FIBERSPACE

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ABSTRACT

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The histories of the fabric arts and of digital technology have been woven together since the early nineteenth century when Ada, Countess of Lovelace, wrote of the use of the punchcards from the Jacquard weaving loom in the programming of Charles Babbage's proto-computer, the Analytical Engine, as 'weaving' numbers and programming. Unsurprisingly, the histories of textiles and the digital are woven together even more tightly in the Digital Age. Today, digital quilts and other digital material culture produced in virtual worlds and online computer games raise profound questions for the future of museum practice and object-based academic disciplines. Digital sewing 'computers' and websites such as the Quilt Index are shaping quilt history as it happens.

This dissertation theorizes quilting, sewing and other fabric arts through the lens of (digital) technology. In this dissertation, I explore the ways in which technology has shaped the fabric arts, and how the fabric arts have shaped technology, from the Luddites to Ada Lovelace. I also examine the impact of the introduction of the sewing machine into the home, the Arts and Crafts Movement and the tension between machine and hand quilting, the decline of hand sewing skills, the use of quilts in research into artificial intelligence, the so-called 'sewing computer' and the future of the networked quilter

as humachine, and crafted objects in computer games and virtual worlds. I also investigate parallels between the political and philosophical tenets of Web 2.0 and the folk art and quilting ethos through such topics as participatory culture, open source, collective knowledge, collaboration and fair use.

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TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION: IMAGINING *FIBERSPACE*

So much of our everyday understanding of culture comes from the construction of binaries. Hard versus soft. Cool versus warm. Masculine versus feminine. These binary oppositions represent computing and quiltmaking, respectively, in the popular imagination, computers being seen as cool, hard, sleek and the preserve of men, whereas quiltmaking is culturally constructed as soft and warm, fuzzy, feminine, motherly. American Studies scholar Simon Bronner has observed both the crystallization and the breaking apart of these binaries in the fields of folk life and folk art in the digital age.

> Such binaries include natural and artificial, public and private, analog and digital, group and network, relational and analytical, and especially folk and official. Although folklorists have previously noted that various communication technologies that emerged in the twentieth century, such as the telephone and photocopier, have altered the way that lore, as well as information, is spread, I find that the Internet, more so than any other media, has unsettled many of the prior cultural binaries, which is evident especially in what I call the transgressive folk web (Bronner, 22).

What happens in the liminal spaces where these binaries intersect, where these powerful, archetypal attributes collide? This dissertation will analyze the objects, spaces and cultural phenomena at the nexus of computing and the fabric arts on the new transgressive folk web, what I am calling *Fiberspace*. (Read: places in cyberspace related to sewing traditions and the textile arts.)[1] *Fiberspace* encompasses digital quilts and weavings made in the virtual world *Second Life*, textiles created in the brick and mortar world and presented digitally, quilts on the popular social network *Facebook*, the

[1] It is important to note here that this study does not mark the first use of the term 'Fiberspace.' The term originally referred to a concept in hyperbolic geometry. I discuss the significance of this etymology in Chapter Three.

Quilt Index (an online scholarly resource for quilt study), crafted textile objects in the online game *World of Warcraft*, and much, much more.

Not surprisingly, this dissertation is the first major work to investigate *Fiberspace*. This can be attributed to the subject's newness—*Fiberspace* has only emerged in earnest in the first decade of the twenty-first century—and, more significantly, the almost counter-intuitive nature of the digital quilt. Indeed, when one thinks of quilters and quiltmaking, computers, and especially Web 2.0 technologies such as virtual worlds, social networking and massively multiplayer online role-playing games (MMORPGs), may be the very last thing to come to mind.[2] After all, even in a culture boasting an increasing diversity of perspectives and voices, technology in the West continues to be constructed as a primarily masculine endeavor (Kramarae, 5). And yet, women, including quiltmakers,[3] of all ages are using sundry digital technologies.

Very little recent published research has been exists on the topic of digital textiles, even in works on virtual worlds in which textiles are created, such as *World of Warcraft* and *Second Life*, let alone on women's cybercultural experiences with digital textiles. Specifically, there has been a dearth of focus upon women in cyberspace. Henry Jenkins, one of the major theorists in cybercultural studies, for example, barely even mentions women in *Convergence Culture,* focusing his analysis on "early adopters" of the World

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[2] Specifically, Web 2.0 refers to the transition of the World Wide Web from a collection of web sites to the Web as a collection of computer applications, a second-generation of web sites that are really web services such as social networking sites and virtual worlds, that let people create, upload and share media online (O'Reilly).

[3] Note that I use the term 'quiltmaker,' rather than 'quilter,' throughout this study. This is because 'quiltmaker' may refer to the person who makes the quilt top and/or stitches the layers of the quilt together, while the more familiar term 'quilter' technically refers only to the act of quilting, of stitching top, batting and back together. This distinction was first noted by quilt scholar Jonathan Holstein.

Wide Web, a resoundingly male demographic (Jenkins, 23). This belies the fact that the Internet has become an increasingly domestic space in the first decade of the twenty-first century.

Compounding this dearth of research is the fact that most of the key sources on quiltmaking and technology come from the period from the late 1980s to the mid to late 1990s. Heim and Hansen's *The Quilter's Computer Companion* (1998) is one of the first to explore the intersection of quiltmaking and digital technology, and is a key work to the study of *Fiberspace*. This volume provided quiltmakers with information about why they need a computer, how to buy a computer and peripherals, the best software for specific quiltmaking needs, the best software for use with an 'old clunker' of a computer, using software to update the design of traditional old block styles, using software to aid sewing, embroidery and appliqué, and using software for phototransfer onto fabric. Though the book is excellent for studying quiltmakers' attitudes toward computers and use of the Internet in the late 1990s, there is no such published study that sheds light on how quiltmakers are using digital technologies and Web 2.0 applications today.

Just what is this place called *Fiberspace*? Where is it? And who populates this brave new world? This investigation into quiltmaking and Web 2.0, digital objects as material culture, and the participatory culture of virtual folk art in the early twenty-first century begins with an historical contextualization of digital and analog technologies in the fabric arts broadly. Primarily, but not exclusively, my analysis here focuses on the side of production, rather than consumption, as I am chiefly interested in user-generated content, the culture of quilters as makers within Web 2.0. Using post-feminist theory, new perspectives on the Myth and Symbol school of American Studies scholarship,

Pierre Lévy's theory of collective knowledge, contemporary currents within intellectual property and globalization, Mark Poster's notion of the humachine and the relation of the sewing machine to the quiltmaker's body, ideas of participatory culture, cybernetics, and writing about technological determinism by Raymond Williams and others, I theorize some of the physical, social and virtual conditions that inform or have given rise to this Fiberspace. In the chapters on *World of Warcraft* and *Second Life*, I use these historical and theoretical underpinnings to analyze various objects created in this digital *Fiberspace*, and the broader online cultures in which these objects were created. Finally, in the chapter on the *Quilt Index* and the Age of Digital Reproduction, I analyze the potential for the use of humanities research questions and methodologies in conjunction with methods from high-performance computing. Ultimately, I make use of these historians, theorists, and methods primarily in my quest to answer key questions about objects and culture in the digital age, questions that cross disciplines from cultural studies to material culture and quilt studies to folklore studies to museum studies. These questions include:

- What exactly is *Fiberspace*, and when and how did it develop? What are the analog antecedents to this digital world?
- What is the historical connection between women, textiles, binary logic and language, computing and the digital? How useful are binaries such as soft and hard, masculine and feminine, and hot and cold, in the imagining and construction of *Fiberspace*?
- What is the relationship between the tenets of Web 2.0 and the praxis and practice of folk art? How have the synergy of Web 2.0 and folk culture online contributed to a revitalization of participatory culture in the early twenty-first century?
- How are digital quilts created, consumed, and understood within online games, virtual worlds, and social networks? What role do digital repositories of quilt images and metadata, such as the Quilt Index, play in *Fiberspace*? What role might digital objects and virtual worlds play in the future of humanities

scholarship?

In exploring these questions, it is my hope that the old binaries that set quiltmaking and computing, or women and technology in opposition with each will be broken down, and that the picture that will emerge will be one that more accurately paints the technological nature of the fabric arts and the feminine nature of technology.

While this dissertation is, at its core, a social history of quilts made in particular media and modes, in particular environments and cultures, and in a particular time, this study of *Fiberspace* necessarily diverges from established scholarship in the field of quilt studies in some significant ways. Generally speaking, social histories of quiltmaking follow a fairly predictable pattern, celebrating the soft, the warm, the fuzzy, and largely ignoring the cool, the sleek, the technological. They trace the historical American quilt through the colonial period and the early Republic, note the influence of Japonisme and the crazy quilt, the revival of quiltmaking brought about by the Bicentennial, pluralism (African-American, Native Hawaiian, American Indian quilts) and the development of the art quilt, but have not yet recognized the digital quilt.

To locate my own work within the discipline of quilt studies, I thus begin with a literature review. This review, "Quilts, Writing and Technology," consists of surveys of scholarly, and in some cases popular, writing in the major field, quilt studies, as well as a study of quilts in American literature and the tensions between sewing and writing and lay and academic scholarship in the field of quilt studies today. My review of the literature in the field focuses on the evolution of scholarship in the field, quilts in American Culture, and quilt studies as a sub-discipline within American Studies. Virginia Gunn's essay published in *Uncoverings*, "From Myth to Maturity: The Evolution of Quilt Scholarship," is extremely useful here. In the literature review, I also

investigate works that, like my own, sit at the intersection of Quilt studies and Digital Humanities, such as Heim and Hansen's *The Quilter's Computer Companion* (1998).

Together, the first five body chapters set the historical and theoretical background necessary for understanding the objects and cultures that make up *Fiberspace* today. Chapter Three, "Chapter Three: *Fiberspace* in the Footsteps of Ada Lovelace: Quilts, Mathematics, Electricity, and Weaving the Digital," provides much of the historical and theoretical background necessary to understanding longstanding relationship between textiles and (digital) technologies, illuminating the importance of theorizing textiles, rather than some other type of material culture, in connection with the digital. In early nineteenth century England, the Luddites were so averse to the mechanization of textile mills for social, economic and political reasons that the very word Luddite has become synonymous for a technophobic. However, the story of the nineteenth century that I wish to tell here is one of textiles and technophilia. Chapter Three introduces the figure of Ada Lovelace and her writing of the punch cards of the Jacquard loom in the earliest computer programming (the programming for Charles Babbage's Analytical Engine), theorizing an early connection between digital technology and textiles. Necessarily, I make use of Sadie Plant's work with weaving, the digital, binary code and gender. This chapter not only explores the place of weaving in computing, but also the place of computing in weaving, connecting current digital applications in the textile arts to Babbage's Analytical Engine and the inherent binaries of *Fiberspace*.

Building on the theoretical groundwork laid in Chapter Three, Chapter Four, "Postmodernism's Victorian Afterlife: Textiles and Technology in the Nineteenth and Twenty-First Centuries," provides an historical background for the tension between

technology and the fabric arts, a tension that colors our understanding of quilts and quiltmaking in the context of the digital to this day. Historical movements and events covered include: the Arts and Crafts Movement, the Colonial Revival, the Cult of True Womanhood, and the nineteenth century trope of the 'Age of Homespun.' I use specific quilts from the Quilt Index, such as Mary Gasperik's *Colonial Quilting Bee*, to illustrate my ideas. The Sewing Machine, its impact on the design and making of quilts, its place in the nineteenth century home, and its impact upon women's lives are also discussed here.

