
FUTURES

The Rise of Women in the Digital Arts

EDITED BY

Donna J. Cox, Ellen Sandor, and Janine Fron

FOREWORDS BY

Lisa Wainwright, Anne Balsamo, and Judy Malloy



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“Nothing could be worse than the fear that one had given up too soon,
and left one unexpended effort that might have saved the world.”

JANE ADDAMS



This book is dedicated to all of the unknown women heroines who came before us and to future generations who come after us. May all of our efforts continue to shine on, inspire, and endure.

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From the creation of the Doomsday Clock to exhibitions at Fermilab, women in the arts fostered dynamic, cross-institutional collaborations that contributed to the “Silicon Prairie.” These women generated new art forms while inventing, codeveloping, and collaborating on the first PHSColograms, Mosaic Internet browser interface, virtual reality CAVE architecture, artistic visualizations of large datasets, and web-based art. These innovations were produced through a collaborative methodology called Renaissance Teams, a term coined by Donna J. Cox, in which artists became producers and directors of these initiatives.

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Foreword



As technological advances careen through our physical and virtual worlds, it is imperative that artists and designers grapple with these tools and methods capitalized within the military, industrial, and entertainment complexes. Artists and designers who can utilize and invent within the technological landscape are critical to the ongoing humanism with which technology must be fused. It is essential that artists test, deconstruct, play, and repurpose the technologies of our rapidly changing world. *New Media Futures: The Rise of Women in the Digital Arts* is not only a testament to a group of artists, designers, scientists, and thinkers who have taken up the question of New Media's role as a civic enterprise, it is also a tribute to the history of women in the arts, a history all too often woefully underrepresented.

Donna J. Cox, Janine Fron, and Ellen Sandor collect an important array of artistic research and personal narratives that are indebted to those who took risks before them and to those still on the horizon of cutting-edge experimental thinking. Theirs is a book celebrating the "Silicon Prairie," those midwestern outposts of creative thinking and daring production, led by a number of key women pioneers. Brava all. Not only was it challenging to jostle for a place in the patriarchal system of the art world, it was also equally daunting to participate in the arena of scientific technologies as a woman. *New Media Futures* demonstrates a triumph in both camps—indeed, a synergistic explosion of art and science in the hands of a number of women practitioners. And so it continues. This book and the artists and projects recounted here will prove a key text for future generations of intrepid women working across disciplines to ask the hard questions about our place in the universe and how to best "map" the conditions they encounter. Technology is a valuable handmaiden in the advances of culture, but only when wielded with a spirit of empathy, collaboration, and care, skills in which women, in my opinion, excel.

Dr. Lisa Wainwright

Vice President of Academic Affairs and Dean of Faculty
School of the Art Institute of Chicago



Foreword

From where I came from growing up in an industrial suburb west of Chicago, I could send my imagination on fantastic trips across America in every direction: east to Boston, west to Denver, south to New Orleans, north to the Upper Peninsula. Exotic far reaches, filled with interesting people with interesting lives, looked like the LA and New York of Hollywood films. Clearly my young imagination was domestically constrained. Until Nixon went to China, I never thought about visiting or living there. To my younger self, the middle of America, the Midwest of my life, was the perfect center from which radiated exciting lines of thought. There is no better evidence for this than the interviews collected in this book.

Those who came of age, biographically or intellectually, in the places of the Midwest spread their insights, innovations, theories, and artworks in all directions. Not rooted to place, their ideas are free to travel the globe. Let's start with Donna J. Cox, coeditor with Ellen Sandor and Janine Fron of this insightful collection. Donna has always been both an artist *and* a scientist. Her ability to produce significant scientific knowledge that is accessible to a range of audiences is exceptional. While I have had the opportunity to meet some of the amazing women interviewed in this book, others I know only through their art and research. I worked with the New Media artist and game designer Janine Fron at the Institute for Multimedia Literacy, University of Southern California. Learning more about Janine's art practice, I was introduced to the work of Ellen Sandor and the New Media form she invented called PHSColograms. That led me to learn about the artist studio/laboratory (art)ⁿ and the work of Dana Plepys and Carolina Cruz-Neira on the development of art-based experiences for virtual reality systems. Nan Goggin was an active member of the Women in Information Technology and Scholarship (WITS) at University of Illinois at Urbana-Champaign, a group I supported when I was doing my doctoral work there in the 1980s. It was at U of I that I first learned about Colleen Bushell's visual design for the interface for the Mosaic browser. In the late 1990s, I had the opportunity to meet Sally Rosenthal who, in addition to having been a pioneer in producing art and technology events for SIGGRAPH, also holds patents for software that enables body-based interactions with virtual objects.

Personally I continue to draw insights from the work of Brenda Laurel, who has been a pioneer exploring the technocultural landscape to understand not only the cultural implications of emergent technologies but also how to design and develop new technologies to serve more liberatory objectives. I was introduced to Brenda by none other than Timothy Leary when we all participated in one of the first academic symposia on virtual reality in 1992. As an academic, a researcher, a designer, and an entrepreneur as well as an activist, Brenda is without peer in her ability to move among domains of intellectual work and to contribute meaningfully to each.

