, particularly in Western Europe in the 1920s.⁵⁵ Lissitzky had been

⁵³ Briony Fer, “The Language of Construction,” in *Realism, Rationalism, Surrealism: Art between the Wars* (New Haven: Yale University Press in association with the Open University, 1993), 88.

⁵⁴ Christina Lodder asserts that the phrase “international constructivism” was coined by Stephen Bann in *The Tradition of Constructivism* (London: Thames & Hudson, 1974), xxvii. Bann was the editor of this book. Lodder, “El Lissitzky and the Export of Constructivism,” n. 5.

⁵⁵ Lodder, “El Lissitzky and the Export of Constructivism,” 27-46. Lodder’s argument is offered as an alternative to the tendency to designate Naum Gabo as the primary figure in the internationalization of Constructivism (and, by extension, to label him the culprit in its “depolitization”). Martin Hammer and Christina Lodder, *Constructing Modernity: The Art and Career of Naum Gabo* (New Haven: Yale University Press, 2000), 96-100. In particular, Hammer and Lodder take issue with Benjamin Buchloh’s reading of Gabo’s career. Benjamin Buchloh, “Cold War Constructivism,” in Serge Guilbaut, ed., *Reconstructing Modernism* (Cambridge, Mass.: MIT Press, 1990), 85-112.

inspired to take up painting through his interactions with Malevich—the two artists had met while teaching at the Vitebsk Popular Art Institute (Vitebskoe Narodnoi khudozhestvennoi uchilishche) in 1919. When Lissitzky returned to Moscow in 1921, he was a member of the suprematist collective UNOVIS (Utverditeli novogo iskusstva; Affirmers of the new art). He was therefore an unlikely candidate to represent the aspirations of the Constructivists. As Lodder writes, Lissitzky believed in an art that was “stripped down to colored planes floating and interacting spatially against pure white grounds.” This art “could and should serve as the correct aesthetic correlative of the new social order.”⁵⁶ Lissitzky was opposed to the Russian Constructivists’ renouncement of painting, much less art, in favor of solely utilitarian ventures. He was wary, Lodder asserts, of “the constructivists’ crude emphasis on technology and utility”, even though he shared “their general ambition to make artistic activity more relevant to the wider social and ideological realm.”⁵⁷

Yet in December 1921 Lissitzky went to Berlin at the behest of the Soviet government.⁵⁸ His mission was to create alliances between Russian and German artists. With the Russian writer Ilia Ehrenburg, he edited the magazine

⁵⁶ Ibid., 28.

⁵⁷ Ibid., 29.

⁵⁸ Some scholars dispute whether Lissitzky went to Berlin on official business, as Nancy Perloff attests, or whether, as Matthew Drutt writes, “The auspices under which El Lissitzky traveled to Germany in late 1921 have never been firmly established.” Nancy Perloff, “The Puzzle of El Lissitzky’s Artistic Identity,” in *Situating El Lissitzky*, 7. Matthew Drutt, “El Lissitzky in Germany 1922-1925,” in *El Lissitzky: Beyond the Abstract Cabinet*, ed. Margarita Tupitsyn (New Haven: Yale University Press, 1999), 9.

Veshch' /Gegenstand/Objet, in which, as has been mentioned, Moholy-Nagy found images for *Book of the New Artists*. Although only two issues of the magazine appeared, both in the spring of 1922, Lodder has demonstrated that they, as well as Lissitzky's related activities in the advocacy of Russian art,⁵⁹ were highly influential in shaping an idea of constructivist art in the West. As Lodder writes, "For Lissitzky, the essential task at hand was to use art as a symbolic, ideological vehicle with which to assist in the transformation of consciousness both in communist Russia and in the capitalist West; for the Moscow constructivists, the imperative was to contribute in a direct, hands-on manner to the building of the new society that had actually come into being in Russia."⁶⁰ In Berlin Lissitzky redefined Constructivism in universalizing and internationalizing terms—terms similar to those addressed above in relation to Kassák's deployment of constructivist art. Therefore it is likely that Lissitzky's conceptualization of Constructivism echoed not only in *Ma*, which adopted images from *Veshch' /Gegenstand/Objet*, but also in *Book of the New Artists*. Although Fer does not focus on Lissitzky in "The Language of Construction," her discussion of *Book of the New Artists* lends credence to Lodder's argument:

⁵⁹ In particular Lodder cites a lecture Lissitzky gave on Russian art in 1922 in which he suggests that Constructivism emerged out of Suprematism, the latter movement having fostered the development of his *Proun* paintings (Proekt utverzhdenia novogo; Project for the affirmation of the new). Lodder, "El Lissitzky and the Export of Constructivism," 31. El Lissitzky, "The New Russian Art: A Lecture (1922)," in Sophie Lissitzky-Küppers, *El Lissitzky: Life, Letters, Texts*, trans. Helene Aldwinckle and Mary Whittall (London: Thames & Hudson, 1980). See also Drutt, "El Lissitzky in Germany," 13.

⁶⁰ Lodder, "El Lissitzky and the Export of Constructivism," 30.

Moholy-Nagy...did not seek to abandon ‘art’ altogether in the way that some of the Russians did, but instead advocated a new unity between art and technology. He saw himself as part of a far wider ‘constructive’ movement.... In *The Book of the New Artists*...he juxtaposed one of his own works with a construction by the Russian Constructivist Aleksandr Rodchenko and a photograph of the OBMOKhU exhibition. (Fig. 14).⁶¹

Moholy-Nagy and Kassák’s joint publication provides a rough parallel to Kepes’s stylistic shifts in the mid- to late-1920s. Kepes entered the Budapest Academy of Fine Arts in 1924 to study painting. Although none of his student works survive, it is possible to assume, based on his later comments, that he endeavored during these years to establish an approach to painting by sampling its contemporaneous manifestations. “I went through...the whole gamut of artistic exploration. I tried expressionism [and] explored cubist spatial analysis, built with constructive techniques.”⁶²

Bread and Light

When a political shift allowed Kassák to return to Budapest in 1926, he founded the briefly lived journal *Dokumentum*, which folded in less than two years, making way for his next periodical, *Munka*, a more eclectic version of his previous publishing ventures (it had, for instance, a sports page). The first issue, which appeared in

⁶¹ Fer, “The Language of Construction,” 92. The OBMOKhU exhibition, which opened in Moscow on 22 May 1921, was the first exhibition of the Working Group of Constructivists. The exhibition consisted of “laboratory works” that were undertaken, not for aesthetic ends, but as a precursor to the ultimate goal of designing everyday objects for mass production.

⁶² Gyorgy Kepes, “Gyorgy Kepes: Searcher in the New Landscape,” interview by Douglas M. Davis, *Art in America* 56, no. 1 (January-February 1968): 38.

September 1928, includes one of Moholy-Nagy's photograms, none of which had appeared in *Ma*.⁶³ This was around the time that Kepes took up photography and gave up painting. He did this because he desired a medium that was directly immersed in the world, or, rather, he sought a material that was *of* the world, a criterion that photography, in its dependence on light, seemed to fulfill perfectly. Within this logic, the only thing better than photography was film, a medium that paired light with movement, making it that much closer to "the real." Kepes reportedly settled on photography due to a lack of resources that kept him from pursuing film, his primary aspiration.⁶⁴ This belief in film is another idea he shared with Moholy-Nagy (among other artists at this moment). Indeed it is an idea he could have gleaned from Moholy-Nagy's book, *Malerei, Photographie, Film* (Painting, Photography, Film), which was first published in 1925. In it Moholy-Nagy states, "Since as a rule light phenomena offer greater possibilities of differentiation in motion than in the static condition, all photographic processes reach their highest level in film."⁶⁵ This is a possible source

⁶³ *Munka* 1 (September 1928): 19. Special Collections, Getty Research Institute, Los Angeles.

⁶⁴ In 1968 Kepes described this decision in terms of "social injustice." "In the late twenties I became deeply disturbed by social injustices, particularly by the inhuman condition of the Hungarian peasantry. In this context, painting seemed a rather anemic tool of human expression; film-making seemed to offer a way to satisfy the needs of my visual sensibilities as well as my social conscience." "Gyorgy Kepes: Searcher in the New Landscape," 38. See also the "Biography" in *Gyorgy Kepes, the MIT Years*, 87.

⁶⁵ László Moholy-Nagy, *Painting, Photography, Film* (Cambridge, Mass.: MIT Press, 1969), 33. English translation of the second edition of *Malerei, Fotografie, Film*, vol. 8 of the Bauhausbücher, 1927. The first edition, published as *Malerei, Photographie, Film*, appeared in 1925.

for Kepes's decision, but he may also have read Moholy-Nagy's article "Produktion-Reproduktion," which was published in *De Stijl* in July 1922, or any of the numerous articles Moholy-Nagy wrote on photography, film, and light beginning in this year.⁶⁶ And should these writings have failed to make their way to him, he would doubtlessly have seen Moholy-Nagy's "A fényképezés megújulása" (The Renaissance of Photography) published in 1928 in the second issue of *Munka*.⁶⁷

Kepes made the photograph *Bread and Light*, 1942 (fig. 15) in Chicago, far removed from his Hungarian years. It is a composite image—part photogram, part camera photograph—joined through superimposition. As the title indicates, it represents a piece of bread floating in an abstract field of shadow and light. This field is defined by generically recognizable shapes—primarily two overlapping rectilinear planes and two intermingled arches. Except for such general descriptions, these forms cannot be identified, even though specific objects, paired with the action of light, were required to make them. In contrast, the bread has all the characteristic specificity commonly associated with photographic image. There is a concrete sense of its texture and density, its rough crust and torn right edge.

The proximity of the bread to the rectilinear forms emphasizes the photograph's thematic juxtaposition of the specific and the general. The bread floats

⁶⁶ László Moholy-Nagy, "Produktion-Reproduction," *De Stijl* 7 (July 1922): 97-101. It is unlikely Kepes would have had access in Hungary to Moholy-Nagy's first text specifically on light, "Light: A Medium of Plastic Expression," which appeared in the American magazine *Broom* 4, no. 4 (March 1923): 283-84.

⁶⁷ László Moholy-Nagy, "A fényképezés megújulása (The Renaissance of Photography), *Munka* 2 (October 1928): 42.

over or against the largest rectilinear plane, which is black and projects from the bottom edge of the photograph into its center. In its stubborn flatness (except for the shadowy indications of its own density) the bread therefore partially contradicts the spatial illusion that the receding form might otherwise create. The rectangle becomes a presentational device, a stage. And the texture of the bread is visible *through* the smaller rectilinear plane, which is white and partially translucent. Finally, the highly specific form of the bread rhymes with the arches, which expand upward (and symbolically toward the light), into a nebulous, idealizing space. In short, the arrangement of the abstract forms in *Bread and Light* function to establish the auratic presence of a humble yet elementary subject.

As this work illustrates, Kepes may have experimented with Constructivism, just as he may have taken note of Kassák's universalizing tendencies, but he never had much use for images of racecars and airplanes in either his artwork or his books. Instead he was more apt to catch onto and transform contemporary concepts of natural phenomena—such as light—that he derived from Moholy-Nagy and others. Bread (which is about as far as one can go from a dynamo), was one of his enduring motifs. Made of grain, bread is a product of the earth—of germination, photosynthesis, human labor. And the making of bread, from the milling of grain to the kneading of dough, will always have mythic associations with the handmade and the home. Kepes's interest in this subject distinguishes him from Moholy, whose fascination with light had more to do with technological developments and the special effects they allowed than with nature, sustenance, and the passing of seasons.

To gain an understanding of why Kepes found this humble subject of interest requires returning to the year of his birth—1906—which happened to coincide with the emergence of debates about Hungary’s future based on new appraisals of its past. It is my contention that Kepes entered into this debate, which he carried on in the absence of its originators, when he came of age approximately two decades later. Further I believe he was free to make this leap back in time precisely because of his “late arrival.” Kepes’s modernism was always one of resourceful, adoptive quotation.

To judge from the historical record, the year 1900 arrived quietly in Budapest, but by 1906 the new century was in full voice there and elsewhere. In that year, the poet Endre Ady (1877–1919), who worked as a journalist in what was then the Hungarian city of Nagyvárad, published *Új versek* (New Poems), a book that made him, as one historian attests, “the originator of a literary and cultural revolution.”⁶⁸ Not only did Ady begin to disassemble traditional rhyming structures, he also acknowledged the intelligentsia’s growing sense of isolation and malaise. Yet Ady’s greatest accomplishment was expressing his belief in the *compositeness* of Hungarian identity. He envisioned this compositeness from his position as a Magyar, or “native” Hungarian, a move that countered the claims to purity of his own ancestry.⁶⁹ And

⁶⁸ István Deák, “Hungary: A Brief Political and Cultural History,” in *Standing in the Tempest*, 39. Today Nagyvárad is Oradea, Romania.

⁶⁹ The Magyar, who became the leaders of Hungary, or the *Magyarország*, were the descendents of a nomadic tribe that conquered the Carpathian basin (latter day Hungary) in the late ninth century. Therefore they were never native to the area but simply the most dominant force. Despite his status as a Magyar, Ady grew up in an impoverished household, a situation that likely contributed to his identification with the lower classes.

except for the form of his poems, which was often innovative, Ady expressed newness through a fondness for oldness. In 1907 he declared his sense of affinity with a particular generation not his own. “I have an odd relationship with the few representatives of the liberal generation of the 1860s still alive today. I feel myself to be both their heir and their contemporary and sometimes wonder if the devil had not sneaked two newer generations between us.”⁷⁰

By referring to the 1860s, Ady was indicating his solidarity with the generation that brought about the *Ausgleich*, or Compromise Agreement, with Austria in 1867. The Compromise gave new sovereignty to Hungary, which had existed for the most part under the Austrian rule of the Hapsburg Empire since the late seventeenth century. Nonetheless the terms of the Compromise fell far short of the reforms envisioned by participants in the 1848 revolution. Most prominently, authority stayed in the hands of Emperor Francis Joseph I who garnered a powerful dual base of support made up of an alliance between, on the one hand, the Austro-German aristocracy and a sizeable Austro-German bourgeoisie and, on the other, the Hungarian nobility and a small but nonetheless influential Hungarian bourgeoisie. This aristocratic/bourgeois and Austro-German/Hungarian constellation of power came to be known as the Age of Dualism. As long as those who had determined the division of power remained in charge—a status quo that required ongoing

⁷⁰ Endre Ady “Glosszák” (Commentary), *A Hét*, 8 December 1907, in *Ady Endre összes prózai művei* (The collected prose works of Endre Ady), 11 vols., ed. Gyula Földessy and István Király (vols. 1-10) and Erzsébet Vezér and József Láng (vol. 11) (Budapest: Akadémiai Kiadó, 1968-1977), vol. 2, 79, quoted in Gluck, *Georg Lukács and His Generation*, 52.

suppression of non-German and non-Hungarian, or non-Magyar, nationalities (including Jews, Slovaks, Romanians, Serbians, and Croats)—they willingly cultivated a modern, liberal nation-state.

Thus the Compromise of 1867 instigated the “golden age of Hungarian liberalism” during which its beneficiaries enjoyed the growing acceptance of basic civil liberties (freedom of the press, of speech, assembly, and religion) and the emergence of a modern economy. If ethnic minorities accepted Magyar dominance, they could enjoy the state’s freedoms. These conditional reforms led to others, such as the separation, in the 1870s, of the judicial and administrative branches, and, in the 1890s, the passage of secularization laws, which separated church from state and reiterated the freedom of religion, a step specifically aimed at acknowledging the rights of Jews. Of course such conditional governmental benevolence was not free from political maneuvering. Since the Magyar population was less than half of the sum of non-Magyar populations, it was in the state’s interest to promote assimilation.

In the 1870s and 1880s this liberalism coincided with economic expansion and, by the 1890s, a growing resentment among the Magyars towards the economic gains of assimilated Jews and other non-Magyar groups. Ady’s disaffection with his own generation reflected an awareness of mounting anti-Semitism and xenophobia. By the early 1900s this resentment had expanded to the university, where conservative students protested against professors who advocated what they saw as the foolish and misguided liberalism of their parents.⁷¹ Ady’s poems, such as “The

⁷¹ The most notorious protest was the Pikler affair, which took place in 1907 and targeted the legal historian Gyula Pikler for teaching that social hierarchies were the

Magyar Fallow” (1906), express dismay at the Hungarian “wasteland” and nostalgia for an inclusive, even international, Magyar outlook. Therefore in the late nineteenth and early twentieth centuries Hungarian nationalism had two very different faces. One, exemplified by Ady, sought interaction with the world at large through a humanistic ideal (albeit complete with the inherent hypocrisies of cultural and ethnic “melting pots”). The other sought a return to an equally romanticized but ultimately exclusionary past.

Joining Ady in his more inclusive outlook were the young composers Béla Bartók (1881–1947) and Zoltán Kodály (1882–1967). In 1906, the same year that Ady’s *New Poems* appeared, Bartók and Kodály published a collection of twenty folk songs entitled *Hungarian Folk Songs for Voice with Piano Accompaniment*. The pair amassed the collection by traveling the countryside with a phonograph. The music they encountered was significantly removed from the accepted norm of Hungarian folk sound (a music known as *verbunkos*, which had both militaristic and nationalist associations). Among the intelligentsia the music Bartók and Kodály “discovered” satisfied two impulses: it was both “exotic”—literally, to their ears, unheard of—and also thrillingly “native,” offering the promise of a sound for an outré nationalism to counter the conservative din.

Before and during World War I the Hungarian avant-garde proclaimed Bartók’s music (he began to compose interpretations of what he had collected) and Ady’s poems as undisputed and even incorruptible references. In his later years

result of economic differences. For a description of this event see Gluck, *Georg Lukács and Generation*, 61.

Lukács, who tended to downplay the significance of his early associations, never failed to acknowledge his indebtedness to Ady, who he credited with awakening his first literary and political ambitions. “The *New Poems* had an absolutely overwhelming impact on me; to put it bluntly, this enabled me to find my way back to Hungary and which I thought of as part of myself.”⁷² Likewise Bartók was an integral part of the period’s intellectual environment, invited, for instance, to play for the Sunday Circle, a group of intellectuals that included Lukács.⁷³ At one such meeting Bartók was later described as a charming naïf. “Béla Bartók, still young but already completely white, came and played ‘The Wooden Prince’ on the piano.... He said very little and smiled sweetly at what probably appeared to him to be our incomprehensible conversations.”⁷⁴

In 1910, the same year that Lukács published his first book, the essay collection *Soul and Form*, Kassák set off on foot for Paris. He returned to Budapest just before the start of World War I intent on countering the Sunday Circle’s prominence, which he dismissed as elitist and out of touch.⁷⁵ Nonetheless he agreed

⁷² Georg Lukács in a 1971 interview with István Eörsi and Erzsébet Vezérs, published as a chapter in Georg Lukács, *Record of a Life: An Autobiographical Sketch*, ed. István Eörsi, trans. Rodney Livingstone (London: Verso, 1983), 38-39.

⁷³ The group began to meet in the first years of the century and formalized their events during World War I.

⁷⁴ Emma Ritoók, unpublished diaries (courtesy Erzsébet Vezér), in Mary Gluck, *The Lukács Generation*, 15-16.

⁷⁵ In a text from 1918, Kassák proclaims that, “For us, art is active, agitative life itself that throbs with our blood. We have left behind us the leaders of the pack of five or six years ago, and their entire swarm abuzz with so-called modernism. They have collapsed due to their own vacuity, as if the ground had been pulled from under their

with the Circle about the importance of Ady. When the poet died in 1919, Kassák wrote the obituary and included it prominently in the February issue of *Ma*.⁷⁶ Likewise in 1917 he illustrated a fragment of one of Bartók's musical compositions on *Ma*'s cover, allowing it to take the place normally reserved for drawings and prints (fig. 16).⁷⁷

Figures such as Lukács and Kassák were drawn to Ady and Bartók for their ability to express connections to the past that had immediate relevance to the present. Ady advocated a new view of the Magyar "spirit," Bartók of the Hungarian peasant. In his early work Lukács was an impassioned spokesperson for the contemporary meaning behind what might otherwise be construed as retrograde acts of nostalgia. "The past," as Mary Gluck has written, became for Lukács and his peers, "an instrument of criticism against the present, as well as a model of integrity and synthesis for the future."⁷⁸ In 1910, Lukács wrote an article in support of the painter Károly Kernstock for the journal *Nyugat* (West). Prophetically titled "The Ways Have Parted," it conveyed a desire for "essences" and "order." "Today once again we long for order among things. We long to recognize them and recognize in ourselves that which is really ours. We long for permanences, for our deeds to be measurable,

feet." Lajos Kassák, "For the Comprehensive *Ma* exhibition," *Between Worlds*, 166. Originally published as "A *Ma* demonstratív Kiállításához," *Ma* 2, no. 8-9 (15 September 1918).

⁷⁶ Lajos Kassák, "Ady Endre 1877-1919," *Ma* 4, no. 2 (26 February 1919): 14-15.

⁷⁷ Béla Bartók, "Kottarészlet," *Ma* 3, no. 2 (December 1917), cover illustration.

⁷⁸ Gluck, *Georg Lukács and His Generation*, 7.

our statements unequivocal and verifiable.... There should be a meaning to all our things.... And the very belief that there is something palpably permanent in the whirlpool of moments.”⁷⁹

The same year that Lukács wrote “The Ways Have Parted” he published *Soul and Form*, a work he would later designate as the summation of his “essay period.” Lukács’s friend, the philosopher Léo Popper, unsuccessfully urged him to include an essay on Gauguin in this volume.⁸⁰ The essay originally appeared in the periodical *Huszadik Század* (Twentieth Century) in June 1907. Approximately sixty-five years later, in 1972, Kepes recalled coming upon Lukács’s Gauguin article as a young man. While he did not state the year he read it, he does acknowledge that the magazine was clearly dated at the time. Yet Kepes credits the article with putting into words what had already occurred to him intuitively. The article, he remarked, “was like a revelation. It was the first time I saw a clear formulation of an artistic stand which is related to the need for social context.”⁸¹

In actuality the article conveys a very different—in a word, individualistic and romanticizing—view of “social context” than Lukács would later embrace as a communist. Yet it also contains premonitions of the author’s eventual rejection of self-focused solutions. As Lukács writes, “Gauguin provides an answer to a very

⁷⁹ György Lukács, “The Ways Have Parted,” in *Between Worlds*, 127-28. Originally published as György Lukács, “Az Utak elváltak,” *Nyugat* (West), vol. 1 (1910).

⁸⁰ This anecdote regarding Popper’s advice to Lukács is relayed in Gluck, *Georg Lukács and His Generation*, 131.

⁸¹ Kepes, interview by Brown, 7 March 1972, transcript, p. 5. Kepes Papers, AAA.

general question which many people have without being conscious of it.... What is the relationship between the modern artist and Life? Only the question is general, the answer is so individualistic in nature that it ceases to have any exemplary, or symbolic meaning. It suggests the possibility of a harmonious solution to a tragic situation; but in essence the solution depends so much on individual feelings as to leave the tragic conflict unresolved.”⁸² Gauguin’s answer, as Lukács sees it, was Tahiti. “For Gauguin, Tahiti was not an escape as many believed, but the reaching of his goal, the end of his experimentations.... Above all Tahiti restored Gauguin as a human being. He had found his place in society, no longer an exotic, luxury item in the hands of amateur collectors, nor a restless anarchist who threatened public safety. A primitive man pointed out to him—for the first time in his life—that he could produce what no one else could, that he was a useful human being.”⁸³ Needless to say, this achievement would have appealed to the young man who was “shopping for a task in life.”⁸⁴ But Kepes seems not to have noticed or recalled the lament in Lukács’s assessment of Gauguin’s “answer.” Instead the article became his admittedly quirky introduction to “the need for social context.” And its romanticism, for better or worse, would color his approach to Moholy, the Bauhaus, and the scientific wonders that awaited him in the United States.

⁸² Georg Lukács, “Paul Gauguin” (1907), in *The Lukács Reader*, ed. Arpad Kadarkay (Oxford, England: Blackwell, 1995), 160.

⁸³ *Ibid.*, 163.

⁸⁴ Gyorgy Kepes, interview by C. Breuer, 29 August 1983, transcript. Marcel Breuer Papers, AAA.

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Before turning to Kepes's years in Berlin it seems appropriate to consider the two artworks known to be extant from his years in Hungary and, further, to discuss them in terms of the nationalist and universalist themes that have been addressed so far. As we have seen, in the early 1920s Kepes began the process of transforming a childhood proclivity for art into an adult vocation. This included reconciling two interrelated perceptions. The first pertained to his youthful awakening to class difference. Kepes was born in Selyp, a rural community sixty miles northeast of Budapest, where his father was manager of an aristocratic estate. In an interview he described his upbringing as lacking for nothing, except perhaps the "spontaneity" and "community" he observed in the peasant population his father oversaw. "We had a very comfortable life, and my childhood was, if one can say, a welcome childhood.... Something which I...felt, but not consciously, was that there are two types of lives, at least in this context. One was how I lived, middle or upper middle class, a certain type of accepted mores, but in spite of having these surface manners, or security, there was something lacking, which was intensity, the spontaneity, the directness of life, and above all, the sense of community."⁸⁵

The second but related perception emerged in response to World War I. In 1914, the year of the war's onset, the Kepes family moved to Budapest. Kepes later recalled witnessing violence at the end of the war from the vantage point and relative safety of his family's apartment. "Seeing what happens to people, I thought that there

⁸⁵ Kepes, interview by Brown, 7 March 1972, transcript, p. 3. Kepes Papers, AAA.

cannot be separate lives, but whatever I am doing, as a young person, or as a young artist, and the world around me, are one single system.”⁸⁶ Characteristically, when Kepes recounted this story more than fifty years later he couched the experience in terms of his connectedness to the world around him, rather than in terms of a life-versus-death demonstration of difference.

Kepes’s earliest known work, a photomontage entitled *In Memory of L.R.* (i.e. Rosa Luxemburg) of 1928, transforms his first perception—class-consciousness—into a disturbing memorial to the slain communist leader (fig. 17). Like Moholy-Nagy’s photomontages from this period, it uses geometric forms—in this case a rectangle inside a square—to frame two of the three photographic elements. Yet these elements are assembled against a black background rather than the white background that is more frequently used in photomontage. El Lissitzky adopted this strategy in *Black Sphere*, an illustration for *6 Tales with Easy Endings*, a novel by Ilia Ehrenburg, 1920-21 (fig. 18).⁸⁷ As Matthew Drutt has observed, both Lissitzky and Moholy-Nagy made negative-positive pairs of photograms,⁸⁸ and the use of a black background in photomontage suggests a similar inclination. On the one hand, the

⁸⁶ Ibid.

⁸⁷ Kepes included two of Lissitzky’s of illustrations for Ehrenburg’s novel in *Language of Vision* (23, 218), indicating that these works were important to his conceptualization of vision in the early 1940s. One of these illustrations shows Vladimir Tatlin constructing his *Monument to the Third International* in a complex space of interlocking planes. Matthew Drutt discusses this image and its significance to Lissitzky’s “impending deployment of abstract space into real space.” Drutt is referring to Lissitzky’s installation of *The Abstract Cabinet* at the Provinzialmuseum, Hanover in 1930. Drutt, “El Lissitzky in Germany,” 11-12.

⁸⁸ Drutt, “El Lissitzky in Germany,” 17.

switch from a white to a black background is eye-catching—it works against the convention of the neutral white (or light-colored) support. On the other hand, the black background implies an awareness of the photograph’s reproducibility—it suggests the photographic negative, partially counteracting the unique, handmade quality of the photomontage.⁸⁹ And in the case of Kepes’s photomontage, the black background is, in fact, appropriate to the purposes of the memorial.

The photographic elements in *In Memory of L.R.* consist of a partial image of what is presumably Luxemburg’s corpse in the square’s lower left corner, and, in the square’s upper right corner, a demurely posed female nude. Outside the square, but placed at a diagonal that leads to the corpse, is a mechanical object, perhaps a set of gears, as if Kepes sought to refer to the “workings” of Luxemburg’s famously independent mind. Her political activism, needless to say, did not include pinup duty, so we can safely assume that the nude is allegorical. This homage to Luxemburg comes nearly a decade after her death and two years after the completion of a very different homage, Ludwig Mies van der Rohe’s severe *Monument to Rosa Luxemburg and Karl Liebknecht* (1926), which was erected in the cemetery in Berlin-Friedrichsfelde (fig. 19). German paramilitaries shot Luxemburg and Karl Liebknecht on the night of 15 January 1919, and their bodies were recovered from a canal. This would have been around the time that Kepes witnessed shootings in Budapest,

⁸⁹ Of course a photomontage on a white background could also be photographed and printed in negative, creating the black-background effect while losing some of the image’s signs of “handmadeness,” the visible vestiges of its construction.

suggesting that personal trauma at least partially explains, if not excuses, the youthful indiscretion of this work.

Compared to Kepes's later works, *In Memory of L.R.* is an anomaly. Not only did Kepes move away from communist subjects, after this moment he rarely included imagery that suggested unease about the role of the "new woman." Eleanor Hight has demonstrated that this was an unease that Moholy-Nagy repeatedly grappled with in both his camera photographs and his photomontages. "With very few exceptions, Moholy-Nagy's photographs of people from the 1920s were of women, and through his pictorial strategies he set up an uncertain relationship with the newly working, sexually liberated women of his circle."⁹⁰ In the late 1930s, Kepes created a series of photographs of his wife, Juliet Kepes, but these images (two of which will be addressed in the following chapter) generally associate the female subject with nature rather than with the "new woman's" emerging presence in culture. Despite the anomalous place that *In Memory of L.R.* holds in Kepes's oeuvre, it nonetheless got him into trouble at the Budapest Academy in the spring of 1929. At the time, Kepes was studying with the painter István Csók. The Minister of Culture visited Csók's classes and declared Kepes's photomontages "subversive," a charge that resulted in his expulsion. Csók, who defended Kepes and other artists, was forced to retire.⁹¹

Another early photograph, *Transylvanian Peasant Children*, dates from 1932, the year Kepes, now living in Berlin, returned for a visit to the Hungarian countryside

⁹⁰ Hight, *Picturing Modernism*, 133-73.

⁹¹ See Botar, "A Comparative Chronology," in *Standing in the Tempest*, 210.

(fig. 20). It depicts two young girls standing with their backs to a cluster of women. The height of the children dictates the framing of the image, so that the women are identifiable only through fragmented details, primarily the alternately patterned and plain fabric of their full skirts. The lower arm of one of the women, mostly covered by a white sleeve with what appears to be an embroidered cuff, hovers at the photograph's upper edge. The woman's arm reaches across her body at the waist, where she grasps an object, perhaps a blanket, propped against her hip. This arm is above and roughly parallel to the upraised arm of the girl on the left, who has positioned a hand near her forehead to shield her eyes from the sun. A hat shields the eyes of the child on the right. Except for these areas of shadow, the children are otherwise washed in sun, as if they stand in the spotlight with a protective "curtain" of women behind them.

This barred access to the children's eyes likewise exaggerates the presence of their clothing, its softness and lack of structure, its wrinkles and irregular hems. The vest worn by the girl on the right echoes a similar garment worn by the woman standing behind her, a detail that signifies in this context native costume traditions rather than current fashion. Judging from the slight angle at which we see the children's faces, both seem to be gazing away from or beyond the photographer, out to the landscape, details of which (grass, shade, perhaps foliage) exist around the edges of the image. Their gazes could suggest a comfortable connection to their surroundings, but their posed frontality—the self-consciousness of which is hinted at by the way the child on the left stands with one of her feet propped along its outside edge—belies the seeming casualness of the scene.

It is instructive to consider this photograph in relation to Kepes's memory of a youthful encounter with Lukács's essay on Gauguin. Specifically, Kepes's idealization of the Hungarian peasant is comparable to the "primitive man" in the work of Gauguin as analyzed by Lukács. As we will recall, Lukács believed that Gauguin's interaction with Tahitian culture "restored [him] as a human being." Kepes remembered the Hungarian peasant as similarly restorative and, moreover, as immutable—harmoniously unified with nature in a way that modern man was not. Kepes's aspired for a return to this mythic harmony, which was to be located in a "new nature," irrevocably transformed by science. As we shall see in greater detail in Chapters Three and Four, "world culture" would become a similar sign—increasingly in evidence after World War II—of what Kepes understood as the elemental qualities of humanity in relation to nature. These were qualities, or "values"—the positive and productive traits that he understood to be common to humankind.

Kepes only occasionally made camera photographs, preferring to work indoors, often without a camera, arranging materials—from the reflective, to the translucent, to the opaque—on light-sensitive paper and exposing them to light. Yet while Kepes only dabbled in representing the Hungarian peasant directly and he quickly shied away from overtly representing his interest in communism, he did not cease to create photographs, such as *Bread and Light*, that embodied, however abstractly, his ideal of community. Therefore unlike Kepes's flirtation with communism, which, at least in its *public face* seems to have been both superficial and

momentary,⁹² his veneration of the Hungarian peasant cannot be so easily dismissed. This is the case even if this manifestation of “wholeness,” which in this instance we can take to be synonymous with a communal ideal, seems far removed from his later adoption of the scientifically charged language of Gestalt psychology, for instance, or his infatuation with the connections, and even equations, made between animal and machine in cybernetic theory. When Kepes immersed himself in these intellectual trends, among others, he nonetheless remained certain that his creative life emerged out of his early perceptions of, on the one hand, community and belonging, and, on the other, inequity and injustice.

Berlin: An Experiment in the Commercial Arts

Sometime in 1930 Kepes initiated a correspondence with Moholy-Nagy who responded by inviting the younger artist to move to Berlin to work as his assistant.⁹³ When Kepes arrived in Berlin that same year, he was surprised to discover that his new employer was in Paris, most likely working on the Deutsche Werkbund’s contribution to the international exhibition organized by the Société des Artistes

⁹² It should be acknowledged that what we know of Kepes’s political convictions comes from his years in the United States. Particularly during the 1950s, he would have been disinclined to speak about the nature of his connections to communism, whether past or present.

⁹³ The whereabouts of these letters is unknown. Moholy-Nagy also traveled to Budapest in 1930 where he was received, as Krisztina Passuth has noted, “as an outstanding representative of the Bauhaus school (although he had already left it by then) [and] as a pioneer of the modern approach in photography, film, typography and commercial and exhibition design.” Passuth, *Moholy-Nagy*, 60. It is therefore possible that the two artists met in Hungary prior to Kepes’s emigration, although there is no record of this having occurred.

Décorateurs.⁹⁴ In his absence Kepes spent his first weeks in Berlin passing time in the office of another Hungarian and former Bauhaus instructor, the architect and designer Marcel Breuer.⁹⁵ This was the first of Kepes's many disappointments in his complex relationship with Moholy-Nagy. From the outset, their relationship was complicated by differing personalities. Sibyl-Moholy-Nagy's book, *Moholy-Nagy: Experiment in Totality*, contains a revealing passage in which the author relays her first encounter with Kepes, who struck her as strikingly different from her future husband:

I went to Moholy's studio to return a film manuscript which he had urged me to read. The face of the young man who took me in the elevator to the top floor of the studio building on the Kaiserdamm reflected intense concentration. He was Gyorgy Kepes, a Hungarian painter who had come to work with Moholy a few years earlier. His reticence, and the perpetual solemnity of his mien, seemed to contrast strangely with Moholy's enthusiastic eloquence and outgoing cordiality. In time I came to understand their partnership. It was founded on their common devotion to *seeing* as a philosophy of life. Their differences of temperament and social orientation, often aggravated by their furious Hungarian egos, were settled through a deep mutual understanding about the fitness of demonstrative means. It was a matter of common emphasis and common taste. Later, in their American years, they added to this unifying vision the dedication to teaching. On behalf of the shared responsibility for the future of universal design they formed a team which lasted for twelve years. It added much to the visual pedagogy of our time.⁹⁶

⁹⁴ It was at the International Werkbund Exhibition that Moholy-Nagy first showed the *Lichtrequisit* (Light-Space Modulator), 1922-30, and the film *Lichtspiel schwarz-weiss-grau* (Light display black-white-gray), 1930.

⁹⁵ Kepes, interview by C. Breuer, 29 August 1983, transcript. Marcel Breuer Papers, AAA.

⁹⁶ Sibyl Moholy-Nagy, *Moholy-Nagy: Experiment in Totality* (1950), 2nd ed. (Cambridge, Mass.: MIT Press, 1969), 62.

Like much of Sibyl Moholy-Nagy's book, this passage betrays a persistent (and perhaps understandable) bias towards her deceased husband. In this respect it is also an uncritical reiteration of Moholy-Nagy's theories on a variety of subjects: vision, empiricism ("demonstrative means"), teaching. Nonetheless Sibyl Moholy-Nagy was not alone in her assessment of Kepes's "perpetual solemnity of mien," a personality trait that was likely compounded during the artist's years in Berlin when he began to meet and interact with some of the artists whose works he could only have encountered in Hungary through dated books and magazines. A group caricature by the artist Géa Augsburg that appeared in the magazine *Index* in 1935 depicts a number of artists—among them Augsburg himself, as well as Kepes, Max Ernst, Xanti Schawinsky, and Moholy-Nagy—in the company of the architects Walter Gropius and Frantisek Kalivoda (fig. 21). Most of the figures are in the foreground of a well-appointed room. There is, for instance, a dandyish Ernst who sits with a seemingly calculated degree of remove from Moholy-Nagy, who is characteristically on the edge of his chair. In the background are portraits—a bust and two paintings. This is where we find Kepes, lying on the floor with his head propped and in profile, the better to display the single, downward-turned line that defines his mouth.

Nor was Sibyl Moholy-Nagy incorrect when she identified a strong bond between the two artists that may have been facilitated, as she suggests, by their different personalities. In 1947 Kepes wrote to his friend, the artist Robert Wolff (who had taught at the Institute of Design), of Moholy-Nagy's death on 24 November 1946. "The whole incredible killing of such a vitality and abundance of life seems

and rests beyond comprehension. For the loss of Moholy-Nagy is one of the rare losses in human life.”⁹⁷

It is with a sense of the complex and competitive dynamic shared by the two artists that we turn to the years 1930 to 1934, when their lives overlapped in Berlin. After Moholy-Nagy arrived back in the city, Kepes became his assistant as the two had planned from afar. But it is likely that they worked together in these years only intermittently. In 1932 Kepes returned to Hungary for an extended stay in order to recover from what he later described as a heart ailment.⁹⁸ And throughout these years Moholy-Nagy was constantly traveling from one project to another. Nonetheless Kepes is believed to have made a minor contribution to Moholy-Nagy’s film *Lichtspiel schwarz-weiss-grau* (Light Display Black-White-Gray) of 1930, designing the credits (which presumably were added after the film received its first showing in Paris at the Werkbund exhibition). He also assisted Moholy-Nagy on commercial projects, confronting for the first time the difference between endeavors embarked on with relative independence and those that had externally determined charges and exigencies.

When Moholy-Nagy left the Bauhaus in 1928, where he had taught since 1923, he sought to establish himself in Berlin as a commercial artist specializing in graphic design, stage sets, photography, and film work. While this decision was made for financial reasons, it was also in keeping with the social value he attributed to

⁹⁷ Gyorgy Kepes to Robert Wolff, 19 January 1947. Institute of Design Collection, U. of Ill., Box 7, folder 210.

⁹⁸ Kepes, interview by Brown, 11 January 1973, transcript. Kepes Papers, AAA.

commercial work at this moment. As mentioned above, Moholy-Nagy began to emphasize the importance of the light-dependent media of photography and film in 1922,⁹⁹ an emphasis that could be clearly demonstrated in the graphic designs he made that incorporated photographs, prior to and after he established his design business. The photogram that comprises Moholy-Nagy's title page for the March 1923 issue of *Broom* is an early instance of this practice (fig. 22). In the same year, he used photomontage and a series of sweeping diagonals to suggest the speed that could be attained using tires made by Pneumatik (fig. 23). And in the early 1930s, Moholy-Nagy spliced together two camera photographs to demonstrate that Jena Works products could go from stove to table (fig. 24).

Yet despite Moholy-Nagy's ongoing use of photography in his art practice and in his commercial work, he continued to paint throughout his years at the Bauhaus. Although he was clearly aware that a number of vanguard artists had renounced easel painting,¹⁰⁰ Moholy-Nagy was reluctant to entirely embrace this position. Nonetheless in 1927 his production of paintings slowed.¹⁰¹ And in 1928 he ceased painting for a period of approximately two years, a hiatus that allowed him to

⁹⁹ László Moholy-Nagy, "Produktion-Reproduktion," *De Stijl* 5 (July 1922): 98-100.

¹⁰⁰ Principle among these artists were the members of the First Working Group of Constructivists (Rabochaia grupp konstruktivistov) were Aleksandr Rodchenko, Varvara Stepanova, Liubov' Popova, Karl Ioganson, Georgii and Valadimir Stenberg, and Konstantin Medunetskii.

¹⁰¹ Passuth, *Moholy-Nagy*, 52.

focus on his design work, which he envisioned as a populist venture.¹⁰² Prior to resigning from the Bauhaus, Moholy-Nagy wrote the article “Die Photographie in der Reklame” (Photography in Advertising), which appeared in 1927 in the Viennese journal *Photographische Korrespondenz*. In this text he sees the union of photography and advertising as much more than a commercial opportunity. Expansion of the role of photography in advertising might even, Moholy-Nagy imagined, assist in “the first groping efforts to take possession of both the apparatus [i.e. the camera] and its expressive potential.”¹⁰³ This, he suggested, would be the case because advertising could serve as the ideal vehicle for expanding a “revolution” to the “masses” that had already taken place “in the visual and simultaneously in the intellectual sphere.”¹⁰⁴ Therefore Moholy-Nagy approached commercial design as a didactic opportunity, comparable to his work at the Bauhaus.

In 1926 Lajos Kassák also trumpeted the potential usefulness of “good” advertising, by which he meant advertising that was free from anything objectionable

¹⁰² Passuth designates this period as a “crisis concerning his career as a painter.” Yet she admits that “We know almost nothing of this crisis, of which little is revealed in his letters or other writings.” Ibid. Nonetheless, Moholy-Nagy’s effort to justify painting is evident in *Painting, Photography, Film*, in which he argued, as Eleanor Hight has shown, that photography “could now fulfill painting’s old narrative functions, that is, documenting reality. Now, Moholy maintained, the interplay of color, plane, and space, with the further implications of movement and time, had become the primary goals of modern painting.” Hight, *Picturing Modernism*, 177.

¹⁰³ László Moholy-Nagy, “Photography in Advertising,” in *Photography in the Modern Era: European Documents and Critical Writings, 1913-1940*, ed. Christopher Phillips, trans. Joel Agee (New York: Metropolitan Museum of Art and Aperture, 1989), 86. Originally published as idem, “Die Photographie in der Reklame,” *Photographische Korrespondenz* (Vienna) 9 (September 1927): 257-60.

¹⁰⁴ Ibid., 87.

in either design or motive. In fact, Kassák maintained that because advertisements were necessary to commerce, it was the artist's duty to participate as a "social creator" in their successful deployment:¹⁰⁵

An effective advertisement is aesthetically pleasing, and an effective advertisement is an indispensable requisite from the point of view of society. Advertisements have come into being as a result of commerce, and commerce is a consequence of humankind's constantly increasing living requirements. Naturally, if one were to deliver a judgment of the overall quality of the brunt of advertisements in present day Europe it would be easy to declare that these advertisements are anti-social and in bad taste. But the same holds true for today's free-market capitalism. Yet this does not mean that we should banish commerce once and for all; it should instead lead to placing it upon foundations that are socially more equitable.... The advertisement has not been eliminated in Russia; it has simply been liberated from the clutches of selfish private interests, so that hitherto anti-social forces have been converted into propaganda that works in the interests of the community.¹⁰⁶

Kassák may have had difficulties with the artworks of the Russian constructivists, but he was clearly less conflicted about the usefulness of their entrée into mundane promotional tasks. It would be easy to dismiss Moholy-Nagy and Kassák's embrace of advertising as little more than a self-interested aggrandizement of an enterprise dedicated to financial gain. But this would fail to take into account their expressed desire to create new, socially relevant outlets for art. They approached advertising as a public information system, a visual tool that could be harnessed for the greater

¹⁰⁵ "The advertisement is *applied art* and the advertising artist is a *social creator*." Emphasis in original. Lajos Kassák, "Advertisements," in *Between Worlds*, trans. John Bátki, 622. Originally published as Lajos Kassák, "A reklám," in *Tisztaság könyve* (Budapest: 1926).

¹⁰⁶ *Ibid.*, 622-23.

good, and they found it inconceivable that a pleasing design could ever have bad intentions.

Moholy-Nagy's circa 1930 design for what is believed to be a book jacket demonstrates the sophisticated persuasiveness of his commercial work around the time that Kepes entered into the business (fig. 25). Entitled *Verantwortete!* (Be Responsible!) it is a photomontage made up of horizontal, flag-like stripes. These linear fragments consist of crowds photographed from above intercut with two identical photographs of part of a woman's face (centering on the mouth) and, finally, a single section dedicated to the work's eponymous command. The device of the horizontal stripes creates a troublingly effective juxtaposition between an individual and the masses, and, more specifically, between a partially glimpsed woman and what appears to be uniformly male crowds. The fact that the purpose of the design remains unknown only adds to its disturbing impact. We can note the designer's ingenious arrangement of crowd scenes so that the figures pictured diminish in size and thus create a sense of perspective (and a seemingly endless multitude). And we can consider the way in which the scale of what we see of the woman's face allows us to imagine, uncannily, an entire face, a completed form. And, moreover, we can observe the introduction of an energetic cursive typeface that seems to have replaced, in this instance, the blocky sans serif type generally associated with the constructivist poster to which the design is otherwise indebted. Yet the ominousness of the image derives mostly from the potential *interchangeability* of its use. It could be benignly reminding citizens not to litter at sports tournaments, but it could also be warning men against

lipstick-wearing “temptresses,” or it could be equating a weakness for “loose talk” with the female speaker, and so on.

Moholy-Nagy’s work for the theater between 1929 and 1931 can be compared to the visual organization evident in the design for the *Verantwortel* book jacket. When presented with the opportunity to design for the stage, he created abstract structures into which he inserted props, treating the space defined by the proscenium arch as a three-dimensional “page.” Moholy-Nagy had developed a theory of the new possibilities of the theater while at the Bauhaus. In 1924 he co-wrote *Die Bühne am Bauhaus* (The Theater of the Bauhaus) with Oskar Schlemmer and Farkas Molnár, the fourth book in the Bauhausbücher series.¹⁰⁷ The coauthors called for a “total theater,” an aspiration that was indebted to Russian Constructivism. Lyubov Popova’s stage design for Vsevolod Meyerhold’s 1922 production of *The Magnanimous Cuckold* is an example of this approach (fig. 26). As Briony Fer has observed, “Popova’s designs transformed the body into a geometric construction.”¹⁰⁸ Thus transformed, the body became an integral part of the overall, geometric *mise-en-scène*. For Schlemmer, as Krisztina Passuth writes, “the theatre signified man’s projected, enhanced, and multiplied presence.... He wanted to imbue the whole

¹⁰⁷ Translated by Arthur S. Wensinger as *The Theater of the Bauhaus* (Middletown, Conn.: Wesleyan University Press, 1961). Moholy-Nagy published a second text on the theater in 1927. See László Moholy-Nagy, “A jövő színháza: a teljes színház,” (Total Theater is the Theater of the Future), *Dokumentum* (March 1927).

¹⁰⁸ Fer, “The Language of Construction,” 138. A similar comparison could be made to Varvara Stepanova’s sets for Sergei Eisenstein’s 1922 production of Alexander Sukhovo-Kobylin’s play *The Death of Tarelkin*, models of which were presented at the *Exposition Internationale des Arts Décoratifs* in Paris in 1925, which Moholy-Nagy attended.

milieu with the atmosphere of the theatre; thus, he included even the balconies of the Bauhaus building in the stage.”¹⁰⁹ In contrast, Passuth observes, Moholy-Nagy was interested in the stage “as a possible variant of the dynamic-constructive system of forces.”¹¹⁰ His work for the theater was less driven by the individual or the collective human presence on stage, than by the opportunity to introduce abstract forms into real space.

Around the time that Kepes arrived in Berlin, Moholy-Nagy was commissioned to design the sets for the Berlin Krolloper’s mounting of *Madame Butterfly* (fig. 27, fig. 28).¹¹¹ This was Moholy-Nagy’s second job for the Berlin opera house, the first being his 1929 design for Walter Mehring’s *Tales of Hoffmann* (fig. 29) This earlier set comprised a grid filled with an array of objects—what appear in photographs to include mannequin parts, several silver balls, and small doll-like figures. The set for *Madame Butterfly*, which was presented in 1931, utilized open latticework that formed a variation on the earlier grid structure. Into this matrix Moholy-Nagy inserted signs of “Japaneseness” in the form of an abbreviated depiction of a traditional house and garden arrayed in front of a backdrop depicting a

¹⁰⁹ Passuth, *Moholy-Nagy*, 56-57.

¹¹⁰ Ibid., 57. I return to Moholy-Nagy’s use of the term “dynamic-constructive” in Chapter Three.