Other topics included in this chapter are the connection of nationalism and the search for what is American about American art, the tension between hand and machine quiltmaking in quilt exhibitions, shows, and fairs of the 20th century, Bauhaus fiber artists, the impact of the national Bicentennial and the bicentennial of George Washington's birth (1932), *The Sun Sets on Sunbonnet Sue* quilt as a visual metaphor for the death of hand sewing skills, Bauhaus textiles and Charles and Ray Eames as a synthesizing force, uniting an arts and crafts sensibility and good design for the people with new media and digital technologies. Early, romanticized histories of quilts in America written in the so-called pioneer period of quilt history, the 1890s to the1930s, by authors such Marie Webster, Ruth Finley and Ruby McKim, Alice Morse Earle, Hall and Kretsinger also figure heavily in this chapter.

While Chapters Three and Four investigate the roots of Fiberspace in the long and mostly analog history of the interplay of textiles and technology, in Chapter Five, "Folk Art and Web 2.0: Quiltmakers, Participatory Culture, Collective Knowledge, and Open Source," I take a political or philosophical tenet of Web 2.0 and plug that same concept

into the folk art ethos. Web 2.0 and folk art (quilting bees, square dances, etc) are both highly participatory, and participation in the arts is intimately connected with technology and commerce (shaped by radio, film, records, television, etc) as well as active democracy and national happiness. I discuss technological determinism here, and avoid falling into that trap myself.

In this chapter, I trace the history of engagement in the arts in America from the nineteenth century, in which home theatricals and homemade music were commonplace, to consumption as participation in the twentieth century, arguing that the model of consumption as participation is politically oppressive and not really engagement at all. I argue that with Web 2.0 and other digital technologies, participatory culture has been revived in the twenty-first century as amateur artists are creating and sharing on the Web. Particularly important here are two works in museum studies and public culture, Bill Ivey's *Arts, Inc*. and Tepper and Ivey's *Engaging Art,* as well as the ideas of Lawrence Lessig, especially as they apply to the very recent prehistory of *Fiberspace* in the computing world of the 1980s and 1990s and the shared values of these seemingly disparate quiltmaking and computing cultures, namely, a belief in the power of collective knowledge, or the wisdom of the group over the individual, and a belief in open source intellectual property.

This chapter also examines digital quilts posted to fan pages, given through social gifting applications, or won in *Facebook* games using sociologist Robert Redfield's concept of the "Little Community" to analyze quilt-related online social networks and social media applications, such as the social gifting application, Quilt Block Party, and others on the popular social network Facebook. Based on my research while working as

a member of the *Quilt Index* staff team on an Institute of Museum and Library Services Building Digital Resources grant project, this chapter also explores how users collaborate to create knowledge on the *Quilt Index*, using technologies from wikis to crowd-sourcing and social networking, with an emphasis on the role of digital quilts in a building of community quiltmakers, scholars, and educators in these disembodied online networks.

Collaboration and open source are key components of both Web 2.0 and quiltmaking cultures. Traditional quilt patterns are the ultimate open source, copyright free art. In this chapter, I theorize quiltmaking as open source using examples such as quilting bees, group quilting, round robin pattern swaps, folksonomy and social tagging. Into this analysis, I also incorporate Kyra Hicks' work on African American quiltmakers' very communal usage of the Internet from her book, *Black Threads*, as well as Pierre Lévy's theories of collective knowledge and Tim O'Reilly's writing on Web 2.0.

Chapter Six, "The Womachine and the Domestication of the Internet," examines the physio-techincal impact that networked sewing technology is having upon (female) quiltmakers' bodies and the socio-technical impact that women online, especially quiltmakers and other fabric artists, are having on the Web in the early twenty-first century. This chapter anchors the study of *Fiberspace* within the tradition of scholarship in American Studies, theorizes the relationship between the sewing computer and the quiltmaker's body, exploring what it means to be a networked quiltmaker today, and traces the history of the Internet from a lawless 'Wild West' to more domestic space inhabited by quiltmakers and mommy bloggers.

I begin the chapter with a personal anecdote: my Great Aunt Fern is 90 years old, lives in an isolated rural community and has terrible arthritis, yet still quilting thanks to

digital machines. I analyze a specific machine, the Husqvarna Emerald 183 'Sewing Computer,' in depth. Then, using the writing of Mark Poster, I explore the ways in which the Internet is exposing the permeability of the home and altering long-standing ideas about the insular, moral home. I propose the idea of a *Fiberspace* within cyberspace, using the writing of Paasonen, Plant and others, and suggest a (near) future vision of *Fiberspace*, a possible future of quilts and the Internet: the quiltmaker as interfaced humachine, a term proposed by Mark Poster in *Information Please*. Then, using the writing of contemporary scholar Ted Friedman, as well as canonical texts Henry Nash Smith's *Virgin Land* and Leo Marx's *Machine in the Garden*, I explore how and to what extent the Internet was indeed domesticated by women online, how the West was won, so to speak, but also how spaces such as the American West, the Internet, and *Fiberspace* came to be mythologized. Aiding in my analysis is David Nye's concept of the technological sublime, and the domestication of earlier 'sublime' technologies chronicled by Nye provides further historical background. Finally, I examine women as early adopters of online technologies, focusing upon my own experience as an early adopter of the popular online computer game *World of Warcraft*. With the conclusion of this chapter, the historical and theoretical foundations are laid for in depth analysis of specific works and worlds within *Fiberspace*.

The following three chapters represent case studies conducted in very different worlds, deep excursions into the artifacts and cultural practices of *Fiberspace*. Chapter Seven, "World of Craft: Crafted Objects in *World of Warcraft*," documents player crafted material culture, especially textile objects made through the tailoring profession, in the burgeoning online game *World of Warcraft*. Questions that guide my analysis in the

chapter include: Can these digital, in-game activities truly be described as tailoring, weaving, quilting, jewelcrafting, etc? Will curators in the future need to present and interpret these objects to the public? How will these digitally crafted in-game or in-world objects be archived and preserved? *Digital Play, Culture and Identity: A World of Warcraft Reader, The Video Game Theory Reader*, and works on material culture, such as Prown and Haltman's *American Artifacts*, provie important background for this chapter.

Fig. 1.1 Quilters in Second Life, screenshot taken in *Second Life*. For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.

In Chapter Eight, "Adventures in *Fiberspace*: Quilts and Quiltmaking in *Second Life* Through the Virtual Eyes of Ione Tigerpaw," I seek to locate *Fiberspace* in both theory and quiltmaking practice through the analysis of quilts and quiltmaking in the

virtual world *Second Life*. Tom Boellstorff's, *Coming of Age in Second Life*, is an important reference point for this chapter. Using the experiences of my own avatar, Ione Tigerpaw, as my primary data, I investigate quilters and quiltmaking in *Second Life* through a look at topics such as quilt shops (such as Becky's Quilts) and quilt exhibitions (including the NAMES Project and Lady Dawn Starbrook's Free Quilt of the Week event) in *Second Life*, digital quilts as material culture, and the relationships between virtual and real world quilts, quilting products, and quiltmaking. I primarily rely upon autoethnography, rather than participant observation or other methodologies that would engage the inhabitants of *Second Life*, in part because of the ethnographic overload that currently exists within the virtual world. Indeed, many anthropologists have joked that there are currently more ethnographers doing field research in *Second Life* than there are actual inhabitants.

Chapter Nine, "The Aura of the *Quilt Index* in the Age of Digital Reproduction: Digital Images, Cultural Authorship, and the Scalability of *Fiberspace*," examines in depth uses and functions of the *Quilt Index*, specifically in the presence of a 'critical mass' of quilt data. "The Aura of the *Quilt Index*" provides detailed background information on The *Quilt Index*, a digital repository providing preservation and access for over 50,000 quilt images and metadata and explores, using Benjamin's concept of the aura of the work of art, what might be the aura of the quilt in the age of massive amounts of quilt data—more than a scholar could ever study in a lifetime.

This study includes discussion of computer algorithms, visual stlyometry, provenometry,[4] pattern recognition and artificial intelligence in quilt scholarship, and the question of quilt authorship in the Age of Digital Reproduction, as investigated by myself and other members of the Quilt Index staff team as part of a Digging Into Data challenge grant. Besides Walter Benjamin's "The Work of Art in the Age of Mechanical Reproduction" and Susan Sontag's *On Photography*, provide much of the theoretical underpinnings of this chapter.

This dissertation begins with the project of imagining *Fiberspace*; it ends in locating *Fiberspace*. In the tenth and final chapter, "Conclusions: Locating *Fiberspace*," I will quilt (or weave) together the various chapters, using cultural studies theory about cyberpsace locating the various case studies—*Second Life, Facebook, World of Warcraft*, the *Quilt Index*, and the like—within a very real (if not temporal) place called *Fiberspace*. This chapter also locates this very interdisciplinary work within the futures of academic disciplines such as quilt studies, American studies, material culture, and museum studies. Much of this work is done in the relevant body chapters, but in the conclusion, I locate *Fiberspace* not only at the nexus of quilts and computing, but also at the nexus of the converging and digital futures of these disciplines. Scholarship on the digital, particularly on digital objects and virtual worlds, is, I believe, the future of all of these disciplines.

Ultimately, I seek to illustrate that the place I call *Fiberspace* is an important historical, theoretical and spatial construct intimately connected to the relationship

[4] The term "provenometry" was coined by computer scientist and mathematician Dr. Wayne Dyksen in 2010 while working on the National Endowment for the Humanities' Digging Into Data project.

between textiles and technology that began when Ada Lovelace first wrote of weaving the digital and digital weaving in the early nineteenth century, that these digital textiles produced in worlds such as *World of Warcraft* and *Second Life* are indeed objects of material culture in the traditional sense, that they are valuable to historians and not to be overlooked by the museum profession, that they raise important questions about documentation, presentation, preservation and access, and that their creation represents an important cultural shift, a new paradigm of participatory culture.

Having described the purposes and overall arc of this study, it is also important to note what it is that this dissertation does not set out to do. The topic of quilts and computing, let alone that of textiles and technology, is an incredibly broad one. It would simply be impossible to cover the whole of such a topic in one work. I thus focus almost exclusively upon history and theory; this dissertation seeks first and foremost to historicize and theorize the intersection of quilts and computing, that place which I call *Fiberspace*. This work is not meant to be a social scientific study of quiltmakers online lives; except in the case of the chapter on *Second Life*, which is largely an autoethnography. Primarily, however, I rely here upon history and theory rather than quantitative or qualitative data. Further, because of the theoretical importance that I place upon participatory culture, user-generated content, and collective knowledge, this analysis stays away from 'high art' and mass-produced analog and digital textiles, focusing in the case studies instead upon popular forms of digital craft.

Finally, to understand this dissertation in context, I think it is important to note that I myself am active in the textile culture in online worlds. Indeed, each of the chapters of this dissertation are highly personal to me, exploring my great aunt as a

networked quilter, my dozens of hours of game play in the massively multiplayer online role-playing game *World of Warcraft*, and my crafting life in the virtual world *Second Life*. Born as Generation X ended and the Millennial Generation began, simultaneously an online gamer and a textile historian and museum practitioner working with the Quilt Index, it is my hope that my experiences in this liminal *Fiberspace* will help to fill the gap between online youth culture and material culture.