Every figure interviewed in this collection has produced inspiring work in multiple forms, across multiple contexts. Tracing the connections among these artist-technologists reveals the presence of a creative network of collaborators who were deeply engaged in research and development of important "edge" technologies. Each woman featured in this book has been a pioneer in exploring the intersections of art and technology. Individually, and as a group, they have influenced the field of New Media Arts in profound ways by integrating technology into their artistic practice, and by bringing art and cultural considerations to bear on their technological innovations.

In closing, I'd like to give a shout out to Laurie Anderson, another unconventional artist and technologist, who—although being a lifelong New Yorker—was born in the Midwest. Long before I knew she was from my hometown (Glen Ellyn, Illinois), her songs provided the soundtrack of my intellectual coming into being. As is clear about many of the people interviewed in this volume, she too is recognized as a pioneer—in her case, in the creative use of electronic technologies. She is, as is everyone mentioned here, a hybrid figure whose work defies simple categorization. Each offers a unique biography that documents her contributions to the richness of our technological lives, and to the creative possibilities of our collective technocultural futures.

Dr. Anne Balsamo

Inaugural Dean, School of Arts, Technology, and Emerging Communication
University of Texas at Dallas



Foreword

In the Midwest, beginning in the late 1970s, an extraordinary group of women artists explored and expanded the frontiers of the digital arts. In *New Media Futures*, the histories of these women of the midwestern “Silicon Prairie” unfold, as told to their colleagues, the editors of this book: Donna J. Cox, director of the University of Illinois’s Advanced Visualization Laboratory at the National Center for Supercomputing Applications (NCSA); Ellen Sandor, founder/director of the collaborative artists’ group (art)ⁿ; and Janine Fron, longtime collaborator and creative director of (art)ⁿ and cofounder of the collective Ludica, which explores the potential of art- and play-centered game design to express women’s narratives.

In twenty-two chapters, the work of women digital artists with midwestern roots and/or residence is disclosed—from Donna Cox’s creation of the iconic supercomputer *Venus*, *Venus in Time*, and Ellen Sandor’s inventive PHSCologram process; to Jane Veeder’s self-portrait game *Warpitout* and Brenda Laurel’s Purple Moon software for girls; from Carolina Cruz-Neira’s role in the development of the Cave Automatic Virtual Environment (CAVE) to Ping Fu and Colleen Bushell’s role in graphical interface design for the Mosaic web browser. Along the way, Abina Manning relates Kate Horsfield and Lyn Blumenthal’s cofounding of SAIC’s Video Data Bank; Margaret Dolinsky fabricates digital projections for opera and experimental cinema; and there is much more.

Presenting individual histories as situated in the development of the technologies themselves, *New Media Futures* not only provides significant models for women interested in exploring computer-mediated creative media but also documents the challenges of creating digital media from the late seventies to the early nineties. Application software, for instance, was unlikely at the time when many of the artists in this book began working. Explanatory books were scarce; programs were created from scratch, often taking the form of a stack of punch cards. As Lucy Petrovic, whose work focuses on interactivity and virtual reality environments, observes in this book: “We were writing code, step-by-step. Initially that was the only way to create art on the computer.”

Yet with the challenges came excitement about the potential of the digital arts. In Donna Cox’s words: “I realized that I could digitally control millions of colors using a computer if I learned how to program. I saw the future, and it was computer graphics.”

In Joan Truckenbrod’s words: “This process is imbued with a complexity—the fact that we can build up layers of ideas, realities, realms that we have envisioned—we can build up a wealth of those and look at them in a very complex way.”

Keyed by Cox’s concept of Renaissance Teams (collectives formed to collaboratively address complex visualization problems), how collaboration fostered creativity in the midwestern “Silicon Prairie” is an underlying theme of *New Media Futures*. The role of welcoming institutions, such as NCSA and the School of the Art Institute of Chicago (SAIC), where women could access advanced computing environments is also important, as are generous male researchers and laboratory heads, including Dan Sandin, Tom DeFanti, and Larry Smarr. Additionally, the centrality of teaching and the role of the women themselves in creating innovative teaching environments weave in and out of the narratives. Joan Truckenbrod was the first chair of the Department of Art and Technology Studies at SAIC. Ohioan Brenda Laurel designed and chaired the graduate Media Design Program at the Art

Center College of Design in Pasadena and served as professor and founding chair of the Graduate Program in Design at California College of the Arts. Nan Goggin is the director of the School of Art + Design at the University of Illinois at Urbana-Champaign.

Since 2003 when my book *Women, Art, and Technology* was published, the New Media Arts have become more integral in the cultural landscape.¹ Contingently, a decline in women in computer sciences and even at times an undercurrent of hostility persists, despite the fact that “Diversity in the workforce contributes to creativity, productivity, and innovation. Women’s experiences—along with men’s experiences—should inform and guide the direction of engineering and technical innovation,” as a recent report from the American Association of University Women emphasizes.²

We are urgently in need of examples of how this innovation can occur. The strength of *New Media Futures*, therefore, is founded on its recognition of the work of the women of the “Silicon Prairie” and on the rich environment of collaboration, teaching, research, scholarship, and the making of art that is core in their histories. As digital culture becomes more central in our lives and scholarship, their histories provide guidance and inspiration on the path to equal inclusion and equal recognition of women in the New Media Arts.

Notes

1. Judy Malloy, “Travels with Contemporary New Media Art,” *GIA Reader* 21, no. 2 (Summer 2010). Available at www.giarts.org/article/travels-contemporary-new-media-art.