¹¹¹ Sibyl Moholy-Nagy indicates that her husband was quickly disillusioned with the prospect of working for the opera. In *Moholy-Nagy: Experiment in Totality* she quotes from his personal writings from 1930, in which he remarked, “Grand opera and Total Theater don’t blend. One can’t dress obsolete content with modern design.” Moholy-Nagy, quoted in Sibyl Moholy-Nagy, *Moholy-Nagy: Experiment in Totality*, 50.

dense mountaintop settlement. In both sets Moholy-Nagy integrated the overt use of light so that he could, as Passuth has demonstrated, “completely change the entire atmosphere from one moment to the next by conjuring up startling monumental constructions of shadow.”¹¹² A journalist writing in 1946 (in a remembrance of Moholy-Nagy following his death that year) proclaimed the effect of the *Madame Butterfly* set (which he would only have seen in photographs) “quite authentically Japanese” even though “no Japanese elements were actually used.” The writer attributes this success to Moholy-Nagy’s talent as an abstractionist, for his “knowledge of the behavior of light, of the psychological effects of vistas and planes.”¹¹³

The *Madame Butterfly* latticework bears similarities to the exhibition panels that Moholy-Nagy designed for Room One of the 1929 *Film und Foto* exhibition in Stuttgart (fig. 30). Although Kepes could not have participated in Moholy-Nagy’s preparation for and mounting of this exhibition since it predated his time in Germany, it seems inconceivable that he would not have been familiar with the basic premise of its structural design. This design balanced the strong horizontals created by the panels with thin vertical supports that extended above and below the panels themselves. The cohesive and all-encompassing design formed an environment that could contain and seemingly unify the diverse array of photographs Moholy-Nagy had amassed. As if to emphasize this unity, none of the images, which came from traditional art sources

¹¹² Ibid.

¹¹³ “Passing of a Pioneer.” Institute of Design Collection, U. of Ill., Box 6, folder 188.

(with an emphasis on the birds-eye view and close-ups) as well as non-art sources (such as X-ray photography and photojournalism) were accompanied by wall labels. Moholy-Nagy's *Film und Foto* installation design created what the art historian Mary Anne Staniszewski has characterized as, "a room-size photo essay dealing with the diverse ways of picturing the modern world that the camera could provide."¹¹⁴

These examples of Moholy-Nagy's design practice—his advertisements and opera stage sets, and his contribution to *Film und Foto*—would be of seminal importance to Kepes. In particular, as we shall see in Chapter Three, the design Kepes devised in 1951 for the exhibition *The New Landscape* at MIT's Hayden Gallery was deeply indebted to Moholy-Nagy's display system. This was the grid—evident in the *Verantwortete!* book jacket, the stage sets, and the *Film und Foto* exhibition—which could miraculously incorporate any context to comprise a seemingly unified whole. This grid functioned by means of an abstract structure that was, to the mind of the modern subject, as rationally determined—in a word, known—as the movement of the Earth around the Sun.

* * *

The potential for socially significant forms of advertising was the rationale Kepes seems to have adopted when given the opportunity to contribute to Moholy-Nagy's commercial design projects in Berlin. Kepes reconfirmed this conviction in Chicago, teaching advertising, or "commercial arts," as part of his "Light and Color" classes and becoming a member of the Society for Typographic Arts. He also

¹¹⁴ Mary Anne Staniszewski, *The Power of Display: A History of Exhibition Installations at the Museum of Modern Art* (Cambridge, Mass.: MIT Press, 1998), 45.

designed advertisements, such as a promotional brochure for the Chicago photo-engravers Collins, Miller & Hutchings. Issued in February 1941 as the “magazine” *Illustration*, “for advertisers, agencies, designers and illustrators,” the six-page brochure contained page layouts dedicated, first and foremost, to demonstrating the range of gradations between black and white that the photoengraver could achieve (fig. 31).¹¹⁵ But a secondary message in this impressive display of printer’s ink is a sense of timelessness linked to rather thin-stretched representations of human universals. In perhaps the most bombastic page we see a crawling infant “upended” through the process of photomontage (fig. 32). From this tenuous position the child gazes up into an ornate frame. This looming object would appear to be empty, except for one line of text set at an angle in the lower right corner (that simply says “the unknown”) and some abstract light effects, most of which extend beyond the frame’s boundaries. With nothing to advertise but the photomechanical medium itself, Kepes endeavored to fill the pages allotted with signs of “Life.” He sought to exercise the advertisement’s usefulness. The results were mixed at best.

An earlier advertisement for the Container Corporation of America was more successful (fig. 33). (Chapter Two will address this corporation’s close affiliation with the New Bauhaus.) In this design we see a photograph of the chambered silhouette of a nautilus shell—a symbol of order in nature—juxtaposed against a hovering black cloud, more shelter than menace. At the center of the nautilus is a cube rendered in axiometric perspective. Projecting from these unified forms are two

¹¹⁵ Gyorgy Kepes, *Illustration* (February 1941), a promotional brochure for Collins, Miller & Hutchings. Institute of Design Collection, box 6, file 172.

diagonal lines that link to a simple rectangle. Positioned just above the corporation's name, the rectangle frames the advertisement's written message, which reads, "Paperboard packaging, like the chambered nautilus, is notable for its beauty and protective strength." Never had the cardboard box been so flatteringly compared. In his design practice as well as his art, Kepes's message regarding the order and overall purpose of human consciousness would increasingly rely on natural rather than cultural metaphors, perhaps because he, too, found them to be the more persuasive.

Yet by the early 1940s, when Kepes had taught advertising for a number of years, he had grown skeptical of the social promise of the subject matter—commercial projects—that had been the beneficiary of his complimentary metaphors. In an undated letter to a former student, the artist Robert Preusser, Kepes confides that he is leaving the School of Design and that his wife has decided to go into advertising design as a way to supplement their income. His reservations about her decision reveal how he had come to judge the field. "I hope she will learn fast all the tricks necessary and better than I was able to do. [The] Advertising field is not the most pleasant territory of human endeavors."¹¹⁶ Despite the fact that commercial advertising quickly disappeared from Kepes's practice after his arrival at MIT—one of the benefits of the security provided by his new job—it could be argued that he simply reapplied his skills of persuasion, this time through his advocacy for the "union of art and science."

¹¹⁶ Gyorgy Kepes to Robert Preusser, n.d. (ca. 1942). Institute of Design Collection, U. of Ill., box 7, folder 196.

A Self-Portrait

Compared with a project at the scale of opera, the sole artwork known to survive from Kepes's Berlin years is his photographic *Self-Portrait* of 1930, which is diminutively sized, just 8 x 5.8 cm (fig. 34). Given the date of this work—the year of Kepes's departure from Budapest—it is possible that it was made in Hungary. I contend it was made in Berlin, where Kepes would have had more opportunities to see El Lissitzky's famous photomontage, *The Constructor (Self-Portrait)*, 1924, of which he made several versions while living in Switzerland (fig. 35).¹¹⁷ Whether Kepes's *Self-Portrait* was made in Budapest or Berlin, it can be understood as a self-promotional device *and* as a gesture of self-reflection generated on the eve of the artist's foray into commercial design. Indeed the indeterminacies inherent to this image suggest that its maker was not yet sure of the image he wished to project. It shows the artist positioned under a skylight, light from which fills the upper left corner of the image and cascades down over the artist and his accoutrements. These are, it appears, a camera and a tripod. The camera is poised miraculously above the artist's head, as if it is actually *resting* on his head, with the lens pointing to the left. Kepes, hair disheveled, gazes directly out, although only one of his eyes is visible, the other being

¹¹⁷ Although Lissitzky returned to Moscow in 1925, he continued to travel. In particular, he went to Dresden and Leipzig in 1930 to work on exhibition designs. Moreover, *The Constructor (Self-Portrait)* was reproduced on the invitation designed by Franz Roh and Jan Tschichold for the *Foto-Auge* exhibition of 1929. It also appeared in the December 1928 issue of the magazine *Production Graphics* (Berlin-New York).

obstructed by shadow and one leg of the tripod. Also visible are bits and pieces of the room—principally the wall and the framing for the skylight.

Assembled under the beam that this skylight emits, the juxtaposition of the camera, the artist's head, and the tripod suggests various intentions. Is the artist, who is essentially positioned between the legs of the tripod, equating his creative mind with the *armature* that holds the camera aloft, and, moreover, decides where it will be placed and utilized? Or is he suggesting that his eye is comparable to the camera *lens*, a duplicate or surrogate? Conversely, with his direct gaze is he actually indicating the *difference* between his eye and that of the lens? The camera, after all, holds any position and achieves any task unknowingly, mechanistically, whereas he, in contrast, is a conscious presence, returning the viewer's gaze. Perhaps all of these interpretations can be implied, and alternately upheld, in the viewing of this photograph. At the same time it should be noted that a significant component of the image is abstraction and the "strange-making" effects of a steep viewing angle. If we imagine removing the artist and his camera from the image, the diagonals created by the tripod and the geometry of the skylight become light and dark forms comparable to those that Kepes and others were making in the darkroom with objects placed directly on light-sensitized paper.

As I have suggested, when Kepes made his *Self-Portrait* he was likely aware of one or more versions of Lissitzky's *The Constructor (Self-Portrait)* to which it

bears a striking resemblance as well as clear differences.¹¹⁸ Both artists placed their respective image (their self-portrait) to the right of center in the work. And both made visual connections between an object and the artist's mind/eye. In *The Constructor*, Lissitzky superimposed an image of his hand so that his palm rests over, and is seemingly dematerialized by, his eye. Interlaced in the fingers of this hand is a protractor, the drawing-end of which rests near a half-drawn circle (clearly drawn with this instrument) and points toward the letters "XYZ" and the artist's name.¹¹⁹ The addition of the protractor therefore creates analogies between the artist's eye and the hand, the hand and the (drawing) tool, and the drawing and the photograph.¹²⁰ In a recent essay, John E. Bowlt has demonstrated that although *The Constructor* has traditionally been regarded as "an icon of the international constructivist movement" and as visible proof of the "machinized Lissitzky,"¹²¹ this seminal work can also be

¹¹⁸ El Lissitzky's *The Constructor (Self-Portrait)* appears in Kepes's book *Language of Vision*, an inclusion that suggests the work remained of interest to him over the years. Kepes, *Language of Vision*, 226.

¹¹⁹ El Lissitzky used his custom stationery to assemble the upper left corner of *The Constructor*. The letter "XYZ" appear in the box where he placed the return address. A piece of Lissitzky's stationery is reproduced in *Situating El Lissitzky*, 242, plate 13.

¹²⁰ For a discussion of the connections between photography and drawing/writing see, Geoffrey Batchen, *Burning with Desire: The Conception of Photography* (Cambridge, Mass.: MIT Press, 1997), 68-69, 101-02.

¹²¹ John E. Bowlt, "Manipulating Metaphors: El Lissitzky and the Crafted Hand," in *Situating El Lissitzky*, 130-31. Bowlt's designation of the "machinized Lissitzky" is made in reference to Kai-Uwe Henken's discussion of "der technisierte Lissitzky" in her essay "Proun, Proun und nachmals Proun: El Lissitzky—Die Technik und die Mittel der Kommunikation," in Norbert Nobis, ed., *El Lissitzky, 1890-1941: Retrospektive*, exh. cat. (Hanover: Sprengel Museum Hanover, 1988), 46.

understood in terms of the artist's training in craftsmanship.¹²² Through his technical education Lissitzky came to appreciate, as Bowlt observes, "the relation of the arts and crafts to machine production as opposed to the common postrevolutionary rejection of the former in favor of the latter."¹²³ In Bowlt's analysis *The Constructor* "celebrates the cerebral and mechanical aesthetic of the constructivist movement with the traditional function of the hand as the extension of the artistic genius."¹²⁴ Moreover *The Constructor* created interrelations between "the eye and the hand, which symbolize the more abstract concepts that intrigued Lissitzky throughout his life—vision versus touch, space versus surface, composition versus construction."¹²⁵

Kepes's *Self-Portrait* is a camera photograph, not a photomontage like *The Constructor*. By photographing himself in proximity to a camera and under a skylight, Kepes enacted an analogous relationship between the artist's eye and the lens. Unlike Lissitzky, Kepes's did not seek to extend or expand this analogy to encompass drawing, handicraft, or touch.¹²⁶ Instead, he emphasized the significance

¹²² Lissitzky attended the Technische Hochschule in Darmstadt from 1909 to 1914 and the Riga Polytechnical Institute (Rizhskii politekhnicheskii institut) in Moscow from 1915 to 1918.

¹²³ Bowlt, "Manipulating Metaphors," 129.

¹²⁴ Ibid.

¹²⁵ Ibid., 133.

¹²⁶ In the United States the connection between drawing and photography would become an integral part of Kepes's theorization of his photographic practice. Kepes described a number of the photographs he made in Chicago and after as "photo-drawings," works he made using the cliché-verre technique. Yet Kepes's photo-drawings generally imported the sense of touch into photography by evoking "high art," whereas, as John Bowlt shows, Lissitzky believed that "'high art' could and

of vision and light, terms that Kepes, like Moholy-Nagy, understood as primary to the artist's mission as the interpreter of the technological and industrial realities of modern life. Lissitzky clearly shared this mission, but he did not see it as being in conflict with either the utility of handicraft or with the equal and perhaps greater significance of the artist's hand.

What is perhaps most compelling about Kepes's *Self-Portrait* is its success in capturing a moment of inquiry and expectancy, of irresolution rather than certainty. Bowlt has described a comparable quality of the indeterminate in Lissitzky's *The Constructor*. "However much Lissitzky sang the praises of American turbines, investigated pangeometry, and spoke of order and organization, he was also the victim of error, speculation, and intuition—and it is these qualities that impart energy and unpredictability to his art."¹²⁷ On the one hand, Kepes appears in his *Self-Portrait* to be burdened by the ungainly photographic apparatus. On the other hand, it was the tool he utilized to capture the light so prominently in evidence in the photograph's upper register.

* * *

The sense of inquisitiveness generated within the boundaries of this small image provides an entrée to some final observations regarding Kepes's experiences in Berlin. In 1972 Kepes stated that he had "always" been fascinated by science. But in

should be replaced by 'low art.' In other words, the utilitarian, manufactured object (whether a manuscript or a machine) was now the legitimate heir to the 'useless' studio painting or sculpture." Bowlt, "Manipulating Metaphors," 141.

¹²⁷ Ibid., 148.

Hungary he could only entertain this interest “in a vague way...I hardly had any real contact with scientists.”¹²⁸ Hungarians, in fact, were among the most prominent scientists and mathematicians of the twentieth century. Nonetheless, in the 1920s, many Hungarian scientists, such as John von Neumann (1903-1957), Eugene Wigner (1902-1995), Dennis Gabor (1900-1979), and Leo Szilard (1898-1964), received part if not all of their educations in Berlin.¹²⁹ Like Hungarian artists they, too, fled the Horthy regime in large numbers and/or found themselves drawn to the unparalleled opportunities in science education that Berlin offered in the 1920s. And in the 1930s, all but Gabor, who settled in London, left Europe for the United States.

In 1972 Kepes spoke of the friendship he established with a Hungarian physicist at the Kaiser Wilhelm Institute. An initiative of Ludolf von Krehl, a medical doctor, the Kaiser Wilhelm Institute was founded in 1929 as one of the first research centers to integrate scientific disciplines for the purpose of biological and medical research. It was comprised of four departments (each independently referred to as an

¹²⁸ Kepes, interview by Brown, 30 August 1972, transcript, p. 9. Kepes Papers, AAA.

¹²⁹ A pioneer of in the field of computing, John von Neumann studied in Berlin from 1921 to 1923 but received his doctorate in mathematics from the University of Budapest in 1926. He taught at Princeton University from 1930 until his death in 1957. Eugene Wigner, who also taught at Princeton (as a professor of mathematical physics), studied at the Technische Hochschule but fled to the United States after the National Socialists took power. He became a U.S. citizen in 1937 and worked on the Manhattan Project at the University of Chicago during World War II. Dennis Gabor was also educated at the Technische Hochschule and left Berlin for London in 1933 where he secured a position in a private research laboratory. In 1947 he became a Reader in electronics at the Imperial College of Science and Technology. Leo Szilard studied at both the Technische Hochschule and the University of Berlin. In 1933 he arrived in London. In 1938 he moved to New York City to do research at Columbia University on uranium chain-reactions. In 1942 he joined the Manhattan Project.

institute): physiology, chemistry, physics, and pathology. It was through his friendship with a physicist, as Kepes informed an interviewer in 1972, that he had his first opportunity to collect scientific photographs. These images initiated, as he later stated, “my first excitement in the visual records of science.”¹³⁰ Kepes was doubtlessly familiar with the array of scientific photographs that Moholy-Nagy had assembled in *Painting, Photography, Film*, which he amassed, as Eleanor Hight has shown, “from his usual eclectic, nonart sources (news services, periodicals, newspapers, and film companies), as well as from individual artists.”¹³¹ Yet when Kepes sought to represent his entrée into the collection of scientific imagery, he was careful to point out that he directly interacted with an actual scientist (although he never named this individual). This procedural detail is, perhaps, an act of one-upmanship—with Kepes describing himself as an artist who goes to the “source” rather than its echo. Yet it should be noted that the basic premise behind this story is borne out in his postwar practice in which he actively sought out scientists willing to provide him with the photographic proofs of their experiments.

Kepes never professed to scientific expertise—on the contrary he emphasized his identity as an artist who functioned intuitively—but his editorial book projects, which included contributions by many scientists as well as engineers and mathematicians, indicate that he was at least familiar with the contemporary developments in these fields. And while Moholy-Nagy collected scientific

¹³⁰ Kepes, interview by Brown, 30 August 1972, transcript, p. 9. Kepes Papers, AAA.

¹³¹ Hight, *Picturing Modernism*, 185.

photographs and incorporated them into his books, he never collaborated directly with scientists or engineers in the making of his art. Kepes, in contrast, increasingly sought to associate himself and his art with the work of scientists and engineers, particularly during his years at MIT. He went, as he later acknowledged, “like a bulldog who never gives up from one laboratory to the other” collecting the photographic “evidence.”¹³² Kepes also relied on the assistance of engineers, although, as we will see in Chapter Four, he tended to consider the engineer to be more lowly figure—the scientist’s helpmate.

The second connection Kepes made in Berlin was to a student at the Psychological Institute at the University of Berlin. Established in 1893 by Carl Stumpf, the Psychological Institute was one of the first centers to focus on experimental psychology. Two of the founders of Gestalt psychology, Kurt Koffka and Wolfgang Köhler, received their doctorates at this institute under Stumpf’s guidance (in 1908 and 1909 respectively). The third personage in what has been designated the “Gestalt triumvirate,” was Max Wertheimer, who studied under Stumpf for two years before completing his doctorate at the German University of Prague under Christian von Ehrenfels in 1904.¹³³ In 1922 Köhler succeeded Stumpf as director of the Institute. While in Berlin, Kepes befriended a person he later

¹³² Kepes, “Sermon for Tranquility: An Interview with Gyorgy Kepes,” interview by Robert C. Morgan, *Afterimage* 10, no. 6 (January 1983): 7.

¹³³ Jean Matter Mandler and George Mandler refer to Wertheimer, Koffka, and Köhler as the “Gestalt triumvirate” in their article “The Diaspora of Experimental Psychology: The Gestaltists and Others,” in *The Intellectual Migration: Europe and America, 1930-60*, Perspectives in American History (Cambridge, Mass.: MIT Press, 1969), 385.

identified (in the same 1972 interview in which he mentions the Hungarian physicist) as “a young psychologist who was in the Köhler Group of Gestalt psychologists.”¹³⁴

This person may have introduced Kepes to the basic concepts of Gestalt theory.

Nonetheless it was not until Kepes was living in Chicago that he acquired some of the writings of the Gestalt psychologists and integrated an interpretation of them into *Language of Vision*. In fact, as we shall see in the chapter that follows, Kepes utilized Gestalt psychology as a way to make a subtle but nonetheless significant distinction between his emerging pedagogical theory and that of the New Bauhaus. By the time Kepes reached Chicago, the Gestalt triumvirate had already relocated to the United States—Koffka at Smith College in 1927, Wertheimer at the New School for Social Research in 1933, and Köhler at Swarthmore in 1935.

London: An Outline of the Universe

In January 1933, Hitler was appointed chancellor of Germany. In that same year Moholy-Nagy accepted design work in Amsterdam and made his first trip to London at the invitation of the art historian Herbert Read. Moholy-Nagy then moved to London in May of 1935 and soon after invited Kepes to join him. Kepes, for a second time, made the decision to move to a new city following a path initiated by Moholy-Nagy. Records vary as to whether Kepes left Berlin in 1935 or 1936, but it is known that he arrived in Chicago in late 1937 so his stay in London was relatively brief.¹³⁵

¹³⁴ Kepes, interview by Brown, 30 August 1972, transcript, p. 9. Kepes Papers, AAA.

¹³⁵ The timeline in *Gyorgy Kepes, the MIT Years: 1945-1977* cites the year as 1936. See *Gyorgy Kepes, the MIT Years: 1945-1977*, 87. Kepes’s Who’s Who entry in the

Nonetheless Kepes later described London as “a tremendous reevaluation.”¹³⁶ It was in London, he felt in retrospect, that he began to have a sense of his future. The central figure in his description of this reevaluation was the British science journalist J. G. Crowther (1899-1983). In 1972 Kepes relayed that he and Moholy-Nagy had designed a cover for Crowther’s first book—a work of popular science entitled *An Outline of the Universe* (1931)—while they were still in Berlin.¹³⁷ Moholy-Nagy is credited with the design, but we can assume that Kepes may have worked on it with him. The cover features a circular disk—a symbolic representation of the universe—within which are centered the author’s name and the book’s title (fig. 36). The quality of the letters, which are rendered in a blocky typeface, is ever so slightly blurry, as if they had been projected onto a surface and then photographed to simulate a still-image of film credits. This filmic quality is emphasized by the repetition of a fragment—a shadowy doppelganger—of the title into the upper half of the disk, as if the film projector (or its simulation) had stalled momentarily in its succession of frames. Moreover the sense of film, or at least of movement, is conveyed by the background over which the disk-like sign of the universe “rises.” This background consists of tiny light-streaks against black. In *Painting, Photography, Film*, these streaks are identified as “star spectra photographed with a prismatic lens” by the

Archives of American Art gives a date of 1935. Kepes Papers, AAA, reel 5303, frame 6. Neither source provides the month or day of his arrival.

¹³⁶ Kepes, interview by Brown, 30 August 1972, transcript, p. 9. Kepes Papers, AAA.

¹³⁷ J. G. Crowther, *An Outline of the Universe* (London: Kegan Paul, Trench, Trubner & Co., 1931).

Observatory Arequipa (fig. 37). Moholy-Nagy had reused the image for the cover of Crowther's book, reorienting it so that the sense of movement flowed vertically, like a filmstrip passing a projected beam of light. Yet for all its filmic effects, the cover is clearly a composite endeavor—a collage of cut-and-pasted paper. These vestiges of the work's creation emphasize the designer's part in creating a fitting visual entrée to Crowther's project—the popular dissemination of scientific knowledge.

In 1972 Kepes referred to Crowther as his “mentor.”¹³⁸ Crowther had studied mathematics and physics at Trinity College, Cambridge, but left without a degree. After World War I he effectively crafted a new profession—the science journalist—and became the first scientific columnist for a major daily newspaper, the *Manchester Guardian*, in 1928.¹³⁹ Like Kepes in his MIT years, Crowther was an industrious networker. Indeed, he gained his position at the *Guardian* in part because of his friendships with leading scientists. He was also adept at synthesizing complex ideas and conveying them to the general public in readable, entertaining prose.

In the preface to *An Outline of the Universe* Crowther diagnoses what he sees as the general public's confusion at the increasing specialization of science:

The vagueness of the modern's notion of the Universe is much more than it might and ought to be, and is a consequence of a lack of comprehensive thinking in recent centuries.... During the last four hundred years there has

¹³⁸ Kepes, interview by Brown, 30 August 1972, transcript, p. 9. Kepes Papers, AAA.

¹³⁹ In a note to the reader of *An Outline of the Universe* Crowther defines the role of the scientific journalist. “The function of scientific journalism is to convey the atmosphere and facts of recent scientific research to the public, the conveyance of atmosphere being the more important part.” Crowther, *An Outline of the Universe*, xiii.

been a reaction from the general to the particular. It is related to the rapid evolution of civilization; when the organization of society is changing rapidly comprehensive notions of the Universe are difficult to form. Recent history seems to show the reaction has become excessive.... [G]reat wars occur because men specialize on their own and their nation's advantage rather than work for the advantage of humanity.... People have now to relearn the habit of trying to see the Universe."¹⁴⁰

Having made his case for integration and synthesis, Crowther provides a structure, or outline, for this new approach to seeing. The book begins with several short chapters on astronomy, the culmination of which is chapter twelve, "The Earth." It then progresses to the "The Ultimate Materials"—the electron, proton, and atom. With this background on the macrocosmic and microcosmic matter that fills the universe, the book arrives at a biologic analysis of Man. The final chapters concern "civilization," a subject that was informed, as we shall see, by Crowther's strong political convictions.

Kepes felt particularly indebted to Crowther because he introduced him to prominent British scientists, including Joseph Needham, Conrad Waddington, J. D. Bernal, and J. B. S. Haldane.¹⁴¹ In the 1930s these scientists were variously involved in the study of form in nature. Most importantly they shared a belief that their research into nature's patterns could be applied to the problems of society. Natural patterns were seen as metaphors of a utopian future.¹⁴² This is the belief that

¹⁴⁰ Crowther, *An Outline of the Universe*, xii.

¹⁴¹ Kepes mentions these acquaintances in Kepes, interview by Brown, 30 August 1972, typescript, p. 9. Kepes Papers, AAA.

¹⁴² For an analysis of this use of metaphor see, Donna Jeanne Haraway, *Crystals, Fabrics, and Fields: Metaphors that Shape Embryos* (1976), repr. with the addition of

constituted the “Science and Society” movement.¹⁴³ Needham was a biochemist at Cambridge whose research focused on embryology and morphogenesis. Waddington was an embryologist and lecturer in zoology at the Strangeways Research Laboratory, Cambridge, where he worked on the analysis of genetic pattern. This research sought, as the science historian Donna Jeanne Haraway has noted, the “structured pathways of development.”¹⁴⁴ In 1927, J. D. Bernal became the first lecturer in structural

a foreword by Scott F. Gilbert and an introduction by Haraway (Berkeley: North Atlantic Books, 2004). Reinhold Martin has taken issue with Haraway’s study of metaphor as “a historian of science unproblematically utilizing aesthetic terms.” Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, Mass.: MIT Press, 2003), 52. Yet Haraway is not alone in her historical analysis of the use of metaphor in science. See, for instance, Evelyn Fox Keller, *Refiguring Life: Metaphors of Twentieth-Century Biology*, Welleck Lecture Series at the University of California, Irvine (New York: Columbia University Press, 1995). Martin’s contention may have more to do with the founding of his theoretical approach in Gilles Deleuze than with a science historian’s employment of an aesthetic term. In 1986 Deleuze and Felix Guattari vowed to “Kill metaphor.” Instead of metaphor they prefer “metamorphosis” because they feel it creates a situation where “There is no longer any proper sense or figurative sense [of a reality external to representation], but only a distribution of states that is part of the range of the world.” Gilles Deleuze and Felix Guattari, *Kafka: Toward a Minor Literature*, trans. Dana Polan (Minneapolis: University of Minnesota Press, 1986), 70, 22, quoted in Claire Colebrook, *Understanding Deleuze*, Cultural Studies Series, ed. Rachel Fensham and Terry Threadgold (Crows Nest, Australia: Allen & Unwin, 2002), 67-68. I find Haraway and Keller’s analyses of the use of metaphor to be more informative of the historical period under discussion.

¹⁴³ The Science and Society movement is discussed in Krishan Kumar, “Utopia and Anti-Utopia in the Twentieth Century,” in *Utopia: The Search for the Ideal Society in the Western World*, ed. Roland Schaer, Gregory Claeys, and Lyman Tower Sargent, exh. cat. (New York: The New York Public Library and Oxford University Press, 2000), 256-57.

¹⁴⁴ Haraway, *Crystals, Fabrics, and Fields*, 16. Haraway sees Waddington’s use of structure in terms of the rise of structuralism. “Perhaps more than anyone else [Waddington] has built the foundation for viewing developmental biology as a structuralism related philosophically to the psychology of Piaget and the anthropology of Levi-Strauss.”

crystallography at Cambridge. Bernal described the field as analyzing “all the textures of natural and artificial products. This is the type of information which links crystallography to biology, on the one hand, and technology on the other.”¹⁴⁵ If Kepes, who was likely conversant by 1936 with Moholy-Nagy’s basic pedagogy (such as the exploration of textures and shapes), was also familiar with this aspect of Bernal’s research, it would not be surprising if he surmised a commonality between the vanguard of art and the methods of science. Throughout most of his career Haldane was a geneticist at the University College, London. His book *The Causes of Evolution* (1932) explained evolution in terms of the mathematical consequences of Mendelian genetics.¹⁴⁶ In *Crystals, Fabrics, and Fields* Haraway addresses each of these scientists and groups them together by demonstrating that their fields overlapped in a new way. Despite some internal disagreements they all believed in

¹⁴⁵ J. D. Bernal, *J. D. Bernal: A Life in Science and Politics*, ed. Brenda Swann and Francis Aprahamian (London: Version, 1999), 7. Bernal was also the author of *The Social Function of Science*, which was published in 1939, two years after Kepes had left London. J. D. Bernal, *The Social Function of Science* (London: George Routledge & Sons Ltd., 1944 [1939]). Deborah Lewittes has analyzed the relationship between Bernal’s work in crystallography and his views on architecture, urbanism, social progress. Lewittes also discusses Waddington’s interactions with architects and artists. Deborah Lewittes, “London Calling: Modern Architecture in the Diaspora, 1933-51” (Ph.D. diss., City University of New York, 2003), 71-73, 80.

¹⁴⁶ J. B. S. Haldane, *The Causes of Evolution* (New York: Harper & Brothers, 1932). Gregor Mendel (1822-1884) is known as the “father of genetics,” but the term was coined by Gregory Bateson (1861-1926) who was also instrumental in the development of systems theory, a topic to be discussed in my Chapter Three. Mendel was a Moravian monk and botanist who in 1865 presented two papers to the Natural Science Society in Brünn (now Brno, Czech Republic), which were published the following year. Nonetheless Mendel’s work was effectively overlooked until the Dutch botanist Hugo de Vries (1848-1935) “discovered” him in 1899. Vries had recently come to similar conclusions.

some version of organicism whereby, as Haraway states, “the study of the parts does not suffice to explain the behavior of the whole.”¹⁴⁷ “The organicists saw themselves as a new phenomenon working at ideas and experiments made possible only very recently by internal developments in biology and by salient intellectual transformations in other sciences, including physics and political theory.”¹⁴⁸ They also enthusiastically interacted with artists and architects. Bernal was a contributor to the book *Circle: International Survey of Constructive Art*, compiled by Leslie Martin, Ben Nicholson, and Naum Gabo and published in 1937. His contribution, entitled “Art and the Scientist” blames the separation of art and science on “bourgeois culture.” “Science was used to make the money, art simply as a means of spending it.” Moreover he links “The whole modern movement in art” as an act of “revulsion...[at] the lavish and aimless materialism of nineteenth-century painting.” Modern artists, Bernal declares, has assumed the tradition of the “artist-scientists of the Renaissance.” Yet they also knew that “the new theories of vision...demanded new art to go with them.”¹⁴⁹

At the time Kepes met them Crowther, Needham, Haldane, and Bernal were outspoken Marxists. This was particularly true of Crowther, who visited Russia several times in the 1930s. After World War II, these political beliefs caused him to

¹⁴⁷ Haraway, *Crystals, Fabrics, and Fields*, 33.

¹⁴⁸ *Ibid.*, 39.

¹⁴⁹ J. D. Bernal, “Art and the Scientists,” in *Circle: International Survey of Constructive Art* (1937), ed. Leslie Martin, Ben Nicholson, and Naum Gabo, repr. (New York: Praeger, 1971), 119-20.

lose his position as director of the British Council's Science Department. Likewise, a particularly frank article on the effects of the American bombing of Hiroshima and Nagasaki led to his dismissal from the *Manchester Guardian*. In the 1930s, Crowther's main goal was to promote international communication between scientists, an intention that can be compared, in its globalizing, universalizing intent, to Kepes's postwar efforts to engage scientists and artists in collaborations. In 1956 Kepes wrote:

Artists and poets on the one hand, scientists and engineers on the other, appear to live in two different worlds. Their common language, their common symbols, do not exist. To develop a vision which brings the inner and outer worlds together, we need common roots once more.¹⁵⁰

Crowther's description of the educational mission of the scientific journalist is close to Kepes's argument for the necessity of encouraging scientific and artistic interactions. In 1931 Crowther defined the "craft" of scientific journalism as "social. It is becoming an essential binder in the structure of a civilization created by the application of science to industry. Modern society may collapse unless the atmosphere of science becomes generally apprehended."¹⁵¹

Yet despite Kepes's debt to Crowther, which he gratefully acknowledged in 1972, he never invited the pioneer journalist to contribute to his books. In all likelihood this was due to Crowther's politics. When Kepes began editing books in the 1950s, he would have been aware of "red scares" in the United States and he may

¹⁵⁰ Gyorgy Kepes, *The New Landscape in Art and Science* (Chicago: Paul Theobald and Co., 1956), 20.

¹⁵¹ Crowther, *An Outline of the Universe*, xiii.

have also questioned Crowther's associations with Russia in the 1930s. In the United States Kepes took the Marxism out of Crowther's convictions about nature as a model for culture. He chose among the experts whose sympathy for communism was masked in their work, or whose views coincided with the liberal mainstream. Such concerns may have similarly inflected Kepes's view of Needham, Haldane, and Bernal, who also never contributed to his books. Kepes was not alone in downplaying his political beliefs after arriving in the United States.¹⁵² The exception to Kepes's stateside separation from his English scientific contacts was Waddington, who was comparatively less active in the public discussion of his politics and who contributed to Kepes's *Vision + Value* book series.¹⁵³ When asked later what drew Kepes to these scientists he responded, "a unity of life, they didn't separate their scientific endeavor from their human commitment."¹⁵⁴ In Chicago, as we shall see in the chapter that follows, Kepes acted on his growing interest in vision as an activity that could be structured. Vision was at once natural—a physiognomic process dependent on light—and cultural—a skill that could be taught, and commonly shared, for the benefit of society.

¹⁵² For instance, Margret Kentgens-Craig has indicated that Walter Gropius quickly abandoned his concept of a "cathedral of socialism." See Margret Kentgens-Craig, *Bauhaus and America: First Contact 1919-1936* (Cambridge, Mass.: MIT Press, 1999), 204.

¹⁵³ See C. H. Waddington, "The Modular Principle and Biological Form," in *Module, Proportion, Symmetry, Rhythm*, *Vision + Value Series*, ed. Gyorgy Kepes (New York: George Braziller, 1966), 20-37. For a list of the other books in this series and a discussion of its focus see Chapter Four.

¹⁵⁴ Kepes, interview by Brown, 30 August 1972, transcript, p. 10. Kepes Papers, AAA.

CHAPTER TWO

STRUCTURES

Factory wheels will turn faster, payrolls will climb upward and carry profits with them, old markets will expand and new markets will develop because at the Bauhaus students are exploring new frontiers of the human mind—limitless frontiers from which will come new industries.

Floyd B. Quigg, 1938¹

In November 1938, approximately a year after he had settled in Chicago, Gyorgy Kepes published his first text—a brief essay entitled “Education of the Eye.”² In 1965 he would edit a book on the subject of the *Education of Vision*.³ This chapter is about the highly productive, formative, and often tumultuous period—less than five years in length—that Kepes spent in Chicago teaching at the New Bauhaus. Soon after arriving in the United States Kepes began to reconsider his conceptualization of

¹ Floyd B. Quigg, “Publisher’s Note,” *More Business* 3, no. 11 (November 1938): 1.

² George [Gyorgy] Kepes, “Education of the Eye,” *More Business* 3, no. 11 (November 1938): 9.

³ *Education of Vision*, Vision + Value Series, ed. Gyorgy Kepes (New York: George Braziller, 1965). For a listing of the other books in this series and a discussion of its focus see Chapter Four.

vision in order to accommodate emerging ideas about the structure of language. Specifically, through the guidance of some of his colleagues, particularly the American philosopher and semiotician Charles Morris, Kepes came to believe that all things, including the practice of art, could be analyzed as part of a sign system. It is this belief that guided the compilation and structuring of his “language of vision.”

Kepes’s early thinking about the idea of vision as a language is evident in his first published essay, in which basic syntactical vocabulary is used to describe the experience of seeing. “As the eye is the agent in conveying impressions to the mind, the achieving of visual communication requires a fundamental knowledge of the means of visual expression. Development of this knowledge will generate a genuine ‘language’ of the ‘eye’ whose ‘sentences’ are the created images and whose elements are the basic plastic signs.”⁴ Yet in this same observation we can also locate echoes of a preoccupation with perception (“the eye is the agent in conveying impressions to the mind”). In Chicago, as we shall see in this chapter, Kepes began to juggle a range of ideas that he would nonetheless organize under the banner of “wholeness” as a social model. And during these same years he created a curriculum that would eventually secure a place in the course catalogue of MIT’s School of Architecture and Planning under the heading “Visual Fundamentals.”

The essay “Education of the Eye” appeared in the Chicago-based magazine *More Business*, which billed itself as catering to the “voice of letterpress printing and photo-engraving.” In anticipation of the New Bauhaus’s positive economic effect on

⁴ Kepes, “Education of the Eye,” 9.

the local economy, the issue was dedicated to the school, featuring an essay not only by Kepes but also by Moholy-Nagy, together with a selection of illustrations that conscientiously demonstrated the photoengraver's craft. The epigraph that opens this chapter is excerpted from the publisher's note that introduced the issue. The author of this note, Floyd Quigg, had high expectations of the industrial ripple effect that would emanate from the New Bauhaus's discoveries. To the regret of the Chicago business community, this ripple did not transpire in the way Quigg had prophesied. But by November 1938, when this issue of *More Business* appeared, Kepes had already assumed the task of "exploring new frontiers of the human mind" with great seriousness. The results of these explorations precipitated his departure in 1942 from the school that Moholy-Nagy had founded. Two years later he published *Language of Vision*, his categorization of the ways in which shapes and forms can be organized on the two-dimensional page.

The previous chapter traced some of the intellectual and artistic sources that contributed to Kepes's advocacy, in 1944, of a world that functioned "unhindered as a whole."⁵ In Chicago we will find that the communal worldview he had absorbed in Europe resonated with the larger purpose of "intellectual integration," a phrase that functioned as the title of a course at the New Bauhaus taught by Charles Morris. This course was an outgrowth of the Unity of Science movement, which sought to build, phrase by phrase, a unified language of philosophy and the sciences. And in Chicago Kepes also responded to and informally studied Gestalt psychology, an approach to

⁵ Gyorgy Kepes, *Language of Vision* (Chicago: Paul Theobald, 1944), 12.

perceptual inquiry founded on the belief that any distinct entity—a melody, for instance, or the arrangement of shapes on a page—is composed not of additive building blocks but of parts that together form a “greater whole.” The Unity of Science movement conceived of a language-bound conception of “truth,” while Gestalt psychology defined a perceptual one. Kepes diffused this potential conflict by immersing it in the blank and accommodating abstraction of “wholeness.”

Before proceeding with a discussion of Kepes’s Chicago years, it will be useful to briefly outline and assess the main themes addressed so far in the course of his westerly passage. Kepes’s artistic ambitions emerged in the mid-1920s in Budapest, a city that had been abandoned by Hungarian intellectuals and artists. Approximately a decade younger than the generation in exile, Kepes remained in Budapest until 1930, interpreting the images and writings found in books and magazines left behind or smuggled in. In the absence of community, he came to believe in the value of envisioning the world as “one single system.”⁶ Although, as we have seen, Kepes made a photomontage that indicated an allegiance to Communism (*In Memory of L.R.*; fig. 17) his solidarity with the “masses” was more typically expressed as a depoliticized idealization of the Hungarian peasant. For the entirety of his career, the peasantry symbolized the potential for a worldwide connectedness; humanism embodied.

⁶ Gyorgy Kepes, interview by Robert Brown, 7 March 1972, transcript, p. 3. Kepes Papers, Archives of American Art, Smithsonian Institution, Washington, D.C. [hereafter AAA].

Around 1928 Kepes began to make photographs, in large part because he had become attuned to the paired significations of light as a natural phenomenon and as a cultural resource. Combined with the chemical and optical components of photography, light renders visible indexical signs—images that are generated by the things in the world to which they refer. Although Kepes was only tangentially versed in the writings of Charles Sanders Peirce—the American pragmatic philosopher and early semiotician to whom we are indebted for the idea of the indexical sign—he nonetheless included in *Language of Vision* an overt representation of indexicality in the form of a photograph of footsteps in the sand (fig. 38).⁷ For Kepes, as this image suggests, light provided direct access to the material experience of modern life. Therefore it brought into being not only city life but also man's changed relationship to nature. In Kepes's worldview nature remained immutable, even as modern man was seeing it new and differently. (This approach to nature will be particularly apparent in Chapter Three.) Concomitant with Kepes's adoption of a belief in photography's new relevance, he ascribed importance to geometry as a universalizing force. He was not, as I have endeavored to show, alone in the translation of his beliefs into these modes of working (photography, abstraction). Indeed, Kepes, as Sigfried Giedion observed, was particularly adept at "continuity."

And, as we have seen, in his late career Kepes was careful to demonstrate that, although he had always been interested in science, it was in Berlin and then in

⁷ For Peirce's categorization of signs into icon, index, and symbol, see Charles Sanders Peirce, "Logic as Semiotic: The Theory of Signs" (ca. 1897-1910), in *The Philosophy of Peirce, Selected Writings*, ed. Justus Buchler (New York: Harcourt, Brace, 1950), 98-119.

London that he began to have opportunities to interact with scientists. This interest, which he pursued as a self-acknowledged amateur, was tied to his belief in the order of nature. Belief in the existence of order was perhaps the best defense against the chaos, fragmentation, and alienation that so tumultuously characterized World War I, its aftermath, and the lead up to World War II. In *Language of Vision*, Kepes expressed order by categorizing the ways in which forms could be manipulated in a two-dimensional field and by finding salient examples of these visual approaches in the world of art. Nonetheless, amidst illustrations from the realms of “painting, [art] photography, and advertising-design”—this was the subtitle of *Language of Vision*—can be found two scientific photographs. The first documents metal filings responding to magnetic force, the second “sponge spicules” (fig. 39, fig. 40).⁸ After World War II Kepes would increasingly utilize scientific photographs as readily duplicable documents of nature’s wonders and humankind’s ingenuity. Yet perhaps as early as the 1930s and certainly by the early 1940s, he had concluded that nature’s order—organicism—was always close at hand, a proximity that suggested to him that social order was potentially attainable.

Working towards this seemingly imminent future necessarily included activities both practical and mundane. In Berlin, Kepes participated in László Moholy-Nagy’s attempts to apply the “new vision” of photography to the field of advertising and, at least for a time, they both sought to exercise the power of

⁸ A spicule is “a small needlelike structure or part, such as one of the silicate or calcium carbonate processes supporting the soft tissue of certain invertebrates, especially sponges.” This definition appears in the *New American Heritage Dictionary*.

advertising to produce social consensus. Likewise Kepes became fluent in Moholy-Nagy's systematizing approach to stage and exhibition design, through which disparate things were united and resolved within a grid system.

Building the New Bauhaus (and rebuilding it as the School of Design)

In the fall of 1937 the New Bauhaus released its inaugural course catalogue. As at the Bauhaus, where Moholy-Nagy had overseen the Bauhausbücher series, the name of the Chicago school was set in lowercase, sans-serif letters. In contrast, the subtitle of the school—"American School of Design"—was set mostly in capital letters ("of" was left in lowercase) in a more traditional serif typeface. The same serif typeface renders the name of the school's founder, the Association of Arts and Industries, suggesting that this group, which will be addressed below, may have had a say in its graphic representation.

For the cover image of the catalogue Moholy-Nagy chose a photograph of geometric shapes—clear plastic cones attached to reflective stands and metallic cylinders hanging from strings (fig. 41, fig. 42). Surrounding these forms on the right and left are what appear to be skyscraper models fashioned out of wire mesh. These, too, are secured by strings, as if Moholy-Nagy had constructed a miniature stage set ringed by housing for futuristic puppets. This, in fact, was not so far from the truth—the photograph documented the model Moholy-Nagy had created in London when he was invited to propose set designs for the film *Things to Come*, 1936 (fig. 43).⁹ The

⁹ Deborah Lewittes has indicated that among the materials Moholy-Nagy used to devise the proposed *Things to Come* sets was an experimental form of Plexiglas.

film was based on H. G. Wells's novel *The Shape of Things to Come*, produced by Alexander Korda, and directed by William Cameron Menzies. In the end, Moholy-Nagy's set designs were not utilized, but the photographic documentation of their design was conveniently recycled to befit his entrée into American education. In its new use the photograph wraps from the front to the back of the catalogue cover and extends to its edges, a design decision intended to immerse the prospective student in the utopian promise of the New Bauhaus. And the compositional arrangement, in which the cones and cylinders occupy an open space ringed by buildings, happened to predict an aspect of Chicago's future downtown district, where high-rises, such as Bertrand Goldberg's Marina City (1959-64), would eventually line sections of the Chicago River (fig. 44). If we entertain this scenario, the geometric forms are monumental public sculptures floating on and hovering over the water, the better to reflect the city lights. Nonetheless, there is also a resemblance of the buildings on the back cover of the New Bauhaus catalogue—they appear only partially constructed, an effect that emphasizes their spirit of newness—to Mies van der Rohe's design for a glass skyscraper for an ideal site of 1922 (fig. 45).¹⁰

Lewittes also discusses Moholy-Nagy's designs for the film in relation to the contemporaneous fascination with air travel, a fascination that nonetheless belied "the memory of the Great War and the anxiety about the growing crisis in Europe." Deborah Lewittes, "London Calling: Modern Architecture in the Diaspora, 1933-51" (Ph.D. diss., City University of New York, 2003), 81. The reuse of photographs for new purposes was not an unusual practice for Moholy-Nagy. Eleanor Hight writes of the artist's integration of his early photograms into his advertisements and periodical covers. Eleanor Hight, *Picturing Modernism: Moholy-Nagy and Photography in Weimar Germany* (Cambridge, Mass.: MIT Press, 1995), 79.

¹⁰ The 1922 design was the second of two skyscrapers that Mies van der Rohe envisioned in the early 1920s. Neither design was built. The first, which dates from

The New Bauhaus opened on 18 October 1937 with an enrollment of thirty-three students. The school was based at 1905 South Prairie Avenue in a mansion donated by the department store heir Marshall Field III. A photograph taken around the time of the school's founding shows a brick residence with a heavy mansard roof and soot-darkened limestone trim (fig. 46).¹¹ To this building Moholy-Nagy attached a stark white office at the parlor level—a box propped on slits—emphasizing, by point of contrast, the pared down approach to design he intended to instill in his students.¹² Yet the lack of transition between the mansion and its addition can also be seen as an indication of the swiftness with which the new school had been organized.

1921, was intended for Friedrichstrasse, Berlin. Krisztina Passuth suggests that Moholy-Nagy knew of Mies van der Rohe's design for the Friedrichstrasse skyscraper when he began making his Glass Architecture paintings of 1921-22. Passuth also indicates that Moholy-Nagy was likely influenced by Adolf Behne's advocacy of glass architecture in *Ma* in 1921 (Adolf Behne, "Művészet és forradalom" (Art and Revolution), *Ma* 6, no. 4 (1921): 44). Krisztina Passuth, *Moholy-Nagy* (New York: Thames & Hudson, 1985), 23. Eleanor Hight discusses Moholy-Nagy's Glass Architecture paintings in relation to his concurrent entrée into photography. "Light became the most important element of his work, whether in painting, sculpture, or photography, from this point to the end of his career." Hight emphasizes Moholy-Nagy's interest in transparency, analyzing its links to constructivism, El Lissitzky use of transparent planes, the popularization of science, and "more spiritually oriented art," specifically Malevich's suprematist paintings. Hight, *Picturing Modernism*, 72-74.

¹¹ Richard Morris Hunt designed the mansion in 1873. By the 1930s the area around South Prairie Avenue was no longer a desirable address for wealthy Chicagoans.

¹² The renovation was overseen by the architect Henry K. Holsman, a member of the Association. Lloyd C. Engelbrecht, "Educating the Eye: Photography and the Founding Generation at the Institute of Design, 1937-46," in *Taken by Design: Photographs from the Institute of Design, 1937-1971*, exh. cat. (Chicago: Art Institute of Chicago in association with the University of Chicago Press, 2002), 21-22.