CHAPTER TWO

LITERATURE REVIEW: QUILTS, TECHNOLOGY AND WRITING

While this dissertation examines a myriad of technologies that have led to the development of *Fiberspace*—the sewing machine, Babbage's Analytical Engine, Web 2.0, and the like—this study, Fiberspace, represents the confluence of two basic technologies—sewing and writing. *Fiberspace* is not only a place in which digital textiles are created or encountered; it is also a place rich in written communication. This literature review will 1) explore the tension between sewing and writing in both nineteenth and twenty-first century America, 2) explore quilts in literature and the importance of the study of quilts through the lens of literature for the American Studies scholar, 3) construct a history of quilt scholarship from the Colonial Revival myths of the late nineteenth and early twentieth century to the serious scholarly work of today, particularly works published in *Uncoverings*, the journal of the American Quilt Study Group, and 4) review key literature that informs this dissertation, scholarly work located somewhere near the intersection of quilts and the digital.

Pens and Needles

"Pens and Needles" was given as the keynote address to a meeting of the American Quilt Study Group (AQSG). In her talk, Ulrich noted a historic tension, going back to the Renaissance, between the world of words and scholarship and the world of the fabric arts. The so-called "woman question," a Renaissance era debate about the role of women in society, asked: If women are rational and educatable, and thus to be given the pen, or should women instead be given the needle (implying that women are irrational

and less educatable) (Ulrich, 221)? Thus, it is somewhat ironic to have an academic gathering devoted to quilts as, at least in the West, writing and the needle arts were imagined in this binary opposition to each other. Further, Ulrich pointed out that many textile scholars are word people rather than fabric people. That is, many textile scholars feel more comfortable writing about quilts than they do making them. Indeed, many scholars of quilts and other needle arts have gone so far as to value the artistry of women's works, but bemoan the fact that the women who made them were forced to sew all their lives. For the discipline of quilt studies to be truly healthy, pens and needles, words and quilts, ideas and objects, must be brought together.

Ulrich suggests that pens and needles, and the worlds of scholarship and stitchery that they embody, can be brought together by examining the eighteenth century, a period that Ulrich constructs as sitting as a sort of liminal point of time between the seventeenth century and Anne Bradstreet, America's first widely published female author, and the nineteenth century and the wild popularity of quilting. In the eighteenth century in America, the production of samplers, which often included stitched letters and/or numbers, was a common part of a girl's education. Also, fancy needlework done in the United States in the eighteenth century was done by literate women, and the bulk of American women's writing that was done before the middle of the eighteenth century survives not on paper, but in needlework (Ulrich, 223-4). So, writing and needlework, *especially* in education, were quite connected in eighteenth century America, perhaps more so than in twenty-first century America.

While she wrote mainly of the eighteenth century, Ulrich's reconnection of writing and scholarship and the fabric arts has great ramifications for the field of quilt

studies today. Within AQSG, there is a definite tension between quilt scholars who first and foremost view themselves as *quiltmakers* and quilt scholars who first and foremost view themselves as *academics*. Those scholars who see themselves as quiltmakers first can be distrustful of scholarship on quilts produced by people who cannot actually quilt. I have sensed this myself through my work with the Quilt Index and the Great Lakes Quilt Center. Independent scholars who are most focused on the quilts themselves have also felt isolated by papers in *Uncoverings*, the journal of AQSG, that have focused on disciplinary perspectives on the fringe of quilt studies, such as literary criticism.

Quilt scholars inside academia, however, are much more likely to be interested in a scholar's writing and analytical abilities, rather than in whether or not they have ever quilted. Some scholars within academia, such as Pat Crews, who comes out of an American studies background, have chastised independent scholars who document quilts, but then do not fully analyze the objects. Focusing on analysis and interpretation to the exclusion of knowing the history of the object, can however, be a pitfall of academic quilt research. In her article, which appeared in *Uncoverings*, "Making Critical Connections in Quilt Scholarship," Judy Elsley noted that literary scholar Elaine Showalter has, in writing about quilts as a metaphor for women's writing and feminist writing, perpetuated many of the romantic myths put forward by early quilt scholars such as Hall and Kretsinger, myths that the AQSG is actively working to dispel (Elsley, 239). For example, Showalter has written that the earliest quiltmaking in America was done in poverty and out of necessity, while quilt scholars have proven that quiltmaking in America began in the upper classes.

This scholarly division was put another way by venerable material culture scholar Jules David Prown in his essay "Material / Culture: Can the Farmer and the Cowboy Still be Friends?" in David Kingery's anthology, *Learning from Things*. The farmer, for Prown, is the material culture scholar focused on objects for object's sake. Farmers (often the independent quilt scholar) are passionate about the objects that they study are most interested in the factual history of the object. Cowboys on the other hand (often quilt scholars within humanities disciplines in academia) are most interested in objects for the ways in which they illuminate larger cultural beliefs.

Elsley's solution to this divide is simple, but not always easy: Independent quiltmaker-scholars and academics must learn to trust each other, value each other's approach, and learn from each other. Research in quilt studies is at its strongest when those theorize quilts do so within the framework of an accurate and thorough history, and those who are interested in the documentation and history of quilts fully analyze their findings.

Quilts and Literature

Almost every nineteenth and early twentieth century literary magazine published short stories in which quilts were a major theme or motif. Women's magazines, such as *Godey's Ladies Book* and *Harper's Bazaar*, and regional farm magazines published quilt-related short stories as well. Cuesta Benberry, in her anthology of early quilt stories, wrote that these stories tell us not only about trends or fashions in quilting and other needle arts of the times in which the stories were written, but also about popular perceptions and attitudes toward quiltmakers and quilts from a particular period. An

analysis of three quilt stories written in America in the 1870s, 1910s, and 1970s, shows not only societal beliefs about quilts and women's lives, but also gives insight into major topics in the field of quilt studies, such as the art versus craft debate, and shows the interconnectedness of quilt studies with other disciplines, such as American studies and literary criticism.

Louisa May Alcott's 'moral bed quilt' tale for children from the 1870s, "Patty's Patchwork," gives insight into the ways in which quilting was a part of women's morality, girl's education, and the mourning process in the mid to late nineteenth century. In the story, ten year old Patty has gone to stay with her spinster aunt while her mother is in the late stages of her pregnancy. Each day, before she may play, Patty's aunt requires her to work on her patchwork. The daily production of patchwork was standard in a young girl's day in America in this period; the diligence and usefulness of creating patchwork quilts was seen to be crucial in a girl's moral education. When Patty's infant sister dies, infant mortality being another (all too) common part of daily life in this period, Patty works through her grief and turns her patchwork into a 'moral bed quilt' (Alcott, 210) because she wants to be strong for her mother, to be, as she puts it, a 'nice little comforter' (Alcott, 215). The idea of *being* a comforter equates quilt and quiltmaker and suggests that the quiltmaker, not only the quilt, possesses qualities of being warm and soothing. Patty's aunt notes that the patchwork quilt is metaphor for life itself, the light and dark patches of the quilt representing the joys and sorrows of daily life. It is also interesting to note that this story appeared in a collection of fiction for children by Alcott entitled *Aunt Jo's Scrapbag* (Jo referring to the character of *Jo March* from Alcott's classic novel *Little Women*). The scrapbag, a collection of random

swatches of fabric, may be read as a metaphor for a collection loosely related short stories.

Scholar Elaine Showalter has written that Susan Glaspell's story "A Jury of Her Peers," from the 1910s, may be read as a metaphor for feminist reading itself. In the story, a wife has just been accused of murdering her abusive husband, and the sheriff and his deputy search the couple's house and farm for clues to prove the wife's guilt. The sheriff and deputy's wives accompany them to tidy the house. However, the wives come across a very erratic, chaotically pieced log cabin quilt. Such strange needlework, they realize, could only have been done by a very troubled mind. The wives rip out the stitches and redo the quilt, effectively destroying the only evidence of the accused woman's mania. Glaspell suggests a strong element of sisterhood here. The wives help a fellow woman in trouble even though they are, as the sheriff jokes, married to the law. When the sheriff and the deputy see their wives working on the quilt, they do not see them destroying the evidence in plain view; they can only comment that women are always interested in fabric and little trifles. Written during a time of agitation for women's suffrage and property rights, Glaspell criticizes what she sees as men's prejudice toward women's arts, including both quilting and women's writing. Men, Glaspell implies, think that women, in their quilting and in their writing, are only interested in trifles, not in lofty of important matters such as justice. Glaspell would have the reader think that men cannot read the language of the quilt, nor see its maker's rage at her husband's abuse, just as they cannot truly understand women's writing. This quilt story points to a growing feminist consciousness in early twentieth century America.

Finally, Alice Walker's story "Everyday Use," from the 1970s, says much about the role of historic quilts in modern society and about feminism and the African American consciousness from the period. In "Everyday Use," a hip, young, urban African American women interested in Pan-African ideas goes back to the Deep South to visit what she sees as her 'backward' family. Dee, or Wangero, as she now prefers to be called, sees the family's heirloom quilts and wants to take them back to the city. The quilts are art to her, representing her African heritage, and she believes that they should be preserved on the wall. By contrast, her mother and sister Maggie, neither of whom ever received an education or left their small, rural community, she quilts as family heritage, to be used on the bed, and ultimately to be worn out. This is an interesting take on the art versus craft debate that has always been a part of quilt scholarship. Here, quilt as art takes on a sinister connotation, while quilt as craft takes on a positive connotation. Walker implies that quilts are a part of living culture, and should be in use within the communities in which they were created, not taken back to New York and hung on the wall, to forever be a static monument to their culture. The Quilt Index, in conjunction with state quilt documentation projects, is one solution to this tension, as it allows for the preservation and access of a quilt's image(s) and metadata for scholars and the general public while at the same time allowing quilts to remain in private ownership. It is also important to note that while all of the early quilts stories documented by Benberry were written by White authors, "Everyday Use" is a quilt story from an African American perspective.

Elaine Showalter, in her essay "Common Threads," wrote that piecing and patchwork are both theme and form in women's writing (Showalter, 149, 169).

Patchwork has come to symbolize a feminist aesthetic in both visual (quilts) and written texts. Each of these stories tells us about quilts and the women who made them were viewed popularly in America in a particular period. This data is valuable not only to scholars in English and American studies, but also to quilt scholars. These disciplines have much to offer each other, and the study of these quilt stories has much to lend to the interpretation and analysis of historic quilts.

A History of Quilt Scholarship

In her essay "From Myth to Maturity: The Evolution of Quilt Scholarship" (1992), Virginia Gunn notes that quilting myths are the realities of quilt history. Romantic myths were combined with history as scholars and quilt enthusiasts wrote about American quilts, such as the myth of Betsy Ross' American flag, the myth of underground railroad quilts as maps to freedom, or the very widely held myth that the first American quilts were patchwork rather than wholecloth and that they were first created by pioneer women, rather than America's emerging upper class. This mingling of historical scholarship with the idea of the American myth in the field of Quilt Studies, Gunn argues, reflects the larger "Myth and Symbol" school within related disciplines, such as American Studies (Henry Nash Smith's seminal *Virgin Land* being a prime example of this) and material culture and decorative arts scholarship in the early twentieth century (Gunn, 194). A sign of maturity in quilt scholarship is a willingness to debunk romantic myths and correct inaccuracies. There have been three phases of quilt scholarship according to Gunn, moving writing in Quilt Studies, as she put it, "from myth to maturity": the Pioneer Period, the Practical Period, and the Quilt Revival (Gunn, 196).