2. Christianne Corbett and Catherine Hill, *Solving the Equation: The Variables for Women’s Success in Engineering and Computing* (Washington, D.C.: American Association of University Women, 2015), 2.

Judy Malloy

Editor, *Women, Art, and Technology*

Preface



Since the inception of this seminal oral history project, our goal has been to reveal infrequently told stories of women active in the arts during the digital revolution from the 1970s through the 1990s. Although cultural revolutions are rarely isolated, undeniable midwestern events gave rise to artistic innovations that played a major role in the birth of New Media Arts. Social developments, including the emergence of civic leadership in education and the arts, aligned with the merits of Chicago's women's movement and shaped the milieu from which the intersecting narratives presented in *New Media Futures: The Rise of Women in the Digital Arts* unfold. The University of Illinois and the School of the Art Institute of Chicago provided a foundational framework for the Chicago arts community that supported synergistic cultural environments in which the creativity and careers of the women featured in this book could flourish.

From late 2008 through 2012, we recorded interviews of twenty-two women whose contributions focused on 1985 as a pivotal point for a set of questions (see the appendix). We personally know many of these vibrant, creative women, and in the process of editing the book we discovered many more. This selection represents a breadth of generations and approaches that serve as exemplars from influential years in the twentieth century's digital revolution.

We interweave the twenty-two interviews through an introduction that summarizes historical events that we believe were most relevant to the Midwest's contributions. We establish the relative position of women in society from the late nineteenth century to the Bauhaus and its evolution of a "Chicago style" video arts culture that intersects with a chronology of post-World War II research initiatives that unveiled computer technologies to the world. This evolution set the stage for women's future explorations in the arts. We introduce the twenty-two women interviewed here as they entered the digital playing field in the arts community and academic research institutions. Mixed media and video art began to intermingle with computer software, networking abilities, and digital interfaces that took on new forms of cultural expression. Here we begin to see an evolution of twentieth-century New Media Arts with the innovation of PHSColograms, computer graphics animation, scientific visualization, interactive media, electronic games, the Internet, and virtual reality CAVE (Cave Automatic Virtual Environment), all produced with collaborative teams led by pioneering artists on the prairie. These types of artistic explorations continued to develop and evolve beyond the 1990s to become known as "New Media" or "digital media" (Cook and Diamond 2011).

Following the book's introduction, we organized the interviews into three main parts. We arranged these sections according to major trends and orientations of the women's collaborations along with their communities of influence and migration. The interviews reveal personal as well as career evolutions in New Media Arts through the important advances they made harnessing digital technologies that additionally created inroads for future generations of women to make their own contributions.

In the introduction, we do not attempt to establish a new feminist arts theory, nor do we claim to show a complete timeline of technology history. However, we elucidate many of the constraining attitudes that women faced throughout the twentieth century. We recognize that many doors have opened for women while some remain closed. We also believe that women from those early years adopted a variety of collaborative strategies in order to navigate their career paths. More research

is necessary to fully understand why women establish tenacious stakeholds within male-dominated professional environments. The women interviewed in *New Media Futures* situated themselves within experimental settings that unlocked their imaginations with the garage-art tools of their time. Collaboration was a strategy with a variety of motivations to be part of a larger vision that required women to adopt the new leadership role of being “artists as producers” or “artists as directors” as each project demanded.

The cultivation of this new domain encouraged people to learn new skills and work together across disciplines, cultures, and institutions, which created a different concept of community. It was no longer unusual for teams to be comprised of artists, scientists, technologists, scholars, and educators all working on the same project, pooling together their expertise and experience. Collaboration became an avenue to access technology as well as the specialized knowledge, language, and surroundings of a like-minded community of kindred spirits. Many of the women we interviewed moved forward on their intuition to catalyze the artistic and technological potentials in the spirit of early pioneer women settlers, often with kids in tow who were being raised amidst the changing culture.

Few of these women dialogued around the nature of collaboration; rather, they navigated an overwhelming crest of raw opportunity without time to reflect—until now. It has been an ongoing challenge to preserve and document the work that has been done while being proactive with its scholarship in ways that continue to explore themes that are relevant to our society.¹ Our investigation encouraged interviewed women to reflect orally because many of these stories have left few historical trails. Their anecdotes witness an exciting but nearly forgotten era. All of the interviewed women recalled wearing many hats and did not always have the time or equipment to document important events or transition their artworks to newer technologies. Today, women in New Media Arts have greater opportunities for collective voice through personal blogs, social media dialogs, and the immediacy of documentation through online outposts and journals such as *Femtechnet*, a feminism and technology network and journal. Continued research and dedicated resources for the preservation of New Media Arts remain persistent challenges facing artists and educators today.

One of our goals is to inspire future generations who may continue to grapple with obstacles and reveal little-known synergies and strategies of women artistically using technology to affect cultural change. We additionally hope to provide a message for future generations to understand some of the midwestern foundations and values that helped engender the now so familiar. It is important that we all work together, with men and women on equal footing, to raise human consciousness and make the world a better place. The synthesis of the arts in New Media is a metaphor for a harmonious society. This book is truly about women supporting each other towards this end.