On 5 January 1936 the Association of Arts and Industries, a Chicago-based business group, announced its decision to found a design school. This goal was in keeping with the mission of the group, which was established in 1922 “for the purpose,” as its first president William Nelson Pelouze stated, “of impressing upon the industries of the central west the great importance of improved artistic design as a national asset in world competition.”¹³ Although the idea for a school had been circulating since the time of the Association’s founding, it was Walter Paepcke, owner of the Container Corporation of America, who was the key figure in the decision to proceed with this plan. He was also instrumental in determining the nature of the school to be developed. In the early 1930s Paepcke established a friendship with A. Conger Goodyear, founding president of the Museum of Modern Art, and became interested in the idea of transforming his company by allying it with modern art. In 1935 Paepcke hired Egbert Jacobson as the Container Corporation’s first art director. Jacobson was responsible for commissioning artist-designed advertisements for the company, such as the one by Kepes from 1938 discussed in the previous chapter (fig. 33). Another example from this advertising campaign was created by the artist A. M. Cassandre in a style that can be likened to a popularized version of Synthetic Cubism (fig. 47). Kepes included this image in *Language of Vision* in the section of the book devoted to “Compression, interpenetration.”¹⁴ It shared the page

¹³ William Nelson Pelouze, *Chicago Daily News*, 23 May 1922, 16, quoted in Lloyd C. Engelbrecht, “The Association of Arts and Industries: Background and Origins of the Bauhaus Movement in Chicago” (Ph.D. diss., University of Chicago, 1973), 126-27.

¹⁴ Kepes, *Language of Vision*, 100-02.

with a still life by Braque in the Collection of Art Institute of Chicago (fig. 48). The Container Corporation's advertising campaign initiated a "packaging revolution."¹⁵ Wanting to extend this success to Chicago businesses at large, the Association for Arts and Industries became convinced of the need for a school "on Bauhaus lines."¹⁶

Yet Walter Paepcke was not alone in the act of persuasion. As the architectural historian Margret Kentgens-Craig has demonstrated, American interest in the Bauhaus dates from the year of the school's founding in 1919.¹⁷ This interest took the form of visits to the Bauhaus by prominent members of the American art and architectural establishment. Katherine Dreier and Philip Johnson were among the first Americans to visit the school, Dreier in 1922 and 1926 and Johnson in 1928. Both returned in the early 1930s. Beginning in 1925 there is a record of a few American students enrolling at the Bauhaus. One of the first was Irene Angela Hecht, who later married Herbert Bayer.¹⁸ And some of the most prominent members of the Bauhaus

¹⁵ James Sloan Allen, *The Romance of Commerce and Culture: Capitalism, Modernism, and the Chicago-Aspen Crusade for Cultural Reform* (Chicago: University of Chicago Press, 1983), 17. Allen credits the Container Corporation as "the first company to combine the aesthetics of modern art and the genius of mass advertising to fashion a corporate image." *Ibid.*, xiii.

¹⁶ Association of Arts and Industries, Chicago, to László Moholy-Nagy, telegram, 6 June 1937, quoted in Sibyl Moholy-Nagy, *Moholy-Nagy: Experiment in Totality* (1950), 2nd ed. (Cambridge, Mass.: MIT Press, 1969), 139.

¹⁷ Margret Kentgens-Craig, *Bauhaus in America: First Contacts 1919-1936* (Cambridge, Mass.: MIT Press, 1999), xii, xix. Intensive communication between the Bauhaus and the American art establishment did not occur until the late twenties. *Ibid.*, 79-91.

¹⁸ *Ibid.*, 92.

visited the United States in the 1920s, adding to the climate of cultural exchange.

Walter Gropius traveled to the United States in 1928, participating in a lecture tour financed by one of his clients, the businessman Adolf Sommerfeld. Moreover, by the mid-1920s the Bauhaus was being contextualized for the museum-going public. The first exhibition to include Bauhaus material was the “International Exhibition of Modern Art” of 1926, which was organized by Dreier and presented at the Brooklyn Museum. In 1931 there was a two-part exhibition in Chicago devoted solely to the Bauhaus at the John Becker Galleries and the Arts Club of Chicago. The Museum of Modern Art demonstrated its opposition to the closure of the Berlin Bauhaus in 1933 by hanging Oskar Schlemmer’s painting *Bauhaustreppe* (Bauhaus Stairway), 1932, in the museum’s lobby (fig. 49).

Indeed, the Bauhaus’s closure spawned increased interest in and sympathy for the school, although this interest generally expressed itself in terms of the potential benefits that the Bauhaus teaching method could have on American education and, by extension, American industry. In 1934 the journalist E. M. Benson wrote an article entitled “Wanted: An American Bauhaus,” which appeared in the June issue of the *Magazine of Art* as a proposal for an Institute of Art and Industrial Design. Benson began his article by deploring the state of arts and crafts schools, which he described as “Entrenched in an archaic system of...instruction that is unalterably blind to industry and the new modes of living resulting there from.” Is it any wonder, Benson asks, “that so many students find themselves hopelessly combating the fire-spitting

dragons of reality with rusty flinklocks?”¹⁹ As an alternative he envisioned a school that would function like a “laboratory which would be for art and industrial design what the Rockefeller Institute is for medical research.”²⁰ Nonetheless, Benson was careful to distance himself from the Bauhaus’s German roots and perhaps its political associations with communism, somewhat nonsensically stating, “I would never suggest that the proposed Institute be *modeled* after its German *prototype*, the Dessau Bauhaus Academy—the first large-scale European school to relate art and industry.”²¹

With the goal of recreating the Bauhaus in the American Midwest, the Association for Arts and Industries contacted Gropius, who was in negotiations for a position in Harvard University’s Department of Architecture, which he assumed in 1937. Given this imminent appointment Gropius declined to run the Chicago school but recommended Moholy-Nagy in his stead. The Association member Norma K. Stahle initiated negotiations with Moholy-Nagy in May of 1937. By the summer he had agreed to take the job. On 23 September Moholy-Nagy gave his first lecture at Chicago’s Knickerbocker Hotel. Speaking to an audience of 800 people, he outlined the New Bauhaus’s program and envisioned, to the pleasure of his listeners from the business community, its possible contributions to local industries. By this time the

¹⁹ E. M. Benson, “Wanted: An American Bauhaus,” *Magazine of Art* 26 (June 1934): 307. The article appeared with an illustration of a proposed building for the proposed school, its design envisioned by Frederick Kiesler.

²⁰ *Ibid.*, 308.

²¹ *Ibid.* Emphasis added.

Museum of Modern Art was in the midst of organizing the exhibition *Bauhaus 1919-1928*, which was mounted in 1938. With the newly opened school in Chicago, the director of MoMA, Alfred Barr, had reason to proclaim in the catalogue preface that “The Bauhaus is not dead; it lives and grows through the men who made it, both teachers and students, through their designs, their books, their methods, their principles, their philosophies of art and education.”²² For a brief moment the members of the Association could congratulate themselves on having fostered an institution that could produce designers, as Barr suggests, “years ahead of the rest of the world.”²³

* * *

The New Bauhaus’s program reflected both similarities to and differences from the Bauhaus curriculum Moholy-Nagy had taught sections of at Weimar and Dessau between 1923 and 1928. To visually exemplify the New Bauhaus’s connection to the Bauhaus, Moholy-Nagy created a curriculum diagram patterned after the one conceived by Gropius in 1922 (fig. 50, fig. 51). Significantly, both schools had a Preliminary Course. (At the New Bauhaus/School of Design this was also called the Basic Design Workshop.) In 1923, Gropius officially redefined the Bauhaus curriculum. In addition to the “elementary instruction in problems of form” that had characterized the Preliminary Course, students would now also conduct

²² Alfred H. Barr, Jr., “Preface,” in *Bauhaus 1919-1928*, ed. Herbert Bayer, Walter Gropius, and Ise Gropius, exh. cat. (New York: Museum of Modern Art, 1938; repr., Boston: Charles T. Branford Company, 1952), 5.

²³ Ibid.

“practical experiments with different materials in the workshops.”²⁴ This new pairing of the “elemental” and the “practical” was intended to “release the creative powers of the student, to help him grasp the physical nature of materials and the basic laws of design.”²⁵ “Laws” would be discovered through the cultivation of “subjective and objective observation” and by “breaking down conventional patterns of thought in order to make way for personal experiences and discoveries.”²⁶

The designation of “practical experiments” and the emphasis on “design” constituted a shift from the Bauhaus’ original pedagogical program, which focused principally on craft. As Magdalena Droste writes, prior to this shift “students had simply used the workshops to practise crafts on the basis of what they had learned in the *Vorkurs*.”²⁷ Droste dates the change to 1922, the year the new curriculum diagram was made public. This was the year that the Bauhaus’ founder began “tirelessly publicizing a new slogan: ‘...art and technology, a new unity...’ Gropius thus put the Bauhaus onto completely new footing—for the motto of 1919 had been ‘Art and

²⁴ Walter Gropius, “The Theory and Organization of the Bauhaus,” in *Bauhaus 1919-1928*, 24. Originally published as Walter Gropius, *Idee und Aufbau des Staatlichen Bauhauses Weimar* (Weimar: Bauhaus, 1923).

²⁵ Ibid.

²⁶ Ibid.

²⁷ Magdalena Droste, *Bauhaus 1919-1933* (1990), repr. (Berlin: Bauhaus-Archiv Museum für Gestaltung; Cologne: Taschen, 2002), 58.

craft—a new unity.”²⁸ Central to the school’s revised mission was the training of students in the production of design prototypes for industry. As Droste writes:

[The Bauhaus] chose as its goal a new field of activity—contemporary design for industrial production, a field with which almost no one had concerned themselves before. Indeed, Germany was not to start using the word ‘design’ until after 1945. For everyone seeking to come to terms with the ‘age of the machine’, the Bauhaus was soon to stand for the very opposite of handicraft, artisan activity.”²⁹

When Moholy-Nagy arrived at the Bauhaus in 1923, he became the symbol of the school’s new mission and Gropius’s most active partner in its enactment. In addition to overseeing the Preliminary Course and the metal workshop, Moholy-Nagy redesigned the Bauhaus’ graphic identity, creating its new public face. In addition, as has been noted above, he oversaw the Bauhausbücher with Gropius, proposing a book series with a total of fifty volumes (eight were realized). Through the public platform provided by the Bauhaus, Moholy-Nagy became a prominent example of what Eva Forgács has designated the “artist-editor-publisher-organizer.”³⁰

²⁸ Ibid. Droste credits the presence of Theo van Doesburg in Weimar in 1921-22 as having contributed to Gropius’s decision to emphasize technology. Van Doesburg was a founder of de Stijl, and in Weimar he established a “de Stijl course” that was attended by Bauhaus students. Indeed Droste states that the significance of van Doesburg’s disapproval of “romantic faddishness” at the Weimar Bauhaus “can hardly be overestimated.” Nonetheless, she points out that Gropius “had intended [the Bauhaus] to be productive right from the start.” To this end, he had contacted artisan’s associations upon opening the Bauhaus. Ibid., 57-58.

²⁹ Ibid., 60.

³⁰ Within this group Forgács includes van Doesburg, Karel Teige, El Lissitzky, and Lajos Kassák. Éva Forgács, “Definitive Space: The Many Utopias of El Lissitzky’s *Proun Room*,” in *Situating El Lissitzky*, ed. Nancy Perloff and Brian Reed, Issues and Debates series (Los Angeles: Getty Research Institute, 2003), 68-69.

Under Moholy-Nagy's predecessor, Johannes Itten, students in the Preliminary Course (which was instituted as the prerequisite to the workshops in 1920), were instructed to familiarize themselves with what Droste has identified as "pairs of opposites," including "intuition and method" or "subjective experience and objective recognition."³¹ To develop his students' awareness of form, Itten placed a strong emphasis on drawing, including in the range of subjects he assigned studies from nature and works by Old Masters. When Moholy-Nagy took over the Preliminary Course, the emphasis on drawing was abandoned in favor of the building of three-dimensional objects using materials such as glass, Plexiglas, and metal.³² The course was also expanded to one year, an extension that allowed for further workshop preparation, for Josef Albers's instruction in materials, and for visits to factories and businesses.

Moholy-Nagy's description of the Preliminary Course in the first New Bauhaus catalogue is substantially simplified and shortened compared to Gropius's 1923 rededication of the Bauhaus, but it makes several of the same basic points concerning the necessity of training in preparation for the workshops:

The preliminary curriculum offers a test of the student's abilities. It helps shorten the road to self-experience. It embodies briefly the essential components of the training given in the specialized workshop of the New Bauhaus. It gives him ample opportunity to make a careful choice of his own field of specialization later.

³¹ Droste, *Bauhaus 1919-1933*, 25.

³² "While hundreds of drawings have survived from Itten's lessons, the numbers from Moholy's classes can be counted on the fingers of just two hands." Ibid., 60.

In addition, Moholy-Nagy divided the coursework into three sections:

- (A) The basic design shopwork
- (B) Analytical and constructive drawing
- (C) Scientific subjects

At the New Bauhaus, the last item in this list, “scientific subjects,” was given particular emphasis with the hiring of two faculty members from the University of Chicago, Carl Eckart and Ralph Gerard, who were responsible for this portion of the curriculum. Moholy-Nagy’s decision to augment the New Bauhaus faculty with science professors can be seen in relation to the changes instituted by Gropius’s successor, Hannes Meyer, who became director of the Dessau Bauhaus in 1928. In Meyer’s revision of the Bauhaus’ curriculum, he specified that one day per week was to be devoted to the sciences for those students who had advanced to the workshops.³³

To judge from course descriptions, the science program at the New Bauhaus was equally if not more ambitious. In Chicago Eckart principally covered physics and mathematics, but in an undated report to Moholy-Nagy regarding topics that had been covered in his course and topics that remained to be addressed, he projected to cover “The calculus,” followed by “The mathematical properties of ornaments,” “Lecture experiments on color,” “Chemistry,” and “Geology.”³⁴ All this in what *remained* of a semester. Gerard’s report is only slightly less ambitious. In it he attests to having

³³ Fridays were devoted to the sciences and Mondays to the arts. The remainder of the week was spent in the workshops, with the students’ schedules based on the eight-hour day then common to industrial shops. Droste, *Bauhaus 1919-1933*, 171.

³⁴ Carl Eckhart, “Physical Science.” Institute of Design Collection, U. of Ill., box 7, folder 204.

taught the “General properties of all living things, with especial emphasis on the relation of structural organization and function.”³⁵ Beyond these subjects the course catalogue also promises “Economics (statistics and marketing),” “Anatomy,” and the “Comparative history of art.”³⁶ If this is not enough, the superhuman student could ostensibly take “supplementary” subjects, such as “Biotechnique—the system of conscious inventions (e.g. Edison), Psychotechnique, Biology, Psychology, Philosophy, Literature (poetry and drama), Music, [and] Economical Geography.”³⁷

There is no record that the list of supplementary subjects was actually taught. Instead, the most significant differences between the original Bauhaus curriculum (as Moholy-Nagy had known it) and the New Bauhaus program were the addition of a photography course and the emphasis on advertising.³⁸ These were the subjects Moholy-Nagy wanted Kepes to teach. But when he contacted Kepes in London to propose this opportunity, Kepes struggled to come to a decision. He later acknowledged that he was torn between two very different choices: accepting Moholy-Nagy’s offer or joining the International Brigade that was aiding the

³⁵ Ralph Gerard, “Biological Science.” Institute of Design Collection, U. of Ill., box 7, folder 204.

³⁶ New Bauhaus course catalogue, 1937-38, p. 6. Institute of Design Collection, U. of Ill., box 3, folder, 53.

³⁷ Ibid.

³⁸ An advertising workshop was introduced at the Dessau Bauhaus in 1927, and it was retained under Meyer’s direction of the school. In 1929 Meyer hired Walter Peterhans to teach photography and to work alongside Joost Schmidt, who was in charge of teaching advertising design. Droste, *Bauhaus 1919-1933*, 180-84.

Loyalist, anti-Franco forces in the Spanish Civil War.³⁹ Kepes, of course, was not alone in his belief in this cause, which he later described, first, in terms of his scientific contacts, and second, in terms of his art:

It was the time of the Spanish Civil War, and almost all the major people in sciences, and some of them in arts also, were deeply involved, at least emotionally with the liberal cause of the Civil War.... I met scientists, who had involvement in art, and also an absolute commitment to what I considered the constructive attitudes to life.... This kind of contact gave me a new vista for the world.⁴⁰

Yet Kepes made this statement in 1972, when it was possible to speak publicly about the principles behind his youthful embrace of Marxism (without actually using words such as “Marxism” or “communism”). In retrospect, the difference between the International Brigade and the New Bauhaus seems vast to us now, but perhaps it was less so in 1937. Moholy-Nagy’s school was the less perilous route, but it was no less idealistic.⁴¹ Moreover its idealism was closely linked to the scientific topics and the integrative, life-absorbing approach to art that Kepes had begun to pursue so avidly. For these reasons Kepes chose Chicago.

³⁹ Kepes, interview by Brown, 30 August 1972, transcript. Kepes Papers, AAA.

⁴⁰ Kepes, interview by Brown, 30 August 1972, transcript, p. 9. Kepes Papers, AAA.

⁴¹ Nonetheless it appears that Kepes criticized Moholy-Nagy for not having joined the communist party, a criticism that suggests Kepes had. In a letter that Moholy-Nagy wrote from La Sarraz, where he vacationed in the 1920s and early 1930s, he confided in his future wife. “K., with whom I share a room and with whom I have worked so closely year after year, accused me of cowardice and lack of character because I am not a member of the Communist Party.” Moholy-Nagy to Sibyl Pietzsch, 29 July 1932, quoted in Sibyl Moholy-Nagy, *Experiment in Totality*, 77.

Charles Morris, who was Eckart and Gerard's colleague at the University of Chicago, was charged with integrating what the students were learning in their science courses (which were already integrated, or at least miscellaneous) with what the students were learning in the workshops. This was the "Intellectual Integration" course previously mentioned. Morris had been introduced to Moholy-Nagy by Rudolf Carnap, an Austrian philosopher who had arrived at the University of Chicago in 1936 via Prague. Morris, who had traveled to meet Carnap earlier in the 1930s, was instrumental in securing the philosopher this position. It is not known whether Carnap and Moholy-Nagy were acquainted prior to their arrival in Chicago.⁴²

Carnap was one of the key theoreticians in the philosophical movement known as Logical Positivism (an outgrowth of the Vienna Circle) and author of one of its first treatises, *Der Logische Aufbau der Welt* (The Logical Structure of the World), published in 1928 and in English translation in 1969.⁴³ Founded on the idea of "protocol statements," or irrefutable observations, Logical Positivism was considered a philosophy to end all philosophy.⁴⁴ Its adherents sought to unite science

⁴² Nonetheless Carnap did have an association with the Bauhaus, having lectured at the Dessau Bauhaus on 15 October 1929, after Moholy-Nagy had left his teaching position there. Carnap's lecture is discussed in Peter Galison, "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism," *Critical Inquiry* 16 (Summer 1990): 709.

⁴³ Rudolf Carnap, *Der logische Aufbau der Welt: Scheinprobleme in der Philosophie* (1928; Hamburg: F. Meiner, 1961). This appeared in translation as idem, *The Logical Structure of the World: Pseudoproblems in Philosophy*, trans. Rolf A. George (Berkeley: University of California, 1969).

⁴⁴ Gary Gutting has written a valuable introduction to a collection of primary sources on the philosophy of science. Regarding positivism—the term underlying the Logical

with philosophy, or to render philosophy so scientific, so “objective,” that it would be indistinguishable from the most exacting, empirical study. As the science historian Peter Galison notes, “From simple observation reports (“protocol statements”) and logical connectives (such as ‘if/then,’ ‘or,’ ‘and’), the logical positivists sought to ground a ‘scientific,’ antiphilosophical philosophy that would set all reliable knowledge on strong foundations and isolate it from the unreliable. Since all valid inferences would be built out of these basic statements, the sciences would be unified by their shared starting points.”⁴⁵ Logical Positivism, therefore, was deeply preoccupied with language or, as Carnap further reduces this equation, with syntax. “All theses and questions of logical analysis and therefore all theses and questions of philosophy (in our sense of the word) belong to logical syntax. The method of logical syntax, that is, the analysis of the formal structure of language as a system of rules, is the only method of philosophy.”⁴⁶ In the United States Logical Positivism became the Unity of Science movement. And in its new manifestation its primary figures were Carnap, Morris, Otto Neurath, and Philipp Frank. It would be difficult to overstate its significance to the New Bauhaus. In the course catalogue for the academic year of

Positivism creed—Gutting writes that it regards “science as the only knowledge worthy of the name. Philosophy is at best a metareflection that makes explicit the conclusions of science and the methods whereby it has produced them.” Gary Gutting, “Introduction: What Is the Continental Philosophy of Science?” in *Continental Philosophy of Science*, ed. Gary Gutting (Oxford: Blackwell Publishing, 2005), 1.

⁴⁵ Galison, “Aufbau/Bauhaus,” 711.

⁴⁶ Rudolf Carnap, *Philosophy and Logical Syntax*, *Psyche Miniatures*, no. 70 (London: Kegan, Paul, Trench, Trubner & Co., 1935), 98-99.

1938-39 Moholy-Nagy included a text by Morris that would be reprinted in subsequent catalogues. The text concerns what Morris understood to be the purpose of the school. This he characterizes as “using contemporary science and philosophy in its educational task of reintegrating the artist into the common life.” He ends the statement by a direct mention of the Unity of Science movement and Carnap. “Moholy-Nagy knew of the interest of Rudolf Carnap and myself in the unity of science movement. He once remarked to us that his interest went a stage farther: his concern was with the unity of life.”⁴⁷

* * *

Kepes’s delayed decision to leave for Chicago meant he was not present when classes began at the New Bauhaus in the fall of 1937. In his stead Moholy-Nagy hired Henry Holmes Smith to teach the first photography classes. Smith was a local commercial photographer who became one of Moholy-Nagy’s staunchest supporters and later went on to teach photography at the University of Indiana using a curriculum derived from the New Bauhaus.⁴⁸ When Kepes arrived in Chicago, he and Smith shared teaching duties. The fact that photography was offered from the moment the New Bauhaus opened contradicts the course catalogue’s indication that photography was to be taught in a “specialized workshop,” open to students “after

⁴⁷ New Bauhaus course catalogue, 1938-39, 10. University of Illinois at Chicago, The University Library, Department of Special Collections, Institute of Design Collection, box 3, folder 54.

⁴⁸ Howard Bossen, *Henry Holmes Smith: Man of Light*, Studies in Photography, ed. Diane M. Kirkpatrick, no. 1 (Ann Arbor: University of Michigan, 1979, repr., 1983).

passing the examination in the preliminary courses.”⁴⁹ This discrepancy may have been due to the fact that much of the school’s facility remained incomplete at the time classes began. The delay is understandable, as it would doubtlessly have taken time to transform the mansion of a capitalist scion into a cluster of workshops. At least initially, the making of rudimentary photograms at the New Bauhaus was a stopgap measure, comparable in spirit if not in degree to the resourceful adoption of simple and relatively available materials (paper, wood) that Gropius and his colleagues made use of in the impoverished years after World War I. In a 1973 lecture Smith described both the excitement and the chaos that accompanied the New Bauhaus’s abrupt inauguration:

Moholy suggested that we start with photograms on that magic material, print-out paper. This permits printing in bright daylight, and we used direct sunlight through a south window in an unfinished room.... The excitement was intense as student assembled materials that interfered with light falling on the paper and watched the ever-deepening reddish color where direct light fell.

We took our prints to what we thought would be a safe place—our unfinished basement darkrooms where they were stored awaiting my return to class a week later. In the meantime plastering proceeded throughout the building, and the plaster buckets were emptied on our prints, destroying them. Of course, we all survived a little older; I shall not refer to our degree of wisdom.⁵⁰

With materials in short supply, students were also instructed to create a light modulator using a single sheet of paper. In *Vision in Motion*, Moholy-Nagy’s posthumously published book, he proclaimed this exercise “the second step [after the

⁴⁹ New Bauhaus course catalogue, 1937-38, p. 6.

⁵⁰ Henry Holmes Smith, “Into the Light,” 107-08.

photogram] in learning the elements of photography.”⁵¹ Varying from this hierarchy, an undated course report to Moholy-Nagy coauthored by Kepes and Smith defines the “document photograph” as “the most significant type of work studied and produced.” Yet by their description of the “document photograph,” which involves “Placing in contact a collage of light filters and photographic materials and exposing [it] to a white light source,” it is evident that they mean something other than what is commonly accepted as documentary photography. What this suggests is that, whether a camera was used or not, the class was almost entirely concerned with “manipulating light in some manner.”⁵² Nonetheless students had the opportunity to see photographs of all types. In 1938 the school presented the exhibition *A Brief Survey of Photography from 1839-1937*, a version of an exhibition Beaumont Newhall had mounted at MoMA in the previous year.⁵³

On the invitation to the school’s dedication and in its first course catalogue Kepes is listed as the instructor of the “Drawing and Light Studio.”⁵⁴ This title would change slightly, but significantly, with every new school year, shifts that reflected Kepes’s aspirations, the school’s controversies and marketing efforts, and the demands brought by World War II. In the 1938-39 course catalogue Kepes is head of

⁵¹ László Moholy-Nagy, *Vision in Motion* (Chicago: Paul Theobald, 1947), 198.

⁵² Henry Holmes Smith and George [Gyorgy] Kepes, “Photography,” undated report to Moholy-Nagy. Institute of Design Collection, U. of Ill., box 7, folder 207.

⁵³ *Photography: 1839-1937*, Museum of Modern Art, 17 March to 18 April 1937.

⁵⁴ Invitation to the dedication of the New Bauhaus. Institute of Design Collection, U. of Ill., box 3, folder 52. New Bauhaus course catalogue, 1937-38, p. 8.

“Drawing and Photography.”⁵⁵ Yet this course catalogue was not actually put into effect, because the school was closed by the Association of Arts and Industries in the summer of 1938. The official reason for this action was lack of funds.⁵⁶ But the Association members had also quickly become dissatisfied with Moholy-Nagy’s management of the school, which they and others (most funders and some students) likened to a “one man show.”⁵⁷ In addition, Moholy-Nagy’s critics were increasingly skeptical of his pedagogy. In general the Association felt Moholy-Nagy was not business-minded enough. In contrast a group of the students, referred to by Moholy-Nagy’s supporters as “radicals,” felt that the arts did not receive enough emphasis. Both dissenting parties agreed that the focus on working in groups and the “elementary” manipulation of materials held back students who were more experienced. In 1938 Nathan Lerner—a staunch Moholy-Nagy supporter and a

⁵⁵ New Bauhaus course catalogue, 1938-39, 8. University of Illinois at Chicago, The University Library, Department of Special Collections, Institute of Design Collection, box 3, folder 54.

⁵⁶ A thorough account of the steps leading up to the New Bauhaus’s closure is available in Lloyd C. Engelbrecht, “Educating the Eye: Photography and the Founding Generation at the Institute of Design, 1937-38,” in *Taken by Design*, 27-29. For additional background information see, idem, *The Association of Arts and Industries: Background and Origins of the Bauhaus Movement in Chicago* (Ph.D. diss., University of Chicago, 1973).

⁵⁷ One disgruntled student, James Conrad, wrote to Henry Holmes Smith (who had moved to Florida for another position after the New Bauhaus was closed). “We don’t want to be angels in Moholy’s little heaven. We want to be free from influence and yet have sufficient guidance to create those things which we feel are good. Personal problems shouldn’t enter into a discussion of a thing as big as the Bauhaus, but neither must the Bauhaus be one individual. We feel that that was Lazslo’s entire aim.” Undated letter from James Conrad to Henry Holmes Smith. Institute of Design Collection, U. of Ill., box 7, folder 203.

student who later became a School of Design instructor—wrote an impassioned letter to Henry Holmes Smith recounting the animosities that had led to the New Bauhaus's closing:

The new bauhaus opened with great fanfare and light attracting attention and students from a very diverse strata. It preached artistic liberation and a democratic educational system, and so was hailed and acclaimed by all (for all here in America know that democracy and progress are wonderful things to admire). The bauhaus, however, made the mistake of trying to actually carry out the idea and impose a democratic order in the school. And those who loved the idea in words found it unbearable in fact. It meant, for example, that one who had spent several years in an art school (however bad) had to attend classes and study with novices. It meant subscribing to the idea that talent was not an isolated divine gift, etc. It also meant that one had to at least give lip service to the idea that perhaps Art was stuff and something to do with the world and people and matter.... For it had become onerous for genius to consort of necessity with the lowly for long. There was the yearning for the hand that would pat one hand, not all. The idea that art had a relationship with everyday things and did not connote a spiritual transcendentalism fed the growing bewilderment that slowly turned to anger and then the natural impulse of weakness, to destroy what we cannot cope with or understand, to destroy evidence of our failure.⁵⁸

What Lerner did not convey to Smith was that the New Bauhaus was being reconceived. On 23 February 1939 it reopened as the School of Design (becoming the Institute of Design in 1944). For the first academic session of the resuscitated school Kepes added "Commercial Arts" to his previous title.⁵⁹ It would seem that upon losing an organized connection to the Chicago business community the newly christened School of Design became more willing to identify itself with commercial

⁵⁸ Nathan Lerner to Henry Holmes Smith, 18 December 1938. Institute of Design Collection, U. of Ill., box 7, folder 203.

⁵⁹ School of Design course catalogue, 1939-40, 10. Institute of Design Collection, U. of Ill., box 3, folder 62.

terms, most notably in its renaming. In the summer of 1940 Kepes also taught the “Color Workshop” at the School of Design’s summer session at Mills College.⁶⁰ In 1940-41 he is listed as head of the “Light Workshop,” a title that likely consolidated most, if not all, of the subjects he taught to date.⁶¹ It was not until 1942 that Kepes’s name appeared alongside the title that he is most often credited with in the literature on the New Bauhaus/School of Design—he was finally head of the “Light and Color Workshop.”⁶² Yet in a circular published for the evening courses that took place in 1941-42 he is also credited with being in charge of “Advertising Arts” and the “Photography and Light Workshop.”⁶³ Kepes was not the only faculty member to experience such shifts in titles and duties. These inconsistencies have generally been overlooked in historical accounts of the school, but I would suggest that they are important because they demonstrate an institution that was far from stable or certain in its identity.⁶⁴

⁶⁰ School of Design course catalogue for Mills College summer session, 1940, n.p. University of Illinois at Chicago, Institute of Design Collection, U. of Ill., box 3, folder 57.

⁶¹ School of Design course catalogue, 1940-41, 12. Institute of Design Collection, U. of Ill., box 3, folder 63.

⁶² School of Design, Summer brochure, 1942. Institute of Design Collection, U. of Ill., box 3, folder 72.

⁶³ School of Design, Evening session brochure, 1941-42. Institute of Design Collection, U. of Ill., box 3, folder 71. “Visual Fundamentals” is the title of one of the classes listed under the Advertising Arts Department. This was the title that Kepes would use to describe his curriculum at MIT.

⁶⁴ The Weimar Bauhaus also struggled with internal instability. It was, as Magdalena Droste writes, “a melting-pot of highly contradictory ideas. At the beginning, German nationalists and anti-Jewish students tried to gain the upper hand.... Anarchist,

The biggest curricular shift at the School of Design occurred after the United States entered World War II on 8 December 1941. In the summer of 1942 Kepes attended a workshop at the “Engineer School” where he gained a certificate in the Camouflage Course for Civilians.⁶⁵ In wartime the course, which took place over less than two weeks, was qualification enough for Kepes to become the designated head of the newly formed Camouflage Department at the School of Design.⁶⁶ Nonetheless, Kepes also felt that his teaching experience had provided him with special skills. This is implied in the introductory lecture he wrote for the first day of his camouflage course:

The present situation demands a reorientation into new fields of activity. Most of these new activities are based on the raw materials of knowledge acquired in various peace-time professions. The best results in the new war assignments will come from those who possess pre-requisite knowledge of these tasks. Many experts were selected by the armed forces for these duties, while many are voluntarily selecting and preparing themselves for war-time jobs in which their skills and talents may be most useful.⁶⁷

In addition to teaching camouflage, Kepes participated in a committee brought together to advise the city government on camouflage tactics. In 1975 Kepes vividly recalled his war work:

socialist, conservationist, life-reformist and esoteric schools of thought all found support at the Bauhaus.” Droste, *Bauhaus 1919-1933*, 50.

⁶⁵ The Engineer School, Camouflage Course Certificate. Conducted for civilians for the period 22 June 1942 to 4 July 1942. Kepes Papers, AAA, reel 5303, file 21.

⁶⁶ School of Design course catalogue, ca. 1942, n.p. Institute of Design Collection, U. of Ill., box 3, folder 76.

⁶⁷ George [Gyorgy] Kepes, “Summary of the Introductory Lecture for the Camouflage Course,” typescript, 16 September 1942. Institute of Design Collection, U. of Ill., box 6, folder 174.

My imagination was captured when, during the Second World War, I was on the mayor's camouflage committee in Chicago. It was then I came to appreciate the overwhelming experience of looking down from an airplane on the nightscape of a large city. We tried to re-pattern the light structure of Chicago for camouflage purposes. Areas of dense light were obliterated and lightless areas like parks and the shore of Lake Michigan were brightly illuminated.⁶⁸

The consequences of this experience, which was, I would suggest, relayed under the spell of nostalgia, would have demonstrable effects on Kepes's career at MIT.

* * *

Kepes's busy years of teaching in Chicago also coincided with his most active production of photographs. Many of these works are either photograms or composite photograms that contain superimpositions of camera photographs, such as *Bread and Light* (1942), a work that was discussed in Chapter One (fig. 15). Often Kepes's photographs resemble drawings, or photographs of drawings. In fact, in the late 1930s and early 1940s Kepes frequently utilized the technique of cliché-verre. Nonetheless, he shied away from referring to this term, preferring his own neologism, "photo-drawing." This is an apt description of a technique that the photo historian Ed Hill has characterized as belonging to "the interstices between photography and printmaking."⁶⁹ There is little agreement as to who should be credited for developing the cliché-verre technique. Hill cites the British engravers William Havell and James

⁶⁸ Gyorgy Kepes, "On Public Art," interview by Katherine Kuh, *Saturday Review* (October 1975): 62. Moholy-Nagy also served on the camouflage committee and Robert Preusser, a School of Design student, served in the war in a division responsible for camouflaging.

⁶⁹ Ed Hill, "Cliché-Verre: Investigating the Interstices," *Afterimage* 9, no. 1-2 (Summer 1981): 18.

Willmore as having attempted and failed to make a hybrid of drawing and early photography (using Talbot's process) commercially viable.⁷⁰ Hill attributes their failure to the cliché-verre's "relative primitiveness, unreliability, and [the] impermanence of photographic materials and techniques."⁷¹ Nonetheless cliché-verre continued to be utilized by artists, most notably by the painter Jean-Baptiste Camille Corot. In 1980 the Detroit Institute of Arts presented an exhibition of nineteenth- and twentieth-century cliché-verres, including a selection by Kepes. The exhibition's curator, Elizabeth Glassman, defined a cliché-verre as an image that is "hand-drawn [and] light-printed. An image is rendered by hand on a matrix (as in printmaking). The matrix, however, is transparent and the image is replicated by the action of light through the matrix onto a light-sensitive surface (as in photography)."⁷²

Kepes's cliché-verres often appear to be worked and reworked—some seem scumbled or brushy. Indeed, they are the photographic evidence of these graphic effects. This is true of Kepes's *Photo-Drawing #4* from 1942 (fig. 52). It is as if the artist created a combinatory process, not only drawing rapidly on the translucent plate, but also occasionally applying objects that present themselves as sharp silhouettes in the finished work. This combination of the drawing and the photogram can be found in *Photo-Drawing #4*, which includes a tiny gear-like shape in its lower

⁷⁰ Hill, "Cliché-Verre," 20. Michel Frizot emphasizes the technique's French roots. Michel Frizot, *A New History of Photography* (Cologne: Könemann, 1998), 98.

⁷¹ Ibid.

⁷² Elizabeth Glassman, *Cliché-Verre: Hand Drawn, Light Printed*, ed. Elizabeth Grossman and Marilyn Symmes, exh. cat. (Detroit: Detroit Institute of the Arts, 1980), 13.

half—an apparition of a machine-made object in a washy reiteration of the handmade image.

The catalogue for the 1980 exhibition *Light Abstractions*, in which Kepes's cliché-verres were also included, features a statement by the artist on his “photo-drawing” technique. Speaking retrospectively, after a career which prominently included the collection of scientific photographs, he couched his approach to the cliché-verre in terms of the microphotograph:

The means I employed in my photographic work is a modulation of light effects created by painted glass surfaces, fusing different viscosity [sic] of liquid pigments, inks and paints. What impressed me and led me to this technique was the chance to render the invisible visible, making the almost microscale physical processes of inter-playing liquid pigments into visible, magnified textual configurations.⁷³

Kepes concluded his statement by comparing the physical to the metaphysical, the material to the immaterial. “I respond to the accidental configurations of these tiny lava formations of ink and paint and choose and provoke interplays of these microscale pigment events that express metaphysical events.”⁷⁴

Of all Kepes's cliché-verres, *Hungarian Past*, from ca. 1937, is perhaps the most suggestive of metaphysical interpretations (fig. 53). If Kepes's *Self-Portrait* (1930), discussed in Chapter One, pictured the artist's ambitious yet uncertain entrée into Berlin, *Hungarian Past* served a comparable purpose: made soon after his arrival in the United States, it functioned as a proclamation of Kepes's Hungarian identity by recourse to the look of myth and monument. Whether the artist had a specific myth or

⁷³ Gyorgy Kepes, “Artist's Statement,” in Jean S. Tucker, *Light Abstractions*, exh. cat. (Saint Louis: University of Missouri at Saint Louis, 1980), 48.

⁷⁴ Ibid.

monument in mind has not been recorded. *Hungarian Past* presents three principle forms—all verticals—grounded on a low horizon line. The form on the furthestmost left resembles a chalice, an effect that is heightened by the additions Kepes made to its uppermost edge—a grouping of small circles and spirals that bubble out of its “rim.” The form in the center of the image resembles a truncated leg firmly planted and standing in profile. And the rightmost form, which appears to be positioned in the distance, suggests a kind of totem with sharp edges like those that comprise crystals. From the planar edges of this form Kepes drew projecting lines.

Kepes’s camera photographs also often contained drawn additions. This is true of *Untitled (Juliet with Peacock Feather and Red Leaf)*, 1937-38 (fig. 54). In this image Kepes has taken a photograph of his wife who gazes directly at the camera with a neutral expression. To one side of the portrait he placed a peacock feather so that its patterned center rests over the subject’s right eye, now concealed. The tip of the feather comes to rest just above the lips. After the photograph was printed, Kepes painted a red leaf over the portrait’s right side, outlining only the leaf’s veins and stem so that we can see one of Juliet Kepes’s eyes through this screen. In a closely related photo—*Juliet with Peacock Feather and Paint*, 1937-38 (fig. 55)—Kepes replaced the leaf with a gear rendered in yellow gouache. As a pair these works suggest Kepes’s thinking about the coexistence of art and technology, but the emphasis is nonetheless on natural pattern. In this context the gear—an emissary from industry—seems more indebted to the feather, whose pattern was constituted in the action of light on silver gelatin. By an act of intimate proximity, the image of Juliet Kepes also appears to remain in and of nature and its wonders. In this reading even

the carefully applied lipstick—an overt sign of culture—is compared to nature’s most marvelous spectacles—that being the way that some animals, notably peacocks, perform their urge to mate.

As these portraits suggest, even Kepes’s most detailed, worked, and reworked images from this period possess a quality that is best characterized as “balanced.” In general Kepes balanced dark forms with light ones, and the visual “weight” of one shape against another. He visually performed, as we shall see in the section that follows, his “language of vision.” This is true of his photographs in which the forms stop short of extending beyond the edge of the image, such as the *Photo-Collage* from 1939 (fig. 56), as well as his photographs, such as *Distorted Reflections* from 1942 (fig. 57), in which the shapes are clearly presented as fragmented or partial. To judge by the selection of photographs that appear in Kepes’s monographs, he was a rigorous editor of his own photographic practice, for the most part removing the inevitable moments of imbalances and disorders that would have occurred, particularly in the chance-filled process of the photogram.

Structured Wholeness

Kepes’s desire to find things in the world that were “balanced,” “whole,” “unified,” “structured,” and “ordered”—these are terms found throughout his writings—was symptomatic of what the literary historian Terence Hawkes has defined as “a developing concern of modern thinkers” that led to “a momentous historic shift in the nature of perception which finally crystallized in the early twentieth century,

particularly in the field of the physical sciences, but with a momentum that has carried through to most other fields.”⁷⁵ The phenomenon that Hawkes is referring to is the emergence of what we now call structuralism. What has been at least partially forgotten in the history of structuralism is the general manifestation of “structural thinking” in what Hawkes hints at as “most other fields.”⁷⁶ This forgetfulness can be attributed to (at least) two factors. First, structuralism was, at heart, a linguistic phenomenon, so the maturation of modern linguistics overshadowed or absorbed the presence of structural thinking in other disciplines (with the exception of anthropology). Second, structuralism was a particularly slow-moving “momentous historic shift.” Its “birth” is usually traced back to two individuals—the Swiss linguist Ferdinand de Saussure (1857-1913) and the American philosopher Charles Sanders Peirce (1839-1914), who has been referred to in relation to Kepes’s conceptualization

⁷⁵ Terence Hawkes, *Structuralism and Semiotics*, 2nd ed. (London: Routledge, 2003), 6.

⁷⁶ The range of structuralism’s disciplinary reach was still very much in evidence in 1968 when Jean Piaget published *Le Structuralisme* (Paris: Presses Universitaires de France). This book, which appeared in English translation in 1970, includes chapters devoted to “Mathematical and Logical Structures,” “Physical and Biological Structures,” “Psychological Structures,” “Linguistic Structuralism,” “Structural Analysis in the Social Sciences,” and “Structuralism and Philosophy.” See Jean Piaget, *Structuralism*, trans. Chaninah Maschler (New York: Basic Books, 1970). In the early 1960s Kepes contacted Piaget inviting him to contribute to the Vision + Value series. Piaget gracefully declined by stating in a letter to Kepes, “I have already written too much in life.” Jean Piaget to Gyorgy Kepes, 7 February 1962, Kepes Papers, AAA, reel 1211, frame. For a seminal historical analysis of structure in science see, Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962).

and deployment of photography. Yet the work of these scholars did not become widely known until after their deaths.⁷⁷

Saussure's great contribution was to replace an atomized view of language with a relational one. The approach to language that Saussure characterized as diachronic assumed that language was a grouping of independent words with historically predicated meanings—meaning accrued through time. In contrast, Saussure specified that language was in fact synchronic, a *Gestaltseinheit*, or unified field, that is inherently complete and self-regulating. Within this theory of language meaning emerges through the immediate manifestation of difference at the phonetic level (for instance cat versus rat) and at the level of the “system of signs.”⁷⁸

Saussure's *Course in General Linguistics* appeared in French in 1915 and in English in 1959. In contrast, American structural linguistics developed through the study of Native American languages. One of the most important American figures in the characterization of the study of language in terms of structure was Edward Sapir (1858-1939) whose book *Language* (1921),⁷⁹ as Hawkes notes, revealed “his growing

⁷⁷ The complicated authorship of Saussure's *Cours de Linguistique Générale* (Course in General Linguistics) is addressed in note 74 of my Introduction. Peirce's *Collected Writings*, an eight-volume set, was also published posthumously, between the years of 1931 and 1958. Terence Hawkes attributes one of the earliest manifestations of structural thinking to the “Italian jurist Giambattista Vico [who] published a book called *The New Science*, which analyzed the structural processes of mythmaking.” This is a task that would famously occupy Roland Barthes. See Roland Barthes, *Mythologies* (1957), trans. Annette Lavers (New York Hill and Wang, 1972).

⁷⁸ Ferdinand de Saussure, *Course in General Linguistics* (1915), ed. Charles Bally and Albert Sechehaye with Albert Reidlinger, trans. Wade Baskin (London: Fontana, 1974), 118.

⁷⁹ Edward Sapir, *Language* (New York: Harcourt and Brace, 1921).

awareness that languages operate by means of some kind of inherent *structuring* principle.”⁸⁰

Kepes’s knowledge of structuralism, or the “science of signs,” came from his interaction with Charles Morris who, as I mentioned at the outset of this chapter, was responsible for teaching the “Intellectual Integration” course at the New Bauhaus. Morris’s foundation in semiotics principally came from his study of Peirce rather than Saussure or Sapir.⁸¹ In addition to the notion of the indexical sign already mentioned, Peirce conceived of iconic and symbolic signs. This division of signs into three types has been useful to scholars seeking to understand visual culture. As Michael Leja has observed, “Peirce’s writings have had immense appeal for analysts of visual culture.” This is partially because Peirce’s “categories of icon and index especially accommodated visual signs.”⁸²

It is likely that Kepes did not know Peirce’s semiotic theory in depth. Unlike contemporary scholars, he did not make references to Peirce’s tripartite sign divisions. Nonetheless, Kepes was deeply attracted to the possibilities that arose when he designated vision a “language,” however that designation varied from the actual terms of linguistic theory. In the 1940s Kepes did not worry about whether vision

⁸⁰ Hawkes, *Structuralism and Semiotics*, 17.

⁸¹ Terence Hawkes has described Morris as “one of the most influential American semioticians.” Hawkes, *Structuralism and Semiotics*, 161.

⁸² Michael Leja, “Peirce, Visuality, and Art,” *Representations* 72 (Autumn 2000): 97. Leja also demonstrates that the bias towards the visual sign in Peirce’s writings was due to his proclivity for “natural patterns of thought and reasoning toward graphic representation and visual symbols.” Ibid.

could constitute a language. He simply believed it did. Morris remained slightly more circumspect. This is apparent in the report he submitted to Moholy-Nagy in the spring of 1938. The report describes the subjects he had been teaching and the ideas he had been encouraging his students to ponder and question. It is important to cite this report at length because it invaluablely interweaves thinking about language with concurrent efforts to “unify” the sciences. Here is Morris on “Intellectual Integration”:

The purpose of this course is to get as clear an idea as is possible of the main human activities (grouped under the general headings of art, science, and technology). It hopes to give the verbal correlate of what, as I understand it, the Bauhaus is attempting to accomplish in practice.

I find it convenient to consider human activities in terms of the languages in which they express themselves. Hence the course opened with an extended discussion of the theory of signs, language being a certain kind of sign structure. On the basis of the general theory which was developed, there followed a discussion of the formal sciences. The treatment of science was based on the study of the interrelationships of the terms of the various sciences; the aim was to show the unity of science by showing how all the terms of the sciences can be stated progressively on the basis of a few terms drawn from the everyday language. The humanistic as well as the natural sciences were included in the development of the general thesis.

We are now discussing the question as to how far art can be regarded as a language. This question necessitated a previous presentation of a theory of value and an attempt to define such terms as “good,” “better,” and “best.” The theory of art as the language of value was based on the theory of signs and the theory of value. The students must write this semester a paper entitled Art and Language, confirming or opposing the general thesis which was developed, stressing concrete analysis of works of art. In connection with this task, the next four class meetings will be symposia arranged by groups of students on literature, sculpture, painting, and music. These meetings will run through May 9.

The remaining meetings will be devoted to technology (including in this term even morality). I will try to show the relation of the arts and the sciences to technology, the “applied” arts being the point of fusion of the fine

arts and the intellectual arts. The final meetings of the class will aim to integrate the work of the year and consider its relation to philosophy.⁸³

In the spring of 1938 Morris thought that art could be understood as a “language of value.” But his ideas about language were not set in stone. In a slightly earlier lecture he expressed an even more universalizing idea of the possibilities of language. Intellectual integration “is in effect a theory as to the nature of the major human activities and their interrelationships. The novelty of this approach consists in focusing the work at an analysis of language, in the belief that since language is the most distinctive characteristic of man, all human activities may be distinguished and compared in terms of the linguistic media which they have developed.”⁸⁴

It was also in 1938 that Morris published *Foundations of the Theory of Signs*, the second book in a series known as the *Foundations of the Unity of Science: Toward an International Encyclopedia of Unified Science*.⁸⁵ His contribution to this ambitious series avidly proclaimed that the study of language would unite all knowledge, beginning with the physical sciences and working its way through the disciplines. He reiterated this idea in the essay “Science, Art and Technology,” which

⁸³ Charles W. Morris, typed description of the “Intellectual Integration” course, 2 April 1938. Institute of Design Collection, U. of Ill., box 3, folder 64. Emphasis added.

⁸⁴ Charles W. Morris, “The Intellectual Program of the New Bauhaus,” unpublished lecture, ca. 1937. Institute of Design Collection, U. of Ill., box 6, folder 195.