The Pioneer Period of scholarly work on quilts, lastly from roughly 1890-1930, not surprisingly coincided with the Colonial Revival in the United States, a renewed interest in early Americana, as well as the Arts & Crafts movement and a general time of great interest in the handmade, from china painting to crazy quilts. Key works of the period include Alice Morse Earle's *Home Life in Colonial Days* (1898), Marie Webster's *Quilts: Their Story and How to Make Them* (1915), and Ruth Finley and Ruby McKim's *Old Patchwork Quilts and the Women Who Made Them* (1929). Finley created a pseudo-scientific history reflective of the time, using Darwinian language of evolution to create a mythic history of how the quilt evolved. She wrote that by 1750, the quilt was a universal art practiced in 'mansion and cabin' (Gunn, 198). Unable to document any actual early colonial quilts, Finley suggested that had all worn out, and that they had been so ubiquitous as to seem trivial, so American historians and diarists simply did not write about them in the seventeenth century. This is laughable to us today as we know the quilt as a textile form did not really emerge until about 1750. It is also, of course, naive to base history on suppositions. This desire of early quilt scholars in the Pioneer Period to claim the patchwork quilt as an indigenous American art form drove their myth, and led to an imagined and imaginary history of colonial quiltmaking as they would have liked it to have happened rather than a history based on the historical record of objects and primary sources.

In contrast, quilt studies in the so-called Practical Period, 1930-70, emphasized patterns and how-to books rather than colonial myths. Some histories were written in the period as well. Though 1932 marked the bicentennial of George Washington's birth and a continued interest in colonial America, it was the Depression and World War II that

most shaped this period of quilt history, giving rise to the practicality of feedsack, newspaper pattern columns, and how-to guides for the homemaker rather than the inventive and glorious histories of the previous generation of authors. Carrie Hall and Rose Kretsinger's aptly titled *Romance of the American Patchwork Quilt* (1932), represents a transitional work between the periods. Adding to and perpetuating the myths, they argued (mistakenly) that patchwork was the first quiltmaking technique and wholecloth came later and that quilts had begun as utilitarian and then moved up to the elites. However, much of their analysis of crazy quilts of the late nineteenth century was very accurate. This might be because crazy quilts came much later in quilt history and were artifacts they might have had first-hand experience with through mothers and grandmothers. This transitional quilt scholarship, while highly useful for its very accurate documentation of late nineteenth century quiltmaking in America, is ultimately still marked by the desire to believe that quilts had always been a part of American history (Gunn, 199). After the War, however, quilt scholarship became the object of more rigorous historical study. Dr. William Rush Denton's *Old Quilts* (1946) is a history Baltimore Album Quilts produced circa 1850. In the book, Denton suggested the following progression of historical quiltmaking techniques in the United States—wholecloth, pieced chintz, chintz appliqué, appliquéd calico and finally the block quilt, or patchwork quilt (Gunn, 199). Significantly, this is the first known history to correctly place the patchwork quilt as the last, rather than the mythic first, in a series of changes in quiltmaking techniques and styles. Unfortunately, while correct, his ideas made little impact as Denton published a very limited number of copies right after the Second World War, when interest in quilts was dwindling as women's roles were moving out of the

home and into the workforce. British scholar Averill Colby's *Patchwork* (1958) represents another key early text that distanced itself from the romantic mythmaking paradigm in writing on quilts. Colby saw no evidence of seventeenth century patchwork and argued that the historical record and the objects themselves show that wholecloth quilts came long before appliqué and block styles (Gunn, 200). Colby is also significant for adding a more global perspective to the field of Quilt Studies, linking the origins of American, English and continental European quilting traditions, and ultimately suggesting that quiltmaking may not be an indigenous American art (Gunn, 200). Of course, such a transnational history was too progressive a history for its time among many American readers. Writing about quilts of the 1960s, was largely a reaction to the debunking of the American myth. Rose Wilder Lane's *Women's Day Book of American Needlework* (1963), for example, largely returns to the myths of Webster, Finley, and Hall and Kretsinger.

The Quilt Revival is said to have begun around 1970, and some would argue, continues into the present day. This period has been marked by an interest in the careful documentation of quilt objects, including state-wide documentation projects and discovery days, as well as a growing interdisciplinarity among scholars working in the field, an interest in quilts among scholars of various disciplines, such as in social historian Laurel Thatcher Ulrich's *The Age of Homespun: Objects and Stories in the Creation of an American Myth* (2001), and the legitimization of quilt scholarship and Quilt Studies as a discipline through the founding of the American Quilt Study Group and its journal, *Uncoverings*. In the 1970s, many of the romantic myths continued to persist, fueled in part by the patriotism and sentimentality of the U.S. Bicentennial in 1976, but

also methodologies that tended to ground history more in objective fact emerged in this same period in the field of Quilt Studies, such as oral history and documentary photography. Patsy and Myron Orlofsky's *Quilts in America* (1974) again represents a transitional text, sitting at the cusp of two very different historical paradigms. The Orlofskys' questioned many of the myths, but ultimately agreed that seventeenth century quilts must have been too common for early American chroniclers to mention (Gunn, 200). Grassroots lay scholarship published in journals such as *Nimble Needle Treasures* (1969-1976) and Joyce Gross' *Quilters' Journal* thrived in the 1970s, though it was the founding of the American Quilt Study Group (AQSG) in 1980, and a sense of growing professionalism and scholasticism, that shaped the discipline for the future.

Uncoverings, the journal of the AQSG, was first published in 1980 and represents a watershed in writing about quilts because it marks the beginning of a truly rigorous standard of historical research in the field of quilt studies. Laurel Horton's anthology (1990), *Quiltmaking in America: Beyond the Myths*, reprinted some of the best research from the 1980s by AQSG members and celebrates the first ten years of *Uncoverings*, featuring scholars such as Barbara Brackman, Joyce Gross, Cuesta Benberry, Virginia Gunn, Merikay Waldvogel, Best Ramsey, and Wilene Smith. Barbara Brackman's essay "Signature Quilts" from that collection is an example of the interdisciplinarity and attention to methodology by those whose research focused on quilts and quiltmaking. Grounded in cultural geography, Brackman noted four main points of origin for signature quilts using Kniffen's method for the study of folk housing. Previous studies of signature quilts had focused solely upon Baltimore and the Delaware River Valley; Brackman, from Kansas, looked at larger distribution of signature quilts to answer a focused

question: How fast and how far did the signature quilt fashion spread? As stated in the introduction, by studying and writing about *Fiberspace*, I hope to answer many such questions. While a knowledge of the historical evolution of writing in the field of Quilt Studies is key to answering these questions, a knowledge of other works, works that sit at the intersection of textiles and technology, must inform this study as well.

Review of Key Literature at the Intersection of Quilts and the Web

There are a few books (besides this dissertation) that sit at the intersection of digital technology studies and quilts. An important work to this study in the field of women, quilting and digital technology is Judy Heim and Gloria Hansen's *The Quilter's Computer Companion* (1998). *The Quilter's Computer Companion* has been a boon to my research. In the late '90s, Heim and Hansen offered quiltmakers common sense information about why they need a computer, how to but a computer and peripherals, the best software for specific quilting needs, the best software for use with an 'old clunker' of a computer, using software to update the design of traditional old block styles, using software to aid sewing, embroidery, and appliqué, and using software for phototransfer onto fabric. Already, this gives one a sense of the tasks for which quiltmakers were using their computers in the 1990s. A related book from the same period, Judy Heim's *The Needlecrafter's Computer Companion* (1995), addresses these same computing issues to a broader audience, discussing computing as applied to a wide variety of textile arts, including knitting, cross-stitch, needlepoint, and dressmaking.

The final chapter of *The Quilter's Computer Companion* diverges quite a bit from the rest of the book, telling quiltmakers what they might do in cyberspace. Again, this

provides a valuable introduction into how quiltmakers were using the Internet in the period. The authors provide advice on finding fellow quiltmakers one already knows in cyberspace, meeting quiltmakers one has never met offline, finding quilt patterns, finding advice and feedback, downloading patterns, and even setting up a fabric or sewing notions shop online. Since this book is over ten years old, this information could feel very dated, and in some ways it does, but in many ways this information is still very useful because the authors focus upon what one can do online rather than upon specific technologies or websites. One of the appendices of this book is also quite valuable for the study of quilts and the digital, Christopher Holland's "The Quilter's Internet Yellow Pages." He breaks up the listings into categories such as websites, list-based discussion groups, clubs and guilds, swap groups, zines, sewing machine information, etc.

Noted quilt historian Barbara Brackman's exhibition catalog, *Patterns of Progress: Quilts in the Machine Age*, features quilts created in various techniques made possible by machine quilting. The real value of this catalog for this kind of a study lies in the introduction, which provides a historical context for machine and computer-aided quilting, discussing major figures and inventions as well as analyzing related ephemera.

Textile historian Ingrid Bachmann's essay "Material and the Promise of the Immaterial," is one of many works referenced in this dissertation that examines the inherent connections between textiles and the digital, noting the binary nature of each, as well as their once joint history in the use of the punch cards of the Jacquard loom in the programming of the first proto-computer, the Analytical Engine.

Sadie Plant's *Zeroes and Ones* and Susanna Paasonen's *Figures of Fantasy: Internet, Women and Cyberdiscourse* are two key works of cyberfeminist and post-

feminist theory that inform this project. They provide an excellent introduction to women and technology, especially digital technologies and women's bodies, and like Bachmann, Plant's work provides useful critical perspectives on the writings of Ada Lovelace, the mathematician working on the Analytical Engine project who first theorized "weaving the digital," in addition to the many biographies of Lovelace cited in this dissertation.

Cheris Kramarae's *Technology and Women's Voices: Keeping in Touch* (1988) is a great resource for looking at textiles and other forms of material culture through the lens of technology, despite the fact that it is a bit dated. The cover illustration of this anthology could be read as a visual metaphor for this very dissertation. Depicted on the cover are two diverse women piecing a quilt upon which they have embroidered images of technological artifacts such as a typewriter, a computer, a washing machine, a sewing machine, a telephone, etc. Essays with content supportive of this dissertation project include "Computational Reticence: Why Women Fear the Intimate Machine," "Chatting on a Feminist Computer Network," "Talk of Sewing Circles and Sweatshops," "Washing Technology and Women's Communication," and "Women and the Telephone: The Gendering of a Communications Technology." As an ardently feminist text from the 1980s, many of the essays decidedly react to the essentialism of the 1970s.

Dana Bard's essay "Literary Practice in Extra-Academic Conversations: Quilting Bees Via Email" follows the conversations surrounding quilting held by ten avid quiltmakers over time via email. Bard found that while most conversations were dedicated to what she calls "the business of quilting" (exchanging patterns, giving feedback on each others' work, etc), some conversations did discuss quilting as a fine art,

prejudices against the textile arts, and dissatisfaction with the dominant male culture. Bard notes that the elements of quiltmakers' online conversations—having conversations to create knowledge, collaboration and power sharing are the hallmarks of a good literacy-learning environment. This article lead me to consider issues of quiltmakers' literacy, both technological and traditional.

Though they do not address quilts or textiles specifically, several works in digital cultural studies are key to the theoretical underpinnings of this dissertation and to a greater understanding of the specific virtual worlds that I interrogate.

Henry Jenkins' *Convergence Culture* describes the places in which old and new, digital media intersect. Jenkins does this through case studies focused upon major media phenomena such as *Harry Potter* and *Survivor*, and examines how convergence is felt by different groups: fans, consumers, the advertising industry, and the media at both the macro and micro perspective. For this project, *Convergence Culture* will help to make sense of the ways in which old and new media mingle in the world of quilting. As stated previously, a critical problem with the use of this book with a topic relating to women's studies is its lack of any real treatment of women's media or concerns.

Pierre Lévy's *Cyberculture* is very useful not only in defining, in a meaningful way, terms such as 'cyberspace,' which are often used but less often understood, but also, for this dissertation, in its discussions of its nature in terms of art and social movements. I use Lévy's theory of a 'collective intelligence' facilitated by the Internet to discuss the sharing and building of a collective knowledge base by quiltmakers online.