To contribute forewords, we chose three women, each of whom shares a kindred avant-garde and collaborative spirit with the twenty-two women’s stories presented here. Dr. Lisa Wainwright is a renowned American art historian, vice president of Academic Affairs and dean of faculty, School of the Art Institute of Chicago. Dr. Anne Balsamo is a cultural theorist, multimedia experience designer, cofounder of *Femtechnet*, and inaugural dean, School of Arts, Technology, and Emerging Communication, University of Texas at Dallas. Lisa and Anne both earned PhDs from the University of Illinois during the backdrop of this rich history. Judy Malloy is the editor of the seminal book *Women, Art, and Technology* (2003) and is a recognized leader in electronic literature and New Media scholarship.

Working on *New Media Futures* has been an incredibly enriching journey for all of us involved in this encapsulating project. We feel blessed and honored to have met, interviewed, and gotten to know these incredible women over the years to whom all of us owe an everlasting debt for their tenacity and guiding inspiration.

Note

1. For an extensive collection analyzing and categorizing collaborative strategies, see *Euphoria and Dystopia* (Cook and Diamond 2011).

Acknowledgments



Without the combined talents, efforts, and dedication of all of our collaborators over the many decades of diligent hard work and striving, the works described in this book would not be possible. It is a testament to the spirit of our times that there are more people involved than technologies used in the realization of the complex collaborations that are herein described. Community is a thread that weaves us all together in the circle of life and is unique to midwestern values that have migrated the world over through the seeds planted on the prairie by contemporary women in the arts as well as their forerunners.

We are indebted to the life's work that has been shared with sincere reflection and deep introspection in the oral history interviews provided by our contributors. Their individually unique and yet overlapping stories helped to illuminate a very exciting and pivotal time in history for women to make a difference in the world by charting innovative, collaborative pathways through the arts and sciences.

Special thanks to Lisa Wainwright, Anne Balsamo, and Judy Malloy for writing the three forewords to the book that speak to the historical context of the underrepresentation of women in the arts throughout modern history, and the significance of women equally contributing towards the making of our culture today.

We gratefully acknowledge the dedication, enthusiasm, and unwavering support of our editor, Laurie Matheson, and her staff for bringing this seminal book to fruition. The co-editors express special appreciation to Jennifer Comeau and Julie Laut for their insightful guidance, and to Dustin Hubbard and Jennifer Fisher for their stunning visual design of the book. The peer reviewers selected by the University of Illinois Press provided knowledgeable insights and invaluable suggestions that enriched the historical background of the manuscript and fine-tuning of the transcribed interviews.

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With fond appreciation to Tiffany Holmes and her staff, including Nia Easley, for organizing the exceptional 150th SAIC milestone event, *Celebrating Women in New Media Arts*, held on March 18, 2016, in the SAIC ballroom in honor of this book. Very special thanks to Jean St. Aubin and the staff of the SAIC Gene Siskel Film Center for the symposium screening and closing reception. Continued appreciation for Walter and Shirley Massey and for SAIC president Elissa Tenny for their enthusiasm and support.

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Special research was conducted at Ryerson and Burnham Libraries, the Art Institute of Chicago; John M. Flaxman Library, School of the Art Institute of Chicago; Special Collections and University Archives, University of Illinois; University Library, University of Illinois at Urbana-Champaign; Columbia College Chicago Library; Charles Deering McCormick Library of Special Collections, Northwestern University; and Avery Library, Columbia University. Additional thanks to Lindsay M. King and Ted Goodman for their help and expertise with providing a plethora of historical references and research materials while at Northwestern University and Columbia University respectively.

We would like to respectfully acknowledge the exceptionally talented and pioneering Renaissance men the editors and book contributors have had the pleasure to work with from the beginning. For their support, enthusiasm, and sharing mutual values to make the world a better place with collaboration as the foundation of artistic and scientific exploration: Dan Sandin, Tom DeFanti, Phil Morton, James Zanzi, Jerry August, Gary Justis, Randy Johnson, Mark Resch, Stephan Meyers, Larry Smarr, Robert Patterson, George Francis, Bill Gropp, Roy Ascott, Roger Malina, Mike Ross, Ryan Wyatt, John Towns, Bill Kramer, Tom Lucas, Mike Bruno, Dan Neafus, Mel Slater, Chunglian Ai Huang, Marc Andreessen, Jason Leigh, Drew Browning, Johnnie Hugh Horn, Michel Ségard, Miroslaw Rogala, Fernando Orellana, Chris Day, Todd Margolis, Ben Chang, Geoffrey Allen Baum, Keith Miller, Chris Kemp, William Robertson, Marcus Thiébaux, Christopher Landreth, Loren Carpenter, Rob Tow, and Scott Fisher.

We would also like to gratefully acknowledge all of the exceptional men and women from the scientific community whom we have had the sincere privilege to work with. Their unique talents, curiosity, enthusiasm, openness, and shared resources have truly helped us to transcend with the arts to make inroads for future generations of explorers. Without their dedication and perseverance during the changing tides of our times, we would collectively miss seeing the forest beyond the trees.

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Ellen Sandor would like to warmly thank Chris Kemp, Diana Torres, and Azadeh Gholizadeh of (art)ⁿ for their dedication and hard work throughout this endeavor and always. Special thanks to Terry Hesser

and Melissa Sage Fadim for creating a documentary film of this lifelong adventure in the arts that parallels the history in this book. It has been a pleasure to work with Georgia Schwendet, Kurt Riesemann, Anne Mary Teichert, Jennifer Raaf, Sam Zeller, and Thomas Junk at Fermilab in Batavia, Illinois, while completing the book. With love and gratitude to Dr. Richard Sandor, Dr. Julie Sandor, Jack Ludden, Elijah Sandor-Ludden, Justine Sandor-Ludden, Penya Sandor, Eric Taub, Caleb Sandor-Taub, Oscar Sandor-Taub, and Dr. Jeffrey Simon.