⁸⁵ Charles W. Morris, *Foundations of the Theory of Signs* (1938), no. 2 of vol. 1, *Foundations of the Unity of Science: Toward an International Encyclopedia of Unified Science*, ed. Otto Neurath, Rudolf Carnap, and Charles Morris, repr. (Chicago: University of Chicago Press, 1970). This “encyclopedia” comprised a series of small books on topics of concern to the Unity of Science movement. There were to have been multiple volumes, but only two were completed.

appeared in the *Kenyon Review* in the fall of 1939. The newly formed journal—the fall issue was its fourth—had, as Morris writes, “opened its pages to a discussion of the place of the arts in the unity of science movement. There...exists today an instrument—the theory of signs—which may prove great power in meeting the recurrent demands for insight into the essentials of human culture.”⁸⁶ Morris was referring to the journal’s second issue, which was devoted to “The New Encyclopedists”—Otto Neurath, Rudolf Carnap, and Morris—with “Pro” and “Contra” opinion papers on the Unity of Science movement.⁸⁷ Indeed, the first few issues of the *Kenyon Review* are a microcosm of the immense expectations and intense debates with which American academics greeted the emerging “science of signs” and its potential impact on “aesthetic discourse.”⁸⁸

Writing in 1964, French critic Roland Barthes was significantly more circumspect about the possibility of applying semiotic theory to the image. In his essay “Rhetoric of the Image” Barthes writes:

We know that linguists refuse the status of language to all communication by analogy—from the “language” of bees to the “language” of gesture—the moment such communications are not doubly articulated, are not founded on a combinatory system of digital units as phonemes are. Nor are linguists the only ones to be suspicious as to the linguistic nature of the image; general opinion too has a vague conception of the image as an area of resistance to

⁸⁶ Charles Morris, “Science, Art and Technology,” *Kenyon Review* 1, no. 4 (Fall 1939): 409.

⁸⁷ “The New Encyclopedists,” *Kenyon Review* 1, no. 2 (Spring 1939). The “Pro” position was taken by Eliseo Vivas, 159-68. The “Contra” position was held by Howard Dykema Roelofs, 168-82. The editor of the *Kenyon Review* closed the issue with an exegesis on “The Arts and the Philosophers,” 194-99.

⁸⁸ Morris, “Science, Art and Technology,” 413.

meaning—this is in the mythical idea of Life: the image is re-presentation, which is to say ultimately resurrection, and, as we know, the intelligible is reputed antipathetic to lived experience. Thus from both sides the image is felt to be weak in respect of meaning: there are those who think that the image is an extremely rudimentary system in comparison with language and those who think that signification cannot exhaust the image's ineffable richness.⁸⁹

In 1964 the philosopher Gustav Bergmann described the awakening to language in terms of a theoretical shift, or turn. "All linguistic philosophers talk about the world by means of talking about a suitable language. This is the *linguistic turn*, the fundamental gambit as to method.... Equally fundamentally, they disagree on what is in this sense a 'language' and what makes it 'suitable.'"⁹⁰

But Kepes never considered such potential complications. Rather, as he remarked in 1972, he was intent on, "structur[ing] whatever I knew into legible form."⁹¹ For him, language was a synonym for structure. While Kepes may have enacted an idiosyncratic interpretation of emerging linguistic theory, it can be argued that *Language of Vision* is an excellent demonstration of how languages and images function ideologically, determining, for instance, how any given two-dimensional space is "known." Before we consider how Kepes went about visually representing

⁸⁹ Roland Barthes, "Rhetoric of the Image" (1964) in *Image, Music, Text*, trans. Stephen Heath (New York: Farrar, Straus and Giroux, 1977), 32.

⁹⁰ Gustav Bergmann, *Logic and Reality* (Madison: The University of Wisconsin Press, 1964), 1977. Emphasis added. Bergmann credited Ludwig Wittgenstein with having brought about the "linguistic turn." See also Richard Rorty, ed., *The Linguistic Turn: Recent Essays in Philosophical Method* (Chicago: University of Chicago Press, 1967). The title was based on Bergmann's formulation.

⁹¹ Kepes, interview by Brown, 11 January 1973, transcript, p. 20. Kepes Papers, AAA.

his “language of vision” it is important to address how Gestalt psychology figured in his thinking about structured wholes.

* * *

As we will recall from Chapter One, Kepes specified late in his career that he first learned of Gestalt psychology from an acquaintance in Berlin who was studying under Wolfgang Köhler. It is unknown why Kepes embarked on the study of Gestalt psychology in Chicago, but his efforts in this regard undoubtedly assisted him in the preparation of lectures and lessons at the New Bauhaus. Prominent members of the German Bauhaus, most notably Josef Albers, had utilized the ideas of the Gestalt psychologists,⁹² but Kepes made it a particularly persistent focus of his theorizing about art. It also contributed to his conception of structure during the writing of *Language of Vision*. Regarding what he calls the “plastic image,” Kepes therefore observes, “It has an organic spatial unity; that is, it is a whole the behavior of which is not determined by that of its individual components, but where the parts are themselves determined by the intrinsic nature of the whole.”⁹³ This is a direct transference to the visual arts of the standard definition of Gestalt theory, expressed by Max Wertheimer in 1924: “There are wholes, the behavior of which is not

⁹² For a discussion of Albers’s use of Gestalten see, Susan Chevlowe, “Josef Albers and the Department of Design at Yale” (Ph.D. diss., City University of New York, 2003), 101-02.

⁹³ Kepes, *Language of Vision*, 16.

determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the whole.”⁹⁴

Wertheimer illustrates this phenomenon through recourse to music and memory. His example is simple and concrete, as if drawn from everyday life. He posits hearing a familiar six-tone melody. When the same melody is played in six new tones it is still recognizable. This example actually comes from Wertheimer’s teacher Christian von Ehrenfels. In 1890 Ehrenfels authored the landmark paper “On Gestalt Qualities” (1890) that was later adopted and developed by Wertheimer and his colleagues.⁹⁵ In this paper Ehrenfels noted that the understanding of a melody is determined by the patterned unity of the whole rather than the individual notes. This, Ehrenfels demonstrated, contradicted associationism, then the prominent school of psychology, which held that consciousness was made up of irreducible sensory and perceptual elements, of atomized parts rather than wholes. It is Ehrenfels who should therefore be credited with the famous summation, “the whole is greater than the sum of its parts.”⁹⁶

The simplicity and concreteness of Ehrenfels’s dictum and Wertheimer’s musical demonstration belie much larger concerns. Indeed, to emphasize the

⁹⁴ Max Wertheimer, “Gestalt Theory” (1924) in *Source Book of Gestalt Psychology*, ed. and trans. Willis D. Ellis (New York: Harcourt & Brace, 1938), 8.

⁹⁵ Christian von Ehrenfels, “Über Gestaltqualitäten,” *Vierteljahrsschrift für wissenschaftliche Philosophie* 14: 249-92. For a discussion of the impact of Ehrenfels’s ideas on the Gestalt psychologists, see Harrington, *Reenchanting Science*, 103-39.

⁹⁶ Ash, “Gestalt Psychology,” 304.

significance of his musical exercise Wertheimer describes his findings in corporeal terms that take on a degree of dramatic hyperbole. “The flesh and blood of a tone depends from the start upon its role in the melody.... It belongs to the flesh and blood of the things given in experience, how, in what role, in what function they are in their whole.”⁹⁷ Something more seems to be at stake for the psychologist who was retrospectively described as “the most philosophically and romantically oriented” of the Gestaltists.⁹⁸ But how did the singular tone—the otherwise unassuming, constituent component of music—come to be a matter of “flesh and blood”? It is worth paying attention to this amplification because Gestalt psychology can, on the contrary, seem “natural” and “given,” a science of the commonsense.

Kepes’s *Language of Vision* also has this same commonsense quality. It is hard to believe that it was initially received as a “timely, courageous book without parallel in its field.”⁹⁹ Perhaps we have become overly familiar with its look, overly conversant in the visual vocabulary of modern design.¹⁰⁰ *Language of Vision* garnered favorable reviews in the art press. It also received positive notices in architectural magazines, such as *Pencil Points*, *Architectural Forum*, and *RIBA*, the journal of the

⁹⁷ Ibid. Perhaps Wertheimer’s comparison between the body and music is not so farfetched. In the United States he was known for composing “musical portraits” of friends. See Jean Matter Mandler and George Mandler, “The Diaspora of Experimental Psychology,” 390.

⁹⁸ Ibid.

⁹⁹ Book-jacket text to the fifth printing (1948) of *Language of Vision*.

¹⁰⁰ This quality is what we describe today as “visual literacy.” See, Donis A. Donis, *A Primer of Visual Literacy* (Cambridge, Mass.: MIT Press, 1973). Surprisingly Donis does not reference Kepes as a precursor.

Royal Institute of British Architects.¹⁰¹ In general, the reviewers restated the “need” that Kepes had outlined in the book for an “organized” approach to vision. None remarked that his approach to vision was restricted to two-dimensions. Nor did any reviewer note that his use of Gestalt psychology was limited to vision as represented in the static image. Rather they seemed to agree that the relationship between tone and melody or, to take a visual example from Kepes’s book, the snake and its camouflaging background (fig. 67), reflected seriously on an extensive range of binary interactions: part to whole, individual to society, inside to outside, nature to culture, peace to war.¹⁰²

In fact, even Wertheimer’s reasoning behind the emergence of Gestalt theory admits to the perception that something was missing from science, psychology, and existence itself:

We go from the world of everyday events to that of science, and not unnaturally assume that in making this transition we shall gain a deeper and more precise understanding of essentials. The transition should make an advance. And yet, though one may have learned a great deal, one is poorer than before. It is the same in psychology. Here too we find science intent upon a systematic collection of data, yet often excluding through that very activity precisely that which is most vivid and real in the living phenomena it studies. Somehow the thing that matters has eluded us.¹⁰³

¹⁰¹ *Architectural Forum* 82 (June 1945): 152. Davidson-Smull, *Pencil Points* 26 (November 1945): 110. Grace Clements, *Arts and Architecture* 62 (April 1945): 30-31, 50. S. W. Hayter, *Magazine of Art* 39 (April 1946): 156-57. *RIBA Journal* 53 (July 1946): 416.

¹⁰² Kepes, *Language of Vision*, 45.

¹⁰³ Jean Matter Mandler and George Mandler, “The Diaspora of Experimental Psychology,” 390.

Wertheimer died in 1943, more than a decade before Kepes began tapping into scientific communities for his editorial projects. Nonetheless Kepes acknowledges Wertheimer in *Language of Vision* and occasionally refers to him in subsequent books. Kepes shared Wertheimer's sense of loss despite progress and sought to add artists to the wayward legions in search of purpose. His solution, like that of the Gestalt founder, concerned identifying singularity in terms of the whole.

Language of Vision

In Kepes's acknowledgements to *Language of Vision* he thanks the Gestalt psychologists for having provided him with "the laws of visual organization."¹⁰⁴ This is another instance of what the art and architectural historian Sigfried Giedion describes as Kepes's receptiveness to the contemporary call for "continuity."¹⁰⁵ This assessment appears in Giedion's foreword to Kepes's book. Entitled "Art Means Reality," it has proven to be a prescient statement, particularly in its success at pinpointing a primary impulse driving Kepes's career. By continuity, Giedion meant to suggest Kepes's interest in furthering the objectives of modern artists who had made their mark in the early twentieth century. Yet he sidesteps naming specific predecessors, preferring to describe them as participants in "the optical revolution—

¹⁰⁴ Kepes, "Acknowledgements," *Language of Vision*, 4.

¹⁰⁵ "The demand for continuity will become more and more the key word of this period. 'Every day something new' is the inheritance of the last century's disastrous urge. It still persists in many ways." Giedion, "Art Means Reality," in Kepes, *Language of Vision*, 6.

around 1910.”¹⁰⁶ If this statement is applied to the visual arts, it connotes a minimally veiled reference to the cubists, and, more generally, to the emergence of abstract painting. The “optical revolution” in question is then the analysis and gradual disassembly or abrupt refutation of Cartesian perspective by early twentieth-century artists—primarily painters, if we remain faithful to the environs of Giedion’s 1910 date. Yet this aspiration to guard the progressive lineage of modern art—an aspiration that Giedion himself acknowledges as being at odds with the avant-garde’s historical preference for rupture—hints at a pervasive, generalized anxiety in which an awareness of discontinuity is expressed as a desire for its inverse.¹⁰⁷ When Giedion cites Kepes’s stated ambition, “To put earlier demands into concrete terms and on a still wider social plane,” he acknowledges the latter’s efforts as a proactive and ultimately palliative link between past, present, and future.¹⁰⁸

Kepes’s first book is also a summary of his teaching experience in Chicago. Yet Kepes was more apt to credit the formation of the book to a teaching stint at the Arts Club of Chicago than to the School of Design, a job he took in 1938 in addition to his other teaching responsibilities. It is likely that Kepes’s second teaching job offered him a combination of support and independence that he did not experience at the School of Design. His students at the Arts Club were mostly designers, although his class was also attended by the gallerist Katherine Kuh who gave Kepes his first

¹⁰⁶ Ibid., 7.

¹⁰⁷ “It is not the rule...for younger generations to consciously continue the work of their predecessors.” Giedion, “Art Means Reality,” 6.

¹⁰⁸ Kepes quoted in Giedion, “Art Means Reality,” in *Language of Vision*, 6.

solo show in 1939. Kuh also facilitated the publication of *Language of Vision* by introducing Kepes to the publisher Paul Theobald. When Kuh became a curator at the Art Institute of Chicago in 1942, she invited Kepes to install the exhibition *Art of the United Nations*, which featured one artwork from each of the twenty-six nations belonging to the newly formed United Nations. The catalogue documents that the works selected were incredibly diverse; what bound the exhibition together was something external to the artworks themselves, the political events that had transformed them into symbols of unity.¹⁰⁹

Kepes's first book is overtly structured—from the division of content into three sections, each with multiple subsections, to the graphic deployment of visuals on the page, to the degree to which the order of the images' internal compositional arrangements is emphasized in the text and by the headings. Through this prominent structural presence Kepes attempted to exemplify vision's "legibility" by establishing sets of comparisons. The book juxtaposes, for instance, a child's drawing to a Chinese scroll painting (fig. 58, fig. 59); a landscape by Claude Lorrain to a "bird's eye view" photograph by Moholy-Nagy entitled *Marseilles Pattern* (1929) (fig. 60, fig. 61); and an undated choreographic dance notation by W. Hogarth to Kepes's own *Photogram with Lines* (1939) (fig. 62, fig. 63).¹¹⁰ Each of these comparisons is intended to demonstrate a particular spatial concept. Therefore similarity is located not in *content*

¹⁰⁹ *Art of the United Nations*, ed. Frederick A. Sweet, most of the catalogue entries are by Florence Hope, exh. cat. (Chicago: Art Institute of Chicago, 1944). The exhibition took place from 16 November 1944 to 1 January 1945. The oldest work in the exhibition was from Iraq, an alabaster head of the Son of Gudea, p. 33.

¹¹⁰ Kepes, *Language of Vision*, 73, 149, 190, 191.

but in *form*. Thus, the child's drawing and the Chinese scroll painting visually explicate the creation of "depth by vertical location." The Lorrain landscape and the Moholy-Nagy photograph depict the potential interchangeability of focus between background and foreground. And the choreographic notation and the Kepes photograph share a comparable use of line in a bounded space.

If we think back to the conceit of Kepes's first published essay, in which he used syntactical vocabulary to describe visual experience, then we can comprehend that these concepts are the "words" in Kepes's visual vocabulary. Indeed, he actually names them for us and then provides visual examples in close proximity to their appearance. Here is a selection of some of these words in the order in which they appear in the book as headings: "plastic organization," "spatial forces," "color balance," "dynamic equilibrium," "plastic organization," "similarity or equality," "nearness," "continuance," "closure," "rhythm," "progression," "depth," "transparency," "interpenetration."¹¹¹

In expressing his belief in the "language of vision" Kepes was also inevitably affirming his belief in the capacity of language to adequately capture visual experience. He achieves this affirmation through the paired workings of the book's images and texts, which function by overlooking the subtle or not so subtle differences between the things they offer up as similar. By definition Kepes's comparisons cannot capture innumerable differences, such as the difference between

¹¹¹ Ibid., 15, 20, 29, 35, 36, 46, 47, 49, 51, 53, 77. It is instructive to consider the words Kepes leaves out of his "language"—disorganization, disorder, imbalance, disequilibrium, and so on.

a child transforming a blank sheet of paper into a graphic record of her encounter with two-dimensional space and a Chinese scroll painter skillfully demonstrating the conventions of his genre. Or perhaps Kepes wanted the viewer to see how different these two visual manifestations are, how mismatched, and then to realize—miraculously—that even despite difference these two things belong together. This is Kepes's belief in wholeness at work. The problem is that the choreographic notation, for instance, is itself already infinitely removed from the bodily feeling of enacting the movements it documents. These are the inevitable losses that come with the gains of translation and representation.

Language of Vision is, first and foremost, a primer for “reading” the static two-dimensional image, even when that image attempts to encapsulate movement, as in Giacomo Balla's *Dynamism of a Dog on a Leash (Leash in Motion)*, 1912, or Harold E. Edgerton's stop-motion photograph *Golfer* (fig. 64, fig. 65). Like Crowther, with his “outline of the universe,” Kepes attempts to provide us with a universal visual vocabulary. He urges imagistic analysis in terms of “spatial forces” and “tone values.” He demonstrates “dynamic equilibrium” and cautions against its opposite. He reveals the “law of continuance” and the phenomenon of “closure.”¹¹² In these and other ways Kepes strove to demonstrate vision's embodiment of a communicative, ordering force.

¹¹² Kepes, *Language of Vision*, 20-21, 36, 51.

Sameness and difference figures, finally, in the title of Kepes's book.¹¹³

Language of Vision plays on Moholy-Nagy's three-word titles for his own publications—*Malerei, Photographie, Film*; *The New Vision*; and *Vision in Motion*.¹¹⁴

Yet Kepes also created a book in order to distinguish his practice from that of Moholy. Chapter One cited Sibyl Moholy-Nagy's August 1948 letter to Kepes in which she asked him to specify how his work differed from that of her deceased husband.¹¹⁵ Kepes replied, as we will recall, that "my bones were almost set in the fashion in which I now think when I came to Berlin."¹¹⁶ Having considered Kepes's paired conceptualization of language and the visual parsing of two-dimensional space, we can now consider what he wrote after this initial comment:

As far as I can generalize, the difference between my approach and that of the old Bauhaus lies in that the Bauhaus emphasized the exploration of new materials, techniques, and sensory fields such as the tactile, which was mainly a process of opening up the horizon; where as I was more interested in organizing these new findings, and put the emphasis, as in my book, on the *meaning of order in the visual experience in its present social context*. My approach implied that all exercises introduced in the light and color workshop

¹¹³ This is true of other books by Kepes: *The New Landscape*, *Education of Vision*, *The Manmade Object*, and *Sign, Image Symbol*.

¹¹⁴ László Moholy-Nagy, *Malerei, Photographie, Film*, Bauhausbücher no. 8 (Munich, 1925). Revised edition, idem, *Malerei, Fotografie, Film* (Munich 1927). A translation of this book did not appear until 1969. Idem, *Painting, Photography, Film*, trans. Janet Seligmann (Cambridge, Mass.: MIT Press, 1969). László Moholy-Nagy, *The New Vision: From Material to Architecture*, trans. Daphne M. Hoffman (New York: Brewer, Warren, & Putnam, 1932). Idem, *Vision in Motion* (Chicago: Paul Theobald, 1947).

¹¹⁵ Sibyl Moholy-Nagy to Gyorgy Kepes, 29 August 1948. Kepes Papers, AAA, reel 5303, frame 213.

¹¹⁶ Gyorgy Kepes to Sibyl Moholy-Nagy, 8 September 1948, reel 5303, frame 220. Kepes Papers, AAA.

and in visual fundamentals had their focal points not only in the extension of the range of visual sensibilities, but also in acquainting the students with *structural laws of plastic experiences*. I always tried to refer these structural laws back to their social meaning.¹¹⁷

In 1972 Kepes expressed his difference from Moholy-Nagy with more candor:

“Moholy was more interested in...express[ing] an achievement, to be with the last moment of artistic ideas.... I had, from the very beginning, a very different basic attitude to both education and art than he had.”¹¹⁸ Kepes felt Moholy-Nagy was too dedicated to the new for the sake of newness. Although page-by-page *Language of Vision* often looks much like Moholy-Nagy’s *Vision in Motion*, there are important differences between them. The title alone suggests that *Language of Vision* is less overtly mobile, more grounded in (admittedly rudimentary) ideas of language as a structure and vision as the manifestation of a succession of Gestalten.

Kepes’s *Language of Vision*, as I have sought to show in this chapter, was the product of a moment, at once euphoric and chaotic, when unity became a “value” for which language, in all its manifestations, was the utopic common denominator. For Kepes, this moment resonated with an idealization of the Hungarian past, which he filtered through his successive experiences in Berlin, London, and Chicago. And, most importantly, this moment that was so concerned with language and its universality functioned as the precursor to Kepes’s immersion in the scientific communities at MIT. Many of the convictions Kepes forged in Chicago would

¹¹⁷ Ibid. Emphasis added.

¹¹⁸ Kepes, interview by Brown, 30 August 1972, transcript, 17-18. Kepes Papers, AAA.

undergo reevaluation in Cambridge, but his ambition to create a common ground for artists and scientists only gained in strength.

In several ways Kepes's work in camouflage presages the shift his approach to visual materials would undergo at MIT. In his introductory lecture to his camouflage course Kepes imagines how the skills of a camouflage worker might be redeployed after the war. His comments reflect a coexistent interest in nature and the city. He envisioned that "A familiarization with the fundamental principles of camouflage will also produce a valuable by-product. That is a readiness to see some of the important potential tasks of the post-war period such as: solutions for site and shelter and an understanding of man-created and natural environment including the esthetic and functional consequences of aerial vision." By September 1942 Kepes had begun to think beyond the edge of the page, even as he was in the midst of writing a book deeply committed to order within a circumscribed confine. What Kepes created in Chicago was a composite—a workable sketch of a worldview—that he continued to refine in the postwar years.

CHAPTER THREE

SYSTEMS

Each pattern, whether it is a crystal, an organism, a community, the solar system, or a spiral nebula, possesses its own internal order and is part of a more extensive order, so that the universe is recognized as a System of systems, a Grand Pattern of patterns.

Lancelot Law Whyte, 1955¹

The sense-data on which the propositions of modern science rest are, for the most part, little photographic blurs, or inky curved lines on paper.

Susanne Langer, 1951²

The previous two chapters identified the intellectual trends in linguistics, psychology, and the philosophy of science that Gyorgy Kepes absorbed while living and working in a succession of cities. Through his interpretation of these trends he developed an approach to artistic expression that was intended to suggest the possibility of social order by means of exemplified and categorized visual order. As we have seen, Kepes

¹ Lancelot Law Whyte, *Accent on Form: An Anticipation of the Science of Tomorrow* (London: Routledge and Kegan Paul, 1955), 54.

² Susanne K. Langer, *Philosophy in a New Key* (1942), 3rd ed. (Cambridge, Mass.: Harvard University Press, 1957), 20.

materialized his ideas about visual order in his book *Language of Vision* and in his assiduously balanced photographic compositions. This chapter addresses Kepes's first decade at the Massachusetts Institute of Technology—from his hiring in 1946 to the publication of his second book, *The New Landscape in Art and Science*, in 1956. During these years Kepes sought to establish himself in a significantly more traditional academic setting than he had experienced in Chicago.

In the postwar years he also confronted, for the first time, the problem of how to persuasively represent his belief in the social utility of interactions between artists and scientists. In Chicago the only scientists Kepes had substantive contact with were Ralph Gerard and Carl Eckart, whose positions as New Bauhaus instructors ensured their sympathetic investment in the school's scientific and technological aspirations. At MIT Kepes encountered a highly competitive environment that was, with some exceptions, considerably less attuned to artists. Anyone wishing to participate in this environment had to, as the mathematician Norbert Wiener boasted, “run the gauntlet of an acute criticism,” an experience that weeded out “those who could not stand the gaff.”³ Writing *Language of Vision* may have induced Kepes to, as he later attested, “structure whatever I knew into legible form,”⁴ but his first years at MIT caused him to question everything he had previously come to believe. As he later remarked, “I

³ Norbert Wiener, *Cybernetics, or Control and Communication in the Animal and the Machine* (1948), 2nd ed. (Cambridge, Mass.: M.I.T. Press, 1961), 1.

⁴ Gyorgy Kepes, interview by Robert F. Brown on 11 January 1973, transcript, p. 20. Gyorgy Kepes Papers, Archives of American Art, Smithsonian Institution, Washington, D.C. (hereafter Kepes Papers, AAA).

was forced to face myself anew and to check what I knew and did not know about the world in which I was living.”⁵

Prior to arriving at MIT Kepes had already developed an aesthetic theory that borrowed freely from Gestalt psychology and the Unity of Science movement. He also became interested in natural patterns and the ways they could function as utopic metaphors for the realization of social harmony. The overriding impulse behind these pursuits was the generalized emergence of structural thinking. This thinking was perhaps most clearly articulated and codified in the field of linguistics.⁶ In the previous chapter I tried but failed to avoid using the word “system” when describing Kepes’s idiosyncratic engagement with structuralism. This attempt was made not because structuralism and semiotics avoided the systemic properties of language. On the contrary, they defined themselves in terms of an approach language as a “system of signs.” Rather, I wished to make a distinction between Kepes’s use of structure prior to and after his arrival at MIT. This distinction can be understood in terms of systems. At MIT Kepes came to embrace the postwar proliferation of “systems theory” that emerged out of the critical environment that Wiener and his peers found so cathartic. This newfound preoccupation with systems over static structures—with dynamically interrelated, permeable entities—is particularly apparent in Kepes’s use

⁵ Gyorgy Kepes, “Gyorgy Kepes: Searcher in the New Landscape,” interview by Douglas M. Davis, *Art in America* 56, no. 1 (January-February 1968): 38.

⁶ Another area of structuralism’s clear articulation was the field of anthropology, through the work of Claude Lévi-Strauss. As Kepes’s knowledge of structuralism came from Charles Morris, whose area of concern was the “unified language of science,” I have not felt it necessary to address structural anthropology.

of scientific photographs, which he intensively collected, displayed, and featured in the books he made after his arrival at MIT. To understand Kepes's work in the decade following World War II, we need to trace the development of MIT as an institution and systems theory as a discourse.

Before proceeding I wish to point out that the division between the previous chapter—titled “Structures”—and this chapter—titled “Systems”—is necessarily reductive, an act of simplification for the sake of characterizing two interrelated aspects within the general trajectory of Kepes's career. Working against such an imposed division are any number of divergent details. Carol Armstrong has written about the indistinctness of history at the level of the detail, its refusal to cleave to the categories we create on its behalf:

Historical reality, in my sense of it, is denser, more contradictory, inconsistent, and plural than...unities and polarizations suggest; epistemological mutation occurs in stuttering fits and starts, neither in smoothly continuous, linear fashion nor in massive sea-changes, neither as evolutionary teleology nor as revolutionary fault line; bits and pieces of old-fashioned thought structures remain among the new, appearing here and there like ruins whose rubble is used to make an incomplete new edifice.⁷

To give an example of this phenomenon in Kepes's history I refer to his use of the term “dynamic equilibrium.” An undeniably prominent part of Kepes's “vocabulary” of vision circa 1944, this term appears throughout *Language of Vision* and functions as one of the book's subdivisions.⁸ Kepes likely adopted “dynamic equilibrium” from Sigfried Giedion, who had in turn acquired it in relation to his understanding of

⁷ Carol Armstrong, *Scenes in a Library: Reading the Photograph in the Book, 1843-1875* (Cambridge: MIT Press, October Books, 1998), 6-7.

⁸ Kepes, *Language of Vision*, 36-43.

contemporaneous biologic theory, most notably Walter Cannon's concept of homeostasis, which he published in 1932.⁹ For Cannon, homeostasis denoted a *permeable* organic structure, capable of being, as he writes, "continuously broken down by the wear and tear of action, and as continuously built up again by the process of repair."¹⁰ Organic permeability is a source of wonder, as Cannon states, "when we realize that the *system is open*, engaging in free exchange with the outer world."¹¹

For Kepes, dynamic equilibrium was akin to a constellation of ideas found in Gestalt psychology, such as the tendency of perceiver to "naturally" experience states of balance and order—or "characteristic togetherness"¹²—within a constantly changing environment. Nonetheless, in the late 1930s and early 1940s, when he was making photographs and shaping the ideas that became *Language of Vision*, he represented "dynamic equilibrium" largely in terms of series of static Gestalten.¹³

⁹ Walter Cannon, *The Wisdom of the Body* (1932), 2nd ed. (New York: W. W. Norton & Company, 1939). Kepes's adoption of Giedion's term is addressed in Reinhold Martin, *The Organizational Complex* (Cambridge, Mass: MIT Press, 2003), 20.

¹⁰ Cannon, *The Wisdom of the Body* (1932), 20.

¹¹ Ibid. Emphasis added.

¹² Mitchell G. Ash, "Gestalt Psychology: Origins in Germany and Reception in the United States," in *Points of View in the Modern History of Psychology*, ed. Claude E. Buxton (New York: Academic Press, 1985), 308.

¹³ Kepes's visual representation of dynamic equilibrium can be compared to the concept of "dynamic symmetry" developed by the teacher and visual theorist Jay Hambidge (1867–1924) in the 1910s and early 1920s. Yet Hambidge emphasized mathematical concepts of order in growth, most prominently symbolized by the Fibonacci series, while Kepes notion of equilibrium is primarily indebted to

Kenneth E. Boulding, one of the early theoreticians of systems theory, has described such Gestalten as “flashlight photographs, as it were, of structures at a moment in time.”¹⁴ Yet this does not mean that Kepes was unaware of *systems of structures*. Indeed every artwork he made had its own internal structure, which he categorized in relation to other visual manifestations of structure. As is evident in *Language of Vision* and, indeed, all of Kepes’s books, such manifestations could be found in his own works, in works by other artists, and in the “world at large,” particularly as it was filtered through scientific photography.

Nonetheless Giedion’s use of the term “dynamic equilibrium,” and Kepes’s adoption of it, should also be seen in relation to a general fascination with “the dynamic,” particularly as it emerged in Russia and Germany in the 1920s. This fascination can be seen, for instance, in the manifesto that Erno Kállai, Alfréd Kemény, László Moholy-Nagy, and László Péri published in 1923, in which they declare their commitment to a “*dynamic* (kinetic) constructive system of forces which organizes space by moving in it, the further potential of which is again in practice *dynamic* architecture.”¹⁵ And although Naum Gabo and Anton Pevsner did not use

homeostasis. See Jay Hambidge, *The Elements of Dynamic Symmetry* (1926), repr. (New Haven: Yale University Press, 1948).

¹⁴ Kenneth E. Boulding, *The World as a Total System* (Beverly Hills: Sage Publications, 1985), 12.

¹⁵ Erno Kállai, Alfréd Kemény, László Moholy-Nagy, and László Péri, “Manifesto,” *Egység* 4 (1923): 51, in Passuth, *Moholy-Nagy*, 288-89. See also László Moholy-Nagy and Alfréd Kemény, “Dynamisch-konstruktives Kraftsystem” (Dynamic-Constructive System of Forces), *Der Sturm* 12 (1922), in Krisztina Passuth, *Moholy-Nagy* (New York: Thames & Hudson, 1985), 290.

the word “dynamic” in their “Realistic Manifesto” of 1920, it was movement and its significance to their art that they so forcefully proclaimed:

We renounce *the thousand-year-old delusion in art that held the static rhythms as the only elements of the plastic and pictorial arts.*
We affirm *in these arts a new element the kinetic rhythms as the basic forms of our perception in real time.*¹⁶

Among the more prominent sculptural symbols of dynamism in the arts between the world wars was Naum Gabo’s *Kinetic Construction (Standing Wave)* of 1920 (fig. 94) and Moholy-Nagy’s *Light-Space Modulator (The Light Prop)* of 1922-30 (fig. 95). These works, as we shall see in Chapter Four, were the revered precursors to the artworks that were produced at the Center for Advanced Visual Studies in the late 1960s and early 1970s.¹⁷ In the United States, Kepes’s use of the term “dynamic

¹⁶ Naum Gabo and Anton Pevsner, “The Realistic Manifesto” (1920), in Charles Harrison and Paul Wood, eds., *Art in Theory 1900-1990: An Anthology of Changing Ideas* (Oxford: Blackwell, 1992), 299. Emphasis in original. Of course Gabo and Pevsner’s focus on “space and time,” which they mention repeatedly in their manifesto, undoubtedly referenced Albert Einstein’s special theory of relativity of 1905, which he refined in 1916 as his general theory of relativity.

¹⁷ In *Chronophobia: On Time in the Art of the 1960s*, Pamela Lee distinguishes postwar kinetic art and artists from their prewar precursors. “Few [prewar] artists defined themselves principally in terms of kinetics; and movement seemed a secondary concern—perhaps even epiphenomenon—to some of their larger aesthetic and conceptual criteria.” Pamela M. Lee, *Chronophobia: On Time in the Art of the 1960s* (Cambridge, Mass.: MIT Press, 2004), 102. Yet this seems a debatable point, to say the least, if we consider, for instance, Moholy-Nagy’s prewar theorization of film and light. He was also actively and insistently concerned with what he designated in *Painting, Photography, Film* as “the time problem.” See *Painting, Photography, Film* (Cambridge, Mass.: MIT Press, 1969), 21. Lee’s desire to establish a distinction between pre- and postwar kineticism is tied to her argument that “the question of time...illuminates the emergence of new communications and information technologies in the postwar era, offering a historical prelude to our contemporary fixations on time within digital culture” (p. xii). I would counter that it is not only useful but also necessary to acknowledge the prewar fixation on time (and speed and movement and light...) and its late twentieth-century legacy. And,

equilibrium” was clearly a composite endeavor, indebted to his knowledge of and participation in “constructive art” of the 1920s and 1930s, and newly enlivened not only by recent biologic theory regarding the dynamism of organisms but also by the emerging discourse of systems theory.

During Kepes’s first decade at MIT he continued to make photographs, but in comparison to the photographs considered in Chapter Two the later images generally suggest unbounded fields and a diminished interest in achieving internal or contained representations of balance. In the postwar years Kepes rethought his earlier charge, which was the representation of localized visual order, in terms of order at the level of the “environmental scale.” What Kepes meant by the “environmental scale” was something very large—perhaps unimaginatively large—and also very public, the perfect example being a city seen from the air. Indeed, Kepes retrospectively suggested that his sensitivity to the “environmental scale” had emerged in 1942, when he flew over Chicago at night for the purpose of envisioning a wartime camouflage strategy.¹⁸

Contributing to Kepes’s conceptualization of scale was the research project on “The Perceptual Form of the City” that he worked on with his colleague at MIT, the

moreover, it is possible to make this acknowledgement without assuming the linearity of history or ignoring the technological and social changes wrought by World War II. In Lee’s formulation, fear of time in the 1960s was new. Indeed, newness is unavoidably emphasized by the seductive neologism “chronophobia.”

¹⁸ Gyorgy Kepes, “On Public Art,” interview by Katherine Kuh, *Saturday Review* (October 1975): 62.

urban planner Kevin Lynch, between 1954 and 1959.¹⁹ Although it is beyond the reach of the present study to address this research project in depth, it is worth noting that Lynch's book *Image of the City* prominently acknowledges Kepes, even suggesting that his name should have appeared on the title page.²⁰ Lynch's book attempts to suggest ways in which cities can be organized so as to be more coherently perceived by their inhabitants. It includes marginal illustrations that resemble images in Kepes's books. This is particularly true of the camouflaged animal—a fox perhaps—that appears on page 12 of Lynch's book, echoing the camouflaged snake on page 45 of *Language of Vision* (fig. 66, fig. 67). And while most of the illustrations in Lynch's book are schematic drawings rather than photographs, many of these drawings compare the city to an organism, using, for instance, a cellular form to describe “a major district containing three sub-districts, which each contain three sub-sub-districts, and so on” (fig. 68).²¹

Kepes was also undoubtedly familiar with Sigfried Giedion's conceptualization of monumentality during the war. In 1943 Giedion was living in New York, and it was there that he collaborated on a paper with Fernand Léger and the architect José Luis Sert entitled “Nine Points on Monumentality.” The purpose of the paper was to reestablish the “value” of monumentality, which had entered a

¹⁹ Kevin Lynch, “Summary of Accomplishments: Research Project on the Perceptual Form of the City,” April 1959. Institute Archives, AC400, box 4, Rockefeller Foundation folder. During this project Kepes and Lynch took groups of people out into the streets of Boston and Cambridge and asked them to describe what they saw.

²⁰ Kevin Lynch, *The Image of the City* (Cambridge, Mass.: MIT Press), vi.

²¹ *Ibid.*, 112.

period of “decline and misuse.”²² As Joan Ockman has observed, “Despite its traditional association with authoritarian regimes, they [the authors of the “Nine Points”] argued, monumentality was not incompatible with democracy.”²³ For Giedion and his coauthors, monuments were “the expression of man’s highest cultural needs. They have to satisfy the eternal demand of the people for translation of their collective force into symbols. The most vital monuments are those which express the feeling and thinking of this collective force—the people.”²⁴ In 1944 Giedion wrote “The Need for a New Monumentality,” which appeared in *New Architecture and City Planning*, a collection of essays edited by Paul Zucker. In this essay, written near the end of World War II, Giedion warned that “we cannot close our eyes; whether we want it or not, the problem of monumentality is lying ahead in the immediate future.”²⁵

Building on his experiences in Chicago and responding to an emerging postwar awareness of interconnectedness and scale, the works Kepes made in the late 1940s and throughout the 1950s are assiduous displays of partialness on the page that serve to suggest continuance beyond the page. This is true of Kepes’s many motion studies, such as his *High Speed Photograph* of 1949 (fig. 69). This black-and-white

²² Sigfried Giedion, José Luis Sert, and Fernand Léger, “Nine Points on Monumentality” (unpublished) in *Architecture Culture 1943-1968*, ed. Joan Ockman, with the collaboration of Edward Eigen (New York: Columbia University Graduate School of Architecture, Planning and Preservation; New York: Rizzoli, 1993), 29.

²³ Ockman, *Architecture Culture*, 15.

²⁴ Giedion, Sert, and Léger, “Nine Points on Monumentality,” 29.

²⁵ Sigfried Giedion, “The Need for a New Monumentality,” in *New Architecture and City Planning*, ed. Paul Zucker (New York: Philosophical Library, 1944), 549.

image portrays a group of identical ball-like shapes grouped in the extreme foreground so that a few of the spheres appear truncated or cropped. Leading from this group is a succession of increasingly ephemeral and partial “copies.” These spherical “echoes” move back into an indefinite space marked by passages of streaking and blurring. It is as if Kepes’s motion study had captured and refracted the waning stages of the moon (or a model of them). In fact a hint as to the simple mechanism that facilitated the effects achieved in this photograph is suggested by the rigid yet faint lines that project at a diagonal from the balls in the foreground. It is likely that the photographer simply attached a ball to a wooden stick or metal rod that he then manipulated in front of the camera. If this is the case, then the “high speed” involved would be equivalent to that attained by the movements of the artist’s hand.

Some of the photographs Kepes collected from laboratories at MIT and elsewhere also captured matter in movement. For instance his book *The New Landscape in Art and Science* features a magnified image of descending drops of water (Plate 262) photographed by the MIT electrical engineer and stop-action photographer Harold Edgerton (fig. 70). Other images Kepes acquired and included in his book had significantly more static sources, such as Plate 131, which is identified as a microphotograph of a *Plastic Replica Surface after Smoothing with [an] Abrasive Surface* (fig. 71). Yet regardless of whether they pictured movement or stasis, the photographs Kepes collected and re-presented contain persistent hints of the world outside their limits. Therefore the water drops are shown taking an artful diagonal path through the image, entering it at the top right corner and exiting at the

lower left. Likewise the photograph of textured plastic entirely fills the image field implying an indefinite extension beyond it.

A number of writers seeking to understand the photographic medium have remarked upon the fact that every photograph is defined by what it excludes, by the pieces of the world it pictures at the expense of others.²⁶ The photographs Kepes amassed and displayed during his MIT years often emphatically proclaim their partialness both visually and, at times, by means of their captions. This is true of Plate 114 in *The New Landscape in Art and Science* (fig. 72). It pictures a delicate and intricate overall pattern, a pattern that could comprise a lace fragment, for instance, or a section of a veined leaf. As in the photographic detail of the plastic surface mentioned above, the pattern pictured in Plate 114 extends to the outermost edges of the image. While it submits to the boundaries of the image it is clearly not coextensive with them. Moreover, we can speak of this image in terms of the balance of black and white, or by reference to the way that the two widest lines or “veins” it pictures run roughly parallel to each other from the top to the bottom of the visual field (as it is oriented in the book). But what is most persistent about this photograph—at least at first glance—is its embodiment of an expansive, patterned generality.

I will return in this chapter to Plate 114 in order to identify what its pattern “is,” or at least to relay how Kepes labeled this image in his book. In the meantime, I

²⁶ “Photography is a thin slice of space as well as time.” Susan Sontag, *On Photography* (New York: Farrar, Straus and Giroux, 1973), 22. See also, John Berger and Jean Mohr, *Another Way of Telling* (New York: Vintage International, 1982), 88-92.

suggest that we imagine ourselves standing in the Hayden Gallery at MIT in the winter of 1951, looking at the photograph in question as visitors to the exhibition of scientific photographs that Kepes curated and entitled *The New Landscape*.²⁷ An installation view depicts the atmosphere Kepes created in the gallery (fig. 73). This was the exhibition that predated the book *The New Landscape in Art and Science* by five years. In the exhibition we would have seen the photograph (or one very similar to it, literally of the same matter) attached to a grid of thin metal poles that had been assembled to occupy the center of an airy space. This display system was a dematerialized version of Moholy-Nagy's for the *Film und Foto* exhibition (Stuttgart, 1929). In the earlier exhibition, each partial wall rested on thin vertical supports placed at either end of its expanse (fig. 30). The vertical supports in both exhibitions projected above the photographs, but in *The New Landscape* they were less visually dominant, a difference that can be largely attributed to the fact that Moholy-Nagy's partitions were painted black, starkly projecting their presence in the gallery. And the verticality of Kepes's grid supports was also utilitarian, allowing for some of the metal poles to be anchored to the ceiling for stability.

Yet unlike Moholy-Nagy, Kepes did not place mattes around the photographs he displayed. Instead, he mounted the photographs on board and placed them on the grid in an orderly fashion—upright and level to the floor—but not in a straight line as

²⁷ The dates of the exhibition were 19 February to 8 March 1951. *The New Landscape* exhibition therefore occurred two years before *Parallel of Life and Art* at the Institute of Contemporary Art, London. The ICA exhibition included scientific photographs but combined them with photos of art and ethnographic objects. The later show was also displayed much more chaotically, with mounted photographs propped on the floor or attached to the ceiling.

we see in the *Film und Foto* installation view. Each photograph in *The New Landscape* was printed at a relatively large scale—a rough average being 30 by 20 inches—so as to adequately project its presence. Nonetheless, the photographs were not so large that they overwhelmed the things around them—other photographs, the details of the architecture itself, a potted plant stationed on the floor. The patterned photograph we have been considering—the future Plate 114—appears in *The New Landscape* installation view in the middle distance, partly blocked by a photograph in the immediate foreground. The latter photograph depicts the spiny phenomenon that is the Lichtenberg Figure, a particularly impressive demonstration of electric sparks (fig. 74). In the exhibition, the photograph of the lace-like pattern was oriented on its “side” in comparison to how it later appeared in the book. This shift in orientation (from the vertical to the horizontal) served to augment the exhibition’s cohesiveness. This is apparent in the installation view, in which the photographs in the immediate vicinity of the image that would become Plate 114 display a similar patterning of lines oriented parallel to the floor.

Some members of the MIT community objected to such displays of artistic license. Indeed, Norbert Wiener complained to Kepes that one of the images in *The New Landscape* was oriented incorrectly.²⁸ And Wiener’s brief contribution to the book that followed the exhibition is at once conciliatory toward the “abstract artist

²⁸ In a 1989 interview Kepes relays that Wiener used to occasionally remind him of this “mistake” when the two encountered each other on the bus that they both took to work. Kepes maintained that Wiener did not understand what he was trying to achieve in the exhibition. Gyorgy Kepes, interview by Antonio Muntadas, 8 July 1989, videotape.

[who wishes to] compose freely about a theme suggested to him by nature” and patronizing toward the novice’s attempt at “a free composition...of the patterns observed.”²⁹ Such extrapolation, Wiener suggests, is perhaps better enacted by the creatively inclined mathematician who is equipped “to disentangle the properties of the particular arrangements which we see in nature.”³⁰ Kepes was always willing to admit his lack of knowledge about the specific mathematic or scientific properties of the patterns pictured in the photographs he collected, but he was emphatically unwilling to relinquish his re-contextualization of these patterns. In 1983 Kepes spoke about the difficulties he encountered on his missions to collect scientific images and, with equal determination, about what they meant to him as an artist:

I went like a bulldog who never gives up from one laboratory to the other. Sometimes I was almost thrown out by the scientists, because they thought I would distort the meaning of science by trying to use just the optical record, which was a very small fragment of the total message. Without knowing too much about what it meant, I was very interested in this beautiful hidden rhythm of the world, because that’s what I almost instinctively tried to do in my photographic work. When I did those photograms, I almost tried to imitate scientific data, or scientific images, without having a justification. I could never give up because I felt that it was more than just an optical game.³¹

²⁹ Norbert Wiener, “Pure Pattern in a Natural World,” in *The New Landscape in Art and Science*, 274.

³⁰ In fact this is what Wiener does in his essay. He takes the six images that were reproduced in *The New Landscape* exhibition brochure plus an image of a Lichtenberg Figure and briefly suggests how each can be understood both mathematically and metaphorically. One image evokes a comparison to “the mathematics of the crackle finish,” another resembles “a rose window.” Ibid.

³¹ Gyorgy Kepes, “Sermon for Tranquility: An Interview with Gyorgy Kepes,” interview by Robert C. Morgan, *Afterimage* 10, no. 6 (January 1983): 7.

None of the photographs in *The New Landscape* were accompanied by wall labels, those condensed sites of factual information that usually accompany museological displays. If Kepes had been intent upon labeling the photographs he arranged he could have figured out the least visually intrusive solution. But there were also precedents for exhibitions that utilized the unlabeled photograph. As we saw in Chapter One, Moholy-Nagy chose not to label the photographs in his curatorial contribution to the 1929 *Film und Foto* exhibition. Likewise, in 1940 the exhibition *Sixty Photographs: A Survey of Camera Esthetics*, which Ansel Adams organized for the Museum of Modern Art, included a section devoted to the “new vision” photographs, among them works by Moholy-Nagy. An installation view shows a line of these images floating parallel to a wall, a feat that was achieved by attaching them to filament strung from the ceiling (fig. 75). There are no labels in evidence in this section of the exhibition, although it is likely that they were grouped on a nearby wall. This was and is the standard practice, and in the installation photograph labels are in evidence under the photographs that were hung on walls.

The exhibition Kepes curated was crucially different from Ansel Adams’s on two counts. First, it was presented in a space newly constructed to house rotating art exhibitions in an educational institution known for its excellence in the physical sciences and engineering. Tellingly, the exhibition garnered little notice outside the local Boston/Cambridge press. The book, as we shall see, was a different matter. It attracted a relatively wide readership and received national press coverage. Second, *The New Landscape* exhibition was presented not as art but rather as the “optical record,” to use Kepes’s words, of the “beautiful hidden rhythm of the world.” That is,

these were records which unassumingly aspired to the most miraculous and memorable kinds of art. By eliminating wall labels Kepes may have succeeded in suggesting to the sympathetic viewer that his carefully arranged images were more like art and less like photographs of scientific specimens. In his contribution to *The New Landscape in Art and Science* Charles Morris writes of passing by an exhibition of paintings “by chance” on his way to see Kepes’s exhibition. “Significantly, there was no sense of shock or contrast as I left the artists’ paintings to stand before the scientists’ photographs.”³² While labels would have been in keeping with museological practice—potentially augmenting Morris’s sense of art-and-science interchangeability—their factual content would have revealed the ruse.

Most significantly, Kepes’s grid of collected photographs attempted to embody the peaceful union of the arts and sciences. As this chapter proceeds we will come to understand that the Hayden Gallery and the library that housed it were the most demonstrative signs of MIT’s attempt to partially reorient itself and its programs after the war. In the spirit of this reorientation Kepes arranged the grid’s contents in order to encourage the viewer to look at the installation as a whole as well as to marvel at its individual photographic components. In a formulation indebted to Lancelot Law Whyte we could say that each of the photographs was positioned in the exhibition (a positioning that included its collection, printing, and display) to represent a system among systems, a grand (and reassuring) pattern among patterns.

* * *

³² Charles Morris, “Man-Cosmos Symbols,” in *The New Landscape in Art and Science*, 98.

Before considering Kepes's response to the emergence of systems theory, this chapter takes an extended detour through MIT's institutional history, a detour that is useful because this history richly mirrors a number of contemporaneous concerns general to American culture at mid-century. Most prominent among them is the attempt to make checks and balances operative in the realms of science and engineering. This became particularly urgent after the United States decided to use the nuclear weapons it had built during World War II. At MIT Kepes and his colleagues were active in advocating an approach to education that was "balanced," "integrated," and "interdisciplinary" to dissipate mounting anxiety about the consequences of the perceived weakness of the humanities in relation to science and engineering. And in order to better understand the immediate milieu within which Kepes functioned—MIT's School of Architecture and Planning —this view into one school's institutional history will also take us into less dramatically inflected technical realms, including aspects of the history of drawing and its relation to architectural education in the United States.