Folklorist Trevor Blank's edited collection, *Folklore and the Internet: Vernacular Expression in a Digital World*, investigates topics pertinent to many of the chapters in

this dissertation, topics such as public folklore online, digital and virtual folklore and folk life, and the vernacular, folk Web. These ideas are helpful for understanding both broad themes of *Fiberspace*, such as the shared ethos of folk artists and Web 2.0 content creators, as well as very specific cultural practices, such as the use of digital festival clothing in the various festivals, or "world events," observed annually by players of *World of Warcraft*.

Bertolt Brecht's prophetic essay, "Radio as a Means of Communication" (1932), proposes an alternate future for radio in which people both create and receive content, rather than simply take in content from a few sources out of their control. Not until Web 2.0 content sharing sites such as YouTube did Brecht's vision of what broadcasting could be come to pass. Read alongside Raymond Williams' *Television, Technology and Cultural Form* (1974), Ted Friedman's *Electric Dreams*, and Carolyn Marvin's *When Old Technologies Were New: Thinking About Electronic Communication in the Nineteenth Century*, the three works provide a convincing case against technological determinism and in favor of social, cultural and artistic agency.

In discussing the digital self, Mark Poster, in his book *Information Please: Culture and Politics in the Age of Digital Machines*, proposes the concept of the humachine, the individual inexorably connected to and reliant upon (physically and mentally) digital machines for very basic activities and functions. I use this idea to argue that aging quiltmakers, who for physical reasons rely heavily upon computer-assisted quilting software and sewing machines to sew and quilt, are excellent examples of the humachine.

In their anthology, *Memory Bytes*, Rabinovitz and Geil have selected a nice variety of essays that work together to build historical and social context within the field of technology studies. This book attempts to erase what the authors call the 'rhetoric of amnesia' and the 'rhetoric of the new' by historicizing the often ahistorical field of digital cultural studies. This approach is essential to informing this dissertation as *Fiberspace* creates a bridge between the digital and the new and the very traditional, history conscious field of quilt and textile studies. Judith Babbitts' essay, "Stereographs and the Construction of a Visual Culture in the United States," and Laura Rigal's "Imperial Attractions: Benjamin Franklin's *New Experiments* of 1751," are particularly valuable reference points for this project.

Kenneth Haltman and Jules David Prown's anthology, *American Artifacts*, makes use of an object-based, case study approach that is particularly relevant to this project. Haltman's essay, "Reflections on a 1923 Candlestick Telephone" is often cited in historical technology studies lists within the field of American Studies. Another essay, "Sewing and Sowing," addresses cultural continuity and quilts.

Walter Benjamin's essay, "The Work of Art in the Age of Mechanical Reproduction" (1936), attempts to explain the complex relationship between works of art and reproductions of works of art. He argues that without reproductions, one would not appreciate the original in the same way—indeed, the 'original' would not exist in a world without reproductions. Benjamin also introduces the idea of the aura of an original work of art and gives historical context for reproductions. While Benjamin's concept of the aura is not as easily applied to quilts and other textiles because of their emphasis on

shared patterns and collective knowledge over individual 'genius,' Benjamin's essay is nonetheless a seminal work in the understanding of works of art.

Similarly, Fiona Cameron and Sarah Kenderine's collection, *Theorizing Digital Cultural Heritage*, features essays that explore the impact of photography upon the museum and the work of art, the dialectic of the digital object as interpretation for physical art versus the digital object as art in its own right, and binaries related to this discussion such as "Art/Science," "Art/Engineering," and Lev Manovich's "Turing-land and Duchamp-land."

The Vitra Design Museum's anthology, *Commerce and Culture: From Pre-Industrial Art to Post-Industrial Value*, includes essays on topics such as the value of tradition, reproductions and originals, shopping and 'tele-shopping,' museums, urbanism, creativity and technology. It mixes classic pieces such as Walter Benjamin's "The Work of Art in the Age of Mechanical Reproduction," Vannevar Bush's "As We May Think," and an excerpt from Emile Zola's *Au Bonheur des Dames* with contemporary scholarly essays.

Tepper and Ivey's collection *Engaging Art* proposes multiple, historically-dependent definitions for participation in the arts, and traces the history of arts engagement in America from a truly participatory engagement in the nineteenth century (piano playing, other kinds of homemade music, home theatricals, etc.) to a passive engagement in the twentieth century as arts appreciation, or to put it bluntly, arts consumption of viewing paintings in galleries, listening to concerts in performing arts centers, etc, and now back to a more active engagement online in the twenty-first century with blogging and photo sharing tools such as Flickr. The essays in this collection very

clearly show how arts participation is shaped by technology—television, radio, film, CDs—and commerce, and why arts participation is so important. The works of legal scholar Lawrence Lessig, including his *Code 2.0*, put Tepper and Ivey's anthology in context, revealing that sometimes antiquated legal opinions on intellectual property and rights management that influence behavior in *Fiberspace* and throughout the Web.

Finally, works on the virtual worlds *Second Life* and *World of Warcraft*, Tom Boellstorff's *Coming of Age in Second Life*, Hilde Corneliussen and Jill Walker Rettberg's anthology *Digital Culture, Play and Identity: A World of Warcraft Reader*, and William Sims Bainbridge's *The Warcraft Civilization*, provide background and socio-technological context on these key research sites within *Fiberspace*.

Taken together, all of these works provide the reader a core foundation for the art historical, social and technological issues raised by this dissertation. The understanding of the linkages between quilts, technology and writing creates a point of entry for the academic, those more comfortable with a pen than a needle, into *Fiberspace*.

CHAPTER THREE

FIBERSPACE IN THE FOOTSTEPS OF ADA LOVELACE: QUILTS, MATHEMATICS, AND WEAVING THE DIGITAL

One may well wonder why I have chosen to articulate and theorize *textiles* in relation to the digital when I could have chosen another medium, say, ceramics, for example. This place I am calling *Fiberspace* is an important theoretical construct, not only because of the myriad ways that contemporary artists, gamers and the like are creating and using digital textiles, but also because of the intimate historical connection between textiles and technology. The loom, like the computer, uses a binary code for processing infinitely complex information. Warp and weft, zero and one, male and female share a common language. This chapter investigates these linkages between digital technology and the textile arts, especially weaving and quilting, including the mathematician Ada, Countess of Lovelace's technical and theoretical writings of the punch cards of the Jacquard loom in the programming of the first proto-computer, quilts in mathematical theory and pedagogy today, and computer-aided and digital weaving in the twenty-first century.

While much has been written by scholars of computer history and contemporary digital culture, such as James Essinger and Howard Rheingold, upon the contribution of weaving, specifically the contribution of Jacquard loom punch cards, to the development of computing and information processing, and published studies in the fields of textiles and contemporary art document digitally-assisted weaving practices today, little work has been done placing the one in the context of the other. Ingrid Bachmann's seminal essay, "Material and the Promise of the Immaterial," begins this work, and with this chapter, I

seek to move this work further, connecting digital weaving with weaving the digital and reflecting upon how nineteenth century weaving and proto-computing lay at the heart of *Fiberspace* today.

Weaving, very simply, is the practice of interlocking two strands of fibers, the warp and weft, at right angles to form a material, such as cloth. The coarser the fiber, the easier it is to weave a material by hand. Delicate fibers, such as silk, must always be woven on a loom (Essinger, 9), and places of woven textile manufacturing became economic centers of activity. The French city of Lyons, for instance, was renowned for its intricately-patterned woven silk production by the beginning of the nineteenth century. The changing fashions of the day created a problem for the industry, though, in that a loom was built to weave one particular pattern, say a rose-patterned brocade. When a pattern, let us continue with the example of roses, went out of fashion in Paris or London society, the demand for that cloth declined and the loom was no longer useful. A new loom for a new textile design then had to be built.

Joseph Marie Jacquard, a Lyonnais weaver working at the beginning of the nineteenth century, famously asked the question, "What do you do when roses go out of fashion?" (Essinger, 12), and sought to improve the productivity of the city's silk industry by creating a *programmable* loom, a loom that could be programmed through the use of punched cards to weave sundry different patterns while keeping its basic machinery intact. In computing terms, the punch cards (pictured on the following page, on the loom alongside the rose brocade) for the patterns to be woven functioned as the software on this loom, while the machinery, the loom itself, was the hardware. [On the following page is an image of the Jacquard loom, the punch cards, and the rose-patterned

silk brocade that they wove.] The Jacquard loom, invented in 1801, was thus one of the first, perhaps the first, computers ever built. Computing as we know it was necessitated by the manufacture of textiles. That the first computer was a loom for the weaving of silk brocade stands in stark contrast to both the vision of textiles as women's "gentle arts" and the vision of computers as sleek, futuristic, and masculine. This breakdown of the dichotomy between masculine and feminine, textile and technological

Fig. 3.1 Punchcards on the Jacquard Loom, image source: Museum of Science and Industry, Manchester.

has been noted by Ingrid Bachmann.

> Textiles as a practice is still quite firmly rooted in the popular imagination as an artisanal activity, a sometimes quaint, historical craft, one of the "gentle arts" usually associated with women whose site of production is historically the home, an antiquated process that operates outside the "real" economy of commodity goods and exchange. It embodies both the nostalgia and historicity surrounding many perceived economically redundant technologies… This scripting of textiles

> and weaving as both a feminine activity as well as an outmoded practice is not unexpected, but it is hugely inaccurate given the seminal role of textile production in both the industrial and digital revolutions of the nineteenth and twentieth centuries respectively (Bachmann, 25).

The Jacquard loom, however, was not the only invention of the period that gave rise to computing and computer science as conceived by Lovelace, however. Experiments conducted in 1751 by American inventor and statesman Benjamin Franklin gave rise to the very notion of binary duality.

Laura Rigal's essay, "Imperial Attractions: *Benjamin Franklin's New Experiments of 1751*," is a critical history of thinking about electricity that begins to explain the extent to which electrical theories have colored ideology, including ideas about politics and gender, in the West to the present day. Ultimately, Rigal notes in the essay that the idea of the +/- binary of electrical charges noted by Franklin in the 1751 pamphlet "was a 'metacode' that put into circulation the binary structure of systematicity itself" (Rigal, 25). Franklin's electrical experiments were thus a historical antecedent to all technologies which make use of binary logic, and by extension, digital technologies, given their binary nature, have very longstanding intellectual roots, going back at least to the Enlightenment (Rigal, 40).

> Within the digital revolution of the twentieth century, the role of textile technology is equally seminal. One of the many ironies, as any first-year computer science student is well aware, lies in the fact that the forerunner of the first computing machine—Charles Babbage's *Analytical Engine*—was based on the early nineteenth century Jacquard loom. Joseph-Marie Jacquard's system of pattern punch cards to store and process information for his automated loom were translated into the first computer punch cards. Weaving, after all, is a process of information storage, a binary system of interlocking threads, mirroring the 0's and 1's of computer programming (Bachmann, 27).

The binary language of negative and positive, zero and one, described by Franklin was to become the language of the Jacquard loom punch card (open and closed), as well as that

of Babbage's proto-computer, and the computers of the twentieth and twenty-first centuries.