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The editors are grateful for each other's camaraderie, collegiality, guiding friendship, and inspiration that have enriched our lives and the evolution of our collaborative process with creative joy.

With heartfelt thanks, we are equally indebted to the many more colleagues, collaborators, and friends who have been with us all on this exciting journey from the beginning and beyond, whose inspirations made all things possible.

Introduction



New Media Futures: The Rise of Women in the Digital Arts captures the spirit of women working in digital media arts and education in the Midwest. These pioneers made essential contributions to the international technological revolution, helping to catalyze what we now think of as the age of digital and social media. The story explores seminal events that took place at the University of Illinois and the School of the Art Institute of Chicago in the 1980s and 1990s, in a fertile environment combining social feminist change, artistic energy, and technological innovation. While women artists in Chicago, marginalized in traditional venues, built a network of independent galleries and exhibit spaces to house and highlight their work, interdisciplinary Renaissance Teams at the University of Illinois developed advanced academic computing communities that created a bridge to the humanities and forged new partnerships between the artist and the scientific environment. This historic merging of art and technology in the Midwest, with women at its heart, encompassed digital games, PHSColograms, virtual reality, supercomputing graphics, and Internet browser-based art, as well as graphic tools for medical research and diagnosis and other technical uses. Behind this revolution lay a history of social change, artistic innovation, women’s civic leadership, and breakthroughs in science and technology.

EARLY ROOTS: ESTABLISHING A STRONGHOLD FOR MIDWESTERN WOMEN IN THE ARTS

Behind the digital arts revolution in the Midwest lies a long history of women building civic leadership and cultivating dynamic social relationships. By forging a stronghold for change in the arts, education, and design, these pioneering women cross-pollinated creative forces that continue to emerge and evolve from historical contexts to the present day.

Women’s civic leadership in Chicago found prominent expression in the Woman’s Building of the World’s Columbian Exposition in 1893: a pavilion designed, decorated, and managed by women. Philanthropist Bertha Honoré Palmer, who had formed the Chicago Woman’s Club in 1876, passionately explained the initiative’s merit: “The Exposition will thus benefit women . . . not alone by means of the material objects brought together, but there will be a more lasting and permanent result through the interchange of thought and sympathy among influential and leading women of all countries, now for the first time working together with a common purpose and an established means of communication” (Elliott 1893, 22). Plans for the exposition were directed by the Exposition Commission, composed solely of men, while the leadership of women participants was segregated. The Board of Lady Managers was created by an official act of the US Congress, which commissioned a building to house women’s exhibits (Peck and Irish 2001, 228).

The classical Beaux Arts–influenced building was designed by Sophia Hayden, the first woman architect to graduate from MIT.¹ Candace Wheeler, appointed director of interior design, was a pioneer of the field for women. The building’s Hall of Honor was anchored by allegorical murals,



In addition to leading the Woman's Building initiative at the World's Columbian Exposition, Bertha Honoré Palmer (1849–1918) was a major benefactor of the arts in the nineteenth century. She helped establish the Art Institute of Chicago in the Midwest as a renowned, international art museum. *Mrs. Potter Palmer*, 1893, by Anders Leonard Zorn, 101 $\frac{5}{8}$ " x 55 $\frac{5}{8}$ " oil on canvas. The Art Institute of Chicago.

commissioned from American impressionist painters Mary Cassatt and Mary MacMonnies, and depicted young girls in modern dress pursuing the fruits of science and knowledge. In *Eve's Daughter/Modern Woman: A Mural by Mary Cassatt*, author Sally Webster reminds us, "While Sophia Hayden's design was noteworthy, it was the enterprise itself, the assembling of women's work—handicrafts, inventions, books, paintings, sculpture, and statistics on women's employment—that galvanized women nationally and internationally. The entire project mirrored a passionate desire by women from all walks of life to document the contributions women had made to the world's culture and economy" (Webster 2004, 45–46).

Describing their mission in the official exposition catalog for the Woman's Building, Bertha Honoré Palmer reflected a broad vision of civic responsibility and social concern:

The desire of the Board of Lady Managers is to present a complete picture of the condition of women in every country of the world at this moment, and more particularly of those women who are bread-winners. We wish to know whether they continue to do the hard, wearing work of the world at prices which will not maintain life, and under unhealthy conditions; whether they have access to the common schools and to the colleges, and after having taken the prescribed course are permitted graduating honors; whether the women, in countries where educational facilities are afforded them, take a higher stand in all the active industries of life as well as in intellectual pursuits; how large the proportion is of those who have shown themselves capable of taking honors in the colleges to which they are admitted, etc. We aim to show, also, the new avenues of employment that are constantly being opened to women, and in which of these they are most successful by reason of their natural adaptability; what education will best fit them for the new opportunities awaiting them. (Elliott 1893, 22)

In addition to leading and contributing to numerous organizations and charities in Chicago, Palmer assembled an influential art collection, including numerous iconic works by the impressionists, that helped establish the Art Institute of Chicago and the metropolis as an international leader in the arts. Prior to Palmer's commissioning of Cassatt to paint *Eve's Daughter/Modern Woman*, the artist suggested to Palmer and her husband some impressionist artists to include in their collection, and she made helpful introductions to her art connections in Paris.² Cassatt's own work includes her 1890–91 experiments

with aquatint color printing techniques, resulting in a suite of ten prints, often referred to as "The Ten," that explored a day in the life of a modern woman. The sophisticated printmaking process Cassatt used marks an early example of a woman artist employing technology in her work.