Visual Fundamentals

In late August 1945, Kepes traveled to Cambridge, Massachusetts, to interview with William W. Wurster for a teaching position in MIT's School of Architecture and Planning. The interviewer was new to his administrative role, having become dean of the architecture program in 1944.³³ Intent on revitalizing the department he had come

³³ Wurster's years as a dean at MIT and later at Berkeley are addressed in Richard C. Peters and Caitlin King Lempres, "An Architectural Life," in *An Everyday*

to head, Wurster wondered if the author of *Language of Vision* would be suited to contribute to this effort. The meeting was a success and set in motion a quick chain of events. On 30 August 1945, Wurster wrote to invite Kepes to join the MIT faculty as an associate professor. He closed his letter by enthusiastically stating, “We are eager to make the Drawing (for want of a more complete word) a strong and integral part of the school.”³⁴ In October Kepes’s appointment was announced in the annual Report of the President, which designated him in charge of “Freehand Drawing.”³⁵ By December he was making arrangements for the move to Cambridge.³⁶ Kepes’s job offer had come just sixteen days after the end of World War II. Already universities throughout the United States, and particularly technical and scientific institutions such as MIT, had begun to swell with returning veterans. A photograph from 1946 shows a section of MIT’s Briggs Field occupied by housing for veterans and ground being prepared for more (fig. 76). Kepes and his family joined the flow of incoming faculty and students.

The news of Kepes’s appointment was included in the same section of the President’s Report that discussed the Finnish architect Alvar Aalto’s upcoming

Modernism: The Houses of William Wurster, ed. Marc Treib, exh. cat. (Berkeley: University of California Press, 1995), 90-92.

³⁴ William W. Wurster, Cambridge, Mass., to Gyorgy Kepes, Wellfleet, Mass., 30 August 1945. Kepes Papers, AAA, reel 5303, frame 0175.

³⁵ William Wurster, “School of Architecture and Planning,” *MIT Bulletin*, President’s Report issue, 1944-1945, vol. 81, no. 1 (October 1945): 139.

³⁶ On 10 December 1945 Wurster wrote to Kepes responding to a request for reimbursement of the latter’s impending moving costs. William W. Wurster to Gyorgy Kepes. Institute Archives, Office of the President, AC4, box 128, folder 12.

“residency” in the architecture program, the architectural historian Henry-Russell Hitchcock’s promised stint as a visiting lecturer, and the writer and city-planning advocate Lewis Mumford’s recent speaking engagement at the school.³⁷ Kepes’s recruitment was clearly part of a number of changes intended to modernize MIT’s architecture program. Indeed, the subject of drawing, which Kepes had been assigned to oversee, became a defining factor in the form this change would take.

When MIT’s founder, William Barton Rogers, drafted an ambitious “Plan for a Polytechnic School in Boston,” in 1846, he considered architectural design to be part of “a full course of instruction in all the principles of physical truth having direct relation to the art of constructing machinery, the application of motive power, manufactures, mechanical and chemical, the art of engraving with electrotpe and photography, mineral exploration and mining, chemical analysis, engineering, locomotion and agriculture.”³⁸ Rogers devised this multipart plan aware that, if it succeeded, the school would be the first in the United States to provide formal

³⁷ This was Alvar Aalto’s second extended visit to the department, the first having taken place in 1940-41. Caroline Shillaber credits Aalto with bringing “the first hint of the modern trend or functional architecture, as it was then called, to appear in classrooms.” Caroline Shillaber, *Massachusetts Institute of Technology, School of Architecture and Planning 1861-1961: A Hundred Year Chronicle* (Cambridge, Mass.: MIT, 1963), 81. Around the time of his stint as a lecturer, Henry-Russell Hitchcock was engaged by MIT to write a summary of its architectural and planning programs. Kepes designed this pamphlet. See Henry-Russell Hitchcock, *Education of Architects and City Planners* (Cambridge, Mass.: MIT, School of Architecture and Planning, c. 1947).

³⁸ William Barton Rogers, “A Plan for a Polytechnic School in Boston,” in *Life and Letters of William Barton Rogers Edited by His Wife*, ed. Emma Rogers, with the assistance of William T. Sedgwick, vol. 1 (Boston: Houghton, Mifflin and Company, 1896), 420.

instruction in architecture. In his organization of subjects, he initially grouped architecture under the rubric of “full instruction in drawing.”³⁹ But when the Department of Architecture opened in 1868, the order of this hierarchy had been transposed, with drawing demoted to the course list. This shift in priorities was likely made in the interest of furthering the school’s mission to promote “practical science.”⁴⁰ As the Boston architect William R. Ware expressed in a letter to Rogers, architecture was the art “eminently adapted to the wants of the community.”⁴¹

By the time of the architecture department’s debut, MIT had been in operation for three years, having opened its doors in 1865, soon after the end of the Civil War.⁴² The three-year delay was deemed necessary by Ware, who, when hired by Rogers to head the architecture department, convinced the institute’s founder of the need for a research trip to Europe in preparation for the establishment of a curriculum.⁴³ The mission of Ware’s voyage was twofold: to acquire a study collection (consisting of photographs, prints, drawings, books, and plaster casts) and to familiarize himself with architecture schools, particularly the Ecole des Beaux-Arts in Paris, which had

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Robert R. Ware to William Barton Rogers, 27 April 1865. Institute Archives, MIT.

⁴² MIT was chartered just before the Civil War broke out and while active hostilities hindered its first years, it actually owed its existence to the political division that resulted in war. William Barton Rogers had left the South in 1853, where he had taught at the University of Virginia since 1835, in large part because of his abolitionist beliefs. It was in Boston that he began to formalize and find support for his idea for a polytechnic institution.

⁴³ Robert R. Ware to William Barton Rogers, 27 April 1865. Institute Archives, MIT.

developed an educational method dedicated to promoting the universal significance of the classical tradition.⁴⁴ It was an adaptation of the Beaux-Arts method that Ware introduced at MIT.⁴⁵

A photograph of the first architecture studios at MIT shows walls densely hung with framed drawings of neoclassical buildings (fig. 77). This arrangement was in keeping with Ware's interpretation of the Beaux-Arts system, which designated drawing as the privileged term and primary skill in the genesis of architecture. Within this system, practicalities pertaining to the site and function of a proposed building were typically of secondary importance. This approach to design retained a particularly close etymological link to its Italian cognate *disegno*. As theorized by Leon Battista Alberti in the mid-sixteenth century, *disegno* could alternately mean

⁴⁴ David G. De Long, "William R. Ware and the Pursuit of Suitability: 1881-1903," in *The Making of an Architect—1881-1991*, ed. Richard Oliver (New York: Rizzoli, 1981), 15. Having apprenticed in the office of Richard Morris Hunt, the first American to graduate from the Ecole des Beaux-Arts, Ware already had some knowledge of the French fine arts education system when he was hired by MIT. In a paper on architectural education Ware writes, "Mr. Richard Hunt...opened in New York an atelier, upon the French system, and for four or five years had a small class of students who enthusiastically pursued, under his electric influence, the study of architectural drawing and composition." William R. Ware, "On the Condition of Architecture and Architectural Education in the United States," *Sessional Papers of the Royal Institute of British Architects* (London, 1867), 85-86, cited in Shillaber, *A Hundred Year Chronicle*, n. 4.

⁴⁵ Like the Ecole des Beaux-Arts, MIT's program included design competitions, but it also introduced coursework rather than relying on the less structured but no less rigorous "atelier" system that Ware encountered in New York, studying with Richard Morris Hunt, and later in Paris. Caroline Shillaber discusses the differences between MIT's program and that of the Ecole des Beaux-Arts in *A Hundred Year Chronicle*, 8. Ware's influence extended well beyond MIT. In 1881 he was recruited to found a similar program to MIT's at Columbia University, an opportunity that confirmed his importance to the spread of Beaux-Arts education in the United States.

“design,” “draughtmanship,” or “drawing,” but whatever its specific application, *disegno* was always associated with cognition, with the formation and expression of ideas.⁴⁶ This is what the art historian David Rosand has aptly characterized as Vasari’s understanding of “the intimate rapport between hand and mind” through which drawing comes to be valued “in its highest ambition as a marking of the intentions of the intellect.”⁴⁷ *Disegno* was therefore the preeminent term common to all of the visual arts.

Paired with classicism, the Renaissance conceptualization of drawing engendered the development of architecture as a creative discipline and as a codified area of study that eventually made its way to the United States. Writing on the history of drawing and paper, the architectural historian Mark Wigley describes this impact in terms of a dematerialization that nonetheless served to instill the discipline of architecture with greater conceptual “weight,” with artistic legitimacy:

⁴⁶ “Seeing that *Disegno*, the parent of our three arts, Architecture, Sculpture, and Painting, having its origin in the intellect, draws out from many single things a general judgment, it is like a form or idea of all the objects in nature, most marvelous in what it encompasses, for not only in the bodies of men and of animals but also in plants, in buildings, in sculpture and in painting, *disegno* is cognizant of the proportion of the whole to the parts and of the parts to each other and to the whole.... *Disegno* is not other than a visible expression and declaration of our inner conception and of that which others have imagined and given form to in their idea.” Giorgio Vasari, *Vasari on Technique*, Introduction to *Le vite de’ più eccellenti pittori, scultori e architettori* (2nd edition, 1568), trans. Louisa S. Maclellan (J. M. Dent & Company, 1907; reprint, New York: Dover, 1960), 205.

⁴⁷ David Rosand, *Drawing Acts: Studies in Graphic Expression and Representation* (Cambridge: Cambridge University Press, 2002), 28. The connection between hand and mind is equally allied with the history of the polytechnic. See Julius A. Stratton and Loretta H. Mannix, *Hand and Mind: The Birth of MIT* (Cambridge, Mass.: MIT Press, 2005).

It was this transformation of the status of drawing that made it possible to elevate architecture from the status of a guild practice to that of a liberal art, an art liberated from the constraints of the material world.... Architecture's status as a discipline turns on its connection to paper. It was able to be included in any system that privileged *disegno*. In fact, in Vasari's view, it belonged at the top of the system. Architectural drawing was the standard example of how a drawing could be indistinguishable from an idea. Nothing could establish the magic of drawing more than the transformation of the most immobile materiality, huge assemblages of stone, into the most delicate mobile form.⁴⁸

Indeed, it was the mobility of drawings that enabled Ware to import the Beaux-Arts style, as it was manifested on sheets of paper containing those concerted, idea-bearing marks made in the graphic media of pen and pencil.

An idealizing and classicizing approach to design remained in effect at MIT into the early 1940s, amounting to what one architectural historian has referred to as a "Beaux-Arts dynasty."⁴⁹ That this dynasty had begun to weaken is evident in an assessment made by MIT President Karl Compton in 1938, when he acknowledged that "design" would always be "the central theme of all good architecture," but "the

⁴⁸ Mark Wigley, "Paper, Scissors, Blur," *Drawing Papers* 3 (1999): 19-20. Published in conjunction with the exhibition *Another City for Another Life: Constant's New Babylon* at The Drawing Center, New York.

⁴⁹ Shillaber, *A Hundred Year Chronicle*, 56. MIT was not alone in wanting to modernize its architecture department. In fact, it arrived at this decision somewhat later than other prominent American departments, most notably two run by Joseph Hudnut, who was Dean of Architecture at Columbia University in 1933 and 1934 before becoming Dean of Architecture at Harvard University in 1935. His presence in Cambridge no doubt had an impact on MIT's gradual shift towards modernism. For an account of Hudnut's work at Columbia, see Rosemarie Haag Bletter, "Modernism Rears Its Head: The Twenties and the Thirties," in *The Making of an Architect: 1881-1981*, 103-18.

techniques of its application must continually adapt themselves to the evolution of the technical and social environment.”⁵⁰

A sharp decline in the enrollment of architecture students may have rendered Compton’s comments more urgent and, in general, fueled a growing awareness of the need for curriculum reform. In the academic year of 1929–1930, the architecture department could boast of 302 students, its highest enrollment to date; by 1943 there were only thirty students registered.⁵¹ The decline in numbers had begun during the Depression, when building opportunities were scarce.⁵² And enrollment fell off even more drastically with the onset of World War II, which drew upon prospective students as well as existing faculty. This departmental crisis led to an internal critique. In 1943 Wurster’s predecessor, Walter R. MacCornack, acknowledged that the schooling of architects at MIT suffered from “two major deficiencies.”⁵³ These, the outgoing dean surmised, were “the almost complete absence of training in the fundamentals of the practical economics of the building industry field and the failure to appreciate the basic problems involved in the economic, social, physical and

⁵⁰ Karl Compton, *MIT Bulletin*, President’s Report issue, 1937-1938, vol. 74, no. 1 (October 1938): 20.

⁵¹ William W. Wurster, “School of Architecture and Planning,” *MIT Bulletin*, President’s Report issue, 1945-1946, vol. 82, no. 1 (October 1946): 146.

⁵² This scarcity occurred concomitant with a growing American interest in modern architecture through such exhibitions at The Museum of Modern Art’s *Modern Architecture: International Exhibition* in 1932, which was organized by Henry-Russell Hitchcock and Philip Johnson, and the publication of their book *The International Style: Architecture since 1922* (New York: W. W. Norton & Co., 1932).

⁵³ W. R. MacCornack, “School of Architecture,” *MIT Bulletin*, President’s Report issue, 1942-1943, vol. 79, no. 1 (October 1943): 123.

political decay of our cities.”⁵⁴ What was needed, MacCornack declared, was an approach to “architecture from a broader point of view.”⁵⁵ Simply put, the department had become alienated from the focused sense of purpose that had initially enlivened its educational undertaking. This estrangement from its classicizing origins had significant repercussions that, as we shall see, Kepes grappled with even before he greeted his first students. With neoclassicism’s fall from grace, the respective fates of the conceptually allied terms “drawing” and “design” needed to be reimagined, and as quickly as possible. Enrollment may have dipped alarmingly during the war, but the department was bracing (and hiring) for an influx of students.⁵⁶

To understand what became of the terms “drawing” and “design” we need to return to Wurster’s letter to Kepes in which he seeks to reassure his correspondent that, “We are eager to make the Drawing (for want of a more complete word) a strong and integral part of the school.”⁵⁷ Wurster’s phrasing (particularly his suggestion that

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ James R. Killian, who was President of MIT from 1948 to 1959, describes the impact of the war’s end on the school’s enrollment. “Nearly 95 per cent [of veterans who had taken leave from MIT to serve in the war] decided to return to the Institute, and in the fall of 1946, when we had expected 700, a total of 1,100 actually registered. In the meantime, applications were pouring in from veterans at a rate that ran about 4,000 a month for nine months and that has tapered off at an astonishingly slow rate. As a result the Institute found itself with 5,660 registered students in the fall term of 1947, a total 80 per cent greater than the largest prewar enrollment.” James R. Killian in John E. Burchard, *Q.E.D.: M.I.T. in World War II* (Cambridge, Mass.: Technology Press, 1948), 315.

⁵⁷ William W. Wurster to Gyorgy Kepes, 30 August 1945. Kepes Papers, AAA, reel 5303, frame 0175.

the word “Drawing” lacks completeness) suggests he was aware of Kepes’s concern that “Freehand Drawing”—the subject he was soon to be announced as in charge of—would be too limited for an artist whose notion of “visual language” paid scant attention to the traditional boundaries between media. The fact that Vasari considered drawing to be the foundation of the arts was not reason enough for Kepes to maintain the tradition of freehand drawing, even though he had actively incorporated drawing into his photographic practice. In Kepes’s view, Ware’s study collection was likely long overdue for deep storage. By promising that drawing would be “integral,” Wurster was attempting to assuage the prospective new hire. What the dean meant by this term can be explained in the words of his predecessor: Kepes was being offered a role in a department that had come to desire “architecture from a broader point of view.”⁵⁸

In fact “integration” was Wurster’s most consistently voiced priority, particularly in regard to bringing architecture students in contact with scientists and engineers. In the same report that contained the announcement of Kepes’s appointment, Wurster writes:

Though there are many paths leading to architecture, the staff of this School feel that our choice of direction should be that which will embrace the strength of the Institute. This means a technical approach which will utilize the M.I.T. laboratories, courses on materials, and such subjects as sanitation, acoustics, illumination, and heating and ventilation.⁵⁹

⁵⁸ W. R. MacCornack, “School of Architecture,” *MIT Bulletin*, President’s Report issue, 1942-1943, vol. 79, no. 1 (October 1943): 123.

⁵⁹ William Wurster, “School of Architecture and Planning,” *MIT Bulletin*, President’s Report issue, 1944-1945, vol. 81, no. 1 (October 1945): 138.

In addition to encouraging architecture students' forays into the realms of sanitation and ventilation, Wurster emphasized what he perceived as the general value of interdisciplinary education, a value he couched in reassuring, nature-referencing metaphors. Within the School of Architecture and Planning, he felt that architecture students should interact with planning students. This, the dean optimistically promised, could have an effect on the respective disciplines comparable to a bucolic mediation, whereby "each group looks over the fence into the other's field and thereby gains greater understanding."⁶⁰ Moreover, to promote his belief in cultivating natural talents and "learning by doing," Wurster urged architecture students to take classes in other subjects, comparing these opportunities to "a stream which is flowing by...for them to dip into, each as his talents allows."⁶¹ And, finally, Wurster wanted the students he oversaw to "recognize the important role of the social sciences,"⁶² a position in keeping with Compton's advocacy, previously cited, of the need for architects to attend to the "social environment."⁶³

Wurster's call for an integrated architecture program may have been inspired by his awareness of the similarly discipline-crossing, art-and-life merging ideas of the

⁶⁰ Ibid.

⁶¹ William Wurster, lecture at the Architectural League, New York City, 6 November 1947, cited in Peters and Lempres, "An Architectural Life," in *An Everyday Modernism*, 91.

⁶² William W. Wurster, "School of Architecture and Planning," *MIT Bulletin*, President's Report issue, 1945-1946, vol. 82, no. 1 (October 1946): 138.

⁶³ Karl Taylor Compton, *MIT Bulletin*, President's Report issue, 1937-1938, vol. 74, no. 1 (October 1938): 20.

Bauhaus émigrés who had found prominent positions in American universities. After all, prior to being catapulted into an administrative position at MIT, Wurster, who had gained his architectural training at U.C. Berkeley, briefly studied urban planning at Harvard University, where Walter Gropius had headed the Graduate School of Design since 1937.⁶⁴ And he may also have been familiar with Moholy-Nagy's position that "art cannot be taught, only the ways to it."⁶⁵ Such encounters were no doubt significant and, perhaps more importantly, mutually rewarding. As Margret Kentgens-Craig has shown, the ideas of the Bauhaus émigrés (such as the melding of art and life, and the principle of learning by doing) were recognized in the United States because they resonated with ideas already circulating within several (admittedly specialized) American contexts, particularly the modernizing elements of the art, architecture, and academic establishments.⁶⁶ For instance, Wurster's advocacy of an approach to education that was both "natural" and "social" bears similarities to the widely admired educational theories of John Dewey. To define Dewey's approach to education, which extended to embrace aesthetic theory, the cultural historian Louis Menand has cited the American philosopher's belief in a "unity of knowledge" in

⁶⁴ Wurster's interest in studying urban planning was influenced by his marriage, in 1940, to Catherine Bauer, whose book, *Modern Housing*, emphasized the importance of Germany in the development of modern domestic architecture. See Catherine K. Bauer, *Modern Housing* (New York: Houghton Mifflin, 1934), 220.

⁶⁵ New Bauhaus course catalogue, 1937-38, p. 4. University of Illinois at Chicago, The University Library, Department of Special Collections, Institute of Design Collection, box 3, folder, 53.

⁶⁶ Margret Kentgens-Craig, *The Bauhaus and America* (Cambridge, Mass.: MIT Press, 1999), 212-15.

which “knowledge is inseparably united with doing.”⁶⁷ Dewey’s unity is realized through social interactions that “naturally” have accurate, even “scientific” results. As Menand explains,

At [Dewey’s] Laboratory School...children were involved in workshop-type projects in which learning was accomplished in a manner that simulated the way Dewey thought it was accomplished in real life: through group activity. Since the project was being carried out in the present, and since it was supposed to proceed in accordance with the natural instincts of the children (“I think...that the development of the children’s interests will follow very closely a truly scientific development of the subject,” Dewey stated in one of his planning letters), what was learned was precisely what was useful.⁶⁸

This reference to Dewey, which indicates the indirect but nonetheless significant impact of his far-reaching theories on the integrative program Wurster developed at MIT, is not intended to diminish the significance of the Bauhaus’s contribution to American education. On the contrary, it is meant to suggest that the efflorescence of “hands-on” education during and after World War II occurred through a remarkable process of intellectual symbiosis. By the mid-twentieth century, the Bauhaus was ensconced in the American educational system, particularly in the fields of art, architecture, and industrial and graphic design.⁶⁹ Yet it is a difficult and

⁶⁷ Louis Menand, *The Metaphysical Club* (New York: Farrar, Straus and Giroux, 2001), 322.

⁶⁸ Ibid., 323. Menand’s citation of Dewey is taken from John Dewey to Clara I. Mitchell, 29 November 1895. John Dewey Papers, Center for Dewey Studies and the department of Special Collections, Morris Library, University of Southern Illinois at Carbondale. Founded in 1896 as the University Elementary School of the University of Chicago, Dewey’s enterprise became the Laboratory School in 1902.

⁶⁹ Kentgens-Craig, *Bauhaus and America*, xi-xii, 35, 194-98, 213; and Susan Chevlowe, “Josef Albers and the Department of Design at Yale” (Ph.D. diss., CUNY, 2003), 109-18.

perhaps fruitless task to definitively attempt to separate out the impact of what could be called the “Bauhaus effect” in the United States from the context in which that effect flourished. Moreover the Bauhaus émigrés tended to encourage the association of their ideas with similar ideas “native” to the American context. In the preface to *The New Landscape in Art and Science*, for example, Kepes quoted Charles Sanders Peirce on the potential of interrelated intellectual pursuits. In this citation Peirce advises his readers to create “a cable [of ideas and arguments] whose fibers may be ever so slender, provided they are sufficiently numerous and intimately connected.”⁷⁰

It is not surprising, therefore, that Kepes and Wurster, who came from different educational backgrounds and experiences, found themselves to be sympathetic allies. As they likely realized upon meeting in the summer of 1945, the dean’s plan for the School of Architecture coincided with Kepes’s ambitions for his art and his emerging approach to teaching. What remained to be negotiated before the first course catalogue containing Kepes’s name went to press was a change in course title. Thus we arrive at the fate of the closely linked terms “drawing” and “design”: when this publication appeared, in June 1946, “Freehand Drawing” had been superceded by “Visual Fundamentals.”⁷¹

⁷⁰ Charles Sanders Peirce, “Some Consequences of Four Incapacities,” in *Collected Papers of Charles Sanders Peirce*, ed. C. Hartshorne and P. Weiss (Cambridge, Mass.: Harvard University Press, 1934), cited in Kepes, *The New Landscape*, p. 17.

⁷¹ *MIT Bulletin*, Catalogue issue, vol. 81, no. 4 (June 1946): 47, 99. This course title had begun to be used by Kepes toward the end of his tenure at the School of Design. School of Design, Evening session brochure, 1941-42. University of Illinois at Chicago, The University Library, Department of Special Collections, Institute of Design Collection, box 3, folder 71.

Kepes had been hired to replace the instructor Johan Selmer-Larsen, who oversaw MIT's last session of "Freehand Drawing" in the spring session of 1946. The spring had been concerned with "Basic figure construction and anatomy; rapid drawing direction from the human figure. [And] Eight weeks work at the Boston Museum of Fine Arts in studying and analyzing the design of architectural and sculptural forms."⁷² Selmer-Larsen's class, in other words, maintained more than a passing allegiance to the same theorization of drawing that had led William Ware to gather and display a study collection at MIT. Under Kepes's supervision, the fall class addressed,

The structure of two dimensional picture surfaces. The elements: point, line, shape, value, form, texture. Their organization: balance, dynamic equilibrium, tension, rhythm, proportion, etc. Experimentation with graphic tools in order to become acquainted with their potentialities.⁷³

Change was afoot, but what did it mean? Firstly, it is important to note that although neither the word "design" nor "drawing" appears in Kepes's course description, their history-laden, legitimacy-bestowing presences are everywhere implied. Both terms assume in this context ghostly supportive roles that encourage the manipulation of "graphic tools" in the service of the "elements" of spatial delineation. As enumerated by Kepes, the "elements" are exceedingly universal and abstract, potentially applicable to any conceptual undertaking. Kepes's elements also

⁷² "Freehand Drawing," *MIT Bulletin*, Catalogue issue, vol. 81, no. 3 (February 1946): 91.

⁷³ "Visual Fundamentals," *MIT Bulletin*, Catalogue issue, vol. 81, no. 4 (June 1946): 99.

suggest a practical involvement in the world at large, as if a person schooled in their usefulness would be equipped to measure and describe contemporary existence. They are, therefore, a modernizing retelling of the mythic, thought-manifesting, and ordering parts of art. In the fall of 1946, they were Kepes's first contribution to "architecture from a broader point of view."

Secondly, it is worth pondering the title Kepes chose for his course. Although "Visual Fundamentals" was inexorably tied to the Bauhaus's Preliminary Course and its American offshoot, the New Bauhaus's Basic Design Workshop, it was also devised by Kepes to stand just slightly apart from these precedents.⁷⁴ It achieves this trick through acts of substitution: the word "visual" instead of "design," and the word "fundamentals" instead of "basic."⁷⁵ The effect was to further augment the sense of universality, of wide-ranging applicability, while also maintaining, through the reference to vision, a tangential semantic connection to *Language of Vision*, a book steeped in Gestalt theory.

Despite having built an interpretation of Gestalt psychology into the core of his teaching repertoire, Kepes's explicit references to this approach to perceptual

⁷⁴ The earliest American offshoot was Josef Albers's design course at Black Mountain College, North Carolina, where he and Anni Albers arrived in November 1933.

⁷⁵ A similar universalizing approach was inherent to Josef Albers's use of the term "basic." In 1969 he stated that, "Basic has acquired another connotation besides 'introductory.' It means something fundamental instead of elementary, a broadening of ground by connecting neighboring fields of interest." Josef Albers, *Search Versus Re-Search: Three Lectures by Josef Albers at Trinity College, April 1965* (Hartford, Conn.: Trinity College Press, 1969), 25, cited in Susan Chevlowe, "Josef Albers and the Department of Design at Yale," 83.

analysis became less and less overt as his career at MIT progressed. For instance, in his second book, *The New Landscape in Art and Science*, he did not cite the Gestalt psychologists as he had in *Language of Vision*, preferring instead to acknowledge a wide-range of sources that included D'Arcy W. Thompson's *On Growth and Form* (1917), Lancelot Law Whyte's *The Unitary Principle in Physics and Biology* (1949), Beaumont Newhall's *The History of Photography* (the 1949 edition), Susanne K. Langer's *Philosophy in a New Key* (1942), and Kenneth Clark's *Landscape Painting* (1950).⁷⁶ The closest connection to Gestalt psychology that Kepes cites is James J. Gibson's *The Perception of the Visual World* (1950), an analysis of perception that built upon the work of the Gestalt psychologists but emphasized the role of time (rather than Gestalten) on the perception of space.⁷⁷ In essence, Kepes's intellectual references at MIT became even more prolific and eclectic than they had been in

⁷⁶ D'Arcy Thompson, *On Growth and Form*, 2 vols. (London: Cambridge University Press, 1917). Lancelot Law Whyte, *The Unitary Principle in Physics and Biology* (New York: Henry Holt, 1949). Beaumont Newhall, *The History of Photography* (New York: Museum of Modern Art, 1949). This is a revised edition of Beaumont's *Photography 1839-1937*, published by the Museum of Modern Art in 1937 in conjunction with the exhibition of the same name. Interestingly the first edition contained more of the non-art photographs that Kepes's utilized in his books. My thanks to Geoffrey Batchen for sharing this insight with me. Susanne Langer, *Philosophy in a New Key* (Cambridge, Mass.: Harvard University Press, 1942). Kenneth Clarke, *Landscape Painting* (New York: Charles Scribner's Sons, 1950).

⁷⁷ As Gibson evocatively described it, the goal of his research was to understand "a world which extends and which endures." James J. Gibson, *The Perception of the Visual World* (Boston: Houghton Mifflin Company, 1950), vii. Gibson later contributed to two of the books Kepes edited. James J. Gibson, "Constancy and Invariance in Perception," in *The Nature and Art of Motion*, Vision + Value Series, ed. Gyorgy Kepes (New York: George Braziller, 1965), 60-70; and idem, "A Theory of Pictorial Perception," *Sign, Image, Symbol*, Vision + Value Series, ed. Gyorgy Kepes (New York: George Braziller, 1966), 92-107.

Chicago at the same time that he allowed Gestalt psychology to become an underlying and largely unacknowledged source for the ways he spoke, wrote, and taught his “elements”: point, line, shape, value, form, texture.

The course title “Visual Fundamentals” does not appear in standard accounts of Kepes’s career. Instead, the typical biographical narrative states that Kepes was hired to establish a program in “Visual Design.” As we can now understand, this is a retrospective simplification of what actually occurred.⁷⁸ The content of this narrative, which derives from Kepes’s own statements, has nothing to say about how, in 1946, a newly hired professor convinced an ambitious dean that “Freehand Drawing,” once the backbone of the department, could finally be replaced with a set of “fundamentals” that were attractive not *despite* but *because* of their lack of medium specificity. “Visual Fundamentals” covertly encompassed both drawing and design—terms associated, respectively, with art and industry—but did not demand a choice (or simply collapsed the difference) between the two realms. Kepes’s choice of the title “Visual Fundamentals” gave him greater conceptual leeway at the same time that his curriculum maintained an aura of scientific exactitude.

The eventual transformation of “Visual Fundamentals” into “Visual Design” is, I would suggest, history told from the perspective of the victor rather than the

⁷⁸ See, for instance, the account of Kepes’s career provided in Judith Wechsler, “Gyorgy Kepes,” *Gyorgy Kepes: The MIT Years: 1945-1977* (Cambridge: MIT Press, 1978), 11; and Ken Johnson, “Gyorgy Kepes is dead at 95; artist and aesthetic theorist,” *New York Times*, 10 January 2002, sec. B, p. 9. Kepes’s own account of his life seems to be the source of this simplification. See Gyorgy Kepes, “Gyorgy Kepes: Searcher in the New Landscape,” interview by Douglas M. Davis, *Art in America* 56, no. 1 (January-February 1968): 38.

vanquished.⁷⁹ This is because the fields of graphic and industrial design had risen to prominence by the mid-twentieth century, so that “design” emerged in the United States as a newly authoritative term in its own right, more readily associated with modernism than with Renaissance conceptions of drawing. And, finally, to make a point that anticipates the forthcoming discussion of systems theory, it is also possible that Kepes came to believe that “fundamentals” was simply too static a word to represent what he wished to achieve in an institution increasingly infatuated with mapping information flows and feedback loops.

The “Nucleus-School”

Before turning to these systems it is necessary to make one final detour, the purpose of which is to understand the rather fraught state that the humanities at MIT had assumed in the postwar years. This predicament, which had concrete ramifications for Kepes’s career, can be traced to 1932. On 9 March of that year, the Institute adopted a new administrative plan, creating three “Schools,” based on its primary areas of instruction (Engineering, Science, and Architecture), and two “Divisions,” the Division of Humanities and the Division of Industrial Cooperation. Each department—from metallurgy, to marine engineering, to physics—was assigned to either the School of Engineering or the School of Science, a change intended to augment administrative oversight. An exception to the multi-department schools was the School of Architecture, which consisted of the Department of Architecture, to

⁷⁹ In 1955, the course title “Visual Fundamentals” was changed to “Advanced Visual Design.” *MIT Bulletin*, Course Schedules issue, vol. 90, no. 5 (June 1954): 178.

which was added, also in 1932, an allied (but until 1944 non-degree-granting) curriculum in city planning.⁸⁰ In the previous section we encountered in another context the mastermind behind this reorganization, the physicist Karl Compton, who became president of MIT in 1930. In the annual report for the academic session of 1931–32, Compton announced the reorganization and defined the Divisions, hinting at the reasons behind their creation:

The three Schools are comprised of those departments of instruction in which degrees are awarded, while in the two Divisions are grouped those activities which are in the nature of “services.” The Division of Humanities includes those departments of the Institute whose special task is the enrichment of the background of our students and the Division of Industrial Cooperation includes the various agencies by which the Institute cooperates with business and industry in the solution of their problems.⁸¹

The Divisions, therefore, were intended to complement the Institute’s primary mission—one by creating professionals and scientists with “backgrounds” in the humanities, the other by encouraging connections with business and industry. Yet the declared secondary status of the new entities—in particular their designation as “services”—belied their actual significance. Indeed, by founding the Divisions, MIT literally institutionalized its core concerns from the Depression onward: firstly, how

⁸⁰ A report published in 1949 described the School of Architecture as “a curious anomaly, almost as though some accident of fate had led it to prosper simultaneously with a technological institution to which it was tied through administration but not in spirit.” *Report of the Committee on Educational Survey to the Faculty of the Massachusetts Institute of Technology* (Cambridge, Mass.: Technology Press, 1949), 38. Wurster was responsible for establishing a degree in city planning and for changing the name of the School of Architecture to the School of Architecture and Planning.

⁸¹ Karl Taylor Compton, *MIT Bulletin*, President’s Report issue, vol. 68, no. 3 (October 1932): 12.

to encourage students to consider the “human and social consequences”⁸² of their fields, and, secondly, how to ensure the Institute’s market relevance.

Although the areas represented by the Divisions were created by the MIT administration to complement each other in their “service” to the Schools, more often than not they were a mismatched pair, each vying separately for the university’s support and validation. And each functioned under inherently opposed missions. Yet despite their defining opposition, the Divisions were nonetheless equally but differently affected by events that took place far beyond the campus on which they competed. With the United States’ preparation for and entry into World War II, MIT’s focus on industry, so consciously cultivated in the creation of the Division of Industrial Cooperation, was quickly redefined by the augmentation of government-sponsored research. Nonetheless, corporate research support did not fall away. On the contrary, it joined forces with government sponsorship so that “cooperation” morphed from a two-way to a three-way endeavor—the university, the government, the corporation. This arrangement continued at a largely unabated (and steadily growing) level long after the cessation of hostilities.⁸³

⁸² *Report of the Committee on Educational Survey*, 42.

⁸³ In the academic year 1944-45, MIT declared the receipt of \$44,354,000 in sponsored research monies. In 1946-47 this support dropped to \$9,825,000, but by 1956-57 it had risen to \$49,118,000, surpassing wartime levels. By 1969-70 sponsored research came to \$171,294,000, or 51 percent of the university’s total budget. See table 1 in Dorothy Nelkin, *The University and Military Research: Moral Politics at M.I.T.*, The Science, Technology, and Society Series (Ithaca: Cornell University Press, 1972), 18.

At MIT the wartime shift in funding was most prominently symbolized by the establishment, in 1940, of the Radiation Laboratory, or “Rad Lab,” a name that ingeniously implied a similarity to the mission of Berkeley’s Radiation Laboratory, which was nuclear physics, and thereby concealed the Rad Lab’s actual purpose—the improvement of radar.⁸⁴ Initiated with \$1.7 million in 1941, by 1945 the Rad Lab functioned with a budget of \$51.4 million. The science historian Peter Galison provides these figures and a detailed account of the Rad Lab’s development and operation in his book *Image and Logic: A Material Culture of Microphysics*, which also analyzes five other World War II-era research centers.⁸⁵ One purpose of this research is to show how the war brought about, as Galison states, a “profound reconfiguration of relations between the academic, governmental, and corporate worlds.”⁸⁶ Each research site had to “confront a sudden expansion, search for a new relationship between theorists and experimenters, forge a novel alliance between

⁸⁴ Ernest O. Lawrence, director of the Radiation Laboratory at Berkeley, suggested this ruse. Francis E. Wylie, *M.I.T. in Perspective: A Pictorial History of the Massachusetts Institute of Technology* (Boston: Little, Brown and Company, 1975), 91.

⁸⁵ Peter Galison, *Image and Logic: A Material Culture of Microphysics* (Chicago: University of Chicago Press, 1997), 243-56, 288-93. The architect of MIT’s 1932 reorganization, Karl Compton, was appointed by President Roosevelt in 1940 to the National Defense Research Committee (NDRC) and was chief of its “Division D,” which handled the area of “detection,” particularly radar. The other high-level American scientists who initiated the Rad Lab were Vannevar Bush and Ernest Lawrence.

⁸⁶ *Ibid.*, 240. This purpose is related to Galison’s central thesis: that the experimental devices devised by physicists and engineers during the war (from cathode-ray tubes to cloud chambers) literally manifested the practical necessity of interdisciplinary collaboration.

experiments and engineers, and face the difficulties that accompanied the move into the epoch of large-scale, centralized and cooperative research.”⁸⁷ The scientists, engineers, and mathematicians who worked at the Rad Lab and elsewhere emerged at war’s end to acknowledge the new dependencies that had arisen between their disciplines. They also became cognizant of their exponentially increased power, both within the university and outside of it, power garnered through their achievements and the unparalleled financial support they had generated for research. After the war the Rad Lab was reconstituted as the Research Laboratory of Electronics with a mandate to continue work on microwave applications.⁸⁸

Yet this newly earned agency was not without its problems: The acknowledged benefits of interdependent research only partially mitigated the perceived pitfalls of specialization. In fact, specialization had actually engendered interdependence. As the example of wartime research so starkly demonstrated, most scientists could no longer “progress,” or even effectively function, without interdisciplinary alliances. Indeed, the ascending value of collaborative scientific work grew in tandem with mounting concern that there were possibly as many or

⁸⁷ Ibid., 241-42.

⁸⁸ Ibid., 291. Galison writes that, “Though over the years it has received but an infinitesimal fraction of the attention heaped on the atomic bomb project at Los Alamos, MIT’s Radiation Laboratory arguably had a greater effect on the postwar development of physics” (p. 243). See also Steve J. Heims, *John von Neumann and Norbert Wiener: From Mathematics to the Technologies of Life and Death* (Cambridge, Mass.: MIT Press, 1980), 179.

more opportunities lost as gained in the surfeit of emerging discoveries.⁸⁹ Existing collaborative ties constituted little more than a partial solution to counter “the familiar lament that science had grown ever more specialized.”⁹⁰

In July 1945, Vannevar Bush, the former MIT engineer who, as Director of the federal Office of Scientific Research and Development, had overseen the wartime efforts of 6,000 American scientists and engineers, chose to bring his concerns regarding specialization to the attention of non-scientists by publishing an article in *The Atlantic*. What he describes is a puzzling conundrum:

There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less remember, as they appear. Yet specialization becomes increasingly necessary for progress.⁹¹

Bush contends that the best way to combat this dilemma is to focus on advancing those technologies that will enhance the scientist’s ability to store and, more importantly, to retrieve information. Effective archiving, he promises, would augment

⁸⁹ As proof of lost opportunities, scientists were fond of citing the example of Gregor Mendel, whose work on heredity, which was published in Brunn, Moravia (now Brno, in the Czech Republic) in 1866, would gain him posthumous acknowledgement as the “father of genetics.” The importance of Mendel’s work was not recognized until 1900, a delay that Vannevar Bush alarmingly described in 1945 as a “catastrophe” that is “undoubtedly being repeated all about us, as truly significant attainments become lost in the mass of the inconsequential.” Vannevar Bush, “As We May Think,” *The Atlantic* (July 1945): 101-02.

⁹⁰ Peter Galison, “The Americanization of Unity,” *Dædalus*, “Science in Culture” issue, 127, no. 1 (Winter 1998): 46.

⁹¹ Bush, “As We May Think,” 101. In 1945, the same year that *The Atlantic* article appeared, Bush also wrote an influential government report. See, United States Office of Scientific Research and Development, *Science, the Endless Frontier: A Report to the President* (Washington, D.C.: U.S. Government Printing Office, 1945).

the productiveness of inter-personal collaborations. The technologies Bush cites as most useful in this regard are photography and computing.⁹² As we have already seen, the documentary capacity of the photograph figured prominently in Kepes's years at MIT. The photographs Kepes collected were the same scientific, laboratory-produced images that Bush envisioned as potential storage sites. How the second term that Bush privileged—computing—figured in Kepes's work will also warrant our consideration.

Bush's article for *The Atlantic* sought a national readership. Appearing the month before the bombing of Hiroshima and Nagasaki, its tone suggested that victory was a foregone conclusion, old news for the writer and his wartime colleagues who had been charged with making "strange destructive gadgets."⁹³ In advance of an official end of hostilities, Bush sought to stake a claim for the future of information sharing. At the local level, the most prominent sign of cross-disciplinary fervor in Cambridge, at least within the domain of the sciences, was manifested in the founding, in 1947, of the Institute for the Unity of Science, which functioned under the aegis of the American Academy of Arts and Science in Boston.⁹⁴ Comparable to

⁹² For instance, Bush imagines mounting miniature cameras on researchers' foreheads so that they would be free to move about their laboratories, snapping photos that could then be added to a data retrieval system. And, in a related vein, he proposes a "memex," a prescient account of the desktop computer that he defined as "a device in which an individual stores all his books, records, and communications, mechanized so that it may be consulted with exceeding speed and flexibility." Bush, "As We May Think," 102, 106.

⁹³ *Ibid.*, 101.

⁹⁴ My discussion of the Institute for the Unity of Science relies principally on three sources. See Galison, "The Americanization of Unity," *Science in Culture*, 45-71;

Rudolf Carnap's efforts at the University of Chicago to publish an *Encyclopedia of Unified Science*, the purpose of the Institute was to publish papers aimed at the "synthesis of knowledge."⁹⁵ The Institute also held meetings, which Kepes was known to attend.⁹⁶ At these events he likely came in contact with an impressive range of scholars including Norbert Wiener, the linguist Roman Jakobson, and the behavioral psychologist B. F. Skinner. In essence both the meetings and the Institute were further manifestations, and perhaps the final flowerings, of the Unity of Science movement that Kepes had witnessed in Chicago.

The founder and director of the Institute for the Unity of Science was the physicist Philipp Frank. When Otto Neurath died late in the war, Frank became the group's de facto leader. This was a fortuitous development for the survival of the movement that had originated as the Vienna Circle and later as Logical Positivism. Unlike Neurath, Frank was willing to contemplate the expansion of the Unity of Science into new areas. This required loosening the rigid requirement that all of its unified terms derive from physics grounded in "logico-empiricism." Something very

Gerald Holton, "From the Vienna Circle to Harvard Square: The Americanization of a European World Conception," in *Scientific Philosophy: Origins and Developments*, ed. F. Stadler (Dordrecht, The Netherlands: Kluwer Academic Publishers, 1993), 47-73; and idem, "Ernst Mach and the Fortunes of Positivism in America," *Isis* 83, no. 1 (March 1992): 55-56.

⁹⁵ Philipp Frank, introductory remarks to the issue on "Contributions to the Analysis and Synthesis of Knowledge," *Proceedings of the American Academy of Arts and Science* 80 (1950): 6.

⁹⁶ Holton, "From the Vienna Circle to Harvard Square," 63.

different was brewing in the postwar climate, which Galison has described as offering “a power beyond dreams”:

The Americanization of unity just after World War II was not sited around an isotypic picture language, a physical language, an *Aufbau*, or an orchestration. It was planted around the new sciences of Los Alamos, the MIT Radiation Laboratory, the stored-program computer of the Institute of Advanced Study in Princeton; this was to be a science unified in pieces, grounded in common widely applicable concepts.⁹⁷

In the late 1930s Kepes had characteristically absorbed the Unity of Science movement into his very accommodating conception of “wholeness.” By the early 1950s the movement’s new converts and some of its original members began to contemplate ideas that would have been inconceivable to Rudolf Carnap. In effect the movement moved closer to Kepes’s holistic worldview. For instance, in an attempt made in the early 1950s to create a “basic operational dictionary” for the Unity of Science Institute, Philipp Frank compiled a list that included, as Galison notes, “such hard-to-imagine-operationalized concepts as love (under psychology) or God, belief (faith), soul, and damnation (under religion).”⁹⁸ This loosening of the movement’s empirical standards ultimately led to its dissolution, but not before it came to be critiqued for its tautological use of language, most notably its “if/then” statements. Signaling the conceptual shift, the philosopher Gustav Bergmann published a book in 1954 with the title *The Metaphysics of Logical Positivism*.⁹⁹

⁹⁷ Galison, “The Americanization of Unity,” 67.

⁹⁸ Ibid., 51-52.

⁹⁹ Gustav Bergmann, *The Metaphysics of Logical Positivism* (New York: Longmans, Green & Co., 1954).

* * *

In comparison with the amplified support and cross-disciplinary growth that the sciences experienced during and just after World War II, the humanities remained decidedly peripheral during the same stretch of time, deemed useful solely in their capacity to provide uplift and propaganda. This was particularly true at MIT where the humanities functioned at the “service” level of the Divisions. And unlike Kepes and his colleagues, who, as we will recall from Chapter Two, invented and proposed wartime camouflaging for the City of Chicago, no artists at MIT thought to apply their knowledge of illusory visual effects in the war effort. This was the case even though the visual arts at MIT were, and had always been, part of the architecture department, an arrangement that conceivably could have promoted such a utilitarian venture.

However by 1949 some members of MIT’s academic community had become concerned about the lack of balance between the sciences and the humanities in the school’s programs. Specifically, they began to wonder if the humanities, including the visual arts, could be utilized to counterbalance the “inflationary atmosphere”¹⁰⁰ that had developed within the realms of science and technology. Although students and faculty members pondered this idea at other universities, MIT seemed to experience a particularly acute and longstanding struggle to determine its potential, perhaps because of the degree to which the Institute had changed its priorities during the war.

¹⁰⁰ *Report of the Committee on Educational Survey*, 4.

Nonetheless, in the immediate postwar years the scientific establishment was, with some exceptions, reluctant to voice concerns about government involvement in university laboratories.¹⁰¹ The increasing belief in the need for the humanities at mid-century can be understood as a move to harness their perceived beneficence and, in the process, register an indirect, gently-couched critique of the status quo in the name of “long-range educational goals” and “non-technical values.”¹⁰² These goals and values, in turn, congenially coincided with the burgeoning inter-scientific unification efforts. This was partly the case because there was a general spirit of integration—Wurster and Kepes were far from alone in their enthusiasm for this term and its expansive effects. More specifically, Frank and his colleagues had become interested in disciplinary hybrids—between chemistry and physics, biology and physics, psychology and biology. Frank in particular saw the need for “socio-psychological” analyses.

¹⁰¹ In 1954 Vannevar Bush, the former head of the National Defense Research Council (NDRC), went so far as to state, “There should be complete removal of the [scientific] system from politics.” Vannevar Bush, cited in Nelkin, *University and Military Research*, 7. Norbert Wiener’s letter of protest in *The Atlantic* is a notable exception to Bush’s position, although Wiener was never in a comparable position of power. See Norbert Wiener, “A Scientist Rebels,” *The Atlantic* 179 (January 1947): 46.

¹⁰² The former quote comes from the *Report of the Committee on Educational Survey*, 4, the latter comes from *Art Education for Scientist and Engineer: The Role of the Visual Arts in Modern Education, Part I of the Report of the Committee for the Study of the Visual Arts, Massachusetts Institute of Technology, 1952-54* (Cambridge, Mass.: Massachusetts Institute of Technology, 1957), 6.

Between 1949 and 1970 MIT published four substantive reports that dealt in various ways with the school's science and humanities "crisis."¹⁰³ To a significant degree, Kepes's career at MIT consisted of engaging this idea and, repeatedly, giving it a *visual* existence through a series of exhibitions and books. His postwar books gained inspiration from the newly inclusive Unity of Science movement, in which all subjects could find a place within an increasingly interconnected organizational structure. Yet Kepes's books also contributed to the efforts to achieve a "synthesis of the arts" that would heal the perceived rift between art and science, and between art and industry. Among the prominent advocates of this idea was Kepes's friend Sigfried Giedion, whose books *Space, Time and Architecture: The Growth of a New Tradition* (1941) and in *Mechanization Takes Command: A Contribution to Anonymous History* (1948) detailed the "crisis" of mechanization and called for its resolution through the revelation of "a true, if hidden, unity, a secret synthesis."¹⁰⁴

¹⁰³ These were the *Report of the Committee on Educational Survey* of 1949 and *Art Education for Scientist and Engineer* of 1952-53 (published 1957), already cited; *Liberal Education at M.I.T.*, MIT, School of Humanities and Social Studies, 1952; and *Creative Renewal in a Time of Crisis*, Report of the Commission on MIT Education, Massachusetts Institute of Technology, November 1970. Kepes participated in one of the committee meetings that resulted in the report published in 1957. Studies conducted after 1970 suggest that the "cultural divide" between the humanities and the sciences is a perennial question at MIT that often seems to be returned to with a degree of amnesia regarding the studies that have come before. See, for instance, Ann F. Friedlaender, "Technology and the Liberal Arts," in *MIT: Shaping the Future*, ed. Kenneth R. Manning (Cambridge, Mass.: MIT Press, 1991), 22-31.