Ada, Countess of Lovelace, née Ada Byron, was the daughter of Romantic poet Lord Byron and Annabella, Lady Byron, very much a child of the Enlightenment. Or rather, as Lovelace biographer Benjamin Woolley has suggested, the daughter of Romanticism and Reason themselves (Woolley, 2). Put another way, Ada Lovelace, both in terms of her own personal history and in terms of the early Victorian era in which she lived, an era which saw the rise of the first truly Modern technologies,

Fig. 3.2 Ada Lovelace, image source: Library of Congress.

embodies many of the binary tensions described in the first pages of this dissertation. Like that which stands at the intersection of textiles and technology today, he was at once the scientific, the technological, the cool, the masculine, and the poetic, the Romantic, the warm, the fuzzy, the feminine.

> Her life spanned the era that began with the Battle of Waterloo and ended with the Great Exhibition—a period of barely forty years that saw the world transformed. This was the age when social, intellectual and technological developments opened up deep fissures in culture, when romance began to split away from reason, instinct from intellect, art from science. Ada came to embody these new polarities. She struggled to reconcile them, and they tore her apart (Woolley, 2).

Lovelace's short life (she died at the age of thirty-six) was marked by her love of mathematics and calculating technologies, but also by an estrangement from her father

from infancy, a gambling addiction, numerous extra-marital affairs, a general ambivalence toward her aristocratic husband and their three children, and by numerous health problems, including frequent migraine headaches, anxiety and panic attacks, and uterine problems, eventually diagnosed as the cancer that took her life.

Lady Byron wrote that Ada's numerous health problems were due to her 'overexcitement' and too much thinking about mathematics, while Lovelace herself saw something insidious in the transitional age in which she lived, citing "the high pressure of the present age & epoch & state of society" as the root cause of her suffering (Winter, 233). In her essay, "A Calculus of Suffering: Ada Lovelace and the Bodily Constraints on Women's Knowledge in Early Victorian England," Alison Winter writes that Victorian women, and even many male Victorian intellectuals presented themselves as sickly.

> Lovelace's invalidism was by no means unusual. The frail, stoical, house-bound, and self-monitoring existence of the invalid was one that many Victorian ladies experienced at one time or another. More significant, "life in the sick-room" replicated in extreme forms certain characteristics otherwise definitive of idealized Victorian femininity; here could be found a delicate creature, confined to the domestic sphere, whose weak body left her dependent on others and simultaneously contributed to her enhanced spirituality. Lovelace was unusual, however, in the ambitions she voiced from this predicament. Intellectual achievements of any kind made a woman stand out in this culture. Lovelace was especially remarkable because her major field of study was one widely reckoned to be peculiarly inaccessible to a woman's mind: mathematics (Winter, 203).

Lovelace is known today for her collaboration with inventor Charles Babbage, especially her writings which theorized Babbage's work, and for her translation and extensive notes on a paper by the Italian engineer L. F. Menabrea, "Sketch of the Analytical Engine Invented by Charles Babbage." However, it is precisely the moments when she was thinking beyond the Age of Reason, not just as a rational scientist and

mathematician, but also as a Romantic poet in the tradition of her father, that Ada made her most important contributions. "She delved into technology with a lineage that combined art—through her poetic and ever-absent father—with mathematics through her stern mother—a 'mathematical Medea.' She raised issues suggestive of the artificial intelligence debate, and upset convention by mixing intuitions with science" (Cornwell, 42).

It is not insignificant that Ada Lovelace was aware of and fascinated by Jacquard's loom some years before Charles Babbage had considered the use of the punch cards from the loom in the programming of the Analytical Engine. On a trip through industrial north England in the summer of 1834, Ada and her mother, Lady Byron, saw the looms in action, and Lady Byron created a drawing of the punch card used in the weaving of ribbons (Essinger, 138-9). "Ada was particularly sensitive to the significance of the Jacquard loom in Babbage's plans. The best way to understand her contribution to Babbage's work is to see it in terms of the relationship between Babbage's work and Jacquard's. Ada loved the Jacquard loom, and added it to her many scientific fascinations" (Essinger, 123). Lovelace's position, then, as what one could call the world's first software developer, was a bringing together, through languages, both literary and binary, of the spheres of computing and textiles. Lovelace wrote of the Analytical Engine,

> The distinctive characteristic of the Analytical Engine, and that which has rendered it possible to endow mechanism with such extensive facilities as bid fair to make this engine the executive right-hand of abstract algebra, is the introduction into it of the principle which Jacquard devised for regulating, by means of punched cards, the most complicated patterns in the fabrication of brocaded stuffs. It is in this that the distinction between the two engines lies. Nothing of the sort exists in the Difference Engine. We may say most aptly that the Analytical Engine *weaves algebraic patterns* just as the Jacquard-loom

> weaves flowers and leaves [Ada's italics] (Essinger, 141).

The rather poetic idea of *weaving algebraic patterns*, that mathematical calculations are made up of a binary logic, a warp and a weft, that could be woven by a machine into a logical fabric, was an extraordinary one. And it was an idea that formed the basis for the discipline of computer programming. According to James Essinger, author of *Jacquard's Web: How a Hand-Loom Led to the Birth of the Information Age*, Lovelace's great achievement in the field of computer programming, an achievement that brought together, from both a theoretical and a practical standpoint, textiles and technology, was not in the translation of Menabrea's writings on the Analytical Engine, but her own writing on the Analytical Engine in the extensive notes which she published along with the translation.

> Had Ada *only* [emphasis original] translated Menabrea's paper her achievement would have been merely a linguistic one. Furthermore, one could reasonably have said that she was to a large extent translating a paper whose intellectual content was substantially Babbage's own. But in fact Ada's translation was merely the starting-point for her work, for published translation is accompanied by seven additional Notes (she consistently capitalized the word). These, denoted by the letters A to G, extend to more than 20,000 words: that is, about twice as long as the actual translation. They offer a penetrating insight into the Analytical Engine, with its revolutionary design and objectives and with its intimate conceptual connection with the Jacquard loom (Essinger, 123).

In the mid-nineteenth century, when art and science seemed to be rapidly diverging from one another, and the ideal of the Cult of True Womanhood and the Victorian woman as house-bound keeper of the domestic sphere was dominant, one could argue that Lovelace's intellectual marriage of computing and weaving can be read as a radical feminist act. Cybertheorist Sadie Plant has argued that the mechanical loom (and by extension, other technologies) threatened the very idea of what a woman is.

> ‘Where are the women? Weaving, spinning, tangling threads at the fireside. Who are the women? Those who weave. It is weaving by which woman is known; the activity of weaving defines her.’ In Plant’s discussion, computerization, as prefigured by the mechanization of the loom, is a threat to the very definition of the female, while it also casts weaving, women and cybernetics in convergence (Paasonen, 176).

The etymology of the word ‘computer’ is simply “one who computes,” and has been in use since the seventeenth century. Significantly, in the nineteenth century, women who did calculation work for insurance companies, nautical and astronomical charts, the U.S. Census Bureau, and other organizations dealing with large amounts of figures were called *computers* (Campbell-Kelly). Thus, the first computers used in the United States were actually women employed in doing mathematical calculations.

Plant goes on in *Zeros and Ones* to argue that the act of weaving and the World Wide Web are intimately connected, not just because of Lovelace’s use of the punch cards of an industrial loom, but also because webs are, by nature, woven. For Plant, women are the spiders weaving the World Wide Web. While this kind of logic can push theory into the bounds of ideology, Plant’s rhetoric of weaving proves useful for understanding Lovelace’s contributions outside the realm of mathematics and computer science. Further, Plant, in her ideas about weaving, webs and women, was from a mere second wave feminist crackpot. Tanya Harrod echoed Plant’s arguments over a decade later in her essay, “Otherwise Unobtainable: The Applied Arts and the Politics and Poetics of Digital Technology”: “But textiles appear ready for anything, as Sadie Plant points out in Zeros and Ones, where Jacquard looms (in any case prophetic of computing) interweave multiple functions: combining software and hardware; displaying cloth as material and an information storage system, as a product and a process” (Harrod, 235).

Lovelace's contribution to computing in the twentieth century has been monumental, though some scholars have been slow to admit her importance, ascribing much of her work to Babbage. In his seminal essay, "Computing Machinery and Intelligence" (1950), Alan Turing anticipated flaws she might have found in his own thinking on artificial intelligence in a section called, "Lady Lovelace's Objection." In 1979-80, the computer programming language developed by the United States Department of Defense was dubbed 'Ada' (Cornwell, 42). Lovelace's ideas about binary logic and using punch card programming as "weaving the digital" have clear connections to computers and computer programming as they developed in the early and middle twentieth century. Many scholars, however, also credit Lovelace's ideas about weaving the digital as the intellectual framework upon which the Internet and World Wide Web are built as well. "… it is not stretching credibility too far to describe the Internet itself as Jacquard's Web" (Essinger, 257). Indeed, there is a great resemblance between the binary logic and actually look of a punch card used in programming in the pixel-based method in which digital images are rendered.

> The pixel-based method of representing an image bears a great resemblance to the way the master-weavers of Lyons wove images from silk. This is because the woven images created in silk fabric by the master-weavers of Lyons on the Jacquard looms still used in Croiz Rousse are themselves in fact nothing more or less than digital images. A digital image in this sense is one in which the picture is represented by a code consisting of only two elements. A digital image is made using a representational systems that places images on a grid, with the tiny squares or rectangles of the grid being either filled in with a colour (which may include black or white) or left blank. The 'filling in' is one element and the blankness is the other. Those are, by the very nature of weaving and computing, the only two options (Essinger, 294).

Weaving not only gave rise to computing and the digital, but computing and the digital have facilitated many changes in the ways in which weavers and other textile

artists work, both in term of form and content. Regina Cornwell noted that, "A hundred years before ENIAC, Ada Lovelace mused about the Analytical Engine as a rich source not only for scientific and mathematical explorations, but also for art and imagination" (Cornwell, 51). It is to the role of computing in fostering art and imagination in the fabric arts that we now turn.

British fiber artist Ann Sutton pioneered the field of digital textiles, joining the Computers Arts Society in the 1960s. She uses a "programmable dobby loom in which the computer instructs the loom with her design" (Harrod, 234). For British textile historian Tanya Harrod, "Some of the excitement is when the yarns have their say, responding unexpectedly to the cloth" (Harrod, 234). Another contemporary artist, Rocio Maria Goff, created a loom-based work of installation art, the *Weaving Histories Loom*. The artist's statement indicates an awareness in the role of the loom as a link in the chain connecting history and future technology.

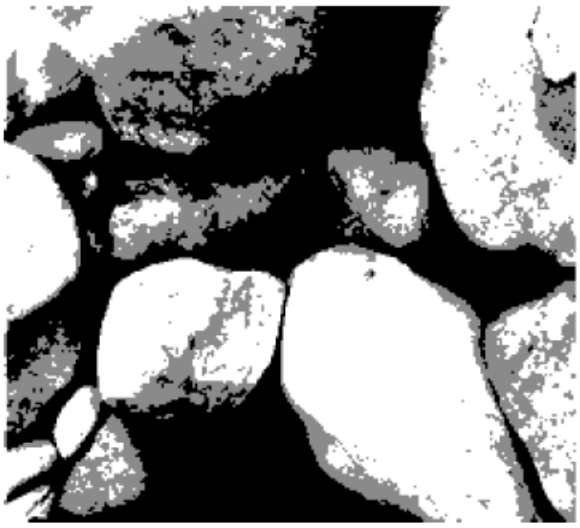
> Within each story are references to old practices of signification combined with the current electrical technology. For example, rhythm and patterning became as important as the narratives themselves. I was interested in old forms that tell something about history as a means of making sense of the past and remembering, as well as projecting into the future. I was also looking at the loom as a memory device whose function is territorializing old and new forms of storytelling (Druckey, 144).