The School of the Art Institute of Chicago (SAIC), formerly the Chicago Academy of Design, was formed in 1882 and housed in the Art Institute's new facility on Michigan Avenue and Van Buren Street. Its basic curriculum emphasized drawing and painting from life, including costumed models and natural landscapes. Lorado Taft, who founded the Sculpture Department, put SAIC on the map for being the only school in the country where students could chisel creations from marble.³ Most of his students were women, and in 1889, his class staged on the lakefront south of the museum a fountain composed of nude nymphs that was considered controversial—not for nudity, but because it was executed by women. That same year, SAIC initiated a program in architecture and formed an alliance with the Armour Institute of Technology to provide instruction in science and mathematics, thus creating early inroads for art and science to take shape in the city's overall development.

Women's access to education improved during the Columbian Exposition era, with the University of Chicago Law School opening its doors to women in 1889 and Northwestern University establishing a women's college in which Bertha Honoré Palmer was a trustee. Columbia College Chicago, founded in 1890 by Mary A. Blood and Ida Morey Riley as a coeducational school, continues to serve the Chicago community as the nation's largest privately enrolled art school. Hull-House, the famous settlement house established on Chicago's southwest side in 1899 by the Pulitzer Prize-winning writer, reformer, and peace activist Jane Addams, hosted Frank Lloyd Wright's influential 1901 talk, "The Art and Craft of the Machine."⁴ Calling the machine "the only future of art and craft" and "the modern Sphinx whose riddle the artist must solve if he would that art live," Wright characterized the machine as "capable of carrying to fruition high ideals in art—higher than the world has yet seen!" (Wright 1901, 77). This American manifesto, later published in *Brush and Pencil*, foreshadowed new schools of thinking that would evolve into the Prairie Style, New Bauhaus, international, and postmodernist styles of architecture for which Chicago became so richly known.⁵



Mary Cassatt's (1844–1926) design of the Woman's Building South Tympanum celebrated young women pursuing knowledge and science. This is one of the themes emerging in the twentieth-century modern woman. Decoration of South Tympanum, "Modern Woman" by Mary Cassatt. Source: Maude Howe Elliott, *Art and Handicraft in the Woman's Building of the World's Columbian Exposition, Chicago, 1893*, "A Celebration of Women Writers." <http://digital.library.upenn.edu/women/>.

Wright was influenced by his aunts, Jane and Nell Lloyd Jones, who in 1886 founded Hillside Home School in Wisconsin, the first coeducational boarding school in the United States. Their "learn by doing" pedagogical approach became the hallmark of Taliesin, the rustic studios that Wright established in 1932 with his third wife, Olgivanna. Among other architects, Wright employed Marion Mahony, the second woman to graduate from MIT

with a degree in architecture. Mahony became the first licensed woman architect in the world to practice in the field.⁶ She initially worked out of a shared office in Steinway Hall, the eleven-story building on Van Buren Street that famously housed Wright and his group of innovative architects.⁷

In 1907, *Ladies Home Journal* published an article that reviewed one of Wright's designs that was delineated by Mahony and quintessentially defined Prairie Style architecture; the article was titled "Fireproof Home for \$5000" and described an L-shaped open floor plan that was centered on a fireplace. Wilhelm Tyler Miller further popularized the Prairie Style with his circular *The Prairie Spirit of Landscape Gardening*, which the University of Illinois published in 1915 for the Illinois Agricultural Experiment Station. Mahony's much admired presentation style of immersing architectural renderings in a richly vegetative prairie landscape, which she often delineated on linen and silk, was imitated by the drafters who worked in Wright's office and adopted by fellow architects of the Prairie School (Van Zanten 2011, 51). Mahony's renderings comprised nearly half of Wright's famed *Wasmuth Portfolio* (1910) that was published in Germany and put Chicago on the international map for its organic architecture innovations made during the Prairie School era (McGregor 2009).⁸ In 1911, Mahony married a fellow architect from Wright's office, Walter Burley Griffin, a graduate from the University of Illinois, and the two worked in partnership on commissioned residences, educational institutions, and businesses in Australia, India, and the United States. In 1912, the Griffins won the competition to design the Australian capital city of Canberra. There were 137 applicants, and Eliel Saarinen won second place. An electronic edition



Marion Mahony Griffin (1871–1961) is one of the world's first women licensed architects. She graduated from MIT—the second woman to do so (Sophia Hayden had graduated from MIT four years earlier)—and was both the first architect and first woman to be licensed in the state of Illinois. She delineated the popular Prairie Style architecture that put Chicago on the international map, attracting future architects to Chicago. "Portrait of Marion Mahony Griffin." *Magic of America*, Art Institute of Chicago portfolio images, Ryerson and Burnham Archives. <http://digital-libraries.saic.edu/cdm/singleitem/collection/mqc/id/48263/rec/259>.

of Marion Mahony Griffin's manuscript, *The Magic of America*, was posthumously published online in 2007 by the Ryerson and Burnham Libraries of the Art Institute of Chicago.⁹