¹⁰⁴ Sigfried Giedion, *Space, Time and Architecture: The Growth of a New Tradition*, Charles Eliot Norton Lectures, Harvard University, 1938-1939 (Cambridge, Mass.: Harvard University Press, 1941). Idem, *Mechanization Takes Command: A Contribution to Anonymous History* (New York: Oxford University Press, 1948). The quotation comes from p. vi of Giedion's foreword to *Space, Time and Architecture*.

Indeed, Giedion identified the polytechnic as having contributed to the crisis, institutionalizing a rift that had begun, he believed, with the demise of the craftsmen's guilds. In keeping with this idea, Kepes may likely have viewed his position at MIT, where he cultivated a role as the arbiter between the arts and sciences, as a step towards the polytechnic's recreation.

The MIT reports on the humanities subtly echo ideas found throughout Kepes's writings, particularly when the reports address such subjects as vision and the complementarity of the sciences and the arts. Therefore, in a report from 1957, two of the ten sections are devoted specifically to vision and the last section, "An Ideal Visual Arts Program," declares,

From a consideration of the foregoing it is possible to define a visual arts program in ideal terms: it will include means to establish the nature and differing qualities of vision; it will extend its discipline to amplify and enrich other forms of communication. It will develop aesthetic sensitivity and encourage discrimination generally. It will draw attention to the human control of form and space and color *no matter where it occurs, in the land or in the machine, in the monument or within the home.*¹⁰⁵

As these reports repeatedly demonstrate, Kepes's opportunities at MIT, including the founding of the Center for Advanced Visual Studies, were born out of the same

Perhaps the most avid advocate of the "synthesis of the arts" was Le Corbusier. See Ann Koll, "The Synthesis of the Arts in the Context of Post-World War II: A Study of Le Corbusier's Ideas and His Porte Maillot Pavilion" (Ph.D. diss., City University of New York, 1999).

¹⁰⁵ *Art Education for Scientist and Engineer*, 13 (emphasis in original). Of course the more general (and equally unacknowledged) reference is the Bauhaus itself and specifically Moholy-Nagy's pronouncements on vision. Therefore in the same report John Ely Burchard worries that, "As I have said many times, a great many young men and women graduate from our institutions of higher learning visually 'illiterate.'" John Ely Burchard, introduction to *Art Education for Scientist and Engineer*, 2.

reoccurring and generally-felt concern—at times a nagging unease that boiled, in the late 1960s and early 1970s, into campus demonstrations—about what an institute of technology should teach beyond its acknowledged core subjects, what type of research it should undertake, and how it should represent itself to the world at large.

It is likely that the founder of MIT, William Barton Rogers, would have been at a loss to understand this controversy. In his plan for the school there is no hint of conflict between science and engineering, or between these disciplines and the arts. This is because as a late practitioner of “natural philosophy” he understood all subjects to be interrelated. Although Rogers is primarily known for his work in geography, he also experimented in photography, lectured on chemistry, was an outspoken abolitionist, and championed the evolutionary theory of his peer Charles Darwin. In keeping with his understanding of education as a universalizing endeavor, Rogers characterized MIT as a “nucleus-school,” a description of completeness that anticipated the type of institution being wishfully hypothesized by some MIT administrators and faculty members in the postwar years.¹⁰⁶ Rogers uses this term in a letter to the philanthropist and education reformer John Amory Lowell:

In a word, I doubt not that such a nucleus-school would, with the growth of this active and knowledge-seeking community, finally expand into a great institution comprehending the whole field of physical science and the arts with the auxiliary branches of the mathematics and modern languages, and

¹⁰⁶ Although Rogers succeeded in founding MIT, he did not have many years to run it. After his death in 1882, MIT primarily became known as a school of engineering. When Karl Compton became president of the institute in 1930, he reinvigorated the physics department, a move that ultimately positioned the school to play a leading role in wartime research during World War II.

would soon overtop the universities of the land in...the extent of its teachings.¹⁰⁷

Rogers's belief in the interrelatedness of education was encapsulated in his inclusion of the word "technology" in the name of his school. The historian Thomas P. Hughes has written of the difficulty of defining this word, a difficulty due more to the breadth of its conception of creativity than to its multiplicity of uses. As an inheritor of Bauhaus theory, Kepes primarily thought of technology in terms of what he deemed to be its new materializations. In fact he sometimes identified the technologies he used as being new when they actually were not. Therefore Kepes described the microphotograph as having revealed "a newly emerged aspect of nature, hitherto invisible but now revealed by science and technology."¹⁰⁸ In fact, microphotography was as old as photography itself and had been practiced by Humphrey Davy and William Henry Fox Talbot, among other early photographers. One of these individuals was none other than the founder of MIT, William Barton Rogers, who wrote to his brother in the spring of 1860 to describe his experiments:

I have been making some further experiments on photographing the electrical light, and on binocular vision, the details of which I will send you in my next [letter], with the request, perhaps, that you would present them at the Oxford meeting. I have obtained a very beautiful photographic impression of the

¹⁰⁷ William Barton Rogers, *Life and Letters*, 421. In a very different context that was, nonetheless, not without parallels to Rogers's pedagogical endeavor, Gropius spoke to Bauhaus students about "a nucleus of belief" that would lead to "a great *Gesamtkunstwerk*." Walter Gropius, "Address to the Students of the Staatliche Bauhaus, Held on the Occasion of the Yearly Exhibition of Student Work in July 1919," in *Bauhaus*, ed. Hans M. Wingler, trans. Wolfgang Jabs (1969; reprint, Cambridge, Mass.: MIT Press, 1976), 36.

¹⁰⁸ Kepes, *The New Landscape in Art and Science*, 17.

stratified discharge, thus showing the absence of actinic as well as luminous rays in the dark interspaces.¹⁰⁹

Hughes defines technology and its historical significance widely and avoids linkages to specific technological manifestations. His definition can therefore help us to better understand the school Rogers conceived:

Defining technology in its complexity is as difficult as grasping the essence of politics.... Usually, technology and politics are defined by countless examples taken from the present and past. In the case of technology, it is usually presented in a context of usage, such as communications, transportation, energy, or production....

The word “technology” came into common use during the twentieth century, especially after World War II. Before then, the “practical arts,” “applied science,” and “engineering” were commonly used to designate what today is usually called technology. In 1831 Jacob Bigelow, a Harvard professor, used the word in the title of his book *Elements of Technology...on the Application of the Sciences and the Useful Arts*. He remarked that the word could be found in some older dictionaries and was beginning to be used by practical men. He used “technology” and the “practical arts” almost interchangeably, but distinguished them by associating technology with the application of science to the practical, or useful, arts. For him, technology involved not only artifacts, but also the processes that bring them into being.¹¹⁰

MIT’s attempt to return to the idealism of Rogers’s “nucleus-school” and its “practical arts” turned out to be a complicated task for a burgeoning Atomic Age. In 1948, the Division of Industrial Cooperation became the Division of Sponsored Research—a more generic name indicative of the fact that research funds no longer came solely or even principally from industrial sources. In 1950, in an attempt to

¹⁰⁹ William Barton Rogers to Henry Rogers, 17 May 1860, in Rogers, *Life and Letters*, 33.

¹¹⁰ Thomas P. Hughes, *Human-Built World*, science.culture series (Chicago: University of Chicago, 2004), 2-3.

institute a “broader mission,” the Division of Humanities emerged as a full-fledged School bestowed with a “status equivalent to that of the other fields.”¹¹¹ These changes were not symbolic; rather they represented the maturation of a new reality. As one MIT administrator put it, “The world of 1950 is not the world of 1940, nor can this institution ever again be the same sort of place it was before the war.”¹¹² Not only had governmental sources of research support joined forces with corporate sponsorship, but also an equally profound shift had occurred in the nature of technological research. Hughes has described the post-World War II era in terms of a growing awareness of “large-scale complexity” and “technological systems” that distinguish it from the machine era. “Because of this complexity,” Hughes writes, “the control, or management of technological systems becomes a major problem for engineers and other expert professionals.”¹¹³ It was not that systems were new, but the perception of them had changed. In the words of Susanne Langer, they had become, like most discoveries, “suddenly-seen things that were always there.”¹¹⁴

* * *

In fact theories developed to describe systems date from the 1930s and emerged, not out of industry, but out of organismic biology, or biological research

¹¹¹ *Report of the Committee on Educational Survey*, 43.

¹¹² *Ibid.*, 4.

¹¹³ Hughes, *Human-Built World*, 77.

¹¹⁴ Langer, *Philosophy in a New Key*, 8.

concerned with organisms treated as wholes.¹¹⁵ Systems theory built upon the work of the nineteenth-century French physiologist Claude Bernard (1813–1878) who is responsible for developing a description of the organism in terms of its “internal environment.” Bernard described the internal environment as “the condition that life should be free and independent.... So far from the higher animal being indifferent to the external world, it is on the contrary in a precise and informed relation with it, in such a way that its equilibrium results from a continuous and delicate compensation, established as by the most sensitive of balances.”¹¹⁶ It is not hard to imagine how Bernard’s conception of, on the one hand, freedom and independence and, on the other hand, equilibrium and “the most sensitive of balances” might have appealed to individuals in search of such states in the social body. One of Kepes’s pre-World War II references, Walter Cannon, whose concept of homeostasis has already been discussed, is acknowledged as an early figure in the twentieth-century development of Bernard’s research. Indeed Cannon’s book *The Wisdom of the Body* includes an epilogue devoted to “Relations of Biological and Social Homeostasis.”¹¹⁷

¹¹⁵ “Organismic biology...emphasizes consideration of the organism as a whole or system, and sees the main objective of biological sciences in the discovery of the principles of organization at its various levels.” Ludwig von Bertalanffy, *General System Theory* (1947), rev. ed. (New York: George Braziller, 1968), 12.

¹¹⁶ Claude Bernard, quoted in Fredric L. Holmes, “Origins of the Concept of the *Milieu Intérieur*,” in *Claude Bernard and Experimental Medicine*, ed. F. Grande and M. Visscher (Cambridge, Mass.: Schenkman Publishing Co., 1967), 188.

¹¹⁷ Cannon, *The Wisdom of the Body*, 305-24.

But it is the Austrian biologist Ludwig von Bertalanffy who is credited with establishing the field of General System Theory in 1947.¹¹⁸ Like the Gestaltists, Bertalanffy defined his project in opposition to “mechanistic” thinking.¹¹⁹ He memorably expresses this view in an introduction that was added to his book *General System Theory* (1947) when it was reissued in 1968. “The concept of ‘system’ constitutes a new ‘paradigm,’ in Thomas Kuhn’s phrase, or...a new philosophy of nature, contrasting the blind laws of nature of the mechanistic world view and the world process as a Shakespearean tale told by an idiot, with an organismic outlook of the ‘world as a great organization.’”¹²⁰ As Donna Haraway has shown, Bertalanffy understood organicism to encompass “three specific jobs in biology: appreciation of wholeness (regulation), organization (hierarchy and the laws proper to each level),

¹¹⁸ Bertalanffy stressed (and his record of publishing supports) that the official naming of General System Theory, which he dates to 1947, was the formalization of his earlier work. In fact, in his influential book *General System Theory* he contends that his earliest use of the term dates to a talk he gave in a seminar overseen by Kepes’s colleague Charles Morris. “The idea [of General System Theory] goes back some considerable time: I presented it first in 1937 in Charles Morris’ philosophy seminar at the University of Chicago.” Bertalanffy, *General System Theory*, 90. In this same book Bertalanffy acknowledges that the history of “general system theory...parallels French structuralism (e.g. Piaget, Lévi-Strauss).” Ibid., xviii-xix.

¹¹⁹ Bertalanffy’s longtime colleague Anatol Rapoport discusses the emergence of systems theory in terms of holism as a general phenomenon—encompassing, in his estimate, biology, Gestalt psychology, Marxism, and “functionalist anthropology and sociology.” Anatol Rapoport, *General System Theory: Essential Concepts and Applications*, Cybernetics and Systems Series, ed. J. Rose (Turnbridge Wells, Kent: Abacus Press, 1986), 1-5.

¹²⁰ Bertalanffy, *General System Theory*, xxi.

and dynamics (process; later, behavior of open systems).”¹²¹ His General System Theory is the application of this organismic model to map any system or set of systems, be it biological, mechanical, or a combination of both.

During the war, theories of biological regulation came to the attention of the mathematician Norbert Wiener who, in 1940, radically shifted the nature of his work at MIT to participate in the war effort. Among other enterprises, Wiener addressed himself to increasing the success rates of antiaircraft gunners. To achieve this goal, he developed the “Antiaircraft (AA) Predictor,” which took available information regarding the location and motion of the enemy airplane to predict its future path and thereby increase the possibility that it would be shot down. The science historian Steve Heims has described Wiener’s computations as “a mathematical theory of great generality, a theory for predicting the future as best one can on the basis of incomplete information about the past.”¹²² The AA Predictor was a method for augmenting the degree of control despite the uncertainty of any number of variables including the unpredictability of human behavior. Wiener is therefore a good example of the new hybrid researcher—he excelled in mathematics but he drew frequently from the fields of biology and psychology.

Key to Wiener’s theory was the notion of “feedback,” an ordering function achieved through the supply of information that could be utilized to counter the

¹²¹ Haraway, *Crystals, Fabrics, and Fields: Metaphors that Shape Embryos* (1976), rev. ed. (Berkeley, Calif.: North Atlantic Books, 2004), 38.

¹²² Heims, *Von Neumann and Norbert Wiener*, 183.

effects of entropy, or disorder.¹²³ As Wiener writes, “Just as the amount of information in a system is a measure of its degree of organization, so the entropy of a system is a measure of its degree of disorganization; and the one is simply the negative of the other.”¹²⁴ Wiener uses the example of picking up a pencil to explain the workings of feedback. The path that the hand follows to achieve this function is guided by visual and kinesthetic information that is supplied continuously to the brain until this simple task is completed. Feedback delivers information and requires a looped system to function. “The central nervous system no longer appears as a self-contained organ, receiving inputs from the senses and discharging into the muscles. On the contrary, some of its most characteristic activities are explicable only as circular processes, emerging from the nervous system into the muscles, and re-entering the nervous system through the sense organs.”¹²⁵

¹²³ Wiener acknowledged his debt to the physicist and statistician Willard Gibbs, who contributed to the modern definition of entropy. As Wiener writes in *The Human Use of Human Beings*, “The commands through which we exercise the control over our environment are a kind of information which we impart to it. Like any form of information, these commands are subject to disorganization in transit.... In control and communication we are always fighting nature’s tendency to degrade the organized and to destroy the meaningful; the tendency, as Gibbs has shown us, for entropy to increase.” Norbert Wiener, *Human Use of Human Beings: Cybernetics and Society* (1950), rev. ed. with afterword by Walter A. Rosenblith (New York: Avon Books, 1967), 26.

¹²⁴ Wiener, *Cybernetics*, 11. Entropy is the second law of thermodynamics. It predicts the inevitable extinction of energy in any given system, the dissolution of any organization into a state of disorder and indifferentiation. Cybernetics can therefore be understood as a theoretical “counterbalance” to entropy.

¹²⁵ *Ibid.*, 7-8.

In March 1946, Wiener was part of a group of scientists who assembled at a conference at Harvard to discuss “Circular Casual and Feedback Mechanisms in Biological and Social Systems.” This initial meeting led to others and to the group’s adoption of Wiener’s term “cybernetics,” after the Greek term *kybernetes* for “steersman” or “governor.” Armed with an impressive name, cybernetics set out to encompass “the entire field of control and communication theory, whether in the machine or in the animal.”¹²⁶ Kepes did not attend the meetings of the cybernetics Group, which were invitation only, but, as we know, he did convince Wiener to contribute to his book, *The New Landscape in Art and Science*. In fact Kepes tried to get Wiener to expand upon the brief essay he had submitted to this editorial project. Wiener brusquely declined, citing other obligations.¹²⁷

Kepes was clearly enthusiastic about cybernetic theory—an enthusiasm he was not alone in sharing to judge by the popular release in 1950 of Wiener’s *Human Use of Human Beings: Cybernetics and Society*.¹²⁸ But it would be incorrect in my estimation to see Kepes’s second book as being principally concerned with cybernetics, the ordering and controlling subset of systems theory.¹²⁹ Rather cybernetics or, more generally, systems theory, is one prominent thematic among

¹²⁶ Ibid., 11.

¹²⁷ Norbert Wiener to Gyorgy Kepes, 7 September 1951; and Wiener to Kepes, 3 October 1951. Kepes Papers, AAA, reel 5303, frames 0287 and 0291 respectively.

¹²⁸ Wiener, *Human Use of Human Beings*.

¹²⁹ This is the position taken by Reinhold Martin. See Martin, *The Organizational Complex*, 38-40, 66-67.

others in *The New Landscape in Art and Science*. Another equally important thematic is humanism based in a pragmatic belief in individual and collective agency. This is evident, for instance, if we “read” the book visually, using it as its editor intended. Kepes began the preface to *The New Landscape in Art and Science* by provocatively stating that “This book is meant to be looked at more than read.”¹³⁰ Its first illustration is a prehistoric cave drawing of an animal (fig. 78). Opposite this image is a drawing of a dog by Kepes’s son Imre, “age three and a half” (fig. 79). The book then builds from this base, introducing artworks that are increasingly “complex,” functional objects that are intricately patterned (a Neolithic vase), and scientific diagrams that are elegantly conceived (Clerk Maxwell’s “Lines of Force between Two Plates”) (fig. 80, fig. 81). As such images suggest, Kepes’s book was an actualization of what Sontag identified in 1965 as the “pan-cultural perspective” that is possible through “mass reproduction.”¹³¹ So much so that a fresco by Piero della Francesca shares a page-spread with a Japanese screen and a detail from Viking Eggeling’s drawings for the abstract film *Diagonal Symphony* (fig. 82, fig. 83, fig. 84). These images appear just before the beginning of a section on “The Industrial Landscape,” a group of photographs that reflect Kepes’s interest in urbanism (which we may recall he was in the process of pursuing with Kevin Lynch at the time the book appeared). This section is followed by “The New Landscape” and its re-presentation of scientific photographs. This is the book’s core after which Kepes

¹³⁰ Kepes, *The New Landscape in Art and Science*, 17.

¹³¹ Susan Sontag, “One Culture and the New Sensibility” (1965), in *Against Interpretation and Other Essays*, rev. ed. (New York: Picador, 2001), 296.

proceeds to “parse” his “new landscape” in a manner not unlike what he did in

Language of Vision, but with a new collection of key words and phrases:

“Transformation,” “Analogue, Metaphor,” “Morphology,” “Module,” “Rhythm,” and “Scale.” Each of these terms heads a section that includes an introduction by Kepes and, in most instances, an essay or essays by the book’s contributors. For instance, “Analogue, Metaphor” begins with Kepes’s analysis of the first of the section’s terms:

Analogues are common boundaries of outside and inside, known and unknown, old and new. They connect group and individual, and within each of us: one level with another, physical and psychological, physiological with symbolic. Our experience attunes us to these correspondences. Finding them, we find the world in order.¹³²

The section then proceeds with Wiener’s contribution, previously discussed, which is followed by an essay by Kepes’s former New Bauhaus colleague, Ralph Gerard on “Design and Function in Living,” and a text on “Physiognomic Perception” by the psychologist Heniz Werner.¹³³ In the second half of the book (which begins after “The New Landscape” section) scientific images are increasingly related to modern art, although Kepes maintains his eye for the “pan-cultural perspective,” comparing, for instance, a Marshall Island chart (fig. 85) to a ternary diagram (fig. 86)

¹³² Kepes, *The New Landscape in Art and Science*, 252.

¹³³ Norbert Wiener, “Pure Patterns in a Natural World,” 274-76, R. W. [Ralph] Gerard, “Design and Function in Living,” 277-79, and Heinz Werner, “Physiognomic Perception,” 280-82, in *The New Landscape in Art and Science*. After his years at the New Bauhaus/School of Design, Gerard participated in the emergence of systems theory, and in 1954 he founded the Society for General System Theory with Ludwig von Bertalanffy, Kenneth Boulding, and Anatol Rapoport.

Kepes's postwar conception of order was grounded in the notion that order already existed in nature and in the human conceptualization of nature. Among other sources he found signs of the understanding of nature's order in art history. For instance, he was particularly taken with Kenneth Clark's book *Landscape Painting* (1950). Indeed in the spring of 1951 he wrote to the venerable art historian asking him to contribute to *The New Landscape in Art and Science*. In this letter Kepes confides, "I was impressed with your final chapter and was particularly struck with some ideas you so powerfully expressed."¹³⁴ Kepes would have doubtlessly been engaged by Clark's characterization of landscape as an idea that progressed over time toward "wholeness." As Clark writes, "Natural objects...were first perceived individually, as pleasing in themselves and symbolical of divine qualities. The next step towards landscape painting was to see them as forming some whole which would be within the compass of the imagination and itself a symbol of perfection."¹³⁵ Yet it was the last chapter that Kepes made special note of in his letter to its author. This was the chapter entitled "The Return to Order."¹³⁶

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In 1983 Kepes stated in an interview that there were three "sources" that had been important to him. As he remarked, "One is Hungarian folk art. The other is

¹³⁴ Gyorgy Kepes to Kenneth Clark, 3 April 1951. MIT Museum, Hayden Gallery file. Clark apparently declined because he is not one of the contributor to Kepes's book.

¹³⁵ Clark, *Landscape Painting*, 4.

¹³⁶ *Ibid.*, 112-30.

microphotographs. The third, if I can refer to it just with words, is the source of consciousness.”¹³⁷ *The New Landscape in Art and Science* was Kepes’s paean to the microphotograph, which he admiringly compared to the visual manifestations of any number of his other eclectic enthusiasms. And while Kepes believed that understanding “nature’s order” would facilitate the emergence of social order, he never envisioned enforcing order through overt mechanisms of control. He simply believed man would choose rightly. In 1989 Kepes stated that his favorite thinker was Ralph Waldo Emerson, who is cited in *The New Landscape in Art and Science*. This was an interesting choice for an artist who early in life proclaimed his allegiance to Marxism. Cornel West has compared Emerson to his contemporary Marx, finding both thinkers held a similar belief in human agency that expressed itself differently:

Similar to Marx, Emerson focuses on the pressing concerns unleashed by the American, French, and Industrial revolutions: the scope of human powers and the contingency of human societies. These concerns are addressed by highlighting the willful self (or selves) up against and overcoming antecedent circumstances, or to put it in the language of social science, the relation between purposeful subjects and prevailing structures, conscious human agents and social constraints.¹³⁸

The passage from one of Emerson’s essays that Kepes cites in *The New Landscape* describes an idealized world in which science and technology function perfectly and are used responsibly:

When its errands are noble and adequate, a steamboat bridging the Atlantic between Old and New England and arriving at its ports with the punctuality of a planet, is a step of man into harmony with nature. The boat at St. Petersburg, which plies along the Lena by magnetism, needs little to make it sublime.

¹³⁷ Gyorgy Kepes, “Sermon for Tranquility: An Interview with Gyorgy Kepes,” 7.

¹³⁸ Cornel West, *The American Evasion of Philosophy: A Genealogy of Pragmatism* (Madison: University of Wisconsin Press, 1989), 10.

When science is learned in love, and its powers are wielded by love, they will appear the supplements and continuations of the material creation.”¹³⁹

The cover of *The New Landscape in Art and Science* includes an X-ray photograph of a rose over which Kepes ran a strip of computerized coding (fig. 87).¹⁴⁰ The implication is that the coding represents the rose in all its uniqueness, that computer science can bring us the rose in all its detail, just like photography. If we contemplate these propositions they quickly become absurd. The photograph of the rose, while elegant and evocative, is nonetheless blanded of color, touch, and smell, all things we expect from roses in the real.¹⁴¹ The coding in this context appears as an even more distant and impenetrable copy, incapable of being understood as a representation of a rose unless it is run through a machine. We can be sure that Kepes intended for his cover to be elegant and evocative. Moreover we can guess that he

¹³⁹ Ralph Waldo Emerson, *Essays* (Boston: Houghton, Mifflin, and Co., 1865), cited in Kepes, *The New Landscape in Art and Science*, 75.

¹⁴⁰ Geoffrey Batchen has noted the striking similarity between Kepes’s cover design for *The New Landscape in Art and Science* and the cover of Lev Manovich’s *The Language of New Media*, a book whose title also appears to echo Kepes’s *Language of Vision*. In Manovich’s version the rose has been replaced by a strip of film. Geoffrey Batchen, “Electricity Made Visible,” in Lucy Kimbell, ed., *New Media Art: Practice and Context in the UK 1994-2004* (London: Arts Council, England and Cornerhouse Publications, 2004), 26-44. A modified version of this essay appears in, idem, “Electricity Made Visible,” in Wendy Hui Kyong Chun, ed., *New Media, Old Media: A History and Theory Reader* (New York: Routledge, 2005), forthcoming. Lev Manovich, *The Language of New Media* (Cambridge, Mass.: MIT Press, 2001). A strip of film (minus the computer coding overlay) appears on the cover design that Kepes devised for Rudolf Arnheim’s book *Film als Kunst* (Berlin: Rowohlt, 1932).

¹⁴¹ Kepes had acquired the photograph of the rose from Herbert R. Isenburger of the St. John X-Ray Laboratory in Califon, New Jersey, who had entered his aesthetically pleasing images to the “International Photography-in-Science Salon,” a contest that was initiated by the *Scientific Monthly* in 1947. Kepes contacted most of the entrants to this contest. MIT Museum, Hayden Gallery file.

wished to convey that the computer, which in 1956 was undergoing rapid improvements, had only good things to offer.¹⁴² Indeed a section of *The New Landscape in Art and Science* is devoted to electronic imagery—principally sound graphs, frequency modulations, and oscilloscope patterns (fig. 88, fig. 89, fig. 90). But at least in retrospect the cover design Kepes created partially betrays the atmosphere of benevolent progress he seeks to foster in the book's interior.

Given that Kepes adopted such utopic notions of scientific and technological beneficence, how do we rationalize the at times troubling sources of his cherished microphotographs? He collected many of his images from individual scientists, university labs, and artists with a penchant for aerial photographs that resembled microphotographs. But he also collected photographs by approaching corporations such as Standard Oil, United States Steel, Eli Lilly, General Electric, Dow Chemical, General Motors, and the Aberdeen Proving Grounds Center for Ballistic Research. I would suggest that we cannot rationalize Kepes's sources beyond acknowledging that he was of the same hopeful mindset as John E. Burchard, MIT's first dean of the School of Humanities, who wrote the foreword to *The New Landscape in Art and Science*. This text opens with an astounding pronouncement about the Bayway Refinery that once encroached on the New Jersey meadowlands. "In the middle of the day it may seem admirable only as a reminder of the beneficence of petroleum in the

¹⁴² Kepes made a related visual statement in a cover design he created for *The Atlantic* 200 (December 1957). In this instance, the computer coding ran as a horizontal stripe across the cover and arranged around it were a colorful array of boxes with rounded edges, suggesting a schematic grid or an abstracted rendition of a console outfitted with blinking colored lights. The issue was dedicated to "mass communications."

modern world or as a monument to an efficient and statesmanlike corporation. But when early evening has shrouded the debris of the landscape and only the lights of the towers remain to be seen, the forms become graceful sculptures.”¹⁴³ In 1956, when this statement appeared in print, Burchard would not have been alone in his belief in corporate benevolence. Indeed, so commonly held was that belief, that when William H. Whyte, Jr.’s *The Organization Man* was published, also in 1956, its critique of the corporation was a *succès de scandale*.¹⁴⁴

The New Landscape in Art and Science received national press coverage, principally in magazines devoted to art and architecture. Like the coverage of *Language of Vision*, the reviews of Kepes’s second book were positive and, for the most part, uncritical. A good example is Edgar Kaufmann, Jr.’s review, which

¹⁴³ John E. Burchard, “Foreword” in Kepes, *The New Landscape in Art and Science*, 13. Burchard’s sculptural description of an industrial site is reminiscent of the aestheticizing approach to industrial subjects by American photographers in the 1930s and 1940s, such as Margaret Bourke-White, Charles Sheeler, and Paul Strand. For a discussion of this phenomenon in photography—particularly in relation to the Sheeler’s photographic series at the Ford River Rouge plant (1932)—see Terry Smith, *Making the Modern: Industry, Art, and Design in American* (Chicago: University of Chicago Press, 1993), 111-35.

¹⁴⁴ William H. Whyte, Jr., *The Organization Man* (New York: Simon & Schuster, 1956). Whyte intended to be provocative, including a section in the book entitled “How to Cheat on Personality Tests” for the enterprising anti-organization man (405-10). A passage from Whyte’s summary of the beliefs of the Organization Man could potentially drop undetected into *The New Landscape in Art and Science*, so close is it to paraphrasing Kepes’s postwar position on man and society. “Man exists as a unit of society. Of himself, he is isolated, meaningless; only as he collaborates with others does he become worthwhile, for by sublimating himself in the group, he helps produce a whole that is greater than the sum of its parts. There should be, then, no conflict between man and society. What we think are conflicts are misunderstandings, breakdowns in communication. By applying the methods of science to human relations we can eliminate these obstacles to consensus and create an equilibrium in which society’s needs and the needs of the individual are one and the same” (7).

appeared in *Architectural Record* in March 1957. Kaufmann wrote of the book that it “shows rapprochements between art and science, reaching toward a more complete grasp of the human condition.... Kepes’ book is essentially a round-up of scouts’ reports on admittedly arduous escape routes to lands of promise.”¹⁴⁵

Perceptual Opportunities

Although Kepes did not teach within the School of Humanities, his career at MIT underwent fortuitous change around the time that it was founded. As a logical outgrowth of the curriculum-balancing concerns that had led to its establishment, the School of Humanities became the most active site at the institute for the negotiation of what was perceived as the art-and-science divide. Therefore, in the early 1950s, when MIT considered whether it should add a requirement in the visual arts for all students regardless of their chosen disciplines, the debate took place primarily within the School of Humanities. This is despite the fact that responsibility for implementing the requirement was ceded to the School of Architecture and Planning, where there were “a group of people particularly well qualified to begin instruction along the lines proposed.”¹⁴⁶ The author of this assessment was the engineer Burchard (1898–1975), one of Kepes’s closest allies. Burchard had been trained in architectural engineering at MIT, graduating in 1925. After working in industry, he returned to MIT as a

¹⁴⁵ Edgar Kaufmann, Jr., “Kepe’s [sic] New Volume Relates Art and Science; Views Present Artistic Dilemmas and Hopes,” *Architectural Record* 121 (March 1957): 62.-63.

¹⁴⁶ John E. Burchard, *Art Education for Scientist and Engineer*, 3.

professor of engineering in 1938. Following his wartime service he was named director of the MIT libraries, a position he held until the founding of the School of Humanities in 1948. In both administrative positions Burchard was a leading force in the effort to augment the role of the humanities at MIT.

Burchard's advocacy for the humanities integrally included the visual arts. And he took his advocacy of the humanities outside the confines of the campus, publishing articles and books on the role of the arts in the "world of science" and the social ramifications of scientific developments.¹⁴⁷ In 1957 his article "Science Education and the Liberal Arts" was accompanied by cartoon-like illustrations conceived to encapsulate the text's main themes. One of these illustrations shows a figure sitting in a modern chair holding what appears to be a drink (fig. 91). The figure gazes toward a roughly drawn image of the Hellenistic sculpture *Laocoon and His Sons*, which in this context looks comically rather than tragically contorted. The caption reads, "The humanities offer the opportunity to adopt some of the painful experiences of mankind vicariously."¹⁴⁸

Between 1946 and 1950 Kepes led a succession of students through the elements of his "Visual Fundamentals," a course that he alternated with one entitled "Light and Color," another outgrowth of his New Bauhaus years. When Wurster left

¹⁴⁷ See, for instance, John Ely Burchard, *Mid-Century: The Social Implications of Scientific Progress* (Cambridge, Mass.: MIT Press, 1950); idem, "The Arts in a World of Science," *Annals of the Japan Association for Philosophy of Science* 2, no. 1 (1961): 22-31. Institute Archives, John E. Burchard Papers, MC76, folder 55.

¹⁴⁸ John Ely Burchard, "Science Education and the Liberal Arts," *College Board Review* 33 (Fall 1957): 18.

in 1949 to become dean of the School of Architecture and Planning at U.C. Berkeley, Kepes might have had reason to wonder if he would ever gain access to the realm of integration that he had been promised in 1946. However it was Burchard who made possible Kepes's first integrative, extracurricular opportunity at MIT. Around the time of the founding of the School of Humanities the institute completed its humanities library. Christened the Charles Hayden Memorial Library, this was a project that Burchard had taken over in his former capacity as head of libraries. The architect Ralph Walker, of the architecture firm Voorhees, Walker, Foley and Smith, designed a clean-lined and boxy two-story building, clad in respectable, vaguely classicizing limestone (fig. 92). There were originally two library areas that flanked an interior courtyard. The north wing was devoted to the humanities, the south to the Dewey Library of Economics and Industrial Relations—this polarized organization of space was a continuance of the two Divisions that Compton designated in 1931. The windows on the south side of the building are the most dramatic, extending floor to ceiling in alternating bays that look out on the Charles River.¹⁴⁹ The libraries were completed in 1950 as the last in a series of buildings to connect to MIT's "Infinite Corridor," the practical yet daunting common hallway of a succession of buildings that house many of the institute's departments.

¹⁴⁹ Today the humanities library is housed on the top floor of the south wing, garnering expansive views to the river. The science library fills the first floor and basement in this same wing, establishing a physical link between the humanities and the sciences in this section of the building. The Dewey Library was rededicated to the social sciences and moved to the east wing, while the north wing was turned over to the Institute Archives.

A gallery was included in the library complex and was placed next to the main public entrance from the street (the most frequently used entrances are internal, linked to the Infinite Corridor). In an article published just prior to the building's inauguration, Burchard and the new head of libraries, Vernon D. Tate, described the Hayden Gallery as possessing "Two walls of glass—one of which forms the wall of the outside building." This was considered advantageous because "students and visitors alike are afforded a clear view of the contents whether the gallery is open or closed."¹⁵⁰ As if to emphasize this expansiveness, the first exhibition in the new space was "The Painter and the City." It was organized by Kepes, who included himself in the show, and it was accompanied by a brochure with an essay by Sigfried Giedion.¹⁵¹

The gallery's surfeit of glass posed a problem for the display of artworks. With only two non-fenestrated walls, curators often resorted to adding freestanding partitions. When composing their written preview of the space, Burchard and Tate acknowledged the potential for distraction that the open gallery could induce, but promised that its finishings facilitated focused concentration. "From the Cardiff green terrazzo floor to the soft neutral gray walls, every effort has been made to direct

¹⁵⁰ John Ely Burchard and Vernon D. Tate, "The Charles Hayden Memorial Library—A Brief Preview," reprint from *The Technology Review* 52, no. 7 (May 1950): 7. Institute Archives, AC20, box 5, folder 229. In the mid-1980s the Hayden Gallery entered into a partnership with the Media Lab and became the List Center for the Visual Arts, moving into the Media Lab's I. M. Pei-designed building in 1985. Given this partnership it is not surprising that the List's mission was to explore the intersection between art, science, and technology with a focus on new media.

¹⁵¹ *The Painter and the City* was presented from 8 May through 15 June 1950. Institute Archives, AC20, box 5, folder 229.

attention away from the surroundings toward the contents of the gallery.”¹⁵² In contradistinction to this attempt at inwardness, the metal grid system that Kepes devised for the display of photographs in *The New Landscape* exhibition was a design solution that echoed the library’s large-paned windows. The effect is a uniform visual “hum” that links inside to outside. In published views of the exhibition the windows are always prominently visible in the background.¹⁵³ These views were the most successful demonstrations of the exhibition’s inside-outside cohesiveness. Unpublished views of the exhibition demonstrate that it was more eclectic both in content and in its methods of display. For instance, one installation photograph documents the inclusion of three molecular models on part of the grid (fig. 93). And in this same image we can see that Kepes placed a few models of organic shapes on the floor beneath his freestanding display system.¹⁵⁴ Moreover, mounted on the non-fenestrated walls were two rows of photographs that had been printed at a smaller, more standardized scale than the images on the grid. The fact that Kepes never chose to publish this view suggests that he preferred to focus solely on those photographic components of the exhibition that he had positioned to hover in space.¹⁵⁵

¹⁵² Burchard and Tate, “The Charles Hayden Memorial Library,” 7.

¹⁵³ See Kepes, *The New Landscape in Art and Science*, 101; and idem, *Gyorgy Kepes, the MIT Years: 1945-1977* (Cambridge, Mass.: Hayden Gallery and MIT Press), 84.

¹⁵⁴ Four of these models are white and resemble the plaster mathematical forms recently photographed by Hiroshi Sugimoto in his series “Conceptual Forms,” 2004.

¹⁵⁵ Although the Hayden Gallery tended to show more paintings than photographs, an aspect of its design suggested it would have been an ideal site for the exploration of photography’s link to the history of paper, printmaking, and bookmaking. This was because a stairway inside the entrance to the gallery led to the basement, which

If we stood in the Hayden Gallery when it was so arranged we might have noticed among the many items on display a particularly delicate photograph documenting a lace-like detail—the future Plate 114. If five years later we came upon the book that developed out of *The New Landscape* exhibition, we would have been surprised to discover that the image in question is identified as a microphotograph of the *Duodenum of a Rat*, in other words, a magnified piece of rat’s intestine. This is a particularly dramatic demonstration of the difference a wall label or book caption makes. It is also exemplary of the degree to which photography can transform (and in this case sanitize and render aesthetically pleasing) the things in the world that it pictures. In the following chapter, however, we will find that Kepes’s relationship to photography shifted, in part because of the distance that he perceived it put between the artist and his subject.

housed the Dard Hunter Paper Museum, dedicated to the display of “samples of paper, techniques of printing and bookmaking, watermarks, and related material.” Burchard and Tate, “The Charles Hayden Memorial Library,” 7.

CHAPTER FOUR

“ART IN CIVIC SCALE”

The battle is still not yet won.
Gyorgy Kepes, 1974¹

All that is solid melts into air.
Karl Marx, 1848²

The previous chapter addressed Kepes’s first decade at MIT, 1946 to 1956, years that coincided with the modernization of the School of Architecture and Planning, where he taught “Visual Fundamentals” and conducted research on the perception of the city. We also witnessed his participation in an institute-wide assessment of the value of the humanities to a school dedicated to the training of scientists and engineers. That this assessment was primarily voiced in administrative memos and reports should not lessen the significance of the debate. Indeed, contained within these documents is evidence of the deepest anxieties and ambitions of a specialized but

¹ Gyorgy Kepes, quoted in Paul Dinger, “‘21st Century Artist’ Quits MIT,” *Christian Science Monitor*, 28 June 1974.

² Karl Marx, “Manifesto of the Communist Party,” trans. Samuel Moore (London, 1888), in *The Marx-Engels Reader*, ed. Robert C. Tucker, 2nd ed. (New York: W. W. Norton & Co., 1978), 476. I first encountered this sentence as the title of Marshall Berman’s classic analysis of modernism. See Marshall Berman, *All that Is Solid Melts into Air: The Experience of Modernity* (1982), rev. ed. (New York: Penguin Books, 1988). The title’s attribution is discussed by Berman on p. 89.

highly influential sector of the United States in the 1940s and 1950s. These anxieties and ambitions constituted a climate of cross-fertilization between the physical and social sciences and the engineering disciplines, a climate that had been cultivated during World War II and continued to develop after the war's end. In 1965, the scientist and science historian Gerald Holton paraphrased C. P. Snow's argument in *The Two Cultures*, writing, "science is determining much of our destiny, that is, whether we live or die."³ Kepes designated himself an interpreter of this newly interdependent environment, a role that manifested itself in the ways he collected, arranged, and contextualized photographs in his books and exhibitions.

Yet by the mid-1960s, Kepes had, for the most part, relinquished photography for "art in civic scale." This was the title of a symposium organized by the Center for Advanced Visual Studies in 1971. The participants in this event—several artists and architects, a city planner, a physicist, and a curator, and three academic administrators—were asked to give their views on "a new civic consciousness of our

³ Gerald Holton, "Introduction," *Dædalus*, "Science and Culture" issue, vol. 94, no. 1 (Winter 1965): vii. Holton's paraphrase astutely captures the life-and-death thematic in Snow's treatise. This is even more the case in "The Two Cultures: A Second Look," which Snow wrote in reaction to the response to *The Two Cultures* and included in the book's second edition, issued in 1964. In "A Second Look," Snow discusses the horror and indignation that greeted his assertion in *The Two Cultures* that "We die alone" (*The Two Cultures*, 6; "A Second Look," 58-59). In fact the subtext of Holton's paraphrase of Snow is fear of a *collective* death—i.e., the nuclear threat. Awareness of this threat runs throughout *The Two Cultures* and "A Second Look," but what Holton does not acknowledge is the equally if not more insistent idea Snow wished to convey—that applied science was now capable of solving death due to poverty and starvation. "We can meet the harsh facts of the flesh, on the level where all us are, or should be, one." Snow, "The Two Cultures: A Second Look," in *The Two Cultures*, 77.

environmental ‘common.’”⁴ Using the title of this symposium as a thematic guide, this chapter considers Kepes’s last years at MIT, specifically the period that began in 1964, when he proposed the establishment of a “small institute of visual arts,”⁵ and ended in 1974 with his retirement. As we shall see, Kepes’s approach to art production in the final decade of his academic career underwent significant change, becoming increasingly collaborative and “environmental.” Yet despite these procedural shifts, he stayed true to what we will recognize as a familiar narrative of belief.

In January 1965, Kepes gave his “small institute” a provisional name—Center for Visual Studies—which he further characterized as a “long-standing dream.”⁶ The

⁴ “Art on a Civic Scale” took place in the Kresge Auditorium at MIT on 19 May 1971. Participating artists included Kepes, Claes Oldenburg, Otto Piene, and Louise Nevelson. The physicist was Philip Morrison. Pedro Ramirez Vazquez and José Luis Sert represented the field of architecture, Kevin A. Lynch the field of city planning. The academic administrators included John E. Burchard of MIT’s School of Humanities and Jerome B. Wiesner, MIT Provost. “Art in Civic Scale,” symposium program. Center for Advanced Visual Studies, MIT.

⁵ Gyorgy Kepes to Provost Charles H. Townes, 19 June 1964. Institute Archives, MIT, Office of the President, AC4, box 128. A report written by Lawrence B. Anderson, Dean of Architecture in 1963 suggests that Kepes’s proposal was already circulating within administrative channels by that year. “It has recently been proposed that funds be provided to allow a few gifted young artists to work here...specifically to enter some of the exciting new prospects in the visual arts provided by the growth of science and technology.” Lawrence B. Anderson, “The Visual Arts in the M.I.T. Community,” 8 March 1963. Institute Archives, MIT, Office of the President, AC400, box 4.

⁶ Gyorgy Kepes to Julius A. Stratton, 18 January 1965. Institute Archives, MIT, Office of the President, AC4, box 128. It is tempting to speculate whether Kepes may have begun to formulate his “long-standing dream” after the Berlin Bauhaus closed under political pressure in July 1933. That Moholy-Nagy was thinking about a school devoted to “light painting” is evident in his contribution to the book *Circle*. “There ought to be an Academy of Light, which would be devoted to teaching and would

name clearly indicated his abiding advocacy of vision as a skill that could be cultivated, not only for the furthering of art, but also for the benefit of society. With the addition of the word “advanced” in the fall of 1965, the name of Kepes’s project took its final form.⁷ Confirmation of the establishment of the Center for Advanced Visual Studies was announced by Lawrence B. Anderson, Dean of the School of Architecture and Planning, in a letter to the faculty dated 1 June 1967.⁸

Kepes’s dream had become a reality. Yet soon after the Center’s inauguration, it began to encounter difficulties. Primary among its struggles was the search for adequate financial support. The Center for Advanced Visual Studies was a precursor to such “new media” institutions as Ars Electronica, founded in Linz, Austria, in 1979, and the Media Laboratory, established at MIT in 1980.⁹ But unlike these later

educate its students to an artistic and economic consciousness of the new creative factor.” László Moholy-Nagy, “Light Painting,” in *Circle* (1937), ed. Leslie Martin, Ben Nicholson, and Naum Gabo, repr. (New York: Praeger, 1971), 245.

⁷ Gyorgy Kepes to Julius A. Stratton, 6 September 1965. Institute Archives, MIT, Office of the President, AC4, box 128.

⁸ Lawrence B. Anderson to Members of the Faculty, 1 June 1967. Center for Advanced Visual Studies, MIT.

⁹ The Media Lab was an outgrowth of the Architecture Machine Group at MIT, which was formed by Nicholas Negroponte in the late 1960s. A number of additional new-media institutions came into being between 1988 and 2001. These include, in order of their establishment, the Zentrum für Kunst und Medientechnologie, Karlsruhe (1988); Kunsthochschule für Medien, Cologne (1990); International Academy of Media Arts and Sciences, Ogaki, Japan (1996); Media Centre d’Art i Disseny, Barcelona (1998); and the iCinema Centre for Interactive Cinema Research at the University of New South Wales, Australia (2001). The Centre Pompidou, Paris, is currently organizing the exhibition *Enseigner, Produire*, which is scheduled to open in November 2005 and will be dedicated to analyzing the history of educational/research institutes dedicated to new media. The Center for Advanced Visual Studies is the oldest institution included in this project.

enterprises, the Center has never attracted sustained corporate support, nor has it consistently benefited from governmental monies like its European counterparts.¹⁰ Its history of financial troubles is due in large part to the fact that it has remained resolutely noncommercial. Unlike the Bauhaus and the New Bauhaus before it—both institutions that also suffered from lack of funds—the Center for Advanced Visual Studies has never aspired to produce marketable products for the industrial sector. Nor, for that matter, has it capitalized on the rapidly expanding electronics industry, although it has been inexorably tied to the new technologies that that industry has produced. Rather, a significant aspect of the Center’s original mission was to develop communal ventures—collaboratively conceived artworks that it endeavored to unveil within the public sector. In this respect the Center for Advanced Visual Studies positioned itself as the ultimate realization of the Bauhaus’s utopic dream to unite artists, technology, and the world at large. This was how Lawrence Alloway, writing in 1970, understood Kepes’s project. The Bauhaus, Alloway remarked, “remained largely an optimistic ideal, frustrated by the level of technology and the difficulty artists had getting hold of the right tools. Now, however, we live slap in the middle of

¹⁰ My account of the Center for Advanced Visual Studies is restricted to its early years, 1967 to 1974, when it was headed by Kepes. Each of the Center’s directors following Kepes—Otto Piene, Steve Benton, and, currently, Krzysztof Wodiczko—have reinterpreted its mission and reconsidered its relationship to science, technology, and the academic community in which it resides, but they have all struggled to keep it financially solvent. In contrast, the Media Lab identified seventy-five corporations as its “founding group of investors.” Nicholas P. Negroponte, “Media Laboratory,” *MIT Bulletin*, President’s Report issue, 1984-1985, p. 189. The Center for Advanced Visual Studies was founded with grants from the Graham Foundation and the Old Dominion Foundation.

the old Bauhaus' tomorrow.”¹¹ In preparation for his retirement, Kepes summarized the mission of the Center for William Porter, who had succeeded Anderson as Dean of Architecture at MIT in 1972. “As an interdisciplinary research center, our function is to explore new creative ideas in art which go beyond the studio scale of the individual artist and his subjective interests and develop artistic tasks of civic scale and environmental dimensions. The scale of these objectives suggests the collaboration of other disciplines at the Institute as well as a cooperation among artists residing at the Center.”¹²

Kepes's proposal for a visual arts institute at MIT was a logical outgrowth of the war of persuasion for the “union of the arts and sciences” that he had waged at MIT since his arrival there in 1946. In the early 1960s, the MIT administration greeted his proposal as viable and even necessary. Yet during the years of Kepes's tenure as the Center's founding director, 1967 to 1974, his enterprise was hampered by the social and political milieu to which it unavoidably belonged. This period—most prominently symbolized by the social crisis of 1968—failed to constitute an environment within which the Center could readily flourish. In addition, as we shall see, support within the art world for artworks that utilized new technologies was far from universal. The Center struggled for sustained public recognition despite the fact that its participating artists cultivated a congenial and productive work atmosphere. Therefore, in addition to defining the motivations and forces that brought the Center

¹¹ Lawrence Alloway, “Art,” *The Nation*, 20 April 1970, 477.