The loom also has both a symbolic and practical function in the Burning Crusade Expansion in the online computer game, *World of Warcraft*, to be discussed at length in later chapters. The mana loom (pictured on the following page) is used by players to weave magical, digital bolts of cloth necessary for in-game crafts.

Fig. 3.3 Mana Loom, screenshot taken in *World of Warcraft.*

There are also many computing applications for weaving beyond the high-art and strictly digital contexts; individual crafters who weave make use of a variety of digital technologies. Judy Heim's *The Needlecrafter's Computer Companion* (1995) features an entire chapter, "Amazing Feats of Star-Trek-Like Computer Wizardry Involving Yarn," with a section on software for weavers (Heim, 167-72). (The entire chapter list for this work, as well as Heim's other work cited, *The Quilter's Computer Companion*, appear in Appendix B.) Software packages for weavers to render designs on their PC include Fiberworks, JaqCAD, Weave, Weavemaker, and Swiftweave (for Macintosh). There are also numerous online discussion networks, social networks, and websites for weavers, spinners and dyers.

Pat Williams, who teaches in the Jacquard Certificate Program at Eastern Michigan University, discusses the use of computer applications in creating a Jacquard weaving from a photograph in her article, "Virtual Weaving," which originally appeared in *Computer Aided Design Exchange Newsletter*. Beginning with a close-up photograph she took of the rocky coastline of Lake Huron in northeast Michigan, Williams details the process of scanning an image in grey scale, manipulating the pixels in Adobe Photoshop to create a two, three or four-tone image, coloring those tones in a program called Painter, and finally weaving with Swiftweave, (referenced earlier in Judy Heim's work.) Illustrated are the scanned and pixilated image (above) and the finished Jacquard weaving (below).



rocks in 3 colors

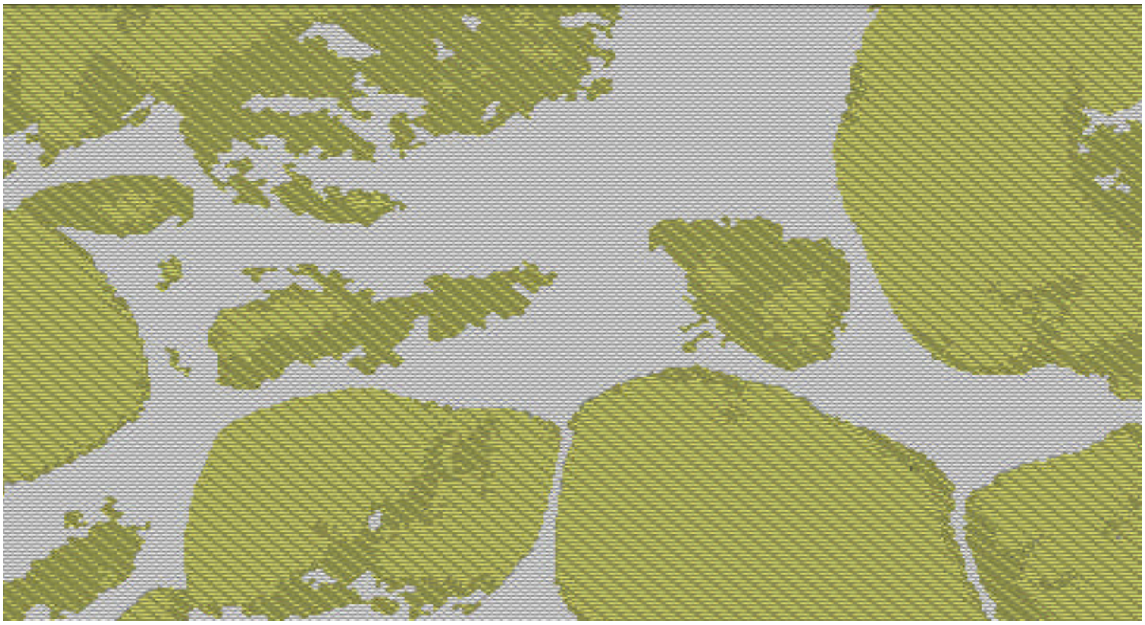


Fig. 3.4 "Rocks in 3 Colors," Swiftweave, Pat Williams and Fig. 3.5 Jacquard Weaving.

Williams' weaving is not truly virtual in the sense of say, weaving on the mana loom in *World of Warcraft*. However, it is an example of the way which working weavers are using digital weaving applications in the brick and mortar world. I will return to the creation of textiles in purely virtual environments in Chapters Seven and Eight.

Because computing began with weaving, with the production of fabric, and with the loom, computing is inexorably tied in theory and praxis to textiles, perhaps even more so in the age of the Web. Writing about computing began with a woman, Ada, Countess of Lovelace, who saw the interconnections between Romance and Reason, textiles and mathematics, and it is to the rather mathematical nature of quilts that I now turn.

The shared binary nature of computing and electrical systems and woven textiles and Babbage and Lovelace's use of the punch cards of the Jacquard loom in computer programming are but two of the myriad examples of the intersections of quilts and other textiles with mathematics, electricity and computer science, intersections which lie at the heart of *Fiberspace*. For example, in Paul J. Nahin's 2009 work on mathematical physics, *Mrs. Perkins's Electric Quilt*, Nahin devotes an entire chapter, "Quilts and Electricity," to the role that quilts play and have played in recreational mathematics. According to Nahin, in a 1907 issue of *Our Puzzle*

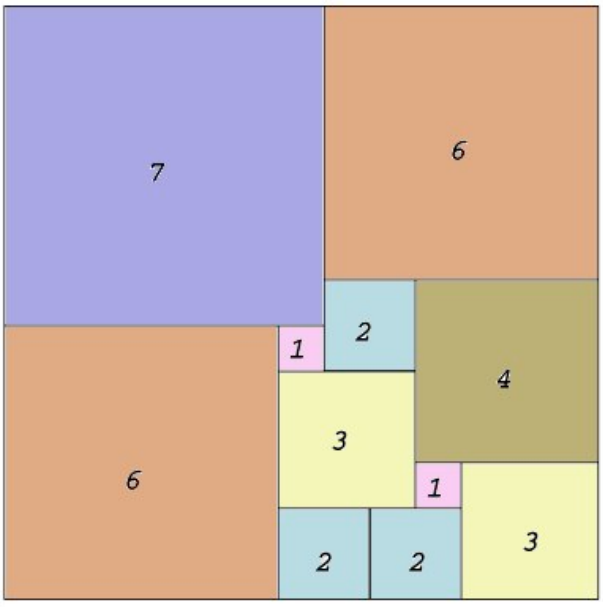


Fig. 3.6 Mrs. Perkins' Electric Quilt, image source: *Mrs Perkins' Electric Quilt.*

Magazine, Sam Lloyd published the original quilt-related mathematical quandary:

> A square quilt of 169 identical square patches (that is, the quilt is thirteen patches by thirteen patches) is to be cut into a number of pieces which are themselves to be square by cutting along the stitch lines [in the ditch]. In other words, you are not allowed to cut through a patch, How can this be done in the fewest number of subsquares (Nahin, 215-6)?

Henry Dudeney's book *Amusements in Mathematics* (1917) reprinted the puzzle, calling the division of a square into subsquares a "Mrs. Perkins's Quilt," seen on the previous page. Interestingly enough, this mathematical problem was named after the fictitious Mrs. Potipher Perkins, a name invented by Dudeney for its folksy and whimsical qualities, qualities which he desired to ascribe to his recreational mathematical puzzles (Nahin, 216). Thus, we see the use of quilts in geometry for two reasons: for the inherent geometric complexities of quilt squares and for the ability of quilts and the culture of quilting to produce an idea of warmth that softens the supposed coldness of mathematics. Once again, *Fiberspace* is where the binaries of warm and cool, hard and soft intersect.

It is both for quilts geometry and their warmth and approachability that quilts have also been used extensively in K-16 mathematical education. Math teachers who also quilt abound. Pictured at left is a quilted interpretation of the Mrs. Perkins puzzle by Barb Vlack. The quilt was designed for one of the wildly popular (among machine quilters) quilt software giant The Electric Quilt Company's

Fig. 3.7. *Mrs. Perkins' Puzzle* by Barb Vlack image source: The Electric Quilt Company.

(Heim, 57-9) monthly contests, the clubEQ August 2006, challenge: Mathematical Concepts for Quilt Designing (the quilts of which are displayed at electricquilt.com). Other quilts created for that challenge include quilts demonstrating the Pythagorean theorem and Pythagorean tree, fractals, Fibonacci rectangles, and Sierpinski triangles. Some, such as Terrie Sandelin's "Fractal Echoes" demonstrate multiple concepts from higher mathematics. One of the quilts Mary Lou Mital made for the clubEQ 2006 challenge, "Cardinals in Winter, A Fibonacci Design," functions both as a Christmas quilt and as a demonstration of the Fibonacci principle. The maker's artists' statement indicates that the quilt, "was designed using the Fibonacci numbers (1,1,2,3,5,....." (Electricquilt.com).

Fig. 3.8 *Cardinals in Winter: A Fibonacci Design* by Mary Lou Mital, image source: The Electric Quilt Company.

Another source for mathematical quilts for educational uses is Diana Venters and Elaine Krajenke Ellison's *Mathematical Quilts: No Sewing Required!* (1999) and *More Mathematical Quilts: No Sewing Required!* (2003) Mathematical concepts demonstrated through quilts in these books include the Golden Ratio and Fibonacci Sequence, spirals, tessellations, fractals, right triangles and the Pythagorean theorem, and many other ideas. However, even today, many curricular materials that aim to engage girls with mathematics through quilts and other textiles are unsuccessful because they promote, rather than condemn, gender stereotypes that function to distance women from the sphere of math and technology. According to Mary Harris, author of *Common Threads: Women, Mathematics and Work*:

> They [publications which appear to aim to link textiles and mathematics] fail because they maintain the stereotype of textiles work as something without intellect, upon which mathematics can be imposed thereby giving it value it did not previously have. Such work contains no recognition of any inherent mathematics in the making or the use of the textiles and the message that mathematics is something separate and superior to the textiles activity is usually clear. Such publications often sell themselves as 'girl-friendly' with the gendered and patronising message along the lines of 'Look girls, here is something serious you can do with your pretty stuff' (Harris, 111).

Recognizing the intellectual component of textiles in mathematics and mathematics through textiles is key to understanding *Fiberspace*.

Indeed, a "fiberspace," a Seifert fiberspace to be exact, is a term in hyperbolic geometry for a kind of three-manifold. In his book *Outer Circles: An Introduction to Hyperbolic 3-Manifolds* (2007), Albert Marden explains the fiberspace through an equation, $M^3 = R \times S^1$.

> An example of a Seifert fiber space, or Seifert manifold, is given by $M^3 = R \times S^1$, with R a compact surface; the boundary components of R, if any, become incompressible boundary tori for M^3. Other examples are obtained by replacing a finite number of circles in M^3 with "singular fibers"; a singular fiber has a

> neighborhood homeomorphic to the quotient of $D \times S^1$ of $D \times R$ under the action $(z, t) \mapsto (wz, t + 1/q)$, where w is a primitive q-th root of unity and D is the open unit disk centered at $z = 0$. Each nonsingular fiber wraps q-times around the singular one. An orientable M^3 is called a Seifert fibered if it is a union of pairwise disjoint simple loops, each with a closed neighborhood, a union of fibers, which is fiber-homeomorphic to a fibered solid torus $D \times S^1$ as described above (Marden, 328).

Several other advanced geometrical concepts with names that have a connection etymologically to textiles, including "spinning," "singular fibers," and "fibering over the circle" are discussed by Marden as well.