Bridging art and education, art historian Helen Gardner published the first edition of her seminal *Art through the Ages* in 1926, the first single-volume textbook to provide a global survey of art history. A graduate of the University of Chicago, Gardner taught at the School of the Art Institute from 1920 until her retirement. Many editions later, *Art through the Ages* remains a standard text in the field. The third edition, published shortly after her death in 1946, was the first to include women artists (Mary Cassatt, Berthe Morisot, Georgia O'Keeffe).¹⁰ That edition's concluding chapter, entitled "The Arts of the Machine," recalls Wright's earlier Hull-House lecture. Gardner observed that "through scientific advances in transportation and communication, the world has been so interknit that it has become in reality, one world, in which advanced, decadent, and primitive cultures, highly diversified in ideology and art forms, have been brought together, head on."

MODERNISM WITH AN INTERNATIONAL STYLE

The 1930s brought two influential exponents of the German Bauhaus style of architecture, László Moholy-Nagy and Ludwig Mies van der Rohe, to Chicago. Moholy-Nagy arrived in 1938 and founded the New Bauhaus, which became the Chicago School of Design and then the Institute of Design, coming in 1949 under the umbrella of the newly formed Illinois Institute of Technology (IIT). Meanwhile, van der Rohe became the director of the Architecture Department at the Armour Institute of Technology. These training grounds offered new opportunities for women artists, including Marli Ehrman, Else Regensteiner, Lenore Tawney, Claire Zeisler, and Theo Leffmann.

Marli Ehrman studied and taught in arts and crafts schools and universities in Europe and created an experimental weaving workshop at the original Bauhaus. After escaping Germany before the Nazi purges, Ehrman relocated to Chicago where she became the director of the Weaving Workshop at IIT's School of Design under Moholy-Nagy's directorship in 1938. She also taught at Hull-House and in 1956 opened



Midwestern-born Georgia O'Keeffe (1887–1986) was an influential twentieth-century artist who helped define modernism with her abstract charcoal drawings, watercolor, and oil paintings, sculptures, and photographs. She briefly attended SAIC and was among the first modern women artists to be recognized in art history texts and included in Helen Gardner's *Art through the Ages*. The Art Institute of Chicago hosted her first retrospective in 1943. "Georgia O'Keeffe, Lake George," 1931, by Alfred Stieglitz, 3" x 3½" vintage gelatin silver print from the Richard and Ellen Sandor Family Collection. Digital photo by James Prinz Photography.

the Elm Shop modernist design studio in Oak Park, where she designed textiles for commercial clients. She additionally collaborated with Marianne Willisch and Mies van der Rohe and was awarded first prize in weaving in a national competition conducted by the Museum of Modern Art and another prize in a national competition awarded by Fairchild Publications, Inc. in New York. Equally important to her own achievements was her mentorship of a new generation of influential textile artists that included her students at IIT—Lenore Tawney, Else Regensteiner, Claire Zeisler, and Angelo Testa—all of whom had successful careers as designers and artists.

Else Regensteiner also immigrated to the United States to escape the Nazi regime. She befriended Ehrman in 1936 after settling in Chicago and became her assistant at the Institute of Design. She attended Black Mountain College during her vacations to study with Anni and Josef Albers. In 1942, she graduated from IIT and was hired as a weaving instructor. She later taught at SAIC from 1945 to 1971 and abroad at the American Farm School in Thessaloniki, Greece, from



László Moholy-Nagy (1895–1946) was a Hungarian painter, photographer, and Bauhaus professor who believed in the intersection of art, technology, and industrial design. He helped establish Chicago as a center of international modernism with Mies van der Rohe (1886–1969) while they both taught at IIT. “Self-Portrait (Moholy appears sunken to bottom of the sea in a fish net),” 1928, by László Moholy-Nagy, 8" × 11½" vintage gelatin silver print from the Richard and Ellen Sandor Family Collection. Digital photo by James Prinz Photography.



“Mies van der Rohe,” 1952, by Harry Callahan, 4½" × 3¼" modern gelatin silver print from the Richard and Ellen Sandor Family Collection. Digital photo by James Prinz Photography.

1972 to 1978. She collaborated with fellow student Julia McVicker to form Reg/Wick Handwoven Originals, whose regular clientele included the Stiffel Company. She was director of the Handweavers Guild of America, cofounded the Midwest Designer-Craftsmen, and authored three books—*The Art of Handweaving*, *Weaver’s Study Course: Ideas and Techniques*, and *Geometric Design in Weaving*—considered hand-weaving classics that brought Bauhaus traditions to a wider audience. Chicago native Theo Leffmann chose another path from her peers and worked with fiber as a mode of personal expression in lieu of practical design applications. She created several bodies of work over a fifty-year period, including figurative sculptures and wall hangings that are represented in the Mary and Leigh Block Museum of Art, Northwestern University.

As a bastion for Bauhaus ideals was building up Chicago, Nordic modernity was flourishing under the influence of the Saarinen family at Cranbrook in Bloomfield Hills, Michigan. The Scandinavian design movement began in Europe during the 1920s to create well-designed objects for everyone. “More beautiful everyday things” was the motto of the movement. Eliel and Loja Saarinen were the first to bring this design philosophy to the United States. Eliel Saarinen was a prominent architect who believed in the fusion of fine arts and crafts, akin to the Bauhaus. Like Wright, he also worked holistically and was

interested in designing everything from the buildings and their interiors and furnishings to their communities. When Cranbrook opened in 1932, it provided students unique opportunities to work alongside European men and women who came to Michigan to create works of architecture, sculpture, furnishings, and textiles for the Cranbrook campus (Waagen 1990, 50).