¹² Gyorgy Kepes to William Porter, 2 May 1972. Institute Archives, MIT, AC8, box 193. Following his forced retirement in 1972, Kepes maintained an association with MIT until 1974. See n. 7 of the Introduction.

to fruition, this chapter seeks to understand why Kepes eventually declared in the year of his retirement that “The battle is still not yet won.”¹³

Conceiving the Center, Defining Advanced Visual Studies

Kepes envisioned the Center for Advanced Visual Studies as an on-campus fellowship program for artists “who have demonstrated interest in collaborative work” and who want “close and continuous work contact with one another and with the academic community of architects, city planners, scientists, and engineers.”¹⁴ The initial concept called for a facility filled with “young artists.”¹⁵ But this idea had been rethought by the time the Center opened. The participants, or “Fellows” as they came to be known, were described as “mature professionals of recognized ability and achievement in various fields in the visual arts.”¹⁶ Soon this was shortened to “mature artists of international stature,” a description that is found in many early accounts of the Center.¹⁷

¹³ Kepes, quoted in Dinger, ““21st Center Artist’ Quits MIT.”

¹⁴ Gyorgy Kepes quoted in a grant application to the Old Dominion Foundation, February 1967, p. 10. Institute Archives, MIT, Office of the Provost, AC8, box 193, folder 3. The application was submitted through the office of the MIT Chairman, J. R. Killian, Jr.

¹⁵ Department of Architecture, “A Program for the Visual Arts,” p. 5. Center for Advanced Visual Studies, MIT.

¹⁶ Gyorgy Kepes, *The Center for Advanced Visual Studies* (Cambridge, Mass.: MIT Press, c. 1968), n.p. This was a substantial booklet that was published soon after the Center opened in late 1967.

¹⁷ See, for instance, Gyorgy Kepes, “The Center for Advanced Visual Studies,” *MIT Bulletin*, Report of the President issue, 1968, vol. 104, no. 3 (December 1968): 47.

This progression from youthfulness to maturity partially explains the addition of the word “advanced” to the name of the new undertaking. Yet a qualification should be made regarding the form this advanced status actually took. Specifically, the Fellows were understood by the Center’s founder to be adept at the *use* of vision rather than its perceptual or physiologic study. Kepes’s “visual studies” were synonymous with the deployment of sight by an individual or group to make assessments regarding the “reality” of a particular cultural moment. Assessments made by artists were presumed to result in socially oriented and orienting artworks. While Kepes believed in the special visual abilities of artists, he did not consider the productive use of sight as the artist’s exclusive purview:

Vision is a fundamental factor in human insight. It is our most important resource for shaping our physical, spatial environment and grasping the new aspect of nature revealed by modern science. It is at its height in the experience of artists, who elevate our perception. Artists are living seismographs, as it were, with a special sensitivity to the human condition. Their immediate and direct response to the sensuous qualities of the world helps us to establish an entente with the living present.¹⁸

And in a similarly universalizing manner, these deployments of sight were intended to take in the “world,” to increase man’s awareness of experience in general, and even to privilege untraditional objects of inquiry. Yet despite such openness, Kepes was more circumspect when it came to absorbing the wider world, for instance, of popular culture. Indeed, as his career progressed, his interest in popular culture seems to have lessened. While Kepes’s accounts of his early career stress the

¹⁸ Gyorgy Kepes, “The Visual Arts and the Sciences: A Proposal for Collaboration,” *Dædalus*, vol. 94, no. 1 (Winter 1965): 120-21.

importance of contemporaneous film,¹⁹ this was not an interest that he seems to have kept current. Moreover, neither his extant photographs nor his photomontages commonly include popular imagery, as Moholy-Nagy's did. Kepes suggested that the designer use his visual skills to make popular culture "more communicative" and even "educational"—these were the (gendered) terms of his argument in favor of advertising design during the years he worked on commercial projects. But in this scenario neither the artist nor the designer would actually conceive of popular culture as a *source*.

Therefore, just as Kepes expressed his opposition to what he deemed to be the extreme *inwardness* of the Abstract Expressionists, so too did he dismiss Pop artists, this time for what he saw as the wrong way they went about *outwardness*. In 1965 Kepes published a second essay in *Dædalus* that was as critical of Pop Art as his earlier 1960 article in the same journal had been of Abstract Expressionism. In the 1965 essay he refrained from naming Pop Art's most prominent figures, but his references to them were telltale. "A most recent group of artists...[has] become fascinated by vulgar features of everyday life, and they have chosen them as emblems. Seductive selling devices of the competitive society—advertising pictures, containers, packages, and the mass-produced heroes of the comic strips—are preferred images."²⁰ For these artists, Kepes enigmatically remarks, "The part

¹⁹ Gyorgy Kepes, interview by Robert F. Brown, 11 January 1973. Kepes Papers, AAA.

²⁰ *Ibid.*, 120.

controls the whole.”²¹ This distrust of popular culture may have contributed to Kepes’s disinterest in those types of new-media art that utilized television or the emerging technologies of video and the computer. In general, Kepes’s taste in nontraditional media favored artworks that incorporated kinetic and/or illuminated elements. Nonetheless the Center that he founded eventually became a site for innovative work in media that he initially greeted with skepticism.²²

* * *

Kepes’s idea of “Visual Studies” would therefore appear to be somewhat different from that fast-expanding branch of contemporary intellectual inquiry that goes by the identical appellation or, in other instances, by the closely related “Visual Culture.”²³ Since the 1990s, both of these nascent disciplines, which are, it should be noted, inherently *interdisciplinary*, have constituted a veritable publishing boom among academic presses.²⁴ One of these books, James Elkins’s *Visual Studies: A*

²¹ Ibid., 118.

²² See, for instance, *Five Artists/Five Technologies*, exh. cat. (Grand Rapids, Mich.: Grand Rapids Art Museum, 1979); and Otto Piene, ed., with Elizabeth Goldring and Vin Grabill, *Center Video*, exh. cat. (Cambridge, Mass.: Center for Advanced Visual Studies, 1981).

²³ For the sake of clarity I have chosen to capitalize these terms to designate the fact that they have come to represent disciplinary areas, however widely and sometimes contentiously defined these areas might be.

²⁴ A far from exhaustive list of these books includes Michael Ann Holly, Keith Moxey, and Norman Bryson, eds., *Visual Culture: Images and Interpretations* (Middletown, Conn.: Wesleyan University Press, 1994); Chris Jenks, ed., *Visual Culture* (London: Routledge, 1995); Victor Burgin, *In/Different Spaces: Place and Memory in Visual Culture* (Berkeley, Calif.: University of California Press, 1998); Malcolm Bernard, *Art, Design, and Visual Culture: An Introduction* (New York: St. Martin’s Press, 1998); Nicholas Mirzoeff, *Visual Culture Reader* (London:

Skeptical Introduction, will suffice to provide us with basic contemporary definitions of Visual Studies and Visual Culture. The comparison of these definitions to Kepes's conceptualization of vision will have something to tell us about seeing in general.

Elkins defines "Visual Culture" in relation to "Cultural Studies." The latter area of inquiry, he tells us, "started in England in the late 1950s.... [It is] a combination of historical writing and social concern...[that gathers and borrows] from a number of neighboring disciplines, including art history, anthropology, sociology, art criticism, film studies, gender and women's studies, and general cultural criticism, including journalism." According to Elkins, Visual Culture "is younger than Cultural Studies by several decades.... In general terms, it would be fair to say that Visual Culture is less Marxist, further from the kind of analysis that might be aimed at social action, more haunted by art history, and more in debt to Roland Barthes and Walter Benjamin than the original English Cultural Studies."²⁵

Routledge, 1999); idem, *An Introduction to Visual Culture* (London: Routledge, 1999); Marita Sturken and Lisa Cartwright, *Practices of Looking: An Introduction to Visual Culture* (Oxford: Oxford University Press, 2001); and James Elkins, *Visual Studies: A Skeptical Introduction* (London: Routledge, 2003). An exemplary overview of this intellectual phenomenon is Margarita Dikovitskaya, "From Art History to Visual Culture: The Study of the Visual after the Cultural Turn," Ph.D. thesis, Columbia University, 2001. Dikovitskaya's dissertation has recently been published as idem, *Visual Culture: The Study of the Visual after the Cultural Turn* (Cambridge, Mass.: MIT Press, 2005).

²⁵ Elkins, *Visual Studies*, 1-2. Capitalization of "Visual Culture" and "Cultural Studies" added. In contrast to Elkins, Geoffrey Batchen has described Visual Culture's potential for political expression, a quality he associates with the very difficulty of defining it. For Batchen, Visual Culture "is an unfortunate combination of words that...seems to simultaneously refer to an object of study, a mode of analysis and a new academic discipline. However, it's the very fact that Visual Culture appears to be a phenomenon encompassing methodological, institutional and archaeological ambitions that makes it such a challenging proposition; the very fact

Elkins is on shakier ground when he attempts to define Visual Studies, which he anachronistically identifies as a “phrase [that] appears to date from the early 1990s, perhaps inspired by the University of Rochester’s program in Visual and Cultural Studies.”²⁶ We will be better informed by referring to a summary generated by the art historian Margarita Dikovitskaya. In particular Dikovitskaya addresses the various ways that Visual Studies has been invoked to characterize new strides in research:

Some researchers use the term visual studies to denote new theoretical approaches in art history (Michael Ann Holly, Paul Duro); some want to expand the professional territory of art studies to include artifacts from all historic periods and cultures (James Herbert); others emphasize the process of seeing (W. J. T. Mitchell) across epochs (David Rodowick); while still others think of the category of the visual as encompassing non-traditional media—visual cultures of not only television and digital media (Nicholas Mirzoeff), but also of the institutional discourses of science, medicine, and law (Lisa Cartwright).²⁷

We can recognize aspects of Kepes’s approach to vision in these research categories—the emphasis on trans-historical and trans-cultural inquiries, for instance,

that it escapes definition as either one thing or another that is the source of its potential political import.” Geoffrey Batchen, paper prepared for the panel discussion “Politics in/as Visual Culture,” organized by Laurie-Beth Clark and Nicholas Mirzoeff, College Art Association, Atlanta, Ga., 18 February 2005.

²⁶ Ibid., 4.

²⁷ Margarita Dikovitskaya, “From Art History to Visual Studies,” 94, cited in Elkins, *Visual Studies*, 5. Most of the scholars Dikovitskaya refers to are mentioned in n. 24. See also W. J. T. Mitchell, “Interdisciplinary and Visual Culture,” *The Art Bulletin*, vol. 77, no. 4 (1995): 540-44; and idem, “What Is Visual Culture?” in *Meaning in Visual Arts: Views from the Outside*, ed. Irving Lavin (Princeton, N.J.: Institute for Advanced Study, 1995), 207-17; James D. Herbert, “Visual Culture/Visual Studies,” in *Critical Terms for Art History*, ed. Robert S. Nelson and Richard Shiff, 2nd ed. (Chicago: University of Chicago Press, 2003), 452-64; David Rodowick, “Paradoxes of the Visual,” *October* 77 (Summer 1996): 59-62.

or the interest in the visual records of science. And we should remember that his dedication to interdisciplinary endeavors was part of the general awareness of disciplinary interdependence that had emerged during World War II in the United States. During the war this interdependence was restricted to the sciences and engineering disciplines. After the war it was extended to the humanities, in large part as an attempt to counterbalance the power that science and engineering had come to possess. When most present-day scholars assume an interdisciplinary approach, this history—a chapter in the larger history of the art-and-science dyad—frequently goes unacknowledged.

Although it is difficult to speak with authority about disciplinary areas as recently adrift in words as Visual Studies and Visual Culture, Kepes is not, to my knowledge, recognized as a precursor to these fields; nor, for that matter, is Moholy-Nagy.²⁸ These are historical omissions that may be in need of redress (particularly the idea that Visual Studies emerged in the 1990s). But we should not be surprised by such blind spots. This is because, as the historian George Roeder tells us, “Visual Culture is what is seen.”²⁹ And what is seen is ideological.³⁰ While Kepes was

²⁸ The lack of reference to Moholy-Nagy and Kepes is particularly remarkable in the case of James Elkins who teaches at the Art Institute in the city—Chicago—that was their old stomping ground. Elkins has published several books dedicated to expanding the types of images that can be the subjects of visual analyses. In particular his use of scientific imagery seems reminiscent of Moholy-Nagy and Kepes’s publications. See James Elkins, *The Object Stares Back: On the Nature of Seeing* (New York: Simon & Schuster, 1996); and idem, *The Domain of Images* (Ithaca, N.Y.: Cornell University Press, 1999).

²⁹ George Roeder, “Filling in the Picture: Visual Culture,” *Reviews in American History*, vol. 26, no. 1 (1998): 275, cited in Elkins, *Visual Studies*, 4.

certainly aware of popular culture, he simply did not envision it as ripe for either art or inquiry. It was unthinkable. Rather he, like some present-day scholars, saw the scientific image as a particularly compelling contemporary visual source, one that seemed to epitomize his age—to take in its breadth and complexity—while also existing in a tantalizing state of neglect. As we will recall from Chapter Three, Kepes’s photographic project to “present new frontiers of the visible world...until now hidden from the unaided eye” required forgetting the presence of microphotographs in photography’s earliest years.³¹ This example is analogous to Elkins’s conviction regarding the newness of Visual Studies. Finding the forgotten is arguably the defining characteristic of the historian’s charge. Yet the desire driving this work—the desire to identify something potentially in need of discovery—can, at times, blind us to instructive precedents.

* * *

It is certainly the case that what Kepes alternately dodged (popular culture) and attacked (Abstract Expressionism and Pop Art) has made it difficult for art historians to contemplate those aspects of his practice that have something to tell us about the age in which he lived. This situation has been compounded by the fact that his postwar art affiliations generally remained concerned with artists who came of age

³⁰ Or, as Michael Leja has written, “Knowledge is ideological: what passes for knowledge at any given moment is radically conditioned by a complex of regnant interests, values, and utilities.” Michael Leja, *Reframing Abstract Expressionism: Subjectivity and Painting in the 1940s* (New Haven: Yale University Press, 1993), 1.

³¹ Gyorgy Kepes, *The New Landscape*, exh. bro. (Cambridge, Mass.: Charles Hayden Memorial Library, MIT, 1951), n.p.

between the wars, or even before World War I. This is particularly true of his editorial projects. For instance, much of the content in the special issue of *Dædalus* that Kepes edited on the “Visual Arts Today” effectively rendered the declared subject a misnomer. This is glaringly apparent in the section devoted to “statements and documents” by artists such as Juan Gris, Paul Klee, Fernand Léger, and Naum Gabo. The youngest contributor to this section, Pierre Soulages, was born in 1919. The only Americans on the list are Saul Steinberg, Stuart Davis, and Ben Shahn. No doubt Kepes’s sense of “today” must have appeared to some readers as stubbornly old-fashioned.

But the presence of the word “advanced” in the name of the Center for Advanced Visual Studies can serve to remind us that Kepes believed himself to be at the forefront of contemporary art practice. Indeed, he understood himself to be so much at the forefront that he saw his practice as having surpassed (or bypassed) the contemporary artists he criticized, artists who, after all, had either mistakenly withdrawn from society (the Abstract Expressionists) or gotten caught up in its illusory seductions (the Pop artists). This conviction can be better understood if we consider how he chose to position himself within the prevailing academic hierarchy. In conceiving the Center, Kepes made the decision, as one of his colleagues approvingly put it, to “nurture of creativity at the top layer.”³² Specifically, Kepes acknowledged that his model for the Center had been the Institute for Advanced Study, the prominent postdoctoral facility that was founded in 1930 with private

³² Lawrence B. Anderson to Gyorgy Kepes, 3 February 1967, p. 2. Institute Archives, MIT, Office of the Provost, AC8, box 193.

monies and a close Princeton University affiliation.³³ At the time of its establishment the Institute's mission was "the pursuit of advanced learning and exploration in fields of pure science and high scholarship."³⁴ Or, as Robert Oppenheimer, one of the Institute's directors, wrote in 1955, "The immediate effects of the Institute's work are in knowledge and in men.... New knowledge leads to new power and new wisdom, and alters the destiny and heightens the dignity of man."³⁵

From its inception, the Princeton Institute had included representatives from a wide range of academic disciplines, but its most famous members have been scientists and mathematicians, perhaps most notably Oppenheimer himself, as well as Albert Einstein, Kurt Gödel, and John von Neumann. The Institute's multidisciplinary foundation *and* its excellence in the physical sciences, mathematics, and computer science must have appealed to Kepes. And although the Princeton Institute has always existed in close relation to the academy, its self-declared "advanced" status can be compared to the equally idealized functioning of the avant-garde in which Kepes was well versed—both suggest newness, experimentation, and, to a greater or lesser degree, skepticism toward accepted truths. Yet in the context of the

³³ This perspective is evident in Kepes's characterizations of the Center to journalists. See, for instance, Douglas M. Davis, "'It is Only the Scientist Who Can Match the Artist's Idealism,'" *The National Observer*, 23 December 1968. See also Gyorgy Kepes, interview by Antonio Muntadas, 8 July 1989, videotape.

³⁴ Louis Bamberger and Caroline Bamberger Fuld quoted in Herman H. Goldstine, *The Computer from Pascal to von Neumann* (Princeton, N. J.: Princeton University Press, 1972), 78.

³⁵ Robert Oppenheimer, "Foreword," *Institute for Advanced Study, Publications of Members, 1930-1954* (Princeton: Institute for Advanced Study, 1955), cited in Goldstine, *The Computer from Pascal to von Neumann*, 78.

Institute for Advanced Study reference to experimentation should be used advisedly. This is because the Institute's dedication to "disinterested" knowledge made it historically averse to experimental as opposed to theoretical work.³⁶ As we shall see, the difference between the theoretical and the actual will also figure in the functioning of the Center for Advanced Visual Studies.

In addition to a conceptual association with the Institute for Advanced Study, it should be acknowledged that Kepes's Center partakes of the larger tradition of schools and institutes that have defined themselves as either alternatives to or satellites of traditional educational sites. Gropius's Bauhaus and Moholy-Nagy's New Bauhaus were Kepes's closest foundational references (although he never acknowledged them in relation to his Center, an omission that we can understand as an act of self-protection and proprietorship). But the Bauhaus and New Bauhaus were themselves part of a larger trend that touched all areas of human inquiry. There were the Bauhaus's precedents, which, as scholars have demonstrated, included Henry van de Velde's School of Arts and Crafts, Franz Cizek's educational theories, and the advocacy of craft by the Deutsche Werkbund and William Morris.³⁷ Not all these

³⁶ Following World War II von Neumann had to convince the Institute for Advanced Study, with which he had been associated since its founding, to take on his project to further the development of the computer. This story is recounted in Goldstine, *The Computer from Pascal to von Neumann*, 220, 241. This historical inclination remains operative in the Institute's present-day mission statement, which declares a dedication to the "disinterested pursuit of knowledge."

³⁷ Magdalena Droste, *Bauhaus 1919-1933* (1990), repr. (Berlin: Bauhaus-Archiv Museum für Gestaltung; Cologne: Taschen, 2002), 8-19. Hans M. Wingler, *The Bauhaus: Weimar, Dessau, Berlin, Chicago*, trans. Wolfgang Jabs and Basil Gilbert (Cambridge, Mass.: MIT Press, 1969), 1-4. Andreas Haus, "Bauhaus: History," in

precedents were directly concerned with pedagogy, but they were all reformist—seeking to define options that differed from standing convention. In this respect they prefigured the Bauhaus’s development of an educational mission based, first and foremost, on an anti-academic identity.

And the reformist impulse that is the heritage of the Center for Advanced Visual Studies also came from well outside the realms of art, design, and architecture. For instance, it is debatable whether Gestalt psychology, which, as we saw in Chapters Two and Three, was key to Kepes’s pedagogy and his propagation of “wholeness,” would have emerged as forcefully as it did were it not for the Psychological Institute that was founded by Carl Stumpf in Berlin in 1894. While this institute was associated with the University of Berlin, it nonetheless functioned independently. And it was at this Institute that the “Gestalt triumvirate”—Max Wertheimer, Kurt Koffka, and Wolfgang Köhler (who, as I have indicated previously, were cited by Kepes in *Language of Vision*)—got much of their training.³⁸

If, moreover, we turn to the wide expanse of general education, we will recall from Chapter Three the example of John Dewey’s Laboratory School in Chicago in the 1930s, where the emphasis was on learning by doing. Or, in the realm of “higher” education, there is Black Mountain College, which John Andrew Rice established in

Bauhaus, ed. Jeannine Fiedler and Peter Feierabend (Cologne: Könemann, 1999), 14-17.

³⁸ For a history of the founding of the Berlin Psychological Institute as an independent entity see, Mitchell G. Ash, “Gestalt Psychology: Origins in Germany and Reception in the United States,” in *Points of View in the Modern History of Psychology*, ed. Claude E. Buxton (New York: Academic Press, 1985), 297.

1933 based on his interpretation of the Socratic method and Dewey's pedagogical theories. These examples differ from Kepes's Center in that they offered complete curricula, but each approached education as a way to validate the "whole person," to treat education as an inherently *integrative* process. The art historian David Thistlewood has designated such educational ventures as "subject-centered" systems whose ultimate goal is social cohesion. Such systems, he states, promote "individual well-being...for the health of a collective social harmony."³⁹

* * *

We will return to the first "mature artists of international stature" that gained studios at the Center as well as some of the socially concerned projects they undertook under Kepes's guidance. But it is important at this juncture to indicate one more reason for the Center's creation. As I have sought to demonstrate, the Center for Advanced Visual Studies is part of a movement among a subsection of nineteenth- and twentieth-century educators and researchers to establish either complete or partial independence from conventional educational systems. By the time Kepes founded the Center in 1967, MIT sheltered a wealth of partially independent entities, although most of them were dedicated to areas in the sciences and engineering. In 1948 John Burchard described the emergence of such research entities during the war, characterizing them as "devices which we are using to handle group research—and to stimulate individual work.... These are interdepartmental organizations which

³⁹ This term appears in a review of the life and works of Herbert Read. See David Thistlewood, "Herbert Read," in *Prospects: The Quarterly Review of Comparative Education* [Paris, UNESCO: International Bureau of Education] vol. 24, no. 1/2 (1994): 380, 382.

coordinate activities of various departments in important fields of overlapping interests.”⁴⁰ Not surprisingly, Kepes, backed by the School of Architecture, wanted just such a place.

This was not simply careerism, although careers and egos were certainly involved. Rather, the Center was one of several steps taken by the School of Architecture in the early 1960s to establish something approaching the equality between the arts and sciences that MIT had committed itself to in 1950 with the founding of the School of Humanities.⁴¹ In the flurry of letters, reports, memos, and grant proposals produced prior to the opening of the Center is a constant theme of a future art-and-science harmony unnecessarily forestalled. In general, the arguments made to promote this harmony do not demonstrably *progress*; they simply *re-circulate*, echoing through the years. Therefore in 1949 the MIT Committee on Educational Survey worried that “students today must wrestle with accumulations of knowledge...far greater than those of their predecessors. Not only must they be trained for a vocation, but they must be made to recognize that the growth of science

⁴⁰ John E. Burchard, *Q.E.D.: M.I.T. in World War II* (Cambridge, Mass.: Technology Press, 1948), 318.

⁴¹ This included the establishment in 1966 of an undergraduate degree program within the Department of Architecture with sub-areas in architecture, building technology, visual arts, and history and theory. At the same time, the professional degree program that MIT had always offered in architecture shifted from a bachelor’s to a master’s degree. Caroline E. Jones, “A brief history of the Visual Arts programs at MIT,” unpublished report, School of Architecture and Planning, MIT. In the late 1970s, the institute established the Master of Science in Visual Studies, which has attracted artists interested in an alternative to the traditional Master in Fine Arts. This new degree was an initiative of Nicholas Negroponte, Otto Piene, and Richard Leacock, but Kepes’s courses in “Visual Fundamentals” and, later, in “Visual Design,” clearly laid the groundwork for its emergence.

and technology has a profound impact on society at large.”⁴² In 1964 a similar idea is expressed in an unsigned report (likely co-authored by Kepes and Lawrence Anderson) as a double bind:

We want to convey the great urgency of this task. To develop our value judgments, our sense of the qualities of life, in scale with the explosion of knowledge and power—this is the crisis our culture is experiencing. Art in its best moments speaks a language that conveys a deeper sense of life; it can enrich twentieth-century values only if it comes to terms with science.⁴³

The topic of interdisciplinary studies was a similarly consistent preoccupation. Therefore in early 1967, when Kepes was preparing for a crucial meeting to determine the fate of the proposed Center, Dean Anderson wrote him a long letter filled with what appear to be talking points. After extolling the benefits of an integrated arts and science program, he encourages Kepes to remember that, “We [the professors at MIT] are breeding a race of young men with prodigious capacity for mental adventure. The essence of their education has been to disregard the jurisdictional boundaries of the disciplines and to look truth in the face wherever it may be found.”⁴⁴ I have chosen this reference from a host of others because it effectively demonstrates the complexities inherent to Kepes and his peers’ propagation of an interdisciplinary “ethic.” In Anderson’s statement these

⁴² *Report of the Committee on Educational Survey to the Faculty of the Massachusetts Institute of Technology* (Cambridge, Mass.: Technology Press, 1949), 89.

⁴³ Department of Architecture, “A Program for the Visual Arts,” p. 1. Center for Advanced Visual Studies, MIT.

⁴⁴ Lawrence B. Anderson to Gyorgy Kepes, 3 February 1967, p. 2. Institute Archives, MIT, Office of the Provost, AC8, box 193.

complexities are, for the most part, subtextual. For instance, a reference to colonialism, while unintended, is certainly implied in the pairing of eugenics and “adventure”; likewise, the disregard of “jurisdictional boundaries” suggests a kind of privilege-bound entitlement. And even the prospect of confronting truth “in the face” comes across with a degree of barely-submerged aggression. These subtexts, I wish to suggest, were not necessarily indicative of the specific drives that generated the Center, but they were part of the culture out of which it emerged.

Unlike the Princeton-based Institute, which was (and is) internally interdisciplinary (with researchers collaborating and working independently within the fields of history, mathematics, and the natural and social sciences), the interdisciplinary aspirations of the Center for Advanced Visual Studies were to be fulfilled by creating outside alliances within the greater MIT community. In practical terms this meant that artists would need to establish ties across Massachusetts Avenue, since the building that had been designated for the Center was located opposite the main campus. The physical distance between the Center and its prospective collaborators, while small, was not insignificant. This is because, with some exceptions, the hierarchy at MIT descends from the Infinite Corridor—that long but far from infinite hallway we visited in Chapter Three from which branched, among many endeavors, the Hayden Gallery.⁴⁵ In Anderson’s view, this apparent detriment was actually in the Center’s favor, as he explains to Kepes. “Your Center

⁴⁵ The most prominent academic departments, generally in the physical sciences and engineering, branch off this hallway. A notable exception is the Media Lab, which established its own freestanding building in 1985.

will be playing the key role: *implanting* and *activating* in the M.I.T. environment the highest quality of...talent in art that we can find, and *seeing to it that this small group establishes communication with its counterpart talent from science, engineering, and management.*"⁴⁶ The Center and its artists had a job to do, a job that concerned actualizing the bonds that had been prophesied by Kepes and his like-minded peers for the better part of two decades.

The Spring of '68

If cross-disciplinary alliances established the purpose of Kepes's new enterprise, then the premise behind its official debut indicated the likelihood of its success. In March 1968 the new Center for Advanced Visual Studies joined forces with the equally new Center for Theoretical Physics. They came together for a "Symposium on Science and Art" and a joint dedication. The event took place in Eero Saarinen's Kresge Auditorium (1950–55). A scientifically conversant critic in attendance described the symbolism implied by the event site and its physical organization. "Downstairs: art, technology and form making—under debate by two sculptors, a historian of metallurgy, an accelerator builder and an art historian. Upstairs: nuclear matter and field-current identities being examined by two Nobel Prize winners in physics. Two cultures, under the single roof that unites them triumphantly."⁴⁷ The roof that

⁴⁶ Lawrence B. Anderson to Gyorgy Kepes, 3 February 1967, p. 2. Institute Archives, MIT, Office of the Provost, AC8, box 193. Emphasis added.

⁴⁷ Grace Marmor Spruch, "A Report on a Symposium on Art and Science Held at the Massachusetts Institute of Technology, March 20-22, 1968," part two of "Two

encompassed this triumph is a thin-shell concrete dome—an eighth of a sphere that resembles a triangle gracefully curved to stand on its three points. Between the grounded points are floor to ceiling glass-paned exterior walls (fig. 96).⁴⁸ In 1968 the Kresge Auditorium was MIT at its most progressively modern.

There to officiate the joint celebration was MIT President Howard W. Johnson, who delivered the opening address. Johnson's words must have pleased and even vindicated the artist who, as a newly appointed professor in the late 1940s, had gone "like a bulldog who never gives up from one laboratory to the other" in search of photographs.⁴⁹ This is because Johnson couched the social purposes of the newly formed Centers in the language of "wholeness":

The occasion of a dual dedication of the Centers for Advanced Visual Studies and for Theoretical Physics allows us a rare opportunity to celebrate the wholeness of man—his learning, his experimental approach to life—his appreciation of what he is and what he may become.

Such a holistic sense of learning—the awareness of interdependence—is not hard to understand. But it is very difficult to achieve. The principle

Contributions to the Art and Science Muddle," *Artforum*, vol. 7, no. 1 (January 1969): 28. Spruch was a research scientist in physics at New York University.

⁴⁸ Saarinen reportedly demonstrated his idea for the building by carving a grapefruit served to him at breakfast. *Art and Architecture at MIT: Walking Tour of the Campus* (Cambridge, Mass.: MIT, Committee on the Visual Arts, 1982), 44. The resulting dome was part acknowledgement, part disavowal of the domes that hover over Buildings 7 and 10, creating the campus's main axis. (The dome for Building 10 was designed by Welles Bosworth in the 1910s; the dome for Building 7 was added in 1934 based on a design by Bosworth and Harry J. Carlson.) Saarinen placed the Kresge Auditorium off-axis from these buildings to highlight the difference of his "organic" practice from what he described as the Bosworth buildings' "pseudo-classic sterility." *Ibid.*, 15.

⁴⁹ Gyorgy Kepes, "Sermon for Tranquility: An Interview with Gyorgy Kepes," interview by Robert C. Morgan, *Afterimage*, vol. 10, no. 6 (January 1983): 7.

should not be one of permitting branches of man's quest for knowledge to exist side by side—even as equals. The principle should be that the whole to be sought is greater than the sum of its parts. In a real sense, M.I.T. has always been an institution that has sought such interdependence—not only in understanding, but in action. But over the past two decades, especially, a new order of awareness has been created by the demands of a rapidly changing society and by the complications caused by dissonant matching of men's aspirations and achievements.⁵⁰

Yet despite declarations of new interdependence, to some commentators the two parts that made up the “Symposium on Science and Art” seemed to reveal a split that paralleled the upstairs-downstairs arrangement organizing the event. Grace Marmor Spruch—a physicist recruited by *Artforum* to write about her experience as a symposium attendee and the scientifically informed critic referred to above—captured this split with deadpan aplomb. What she witnessed was a fair amount of confusion and disagreement both on the panels and in the audience. Even when deferring to the dedicatory theme, the speakers remained, for the most part, at cross-purposes. Therefore in the morning session the physicist Robert Wilson (who was in charge of building “the world's largest accelerator, at Weston Illinois”) spoke of the responsibility that scientists bore, as Spruch paraphrased it, “of making things esthetically pleasing.” This is because, “Ugly science usually does not work.”⁵¹ In contrast, the sculptor Harold Tovish (who was the first Fellow to occupy a studio at the Center in November 1967) confessed to, as Spruch relays,

⁵⁰ Howard W. Johnson, “Dedication of the Center for Advanced Visual Studies and the Center for Theoretical Physics,” unpublished dedicatory address delivered at the Kresge Auditorium, MIT, 20 March 1968. Center for Advanced Visual Studies, MIT.

⁵¹ Grace Marmor Spruch, “Report on a Symposium,” 28.

an attitude toward technology that is ambivalent, if not schizophrenic; it consists of an awe based on the vague fear that scientists “are out to get us.”... He admitted that scientists have produced “all sorts of wonderful things like TV,”...and he is even working on a piece of sculpture called *Accelerator* “which won’t function like Wilson’s.” Nevertheless, he complained that when he has a part of a sculpture made in a foundry, what comes back is decidedly below expectations, when “they can turn out 90 mm shells like cookies.”...

...The session ended with Tovish deeming the huge radar dish in Puerto Rico “superb,” and [the artist Otto] Piene expressing admiration for the artistry of television towers. One came away with the definite impression that the scientists in the group looked upon art as being more important than science to man, while the artists thought the reverse.⁵²

The afternoon session addressed the subject of communication, but this seemed only to compound the problem:

We went away from this session on communication with the feeling that a large segment of the audience had not been able to quite figure out what the panelists were trying to communicate. We hoped the people upstairs had fared better with the nucleon-nucleon interaction and effective forces in nuclei, and the problems of weak interaction theory, as presented by Gerald E. Brown and Murray Gell-Mann. We understood they had difficulty with the slide projector, however. There were complaints about the day’s sessions being parallel—from the physicists.⁵³

Spruch ends her account by describing the open houses that took place at the respective centers following the last panels. Her description is worth quoting, not only because it allows us to gain a sense of the physical experience of Kepes’s Center, but also because it lends credence to two issues that have begun to surface regarding the nature of “advanced visual studies” in this context. The first issue concerns the fact that the Center was actually not at the center—the warren of interconnected buildings that house the majority of MIT’s academic departments. Indeed, it can be argued that

⁵² Ibid., 28-29.

⁵³ Ibid., 31.

the Center owed its existence to this distinction. From the proposal stage of the Center's establishment it was understood that participating artists would be working from the outside in, creating the by-now mythic greater whole from disparate parts.

The second issue that Spruch addresses—it is actually the main premise of her piece—is that scientists had taken on some of the characteristics of artists (for instance in their concern for aesthetics and human culture) and the artists' studios had adopted something approximating the look of scientific labs. Therefore, upon entering the Center for Advanced Visual Studies, she encountered:

Bare composition floors, stark white walls and partitions setting off photographs and designs. Flashing lights, filters, projectors, brass and steel constructions, wires, magnets, motors, an exhibition on light and motion. A polyethylene tube coiling like some immense transparent python, ingesting its meal of air from a floor pump. A stairway leading down to a lower level to accommodate huge balloons suspended from the ceiling, reminiscent of accelerator rooms in physics laboratories. Then, a machine shop, replete with drill press and milling machine. We came upon Harold Tovish furiously jabbing at a large black box with a screwdriver.⁵⁴

To reach the Center for Theoretical Physics, Spruch proceeded to “the enormous main building of M.I.T. [which] had been done over to make the center. The entrance was like that of a plush art gallery. A wire sculpture hung from the ceiling. Carpeting flowed out of the offices into the corridor from wall to distant wall. Paintings. ‘This place looks like a visual arts center,’ someone was heard to say.”⁵⁵

The aesthetic differences Spruch noted between the two centers extended to their campus identities. The Center for Advanced Visual Studies generally maintained

⁵⁴ Ibid., 32.

⁵⁵ Ibid.

a public presence by organizing exhibitions, symposia, and outdoor events. At the same time, Kepes's books—particularly the recently published Vision + Value series, a multi-volume set that appeared in 1965 and 1966—were being marketed to readers interested in “the reintegration of our contemporary scientific, social and artistic environment” (fig. 97).⁵⁶

Judging from the press coverage these books received, most of Kepes's readers came from art, design, and architecture circles. The Vision + Value series, whose critical reception will be addressed below, can be understood as an extended reiteration of *The New Landscape in Art and Science*. The series was organized into six subject areas, each of which comprised one volume. In order of appearance these were *Education of Vision*; *Structure in Art and in Science*; *The Nature and Art of Motion*; *Module, Proportion, Symmetry, Rhythm*; *The Man-Made Object*; and *Sign, Image, Symbol*.⁵⁷ It was as if the Vision + Value readers were invited to review illustrated records of the MIT seminars that Kepes began to organize in the mid-1950s. Indeed, these seminars, for which Kepes devised a general subject and then invited guest speakers to give presentations, actually generated the book series. Characteristic of Kepes's eclectic interests, the speakers came from a wide array of

⁵⁶ Advertisement for the Vision + Value series, which appeared in *Art in America* 56, no. 1 (January-February 1968): 81.

⁵⁷ *The Education of Vision*; *The Nature and Art of Motion*; and *Structure in Art and Science* appeared in 1965; *The Man-Made Object*; *Module, Proportion, Symmetry, Rhythm*; and *Sign, Image, Symbol* in 1966. In 1972 the seventh and last volume appeared, *Arts of the Environment*, but its smaller format (a cover dimension of 9 1/2 x 8 in. compared to the 11 x 9 in. for each of the previous volumes) distinguishes it from the group. All were edited by Kepes and published by George Braziller, New York. Kepes had originally planned ten volumes.

disciplinary areas, particularly the physical and social sciences, architecture and urban planning, and the visual arts. Some of the seminar speakers contributed to the Vision + Value books and other submissions were solicited to fill out the various subjects. There are contributions from Kepes's longstanding alliances—for instance, Rudolf Arnheim's essay "Visual Thinking" opens *Education of Vision*.⁵⁸ And Kepes's sustained interest in the social relevance of natural patterns is evident in Lancelot Law Whyte's contribution to *Structure in Art and in Science*, which is entitled "Atomism, Structure and Form."⁵⁹ Most of the volumes in the series include sections of "Visual Documents" that can be compared to the ways in which Kepes organized photographs in *The New Landscape in Art and Science*, juxtaposing images from disparate sources to demonstrate visual similarities.⁶⁰

In contrast to the public presence that Kepes and the Center for Advanced Visual Studies sought to cultivate, the Center for Theoretical Physics took a different approach, establishing a significantly lower profile. It did so not because it wished to downplay its activities, which, being dedicated to "pure" science were less apt to draw the criticism of students and professors opposed to military research. (There will be more to say about this dissent presently.) Rather, the Center for Theoretical

⁵⁸ Rudolf Arnheim, "Visual Thinking," in Gyorgy Kepes, ed., *Education of Vision* (New York: George Braziller, 1965), 1-15.

⁵⁹ Lancelot Law Whyte, "Atomism, Structure and Form," in Gyorgy Kepes, ed., *Structure in Art and in Science* (New York: George Braziller, 1965), 20-28.

⁶⁰ These collections of images appear in *Structure in Art and in Science* (pages 1-19); *The Nature and Art of Motion* (pages 1-23); *Module, Proportion, Symmetry, Rhythm* (pages 75-101); *The Man-Made Object* (pages 9-29); and *Sign, Image, Symbol* (pages 15-41).

Physics kept a lower profile because it could. It never had to worry about its legitimacy or, for that matter, include the word “advanced” in its name. “Theoretical Physics” was clearly advanced enough, and self-evident headiness begot stability. In contrast, the Center for Advanced Visual Studies found it necessary to explain and market itself somewhat incessantly. The Centers’ distinct identities are brought home by a cursory comparison of the first few reports that each was required to submit annually to the MIT administration. (These reports were then incorporated into the Report of the President, an annual issue of the *MIT Bulletin*.) Those for the Center for Advanced Visual Studies ticked off the year’s accomplishments. Even setbacks were recast as successes at the level of the “theoretical dimension.”⁶¹ In contrast, the reports generated by the Center for Theoretical Physics were brief to the point of nonchalance.

* * *

The mission of the Center for Advanced Visual Studies was to foster a positive, optimistically forward-thinking presence on campus—a presence that was, I contend, an unspoken requirement of its continued administrative support. This placed it in an odd relationship to the student unrest that began to emerge soon after its springtime dedication. As the historian Dorothy Nelkin has shown, prior to 1968, MIT did not have a history of political activism.⁶² Nevertheless, by the mid-1960s a

⁶¹ Gyorgy Kepes, “The Center for Advanced Visual Studies,” *MIT Bulletin*, Report of the President issue, 1969, vol. 105, no. 3 (December 1969): 436.

⁶² Dorothy Nelkin, *The University and Military Research: Moral Politics at M.I.T.*, The Science, Technology, and Society Series (Ithaca: Cornell University Press, 1972), 10, 101.

growing number of students and faculty were beginning to express disapproval of MIT's engagement in weapons-related research. That the MIT administration was aware of this concern is evident in its annual report for 1967. The author of the report, MIT's President Johnson, writes of "the historic force that is M.I.T."⁶³ To characterize this force he lists what he believes are the Institute's "major concerns." The first pertains to its "primary focus on enlarging the horizon of science and the development of technology and its applications to our society."⁶⁴ Other concerns address "the nature of our physical environment and the means to explore and control it" and "the nature of life and health."⁶⁵ The last of Johnson's concerns is considerably less succinct, but it is worth citing because it captures the contradictions inherent to the university's increased financial dependence on and intellectual commitment to government-sponsored military research. These are the contradictions that eventually brought students out in protest. As we shall see, their concerns at once complicated and validated the project of the Center for Advanced Visual Studies. As Johnson writes,

M.I.T. has a major concern with the social, economic, political, and administrative problems of our society and seeks to contribute to the body of knowledge aimed at their solutions. Progress in the social and human relationships, whether at a world level or a community one, has been sadly slower than progress in areas of science and technology. At M.I.T. we believe that the two tracks relating to the human and technical sides of man's

⁶³ Howard W. Johnson, "Report of the President," *MIT Bulletin*, Report of the President issue, 1967, vol. 103, no. 3 (December 1967): 1.

⁶⁴ *Ibid.*, 2.

⁶⁵ *Ibid.* 4-5.

advancement need to be joined more effectively if real progress is to be made in the future in either area.

At an entirely different level of observation...it is almost impossible for the scholar not to be troubled by the presence on the campus of research or information or activity that is classified. Such work goes against the grain of the openness of intellectual dialogue and debate. Yet in the real world in which important work in some fields must have access to classified information, or, even more importantly, where the country may call on us for help in what we regard as appropriate extensions of our academic work, exceptions have been made, and in the future will be made again. To seek to understand the conditions under which M.I.T will undertake these exceptions, a serious study of this whole problem was undertaken by the Academic Council and by the Faculty Committee on Education Policy.⁶⁶

In this statement Johnson sought to disassociate the university's commitment to finding solutions for local and global problems from the necessities inherent to the "real world." Of course both the search for solutions to social problems and the advancement of military research belonged to the domain of applied science. And Johnson's attempt to resolve this rhetorical contradiction by appealing to "an entirely different level of observation" was likely received with deep skepticism by his opponents. It was in this conflicted context that the Center for Advanced Visual Studies promised to make connections to scientists and engineers *and* foster a general interest in the use of vision for social "orientation" and unity.

In the fall of 1968 rising concern about MIT's military research became part of the widespread opposition to the Vietnam War when "Resist," a national draft resistance organization, used an MIT building to protect an AWOL serviceman. By the end of the year, Johnson, who several months earlier had officiated at the dedication for Kepes's new Center, assumed a more difficult task as the administrator

⁶⁶ Ibid., 7-8.

in charge of responding to an emerging campus-wide crisis. As he writes in December 1968, “The problems that bedevil society today, that tear at its heart, and that reflect and magnify themselves on campuses, relate to the basic arrangements for living in a modern world. It is necessary but insufficient thinking, I believe, to relate them wholly to crises in the international situation—the [Vietnam] war—or in the domestic situation—what has been aptly called the white problem.”⁶⁷ Early in the crisis, that is, Johnson sought to approach the protests abstractly, as if war and racism were simply the unfortunate echoes of modern man’s greater struggle.

But the protesting students and faculty members were quite specific about what they found wrong with their immediate surroundings. Indeed, they reserved their greatest consternation for the Instrumentation and Lincoln Laboratories, which conducted applied research that provided a direct-feed to the military.⁶⁸ In 1969 the Instrumentation Laboratory received \$54.6 million from the Department of Defense and the National Aeronautics and Space Administration. This was one-quarter of MIT’s total operating budget.⁶⁹ The Lincoln Laboratory was slightly less

⁶⁷ Howard W. Johnson, “Report of the President,” *MIT Bulletin*, Report of the President issue, 1968, vol. 104, no. 3 (December 1968): 2.

⁶⁸ The Instrumentation Laboratory (originally known as the Confidential Instruments Development Laboratory) was established at MIT during World War II by Charles Stark Draper, a professor in MIT’s Department of Aeronautics and Astronautics. It specialized in the development of ballistic missiles. Of particular concern to activists was the lab’s involvement in the Poseidon missile. For several projects Draper and the Navy agreed on a “womb to tomb” involvement. This meant that the Instrumentation Laboratory, as Dorothy Nelkin notes, “was to work out theory and design, build engineering models, and test the system for production.” Nelkin, *The University and Military Research*, 39.

⁶⁹ *Ibid.*, 2.

controversial. It was not on campus and did not assemble weapons, but it was nonetheless provocatively described in *Time* magazine as having invented “a foliage-penetrating radar that detects Viet Cong hiding in the jungle.”⁷⁰ And what was known of the activities of both labs generally remained shadowy—both were released from the responsibility of disclosing the exact nature of their current and future projects, a policy that blatantly contradicted the university’s traditional commitment to the free exchange of ideas.

By the end of 1968 there were few traces left of the postwar confidence in and enthusiasm for what the dean of MIT’s School of Humanities, John Burchard, described in 1948 as “the ferment of ideas, the prevailing temper to re-evaluate and to strike out in new directions, and the broadened concept of the institution’s responsibilities.”⁷¹ Indeed, by early 1969 the protestors were expressing something very different. On 3 March 1969 the Science Action Coordinating Committee orchestrated a campus-wide work stoppage. And in November 1969 there were three-days of protests that included the occupation of the student center, marches through and speeches in the administration building, and an attempt at blocking the doors of the Instrumentation Lab. A placard in a photograph taken at one of these protests asks, “How does MIT serve ‘The Human Purpose?’” (fig. 98) As this image suggests, the protestors had learned the rhetoric of humanism and had found it lacking.

⁷⁰ “M.I.T. and the Pentagon,” *Time*, 7 November 1969, 48-49.

⁷¹ John E. Burchard, *Q.E.D.: M.I.T. in World War II*, 314.

By late 1969 Johnson acknowledged that, “the active concerns of contemporary man...are swarming in upon us through every door and window and influencing the thinking and the behavior of the community as a whole and every one of us here, from the youngest freshman to the president. This represents a profound change in the role of the American university.”⁷² Not surprisingly, his “major concerns” of 1968 had become searching questions. One reads, “Will we be wise enough and reasonable enough to choose the proper course for action, and to move along it together toward real and lasting progress?”⁷³ The week after the November “siege,” *Time* devoted an issue to the antiwar protests, proclaiming a “Counterattack on Dissert” on its cover. This headline appeared poised over two columns of headshots flanking a photograph of the Washington Memorial towering over a protest (fig. 99). The left column pictures Spiro Agnew, Richard Nixon, and Dean Burch (then the newly-named chairman of the Federal Communications Commission); the right column is dedicated to pictures of the “unelected elite,” Agnew’s recently coined phrase for the news media (among them Walter Cronkite and David Brinkley). Yet when Johnson published his report on MIT’s most tumultuous year, he seems to have come to a resolution about how to administer the crisis, and it was not by either attack or “counterattack.”

The university is in the middle of a public cross fire standing out in the open. It has purposely developed no armor, no moats, no walls because that would have destroyed its openness. As I said to the faculty on the eve of a three-day

⁷² Howard W. Johnson, “Report of the President,” *MIT Bulletin*, Report of the President issue, 1969, vol. 105, no. 3 (December 1969): 1.

⁷³ *Ibid.*

assault on the Institute last November: “We are vulnerable, we were created vulnerable, and we will remain so as long as we are free.”⁷⁴

In fact Johnson had reason to feel a degree of resolution. This is because on 20 May 1970 MIT had announced its decision to divest from the Instrumentation Laboratory. The Lincoln Laboratory remained active, but it shifted its priorities and became slightly more accountable. Neither side was satisfied, but the partial divestment had effectively diffused the protests.

I have described these events in some detail not only because they provide a view to the social context of the Center but also because of the story they tell about the period’s acute generational conflict. No doubt Johnson was at odds with the students, but he was not an unsympathetic character. In one magazine article he was “the man who cooled M.I.T.”⁷⁵ One of the most vocal faculty members involved in the protests, Noam Chomsky, described the MIT president as “an honest, honorable man.”⁷⁶ Johnson was, like Kepes, a humanist. He may even have shared most if not all of the values and convictions held by his outspoken opponents. In 1971 Johnson stepped down as MIT’s President and assumed a part-time position as chairman of the MIT Corporation. His replacement was Kepes’s friend Jerome B. Wiesner, an electrical engineer with a long MIT association who had been Provost since 1966.

⁷⁴ Howard W. Johnson, “Report of the President,” *MIT Bulletin*, Report of the President issue, 1969-1970, vol. 106, no. 2 (September 1971): 7. The university may not have had armor or moats but the Instrumentation Lab had “Stout screens [covering] the windows...and two-by-fours on hand to bar the doors.” “M.I.T. and the Pentagon,” *Time*, 7 November 1969, 49.

⁷⁵ “The Man Who Cooled M.I.T.,” *Time*, 21 November 1969, 68.

⁷⁶ *Ibid.*, 72.

Wiesner was Johnson's choice of successor and was known for his outspoken opposition to the "thrall of military-industrial interests."⁷⁷ In his final annual report Johnson writes of his desire for "a unity of liberal education," of the need for "this oneness of education."⁷⁸ In short, his position had not changed much from the spring of 1968 when he stood in front of an audience of artists and scientists in the Kresge Auditorium and spoke of "wholeness."

Into the Center

The building that had been designated for the Center was MIT's former student bookstore at 40 Massachusetts Avenue (fig. 100).⁷⁹ Its renovation was handled by the architectural firm of Marvin E. Goody and John M. Clancy. Goody taught in the Department of Architecture. In a letter to a journalist he describes the building as consisting of "three painting studios, two sculpture studios, a light and color studio, and ancillary spaces such as dark rooms, shops, offices, etc."⁸⁰ The "light and color studio" was Kepes's space. A photograph that likely dates from 1968, soon after the

⁷⁷ "Transition at M.I.T.," *Time*, 15 March 1971, 51. See also Jerome B. Wiesner, *Where Science and Politics Meet* (New York: McGraw-Hill Book Co., 1961).

⁷⁸ Howard W. Johnson, "Report of the President," *MIT Bulletin*, Report of the President issue, 1971, vol. 107, no. 2 (September 1972): 7.

⁷⁹ The Center was forced to move from 40 Massachusetts Avenue in the mid-1980s. It has since occupied a number of sites, although it has never again had a building of its own. Presently it is housed in a section of an off-campus building at 265 Massachusetts Avenue next to the MIT Museum. 40 Massachusetts Avenue has become an inter-denominational facility for campus-based religious groups.

⁸⁰ Marvin E. Goody to Anne Wilson [of *Architectural Forum*], 29 February 1968. Center for Advanced Visual Studies, MIT.

Center occupied the building, shows a sizeable room viewed at an angle that frames a swath of dormer-like windows (fig. 101). The photographer was Kepes's longtime assistant, Nishan Bichajian, who copiously and quite formally documented the Center, its activities, and its people. Bichajian's format was the 8 x 10 black-and-white. And he took so many photographs—of studios, people, and artworks—that his practice comprises much of the visual record left behind by the Center from its early years.⁸¹

Except for dramatic fenestration, the room Bichajian captured is bracingly austere. This is not a room that contains signs of the campus strife just outside. Likewise, there are also no hints of the visual cacophony encountered by visitors to the Center's first open house, although a later photograph, from 1972, shows a significantly more lived-in space (fig. 102). Yet in 1968 Kepes's studio was like a stage-set—a study of rectilinear forms seen at an angle. In addition to the windows, rectilinearity presents itself in the shape of two expansive tables, wide floorboards, a heater, and slop sink. Of all the objects and shapes that comprise the room, including the dramatic windows, it is the sink that is most suggestive of an artist's studio. Of

⁸¹ Although his style is comparatively more formal, Bichajian can be likened to the New York photographers Peter Moore and Babette Mangolte who were also active during this time. Each made an abundance of black-and-white photographs of ephemeral artworks and performances. Moore and Mangolte captured what are now considered to be landmark events in the history of Fluxus, Grand Union, and the Judson Church. Rarely acknowledged, these photographers have nonetheless greatly impacted how we know this period. For a selection of photographs by Moore and Mangolte see, Hendel Teicher, ed., *Trisha Brown: Dance and Art in Dialogue, 1961-2001*, exh. cat. (Andover, Mass.: Addison Gallery of American Art; Cambridge, Mass.: MIT Press, 2002).

course a human presence is also implied by the sundry objects and stacks of books, papers, and small boxes that rest on the tables.

Nonetheless it is the windows that were intended to signal “studio” from both the interior and the exterior of the space. These windows—there are three banks of them in the building—had been added by Goody in a bold attempt to capture architecturally Kepes’s career-long dedication to light. Each bank resembles a triangular “shed” that juts upward and away from the building’s otherwise strict horizontality. From the perspective of the exterior the result is only moderately successful, with the building as a whole appearing top-heavy and bunker-like. Yet from the interior, Kepes’s studio/office had much to offer in terms of a useable space—most notably ample walls and light.

Bichajian took a second view of the same room as it appeared in 1968, this time moving into it so that the peaked form of the windows is no longer visible (fig. 103). As if to compensate for this loss of natural light, four framed photographs—all likely by Kepes—have appeared, propped on the table against the wall. The three that sit side-by-side resemble abstract light studies of which Kepes made many. So many in fact that they are particularly difficult to identify or date, although it is possible that the three placed close together belong to a series that Kepes referred to as “high-speed photographs” made in the late 1940s and throughout the 1950s. Speed in this instance indicated not “fast” film but the manipulation of a light source or object in front of the camera.

The single photograph offset from the group of three is the distinctly calligraphic *Photo-Drawing* of 1957 (fig. 104).⁸² This black-and-white image was likely created using a hybrid cliché-verre/photogram technique. It presents knots of calligraphic lines of various thicknesses that appear to tumble through the center of image. The lines mimic ideographic signs and therefore, in addition to drawing, they reference writing and, by extension, writing's relation to drawing. But the possibility that one gestural clump of lines or another could coalesce into an ideogram, readable by the observant viewer, is counteracted by the bold, thick, and densely black stripe that crosses the image from left to right at a shallow diagonal. Slicing through this stripe is a single white disk, an exceedingly elegant intervention that contributes to holding the image (should there ever have been any doubt) in the realm of Art. In this context the calligraphic notations found in this *Photo-Drawing* function as a signature representing Kepes's artistic identity in an otherwise spare room.

Yet these earlier photographs by Kepes, captured within a photograph by his assistant, also suggest an important aspect of Kepes's late practice. In the 1960s he began to characterize the medium of photography as important to his past but not to his present. This hiatus from the practice of photography is evident in the fact that Kepes chose to decorate his office with photographs that were at least a decade old. This did not mean that he no longer utilized photography. In fact we will see two of the ways that it figured in his work at the Center. But the degree to which he distanced himself from the photographic medium around the time of the Center's

⁸² The (MIT) Hayden Gallery catalogue incorrectly lists the date of this work as 1942. *Gyorgy Kepes: The MIT Years: 1945-1977* (Cambridge, Mass.: MIT Press, 1978), 32.

founding is clearly stated in an interview he gave in 1983. During this interview he confirmed a shift in his work by remarking, “I’m not a photographer. I made excursions into photography because it’s exciting—maybe the most potent exploration in the visual arts in the last 30, 40, or 50 years—but my heart was never really in photography.”⁸³ This is a bold assertion from an artist whose reputation, particularly as it is established within museum collections, rests primarily on his photographic practice. Kepes explains to the interviewer why he no longer considered himself to be a photographer. This is because, “Photography puts a screen between you and the work.”⁸⁴ This is an intriguing comment. It equates “the work” with “the world out there,” with the “stuff” of “life” that is fodder for incorporation into representation, while also implying that “the work” is synonymous with the selective, ordering process that representation necessarily is. What we might have expected Kepes to say is that “photography puts a screen between you and the thing being represented.” Yet even this hypothetical “correction” mixes the language of photography with that of film. The remainder of this chapter is concerned with demonstrating how Kepes’s comment—his attempt to dissolve the “screen” that is representation—reflects his late practice.

This task will ostensibly take us far outside the bounds of the photographic medium, but photography will nonetheless remain ever-present. To understand why this is so we need to consider the main hallway of the Center for Advanced Visual

⁸³ Gyorgy Kepes, “Sermon for Tranquility: An Interview with Gyorgy Kepes,” interview by Robert C. Morgan, *Afterimage*, 10, no. 6 (January 1983): 6.

⁸⁴ Ibid.

Studies. In the absence of an exhibition space in the Center, Kepes lined the hallway with a rotating selection of blown-up photographs mounted on board (fig. 105).

Sometimes these images were derived from scientific sources. Indeed, some of the mounted photographs were the same images that appeared in *The New Landscape* exhibition. Also presented in the hallway were Kepes's own photographs (principally light studies and photograms) or photographic documents of his works in other media. Finally the hallway featured photographs of works by the Fellows, who were mostly sculptors, not photographers. Kepes resorted to photography, just as he resorted to the hallway as an exhibition space, because he lacked space. The artworks he most wanted to create were environmental sculptures that were intended for the out-of-doors, free from the limits of the gallery space.

In 1967 Kepes appointed the first "Fellows"—the artists Will A. Garnett, Otto Piene, Vassilakis Takis, and Harold Tovish—each of whom was provided with a stipend and a studio in the building at 40 Massachusetts Avenue. The following year he added Ted Kraynik and Jack W. Burnham to this group. Takis left after a year and the artist Wen-Ying Tsai took his studio. In 1969 the filmmaker Stan VanDerBeek split his time between the Center and WGBH, known for its pioneering work in art video. These were the primary artists who were active at the Center during its first years of existence, 1967 to 1969.

It is beyond the reach of this study to provide an in-depth discussion of these artists. While Kepes acknowledged that each of the Fellows had an independent practice, what he was primarily interested in were group collaborations. Nonetheless, he still encouraged the individuals in question to pursue the "artist's free creative

exploration,” exploration liberated from the complexities of collaboration within the public realm.⁸⁵ For reasons that will become apparent, solitary exploration was often an easier route to pursue. General comments on the nature of their independent activities follow. I have provided the artists’ birth dates in this section to demonstrate that Kepes stayed true to his commitment to appoint “mature” artists—artists past the age traditionally associated with “emergence.” He also chose artists from around the world, to some degree creating a microcosm of the global unity he so desired.

The German artist Otto Piene (b. 1928) was known at the time of the Center’s establishment for his light sculptures (fig. 106) and for the founding of Group ZERO in 1957 with Heinz Mack.⁸⁶ At the Center Piene developed monumental inflatable sculptures, which were often enacted out-of-doors in participatory events (fig. 107). Of any artist, Piene has retained the closest and longest association with the Center, succeeding Kepes as director in 1974, a post he held for twenty years. A classically posed photograph of Piene, Kepes, and Harold Tovish shows them grouped near a model for a public sculpture (fig. 108). The model, which is shown resting on the floor, is probably by the Japanese artist Michio Ihara (b. 1928), who studied at MIT and became a Fellow in 1972. Characteristic of the graceful geometric materializations Ihara created, it consists of thin strips of metal placed upright and

⁸⁵ Gyorgy Kepes, “Center for Advanced Visual Studies,” *MIT Bulletin*, Report of the President issue, 1968, vol. 104, no. 3 (December 1968): 48.

⁸⁶ Group ZERO was based in Düsseldorf. As its name suggests, it sought to start from nothing, to make a new beginning. Its artists (Mack and Piene were joined by Günther Uecker in 1961) tended to work on a large scale using technology—light was their preferred medium.

organized in concentric circles. As the circles get smaller, the metal strips uniformly gain in height. The piece as a whole resembles the armature of a circus tent. Kepes is shown standing at the center, to one side of the model, so that its peak—which rises to about the height of his waist—rhymes with his upright, centered position. To his left and right are Piene and Tovish, kneeling in a demonstrable act of close inspection. The human triangle—three artists posed in an informal but unmistakable hierarchy—echoes the triangulated sculptural form.

The American photographer Will Garnett (b. 1916) is less easily knit into the fabric of the Center. His specialty was dramatic aerial photographs of landscapes, a number of which appeared in the brochure that accompanied the “Symposium on Art and Science” (fig. 109).⁸⁷ But his association with the Center was not a long or profound one like Piene’s.⁸⁸ Garnett was an emissary from Kepes’s photographic past. Vassilakis Takis (b. 1925), from Athens, is a sculptor who, at the time of his MIT fellowship, was interested in the sculptural representation of natural phenomena. A photograph of Takis in his studio shows him standing amongst an assemblage of

⁸⁷ Three of Garnett’s photographs appear in this brochure. Kepes chose aerial images that resembled the surface of the moon (*Hills near Paso Robles, California; Dunes, Death Valley*), choices that may have been influenced by a general anticipation of the moon landing that took place on 20 July 1969. Nonetheless, in a strategy codified in *The New Landscape*, these images also resemble the microphotographs featured in the brochure. Gyorgy Kepes, *The Center for Advanced Visual Studies*, inaugural brochure (Cambridge, Mass.: MIT, c. 1968), n.p.

⁸⁸ In retrospect it is not surprising that Garnett, whose practice required travel, would not have taken to the sedentary life of the artist’s residency. And beyond his photographic contribution to the Center’s inaugural brochure, he left no other traces behind of his time at MIT. Not surprisingly he was accidentally left off the Center’s twenty-fifth anniversary poster that was intended to list each of the Fellows.

wire sculptures and electronic devices that bring to mind Spruch's description of the Center as a laboratory (fig. 110). The same atmosphere is apparent in the studio of the Chinese artist Wen-Ying Tsai (b. 1928), which is filled with his *Cybernetic Sculptures*, clear descendents of Gabo's *Kinetic Construction (Standing Wave)* of 1920 (fig. 111, fig. 94). Tsai's *Cybernetic Sculptures* appeared in the Museum of Modern Art's 1968 exhibition *The Machine as Seen at the End of the Mechanical Age*.⁸⁹ Harold Tovish (b. 1921), from New York, devised anthropomorphic and frequently kinetic works that often took their inspiration from scientific concepts (fig. 112). In 1968 Jack Burnham (b. 1931) was a sculptor and critic. Today he is best known for his book *Beyond Modern Sculpture* (1968) and as the curator of the *Software* exhibition at the Jewish Museum in New York in 1970.⁹⁰ A photograph of Burnham taken at the Center shows him posed with his typewriter (fig. 113). While at the Center he made light sculptures and began writing his second book, *The Structure*

⁸⁹ The catalogue describes the *Cybernetic Sculptures* as being based on the "principle of the harmonic motion in a 'standing wave' produced by a vibrating rod.... Here, several units are grouped together. Their visual effect when in motion is continually modulated by high-frequency stroboscopic lights. The lights react to sound, such as that of a voice or the clapping of hands." K. G. Pontus Hultén, *The Machine as Seen at the End of the Mechanical Age*, exh. cat. (New York: Museum of Modern Art, 1968), 201.

⁹⁰ Jack Burnham, *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of this Century* (New York: G. Braziller, 1968). Burnham later critiqued his involvement in the art-and-technology movement of the 1960s and early 1970s. Jack Burnham, "Art and Technology: The Panacea that Failed," in *The Myths of Information: Technology and Postindustrial Culture*, ed. Kathleen Woodward (Madison, Wis.: Coda Press, 1980), 200-15.

of Art (1971).⁹¹ Ted Kraynik (b. 1917) made kinetic sculptures with light and sound effects, some of which relied on electronic displays (fig. 114).

In 1969 Kepes began to open up the Center to younger artists who received unpaid appointments and opportunities to work with the Fellows on their projects. The first women artists entered at this level. The sound artist Maryanne Amacher (b. 1942) appears to have been the first woman to be recognized as a full Fellow. Based on the annual reports filed by the Center this occurred in 1971 or 1972.⁹² Amacher is known for her innovative approach to art-making and musical composition. A news clipping dating from 1966, before her appointment to the Center, shows the artist standing next to a panel of telephone wires. The caption reads, “She hears a rhapsody” (fig. 115).

The artists Kepes chose for the Center participated in the efflorescence of kinetic and environmental art in the late 1960s and early 1970s. They were variously concerned with making artworks that utilized nontraditional media—particularly light and kinetic elements—and they frequently conceived of sculptures that were interactive and event dependent. A number of the Fellows participated in the

⁹¹ Jack Burnham, *The Structure of Art* (New York: George Braziller, 1971).

⁹² Gyorgy Kepes, “The Center for Advanced Visual Studies,” *MIT Bulletin*, Report of the President issue, 1971-1972, vol. 108, no. 3 (December 1969): 62. After Kepes’s retirement the male to female ratio became significantly more equitable, a shift that has gradually come to represent the Institute as a whole. In 1963 the earliest glimmers of this shift—and the obstacles it faced—is evident in a profile on the school that appeared in *Time*. “Hardly anyone imagines girls attending mighty M.I.T. Yet last week Tech, as Boston calls it, dedicated its first dormitory to go with its first women’s dean, an attractive blonde lured from nearby Radcliffe. As it turns out, Tech has 238 girls—all swimming fast and straight in a sea of 6,860 men.” “Where the Brains Are,” *Time*, 18 October 1963, 51.

exhibitions associated with kinetic and environmental art. As has been mentioned, Tsai participated in MoMA's exhibition *The Machine as Seen at the End of the Industrial Age*, as did Takis. Piene and Takis were invited to submit proposals to the Art and Technology Program at the Los Angeles County Museum of Art, but the museum was unable to come up with the necessary funds for Piene's project and no company was located to generate Takis's.⁹³ Most of the Fellows were represented in the exhibition *Explorations* at the National Collection of the Fine Arts in 1970, which was curated by Kepes. In addition, the Center for Advanced Visual Studies and its artists are included in contemporaneous books that chronicled technologically infused art. These include Jack Burnham's *Beyond Modern Sculpture* (1968), Jonathan Benthall's *Science and Technology in Art Today* (1972), and Douglas Davis's *Art and the Future: A History/Prophecy of the Collaboration between Science, Technology and Art* (1973).⁹⁴ Yet despite this early record, the Center for Advanced Visual Studies has been mostly overlooked in more recent books on electronic and interactive art.⁹⁵

⁹³ Maurice Tuchman, ed., *A Report on the Art and Technology Program of the Los Angeles County Museum of Art, 1967-1971* (Los Angeles: Los Angeles County Museum of Art, 1971), 322-25.

⁹⁴ Jonathan Benthall, *Science and Technology in Art Today* (New York: Praeger Publishers, 1972); Douglas Davis, *Art and the Future: A History/Prophecy of the Collaboration between Science, Technology and Art* (New York: Praeger Publishers, 1973).

⁹⁵ Neither Kepes nor the Center for Advanced Visual Studies is mentioned in the following surveys: Michael Rush, *New Media in Late 20th Century Art* (New York: Thames & Hudson, 1999); Christiane Paul, *Digital Art* (New York: Thames & Hudson, 2003); and Rachel Greene, *Internet Art* (New York: Thames & Hudson, 2004). An exception is Frank Popper's *Art of the Electronic Age*, which discusses

To understand what Kepes wished to accomplish with this group it will be useful to briefly return to the years when he was developing the idea for a “small institute of visual arts.” Although Kepes had been circulating this idea through MIT’s administrative channels since 1963, it made its first public debut—its first debut outside his immediate peer circle—in 1965, with the publication of his essay “The Visual Arts and the Sciences: A Proposal for Collaboration” in *Dædalus*.⁹⁶ This is an essay that Kepes published five years after the special issue of *Dædalus* that he edited on “The Visual Arts Today.”⁹⁷ In the earlier project Kepes was critical of Abstract Expressionism. By 1965 he sought to express disapproval of Pop and other

Kepes and includes a section on laser and holographic art that features the work of Harriet Casdin-Silver and Rockne Krebs, former Fellows at the Center. Frank Popper, *Art of the Electronic Age* (New York: Thames & Hudson, 1993), 12, 29-39. Popper was the curator of *Kunst Licht Kunst*, one of the earliest museum exhibitions of light art. See idem, *Kunst Licht Kunst*, exh. cat. (Amsterdam: Stedelijk, 1966). In addition, a recent essay by Joanna Drucker discusses the work of Jack Burnham and its importance to the conceptualization of this period. See Joanna Drucker, “Interactive, Algorithmic, Networked: Aesthetics of the New Media Art,” in *At a Distance: Precursors to Art and Activism on the Internet*, ed. Annmarie Chandler and Norie Neumark (Cambridge, Mass.: MIT Press, 2005), 34-59. One of the most interesting and provocative contributions to the history of art and technology is Pamela Lee’s *Chronophobia: On Time in the Art of the 1960s*. While I take issue with Lee’s contention that the fascination with time in the 1960s was demonstrably different from its prewar manifestations (see my n. 17, Chapter 3), her book suggests new and fruitful interrelationships between the various approaches to artmaking (kinetic art and minimalism, principally) during this period. Like Drucker, Lee writes about Burnham. She also briefly discusses Kepes and the Center for Advanced Visual Studies in relation to systems theory. Lee, *Chronophobia* (Cambridge, Mass.: MIT Press, 2004), 69-70 (on Kepes and the Center); 72-77 (on Burnham).

⁹⁶ Gyorgy Kepes, “The Visual Arts and the Sciences: A Proposal for Collaboration,” *Dædalus*, “Science and Culture” issue, vol. 94, no. 1 (Winter 1965): 117-34.

⁹⁷ Gyorgy Kepes, ed., *Dædalus*, “The Visual Arts Today” issue, vol. 89, no. 1 (Winter 1960).

contemporary artists who he felt had, like the Abstract Expressionists, retreated to “private attachments” (solipsism, soup cans, comics, and the like) in response to what he described as the increased scale of modern existence. As we will recall from Chapter Three, in the 1950s Kepes represented this belief in the scale of contemporary existence by displaying microphotographs in the exhibition *The New Landscape*. Within the polarized scale spectrum he set out to emphasize, it was the microscopic image that seemed to prove his point most dramatically—that the universe was ordered and modern man, whether he could see it or not, was part of this order.

But by 1965 Kepes’s perspective had shifted toward the very large. This is because he had come to believe that artists should make “art in civic scale,”⁹⁸ or “environmental” artworks, in order to demonstrate the same concept that the microphotographs had embodied—that the world was “an interconnected whole.”⁹⁹ The program for the “Art in Civic Scale” symposium demonstrates the idea of expansion graphically, with the letters “A” and “V” doubling as “arrowheads” from which project lines that run off the page (fig. 116).¹⁰⁰

⁹⁸ “Art in Civic Scale,” symposium program, 19 May 1971. Center for Advanced Visual Studies, MIT.

⁹⁹ Gyorgy Kepes, “The Visual Arts and Sciences,” 121.

¹⁰⁰ This design is characteristic of the Center for Advanced Visual Studies’ distinctive graphic identity. Although the Center’s ephemera—posters, invitations, and the like—lack design credits, they are primarily the work of Muriel Cooper, who is credited with designing most of the exhibition catalogues associated with the Center’s first decade. Cooper’s designs relied almost entirely on the bold display of text in large font-sizes; with the addition of arrows, the “Art in Civic Scale” brochure is among the more “decorative” early designs she created for the Center. Cooper had

This shift from the micro to the macro was an outgrowth of the engagement with urbanism that Kepes had cultivated with Kevin Lynch during the years 1954 to 1959, when they researched the “perceptual form of the city.” As we saw in Chapter Three, this research was, in turn, allied with Sigfried Giedion’s conceptualization of monumentality and the urban experience. In his 1944 essay “The Need for a New Monumentality” Giedion approvingly cited the phenomena of “civic spectacles” such as firework displays. Through such events, Giedion believed, “Community life is closely connected with a sense for relaxation, with the urge for another vivifying influence beside the job and the family, an influence capable of expanding men’s narrow private existence.”¹⁰¹ It was such efforts at expansion that Kepes had in mind when he acknowledged his desire, in the 1983 interview cited above, to remove the “screen” from art-making and art-viewing.

Yet Kepes’s focus on the monumental was also inevitably inseparable from contemporary social unrest. He believed that this focus came with special risks of “exposure” that were nonetheless worth taking. As he writes, “We cannot renounce

worked for MIT’s publications office in the early 1950s and returned to MIT in 1967 to oversee design at MIT Press (she designed its logo). In 1977 she became a design professor in the School of Architecture and founded the Visible Language Workshop (cf. Kepes’s *Language of Vision*), one of the more prominent “groups” in the Media Laboratory. For another example of Cooper’s work for the Center for Advanced Visual Studies, see *Art Transition* (Cambridge, Mass.: Center for Advanced Visual Studies, 1975), which was published to accompany the eponymous symposium and related “environmental” art events that took place at MIT in October 1975. As the design for “Art in Civic Scale” demonstrates, Cooper generally placed text high on the page and fastidiously respected the “grid,” or columnar structure, she established for any given project. This stylistic tendency gives her work an air of “principled” utilitarianism.

¹⁰¹ Sigfried Giedion, “The Need for a New Monumentality,” in *New Architecture and City Planning*, ed. Paul Zucker (New York: Philosophical Library, 1944), 565.

the dimensions of the twentieth century—of which the new perspectives opened by scientific triumphs are a part—just because in certain respects adjustment to them is not achieved without distress; we may suffer from exposure to the new scale, but it is necessary for us to meet it.”¹⁰² Kepes was not an outspoken supporter of or participant in the student and faculty protests at MIT in the late 1960s and early 1970s.¹⁰³ Nor was he an opponent. Instead the unrest confirmed to him what he had already identified as the need for art that matched the scale of the urban environment. This would be art that was collectively conceived by the Fellows for the ostensible benefit of each individual constituent of the masses. Kepes typically conceptualized this goal in terms of “inner and outer worlds.” As he writes in the introductory booklet published on the occasion of the Center’s dedication:

Artists have the job of defining our inner world, discovering and elucidating the human values available to us.... These values, satisfactions, and promises, however, do not exist inside us, shut off from the rest of existence. They are also interfacing properties of the outer world of nature, which scientists discover, define, and elucidate.¹⁰⁴

As this arrangement suggests, the ideal Kepes aspired to was a complexly layered affair that fluctuated between—and often elided—the respective goals of the

¹⁰² Gyorgy Kepes, “The Visual Arts and Sciences,” 121.

¹⁰³ Kepes did not sign a letter dated 27 January 1969 from the MIT faculty (under the aegis of the Union of Concerned Scientists) to the MIT administration in support of the one-day work stoppage. The letter was signed by forty-seven faculty members, including the chairmen of the physics, chemistry, and biology departments, as well as professors in the humanities and social sciences. “Letter from the Union of Concerned Scientists to the MIT Administration,” *The Tech*, 25 February 1969, 1, 3.

¹⁰⁴ Kepes, *The Center for Advanced Visual Studies*, n.p.

individual and the group. This was the type of art that he envisioned as the project of the Center for Advanced Visual Studies.

The first major project that Kepes lobbied to complete soon after the Center opened reflected these goals. In 1964 he conceived of *Programmed Light Walls for Boston Harbor*, which he described as “a proposal for vertical light beams that are sensitive to the surface motion of the sea.”¹⁰⁵ The sculpture he envisioned would have rivaled the monumentality of Brancusi’s *Endless Column* (1935-38) at Tîrgu-Jiu, Romania, or, in what is a closer visual comparison, the *Tribute in Light* memorial that was first illuminated near the former site of the World Trade Center on 11 March 2002 and has since been presented as an annual commemoration of the attacks that took place there on 11 September 2001 (fig. 117).¹⁰⁶ Kepes’s *Programmed Light Walls* were never realized, but in 1969 he made photographic “sketches” of his ideas for their configuration (fig. 118). The person responsible for taking and printing these photographs was Nishan Bichajian. Because the sculptures (or models for sculptures) consisted of light beams, photography was a particularly appropriate way to capture

¹⁰⁵ Gyorgy Kepes, “Artist’s Statement,” in *Boston Celebrations: Part I, Jubilee Projects by the Fellows of the Center for Advanced Visual Studies, Massachusetts Institute of Technology*, exh. cat. (Boston, Mass.: Institute of Contemporary Art, 1975), 34.

¹⁰⁶ The *Tribute of Light* was a collaborative design by Gustavo Bonevardi, John Bennett, Richard Nash Gould, Julian LaVerdiere, and Paul Myoda. In his 1965 *Dædalus* article Kepes describes *Tower of Light*, a work closely related to his *Programmed Light Walls for Boston Harbor*. *Tower of Light* was an unrealized proposal for Baltimore’s Charles Center. See Gyorgy Kepes, “The Visual Arts and Sciences: A Proposal for Collaboration,” *Dædalus*, “Science and Culture” issue, vol. 94, no. 1 (Winter 1965): 128-30.

their intended effects. So useful, in fact, that photographic prints, rather than the objects themselves, were what Kepes eventually exhibited.¹⁰⁷

The likely impetus for the creation of the photographs—for the transformation of an idea into an image—was Kepes’s hope that the Center for Advanced Visual Studies would be chosen to participate in the official celebration of the American Bicentennial. Ultimately not even the City of Boston was chosen—the main celebration took place in Philadelphia. But Kepes’s idea suggests the tremendous scope of his ambition. Such an ambition is not easily deflated. When the Center’s Bicentennial plans fell through, he encouraged the Fellows to achieve the idea on a “theoretical” level.¹⁰⁸ This resulted in a number of projects being created on paper, as sculptural models, or, in the case of Kepes’s *Programmed Light Walls*, as photographic simulations. None of the projects seem to have been conceived collaboratively. Kepes’s response to this disappointment—the first major project of the Center awash in paper rather than spectacle—indicates the depth of his resilience.

Kepes was able to rationalize working at the level of the “theoretical dimension” because he had long held a bias that preferred the work of the scientist to that of the engineer. This can be seen in his desire to model the Center for Advanced Visual Studies after the Princeton Institute for Advanced Study, which, as we will recall, was founded to facilitate the “disinterested” pursuit of knowledge. After World

¹⁰⁷ See *Boston Celebrations: Part I*, exh. cat. (Boston, Mass.: Institute of Contemporary Art, 1975), 34-37.

¹⁰⁸ Gyorgy Kepes, “The Center for Advanced Visual Studies,” *MIT Bulletin*, Report of the President issue, 1968-1969, vol. 105, no. 3 (December 1969): 436.

War II and the collaborations that it instituted between scientists and engineers, this preference—which functioned by means of a hierarchy—was largely obsolete in practice, but it nonetheless remained a commonly shared belief. Therefore in 1968 a journalist noted that the Center did not yet have “artistic Einsteins or Oppenheims in residence yet [but] there is plenty of talent and activity.”¹⁰⁹ In this same article Kepes is quoted as saying, “Now the artist can climb up to the top with the scientist and see the horizon. That’s far better than random explorations below with an engineer, here and there.”¹¹⁰ Kepes’s preference for scientists over engineers was one of the ways he distinguished the project of the Center for Advanced Visual Studies from Experiments in Art and Technology (E.A.T.), which had been launched by the artists Robert Rauschenberg and Robert Whitman and the engineers Billy Klüver and Fred Waldhauer in 1966. (Although Kepes’s public criticism of Pop Art predates the founding of E.A.T., the creation of an art and technology group likely added fuel to the fire.)¹¹¹ But the problem with Kepes’s idealization of the scientist is that he

¹⁰⁹ Davis, “‘It is Only the Scientist Who Can Match the Artist’s Idealism.’”

¹¹⁰ Kepes quoted in Davis, “‘It Is Only the Scientist Who Can Match the Artist’s Idealism.’”

¹¹¹ On 14 January 1969 Rauschenberg sent Kepes a telegram asking him to attend “an informal but official meeting of the Board of Directors of E.A.T.” A penciled note on the telegram indicates Kepes declined this invitation. Robert Rauschenberg to Gyorgy Kepes, telegram, 14 January 1969. Gyorgy Kepes Papers, Archives of American Art, Smithsonian Institution, Washington, D. C. reel 1211, frame 1170. The previous year Kepes had invited Rauschenberg to participate in the “Symposium on Science and Art” but due to dense fog in New York (a hazard technology has yet to solve) he was apparently unable to fly into Boston. Instead he sent a stand-in who took the stage and announced, “I am not Mr. Rauschenberg... I am anonymous. I am here to defend the position of the artist.” Anonymous, quoted in Spruch, “A Report on a Symposium,” 32. Warhol did something similar at the opening of the “Art and Technology”

needed engineers to help him create the monumental works he had in mind. Indeed, three of the four MIT professors that he credits in 1968 with assisting the Center were engineers—Harold Edgerton (famous for his stop-action photographs), Norman C. Dahl, and Ain A. Sonin. The sole scientist was the physicist Walter Lewin.

Most significantly Kepes's optimistic idealizations were not a match for the events of 1968 and 1969. Around the time that the Center's Bicentennial project faced demotion to the level of theory, the XIV Triennale di Milano was stormed by protestors. This took place on 30 May 1968 during the exhibition's press preview—the perfect occasion for extensive press coverage of the disturbance. The exhibits were reportedly destroyed and the show never reopened. Kepes had organized “The City by Night” for the Triennale, an exhibition that brought together his interest in light and the city.¹¹² In his 1965 *Dædalus* essay Kepes described what interested him about their combination:

When evening comes and the lights are turned on, the city is transformed, however chaotic, blighted, or ugly its daytime face. Points, lines, plane figures, and volumes of lights, whether steady or intermittent, moving or still, white or colored, whether from windows, signs, spectacles, headlights, traffic lights, or street lights—all compose a fluid, luminous wonder.¹¹³

exhibition at the Los Angeles County Museum, which was presented in the spring of 1971. David Antin describes Warhol's piece in the show as “astonishing. It is the only fully attested fake Warhol in existence.... Typically Warhol made this clear by having his stand-in photographed alongside the fake piece.” David Antin, “Art and the Corporations,” *Art News*, vol. 70, no. 5 (September 1971): 24.

¹¹² The curator Mirko Zardini is currently organizing the exhibition “Sense of the City” for the Centre d'Architecture, Montréal. It is scheduled to open in October 2005 and will feature documentation of Kepes's “The City by Night” exhibition.

¹¹³ Gyorgy Kepes, “The Visual Arts and the Sciences: A Proposal for Collaboration,” *Dædalus*, vol. 94, no. 1 (Winter 1965): 125.

Kepes's engagement with the city by night can be traced back to the designs he conceived to camouflage the City of Chicago around the time of the United States' entry into World War II. But the publicized storming of the Triennale demonstrated how dramatically and profoundly times had changed.

Kepes had organized "The City by Night" independent of the Center, but this was not the case of the contribution he conceived for the X Bienal de São Paulo. In 1968 Kepes was invited by Bienal officials to organize the exhibition's American section to open in 1969. In response to this opportunity, he sought to shape a project that would treat "interdependence as basic to a livable contemporary life."¹¹⁴ Indeed, interdependence was to literally constitute the exhibition's form:

Because of our belief in this interdependency, we contend that creative ideas in art play key roles in the shaping of our common life. To symbolize this conviction, our intention was to form, with a wide range of vital art works, an environmental community—one which, like an intricate system, can exist only through the interconnected workings of its members. Our aim was to realize an exhibition as a totality and not merely an anthology of independent artistic statements, however rich they might be.¹¹⁵

Kepes wished to create an (artistic) example of harmonious collectivity. Complicating this goal was the fact that most of the artworks chosen for the exhibition—which had been created by the Fellows and by artists outside the Center—had not been

¹¹⁴ Gyorgy Kepes, statement regarding the events surrounding the involvement of the Center for Advanced Visual Studies in the X Bienal de São Paulo, 11 July 1969. Institute Archives, MIT, Office of the Provost, AC8, box 193, folder 3.

¹¹⁵ Ibid.

generated collaboratively.¹¹⁶ Not to be deterred, Kepes opted to achieve a sense of “collaborative spirit” by means of the installation design. In order to institute homogeneity, he planned on lowering the lights—creating a unifying blanket of darkness. Illumination was to come from those artworks that included light components.¹¹⁷ He also planned on displaying the artworks in close proximity to each other, ignoring authorship in the interest of the group.

Despite these intentions, it soon became apparent that Kepes would have to postpone his experiment in collectivity. This is because nine of the twenty-one artists included in the show withdrew in protest over Brazil’s increasingly repressive military regime.¹¹⁸ One of the artists who declined to exhibit was Robert Smithson. To make his withdrawal official, Smithson sent Kepes a stinging letter:

I am sick of “lighting candles,” I want to know what the “darkness” *is*.... As the rockets go to the moon the darkness around the Earth grows deeper and deeper. The “team spirit” of the exhibition could be seen as endorsement of NASA’s Mission Operations Control Room with all its crew-cut teamwork. Some Brazilians see the “advances” of technology as a military by-product. I am withdrawing from the show because it promises nothing but a distraction amid the general nausea. If technology is to have any chance at all, it must

¹¹⁶ The exception was Kepes’s contribution to the exhibition, *Photo-Elastic Walk* (1970), which he created with William Wainwright. It consisted of tiles that changed color when visitors stepped on them.

¹¹⁷ Light was emitted, for instance, from Stephen Antonakos’s *Red Neon from Wall to Floor* (1967), Jack Burnham’s *Components: Twelve fourteen-foot Green Electro-luminescent Tapes* (1969), Lila Katzen’s *Liquid Environment* (1970), Gyorgy Kepes and William Wainwright’s *Photoelastic Walk* (1969), Ted Kraynik’s *Video-Luminar Light Mural* (1969), Les Levine’s *White Sight* (1969), and Fredrich St. Florian’s *Imaginary Space Simulator* (1969).

¹¹⁸ Brazil’s military had taken power in the mid-1960s, but in December 1968 General Emílio Médici was named president, initiating a period of brutal repression that did not begin to lessen until 1974.

become more self-critical. If one wants teamwork he should join the army. A panel called “What’s Wrong with Technological Art” might help.¹¹⁹

Needless to say, Kepes saw the issue differently. Indeed, he saw it oppositely. He describes his position in an official statement provided to the MIT administration:

We feel as disturbed and concerned at the lack of creative and democratic liberties as those who have withdrawn, and the intention of the fourteen of us had been to participate in the exhibition without concealing our deep resentment against cultural suppression. To our great disappointment we have to conclude that our basic concept to create a community exhibition has been crippled by the withdrawal of nine participants of the community.

It is therefore with the greatest regret that I announce that the aim of the exhibition as originally conceived cannot now be realized due to the withdrawals, and that I do not see justification for presenting at the Bienal an incomplete exhibition which would be misleading.¹²⁰

Where Kepes—a European émigré who had come of age in the years after World War I and had taken refuge in the United States during World War II—saw the potential for light, Smithson—a native-born American who came of age in the late 1950s—saw only impenetrable darkness, at least by the route that he understood his elder to be pursuing.

The São Paulo Bienal was recreated as the exhibition *Explorations* at the National Collection of Fine Arts in Washington, D. C., part of the Smithsonian Institution. In this replacement venue Kepes implemented his plan to darken the space and place works in close proximity to each other, blurring authorship in deference to

¹¹⁹ Robert Smithson to Gyorgy Kepes, 3 July 1969. Institute Archives, MIT, Office of the Provost, AC8, box 193, folder 3.

¹²⁰ Gyorgy Kepes, statement regarding the events surrounding the involvement of the Center for Advanced Visual Studies in the X Bienal de São Paulo, 11 July 1969. Institute Archives, MIT, Office of the Provost, AC8, box 193, folder 3.

the group. His own contribution to the exhibition, *Photoelastic Walk* (1969), created in collaboration with William Wainwright, consisted of clear plastic floor-tiles that covered polarizing screens. When visitors stepped on the screens—a behavior that was encouraged—“the refractive index,” as Kepes and Wainwright quite formally described it, was “altered and bright color lines...contour the principal stresses.”¹²¹ Visitors to the exhibition were therefore officially invited to partake of the collective Kepes imagined.

Earlier in this chapter I cited Lawrence Alloway’s analysis of Kepes’s mission for the Center for Advanced Visual Studies, which he attributed to an attempt to realize the Bauhaus’s art-and-technology ideal. Alloway made this association in his review of the *Explorations* exhibition. And, having made it, he went on to suggest a more complicated truth. “Easily manipulable technologies are available and funds are not too hard to obtain from obliging industry. We are, in fact, inundated by art of the kind hoped for in Bauhaus theory, in which the artist becomes technically hip and industry becomes humanized (like the final handshake of Capital and Labor on the roof of the Cathedral in Fritz Lang’s ‘Metropolis’).”¹²² The writer was clearly unwilling to label the venture a ringing success, despite elements and artists that he points out for praise:

¹²¹ Gyorgy Kepes and William Wainwright, “Photoelastic Walk,” artists’ statement in *Explorations*, exh. cat. (Washington, D. C.: Smithsonian Institution Press, 1970), n.p. The formality of Kepes and Wainwright’s statement is at odds with the interactive play the piece was intended to encourage.

¹²² Alloway, “Art,” 477.

All the flashing lights and shimmying rods and transparent walls and silver pillows (not Warhol's unfortunately) fail to give the effect of art and technology reconciled, a model of order for us all. The sum of these works is a frivolous and gross fantasy of technology, like Buck Rogers or its modern descendents, Marvel comic books. To suggest the effect of this environment consider what happens to the work of one of the good artists in the show, Otto Piene, whose "Fleurs du Mal," an inflatable piece, is made to look like mutated cacti in a mad scientist's underground laboratory.¹²³

Explorations became associated with a utopic project that unraveled at the moment of its realization. The exhibition was deemed to be alienating or simply overwhelming, rather than harmonizing and empowering. Moreover Alloway and other critics agreed that its component parts—individual artworks—resisted melding into that ever-elusive greater whole. Recently there have been glimmers of a critical reevaluation of this period. For instance, Takis's works appeared in the exhibition *Force Fields: Phases of the Kinetic* at the Museu d'Art Contemporani de Barcelona in 2000, an innovative survey of gesture and movement in art.¹²⁴ It is likely that this reevaluation will continue. Perhaps we will come to understand that exhibitions such as *Explorations* were not only the electrified descendents of the Bauhaus's technological aspirations, but also the awkward beginnings of the interactive artworks we now take for granted.¹²⁵

¹²³ Ibid. A similar critique was made by Emily Wasserman in *Artforum*. See Emily Wasserman, "Explorations," *Artforum* 8 (June 1970): 87-89.

¹²⁴ Guy Brett, ed., *Force Fields: Phases of the Kinetic*, exh. cat. (Barcelona: MACBA; London: Hayward Gallery, 2000).

¹²⁵ Jack Burnham has emphasized the awkwardness of the art-and-technology exhibition of the late 1960s and early 1970s, pointing out that they often malfunctioned. Jack Burnham, "Art and Technology: The Panacea that Failed," in *The Myths of Information: Technology and Postindustrial Culture*, ed. Kathleen Woodward (Madison, Wis.: Coda Press, 1980), 200-15.

Yet in the 1960s, even Kepes's books, which had previously received positive critical receptions, began to suffer in the press. This is apparent in James Marston Fitch's 1967 review of the Vision + Value series in *Architectural Forum*. The reviewer protests Kepes's characteristic use of photographs, in which disparate things are organized into collections of visual comparisons:

On the basis of subject matter alone, this series (there are three more just out!) strikes me as a preposterous enterprise. It is preposterous because it purports to 'illuminate' all sorts of disparate phenomena, covering a range of enormously divergent concepts, through the single 'unifying' channel of vision. The result is a metaphysical abstraction of real relationships, a consistent distortion of scale and magnitude that is authentically stupefying. The only unity here is the fact that all words and all pictures can ultimately be grouped together on the printed page. Books like these make one question the value of the printed page and the photographic facsimile.¹²⁶

Fitch pointed out what no reviewer had before: that Kepes's open-minded and all inclusive approach to imagery was, in fact, discriminatory. Kepes's desire to comprehend the world in terms of similarities blinded him to any number of dissimilarities and particularities. Moreover it forced him, as Fitch writes, to "divorce the visual aspects of the world from the complex multi-dimensional matrix of sensual reality." Kepes had violated "the perceptual continuity of existence."¹²⁷ This is a provocative statement given that Kepes saw himself as having devoted his life to understanding "the source of consciousness."¹²⁸ In the late 1960s and early 1970s,

¹²⁶ James Marston Fitch, "Review: *Sign, Image, Symbol; The Man-Made Object; and Module, Proportion, Symmetry, Rhythm*," *Architectural Forum* 126 (March 1967): 74.

¹²⁷ *Ibid.*, 75.

¹²⁸ Gyorgy Kepes, "Sermon for Tranquility: An Interview with Gyorgy Kepes," interview by Robert C. Morgan, *Afterimage* 10, no. 6 (January 1983): 7.

critics such as Alloway and Fitch were clearly less sympathetic toward Kepes's approach to this endeavor. Alloway at least understood Kepes's links to the Bauhaus, his grounding in the early twentieth century. Fitch either did not know this history or was unwilling to grant it consideration.

By 1969 Kepes was one of the last European survivors of the Bauhaus generation's art-into-life ideal. The artists of Smithson's generation established practices that alternately echoed this ideal or refuted it. If they knew of their precursors, they expressed little interest in acknowledging them. In 1969 Smithson wrote not only of a totalizing approach to art but also of a "new landscape":

Art today is no longer an architectural afterthought, or an object to attach to a building after it is finished, but rather a total engagement with the building process from the ground up and from the sky down. The old landscape of naturalism and realism is being replace by the new landscape of abstraction and artifice.¹²⁹

In marked contrast to Kepes, Smithson saw the "new landscape" as constructed and produced, a matter of "artifice" rather than a harmonious balance between man and nature. And, likewise, Smithson's monuments were not to be created in the orchestrated public spaces of cities. Rather, he went in search of them at the edges of cities, where suburbia met areas of industrial neglect and waste. In Smithson's essay "A Tour of the Monuments of Passaic, New Jersey," the found monuments included a

¹²⁹ Robert Smithson, "Aerial Art," *Studio International*, in Mark Linder, "Towards 'a New Type of Building': Robert Smithson's Architecture Criticism," in Eugenie Tsai, ed., *Robert Smithson*, exh. cat. (Los Angeles: Museum of Contemporary Art; Berkeley: University of California Press, 2004), 197-98.

pumping derrick, an unfinished bridge, and a dreary parking lot.¹³⁰ For Smithson, entropy, or disorder, was a refreshingly bleak alternative to the utopic pursuit of order and values. “As the cloying effect of such ‘values’ [of “purity and idealism”] wears off, one perceives the ‘facts’ of the outer edge, the flat surface, the banal, the empty, the cool, blank after blank; in other words, that infinitesimal condition known as entropy.”¹³¹

To Smithson and his peers, Kepes was at best out-of-date and at worst an unwitting supporter of the Establishment. Although Kepes’s artistic practice shifted over the years, his belief system stayed bound to the myth of the modern man. It was his ballast. In the late 1960s and early 1970s, this myth was rightfully and righteously under attack. Some things changed. The United States withdrew defeated from Vietnam. The various movements for civil rights brought new awareness to entrenched discrimination. But much stayed the same. MIT’s Lincoln Laboratory still conducted weapons-related research and the humanities remained the campus underdog. By late in his career, Kepes’s words could deflect the various crises blow by blow, mostly by remaining abstract—by evoking wholeness, order, unity. And in 1972 he embarked on a new proposal destined for the “theoretical dimension.”¹³² But

¹³⁰ Robert Smithson, “A Tour of the Monuments of Passaic, New Jersey,” *Artforum* (December 1967), in *The Writings of Robert Smithson*, ed. Nancy Holt (New York: New York University Press, 1979), 52-57.

¹³¹ Robert Smithson, “Entropy and the New Monuments,” *Artforum* (June 1966), in *The Writings of Robert Smithson*, 11.

¹³² See, for instance, Gyorgy Kepes, “The Artist as Environmentalist: A Proposal,” *Ekistics* 34 (November 1972): 372-74. This is a proposal for a monumental sculpture that would purify water.

his attempts to create visual and textual representations of interdependence generally failed to reach the expansive and harmoniously united audience he envisioned. This is mostly because significant elements of that audience had come to see the humanism of Kepes's generation as flawed, its manifestations of order as relative rather than universal, biased rather than all-accepting.

This skepticism is our abiding reality. More often than not, we see Kepes as inheritors of Smithson's eyes. And we subject him to special scrutiny because of the longevity of his utopic project, which came to coexist, however uncomfortably, with its late twentieth-century critics. Yet we would be wise to temper our sense of critical certainty, particularly as we search Kepes's career for keys to our own technologically infatuated moment. Recently the artist Barry Le Va, a member of Smithson's generation, questioned whether "you can ever tell the difference between order and disorder."¹³³ And another Smithson contemporary, Susan Sontag, stated in 1996 that the world she described in 1965, when she wrote of the potential for "one culture," "no longer exists." "Instead of a utopian moment, we live in a time which is experienced as the end—more exactly, just past the end—of every ideal.... An illusion of the end, perhaps—and not more illusory than the conviction of thirty years ago that we were on the threshold of a great positive transformation of culture and society."¹³⁴

¹³³ Barry Le Va, quoted in Nancy Princenthal, "Reconfiguring Barry Le Va," *Art in America* 93 (May 2005): 134.

¹³⁴ Sontag, "Thirty Years Later..." in *Against Interpretation*, 311.

Kepes's observation in 1974 that "The battle is still not yet won" is a sentence so laden with incompleteness, so full of progress postponed, that it prompts an observation: Kepes may have advocated for the "union of art and science" but in so doing he contributed to the conceptualization of this disciplinary divide. He tended to the walls of a centuries-old rift, conscientiously pointing out its new cracks and patched repairs. Although science opened up Kepes's art to admittedly wondrous aspects of the "world," the art-and-science binary was an inherited fortress that effectively defined him. In recent years historians have sought to diffuse this binary. In a co-authored essay the art historian Caroline A. Jones and the science historian Peter Galison ask, "What are the conditions under which objects become visible in culture, and in what manner are such visibilities characterized as 'science' or 'art'?"¹³⁵ This is a question, therefore, for the expansive realm of interdisciplinary studies, a portion of whose history I have sought to trace through my analysis of Gyorgy Kepes's career. We will be better equipped to act on this question if we understand both the opportunities and the pitfalls it presents.

¹³⁵ Caroline A. Jones and Peter Galison, eds., "Introduction," in *Picturing Science, Producing Art*, (New York: Routledge, 1998), 1.

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