Loja Saarinen, who trained as a sculptor and photographer in Finland before immigrating to Michigan in 1923 with her husband, architect Eliel Saarinen, made pivotal contributions in the Midwest at Cranbrook Academy of Art, where she taught and designed textiles until retiring in 1942. While Loja built most of Eliel’s architectural models, she also designed rugs and textiles for the buildings he designed for Cranbrook. This helped her establish her own firm, Studio Loja Saarinen, before October 1928. Frank Lloyd Wright and Charles Eames were among her many clients. The following year, the Weaving Department opened at Cranbrook, of which Lola was named director (Clark 1983, 173–96). Her successor, Marianne Strengell, was both an influential teacher at Cranbrook through the 1960s and a successful designer whose clients included Knoll Associates, General Motors, Ford Motor Company, and the architectural firm Skidmore, Owings and Merrill in Chicago.

In parallel, Frank Lloyd Wright designed thirty-six structures on the West Coast that began with the Stewart House in Santa Barbara (1909) and

ended with the Marin County Civic Center in San Rafael (1959), migrating midwestern innovations in organic architecture and modernism.¹¹ In a July 1957 address to the people of Marin County, Wright said, “Beauty is the moving cause of nearly every issue worth the civilization we have, and civilization without a culture is like a man without a soul. Culture consists of the expression by the human spirit of the love of beauty.” Wright believed the Civic Center offered “a crucial opportunity to open the eyes of not Marin County alone, but of the entire country to what officials gathering together might themselves do to broaden and beautify human lives.” Other historical works in California by Wright include the Barnsdall (Hollyhock) House (1917–1921), the Charles Ennis House (1923), the Storer House (1923–1924), and the Freeman House (1923–1925), all built in Los Angeles.¹² Wright’s work on the West Coast influenced California-based architects Richard Neutra, Rudolph M. Schindler, and Frank Gehry, which helped spread midwestern-born ideals throughout the twentieth century for using creativity and innovation to make the world a better place for future generations (Wilson 2014). In addition to Marion Mahony Griffin, Wright employed many talented women in a variety of capacities throughout his career, including Lois Davidson Gottlieb, Isabel Roberts, Jane Duncombe, Eleanore Pettersen, and Read Weber, among a hundred others (Willis 2009).

ALTERNATIVE ART SPACES EMERGE: CHICAGO’S COUNTERCULTURE BEGINS

In the post–World War II period, a multitude of alternative art venues, spaces, and contexts sprang up in Chicago. One launching pad was the venerable Art Institute itself, whose “Chicago and Vicinity Show” came under criticism in 1947 for favoring works by the institute’s students and faculty over those of community members. When the museum responded by banning all student participation in the exhibition, more than 800 protesting students from both SAIC and the Institute of Design at IIT signed a petition they presented to Daniel Catton Rich, the Art Institute’s director. When the museum refused to rescind its ban, the students mounted their own show, *Momentum*

Exhibitions, from July 15 to August 28, 1948, at Roosevelt College, that was open “to all artists of the local area, to all media, to all art languages . . . to provide that universality of opportunity necessary to insure the vital movement of art” (Warren 1984, 11). Josef Albers, Robert von Neuman, and Robert Jay Wolff came to Chicago at their own expense and juried the show.

One outcome of these exhibitions, which continued through 1964, was the growing number of alternative spaces to Chicago’s art establishment that began to emerge, along with the formation of artists’ groups to support them. To meet the demands of SAIC students, the school expanded and remodeled again, and in 1959 the museum received a generous endowment from Mrs. Sterling Morton to add a south wing to the building. However, a structure housing several of the SAIC studios stood on part of the ground the new museum wing was going to cover, and so it was decided that a long-term plan to consolidate SAIC could finally be implemented, with nineteen new classrooms and its own Columbus Drive entrance. In this respect, the students managed to unite the school with the museum through *Momentum Exhibitions*, while forming a united sense of community among Chicago artists. In Lynne Warren’s critical essay “Chicago Alternatives” (1984), she explained, “The moral imperative of artists of the 1950s and 1960s was that work should be shown without regard to, as Leon Golub put it, ‘the status of its creator or the circumstances implicit in its creation’” (Warren 1984, 15).¹³

Warren’s essay implied that many Chicago artists who were doing interesting work had been left out of exhibitions at the Hyde Park Art Center and other establishments because Chicago’s art world was becoming stagnate with acceptable “counterculture” works by the Chicago Imagists, for example, thereby narrowing the community’s range of participation.¹⁴ Activist and art critic Lucy Lippard wrote a thoughtful feminist essay, “The Women Artists’ Movement—What Next” (1976), where she highlighted the importance of alternative art and cautioned women artists not to be “content with a ‘piece’ of the pie, so long dominated by men, satisfied with the new found luxury of greater representation in museums and galleries (though not yet in teaching jobs and art history books) rather than continuing to explore the alternatives.” For Lippard, alternative spaces and ways of making art could change “the superficial aspect of the way art is seen, bought, sold and used in our culture” (Parker and Pollock 2013, 135).