In the West, mathematics has been constructed as a male endeavor, while needlework and the textile arts have been gendered as female. This is related to the idea of the educatability of women (and the perceived lack thereof), that lead to the "pens and needles" division of labor discussed in the previous chapter, and this bifurcation belies the common thread connecting the pursuits of mathematics and textiles, the logic or systematicity of the binary. A logical system cannot function only with either male or female, zero or one. Ada Lovelace was able to leverage her family's money and privileged situation to do advanced work in mathematics, work informed by an understanding of woven fabrics. Historically, many women have been less fortunate.

A relatively new branch of cultural anthropology (Harris, 195), ethnomathematics, explores alternative mathematics, ways of knowing, using and doing mathematics outside Western academic mathematics. Harris proposes that the mathematics of textiles be viewed through the disciplinary lens of ethnomathematics.

> Ethnomathematics is that 'which is practised among identifiable cultural groups such as national-tribal societies, labor groups, children of a certain age-bracket, professional classes, and so on' (D'Ambrosio, 1991). Under such a definition, the academic mathematics of institutional education, and the mathematics of women who sew, are both examples of ethnomathematics among many (Harris, 1987). The institutionalisation of one elite ethnomathematics at the end of the nineteenth

> century, and its world spread, effectively devalued all others then and since (Harris, 195).

Ada Lovelace's seminal idea of 'weaving the digital' was conceived at the intersection of these two ethnomathematical systems, nineteenth century British academic mathematics and what Harris calls "the mathematics of women who sew." It is because of her work moving between these two different mathematical cultures that Lovelace was able to theorize the link between textiles and technology that must underlie any discussion of textiles in the digital age.

It perhaps goes without saying that weaving is not the only textile discipline which has changed and evolved to incorporate digital culture and digital technologies. Every fabric craft, quilting, knitting, sewing, cross-stitch, and beyond, has effectively become a mathematical, digital craft in the early twenty-first century. Telling the story of textiles, especially quilts, and the digital in the late twentieth and early twenty-first centuries will be the major work of this dissertation. However, as we have seen, it is crucial to ground the study of the digital in its historical antecedents.

Telling the story of Lovelace and the Jacquard loom, of the shared binary nature of computer programs and woven fabric, gives *Fiberspace* historical context and begins to take apart the stereotypes of women and computing, and of women and textiles. According to Bachmann, "What is at stake in the scripting of technologies as old, new, hot, cold, authored, anonymous? And what is at stake with the dismantling of the frontier myth of digital technology? … We are reminded that even in our newest technologies we remain firmly rooted in the structures of the past" (Bachmann, 33). It is thus important to note the extent to which Ada Lovelace's work informs the history and theory that lie beneath *Fiberspace*. The pages and ideas that follow in this dissertation are, to a fair

extent, a continuation of Ada Lovelace's ideas and work, which was cut tragically short and whose conceptual significance for the realm of textiles was largely forgotten for around one hundred and fifty years.

CHAPTER FOUR

POSTMODERNISM'S VICTORIAN AFTERLIFE: TEXTILES AND TECHNOLOGY IN THE NINETEENTH AND TWENTY-FIRST CENTURIES

> "At some point in their lives all sewers yearn to design a dragon costume, complete with a shimmering tail." -- Judy Heim

It is not insignificant that this chapter focuses primarily upon the nineteenth and twenty-first centuries, and much less so upon the twentieth century. Indeed, there is a sizeable literature on postmodernism's "Victorian Afterlife,[5]" which argues that the storage ready availability of digitized visual information has surprising affinities with Victorian aims and aesthetics (Harrod, 230). This chapter on textiles and technology in the nineteenth and twenty-first centuries begins with the notion of the incongruity between technology and textiles in the industrializing nineteenth century through the example of the Luddites, figuring the sewing machine as a 'machine in the garden.' Then, I transition into two histories of textiles and technology. The first is a history of the development of sewing technologies, particularly as they applied to quiltmaking. The second history is simultaneous and parallel history to the first, and examining the Victorian aesthetics of John Ruskin, William Morris, Charles Eastlake and other critics, artists and philosophers. I also examine the ways in which the ideals of the Arts and Crafts and Aesthetic Movements played out in regard to anxieties felt by the arbiters of taste of the period about technology in the realm of craft, especially in quiltmaking. These two histories, largely set in the nineteenth century provide a general historical background for all of the chapters that follow, while at the same time setting the stage for

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[5] See John Kucich and Dianne F. Sadoff's anthology, *Victorian Afterlife: Postmodern Culture Rewrites the Nineteenth Century*, for more background on this term.

a discussion of *Fiberspace*, what I am calling the digital craft community of the early twenty-first century, as a decidedly post-Victorian manifestation of culture. The Victorian-ness of *Fiberspace* is significant in understanding the complicated relationship of textiles and technology today.

In the previous chapter, I told the story of Charles Babbage's proto-computer, the Analytical Engine, and of how Ada Lovelace conceived the machine as *weaving the digital* in a sort of marriage of science and art, reason and Romanticism. In the mid-nineteenth century, one finds a Romanticization of commerce and industry. This romance is most readily seen in the new paradigms in architecture and manufacturing.

> While Babbage's appreciation of 'beautiful combinations' looks forward to a modernist aesthetic that takes abstract efficiency as a predominant criterion of beauty, he remains unable to account for the creation of such beauty without falling back on familiar Romantic models. The Romantic aesthetic economy still applies, but to the development of technological processes rather than to concrete individual works (Bizup, 65).

The inability to extend this romance with industry as a whole to individual works—a particular mass-produced comforter, for example—forms much of the basis of reaction of the proponents of the Arts and Crafts movement against industrially-produced decorative arts.

The most historically infamous reactionaries against technology, textile mill technology no less, were the Luddites. A word now applied to any technophobe, the origin of the term 'Luddite' comes from the British textile workers who, around 1810, rose up against their employers and smashed the new mechanized textile looms.[6] It was not truly the technology to which they objected, however. It was the business

[6] See Stephen Jones' *Against Technology: From the Luddites to Neo-Luddism* for a further historical discussion of the Luddites.

philosophies of industrial capitalism that would allow skilled human beings to be made redundant by machines. Ever since, anti-technological sentiment has been intimately connected with the textile arts in history as well as language for 200 years. As Joseph Bizup notes in *Manufacturing Culture*, "The nineteenth-century vision of the factory as an integrated productive system and paradigm of a new social order entailed a substantive reconceptualization of the nature and role of 'skill'" (Bizup, 59). Particularly in the visual arts and crafts, this reconception of the nature and role of skill was seen as incredibly problematic, so much so that the bulk of hand-made objects created on both sides of the Atlantic in the late nineteenth century was created at least in part in reaction to the perceived decline in skill that manufacturing was perpetuating (Brackman, 23-4).

There were, of course, many others in nineteenth century society who opposed industrialization, manufacturing culture, and the popularization of science on various grounds. Popular novels such as Elizabeth Gaskell's *North and South* (1854-5) expressed a kind of sympathetic anxiety toward industrialization and the textile mills in the north of England. In *Machine in the Garden*, Leo Marx notes that technological anxieties "have appeared everywhere in American writing since the 1840s" (Marx, 15). Indeed, in the United States in the mid-nineteenth century, American authors such as Hawthorne, Melville, and Thoreau perceived mills and railroads as shattering the peace of the American Eden, albeit an Eden that never really had existed, and thus sought a pastoral ideal in literature.

> But, hark! there is the whistle of the locomotive—the long shriek, harsh, above all other harshness, for the space of a mile cannot mollify it into harmony. It tells the story of busy men, citizens, from the hot street, who have come to spend a day in a country village, men of business; in short of all unquietness; and no wonder that it gives such a startling shriek, since it brings the noisy world into the midst of our slumbrous peace (Marx, 13).

As in the above example from the diary of Nathaniel Hawthorne written at Sleepy Hollow, near Concord, Massachusetts, 1844, "much of the singular quality of this era is conveyed by the trope of the interrupted idyll" (Marx, 27). While this trope was directed by authors such as Hawthorne at what David Nye termed the 'American technological sublime[7],' the trope of the interrupted idyll is equally applicable to the sewing machine. The introduction of the sewing machine into the sanctity of the nineteenth century home may be read as 'the sewing machine in the garden.'

Of any technological innovation that has changed quiltmaking practices and, by extension the home lives of women and families, the sewing machine is probably the most obvious. Just as blogs and personal pages on social networks are key ways in which people in 2010 construct their identities, the sewing machine was key to a woman's (and even the whole family's) self-fashioning in the late nineteenth century. One can find many examples of prairie families posed outside modest sod houses, the sewing machine lined up amongst them as if the machine itself was a member of the family. Pictured on the following page is the W. H. Blair family, Nebraska, 1888 (Brackman, 12).

[7] The sublime was first described in classical antiquity by Longinus. In the eighteenth century, the sublime was constructed as a permissible eruption of feeling that overwhelmed reason, only to be recontained by it. The American technological sublime as described by Nye emereged in the nineteenth century and exalts the conquest of nature, while the Kantian (European) sublime (as one might see in a Caspar David Friedrich painting) made the individual humble in the face of it.

Fig. 4.1 W. H. Blair Family, Nebraska, 1888, image source: *Patterns of Progress*.

We have, then, two competing schools of thought on textile technology in the popular imaginary of the nineteenth century. On the one hand, the machine becomes a worker competing for work against the human makers, except the machine needs neither wages nor benefits. On the other, the sewing machine can be a domestic helper, so valued that the machine is a critical member of the family household. Either model, though, relies upon the anthropomorphication of the technology and the relationship of the anthropomorphic machine to the body of the human artist or work.[8]

The two-thread interlocked stitch sewing machine was invented by Walter Hunt in the 1830s, and as Barbara Brackman notes in *Patterns of Progress: Quilts in the*

[8] This idea of the anthropomorphication of sewing technology and the anxieties that come with such a notion is important to understanding not only the post-Victorian turn that will be described in the pages that follow, but for the concept of the networked quilter as a womachine that forms the basis of Chapter Six.

Machine Age, from its very inception, there was speculation that the sewing machine would drastically alter women's lives. According to Brackman, Hunt's daughter was so worried that the popularization of the sewing machine would financially ruin women across America financially by depriving them of incomes from hand sewing for others, that Hunt never marketed his invention (Brackman, 10-11). The sewing machine was re-invented in the 1840s by Elias Howe and was marketed to individual households in the United States by Singer beginning in the 1850s. Ironically, rather than making single women destitute, the demonstration and marketing of the sewing machine actually provided many nineteenth century women with an opportunity for employment outside the home.

The sewing machine not only changed the way in which women envisioned themselves (and by extension their bodies) and their households in the nineteenth century; it also changed quilt styles and provided new kinds of employment for women as sewing machine demonstrators and salespeople (Wosk, 31). In her history of machine quilting, Barbara Brackman noted four major changes to the craft that were brought about by machine quilting: a focus on intricate appliqué, the incorporation of many thin scraps of several very different fabrics (the crazy quilt), a shift from valuing the stitches to valuing the choice and arrangement of fabrics, and finally the loss of hand-sewing skills as one of the hallmarks of a genteel young woman (Brackman, 23).

This economic opportunity was not the only way in which the sewing machine changed women's lives in the nineteenth century. Dramatically cutting the time required for chore or household sewing, the sewing machine gave many women much more time for 'fancy' sewing. The extra time, combined with influences from Japanese design and

British illustration exhibited at the 1876 Centennial Exposition in Philadelphia, led to the development and popularity of the crazy quilt in America.

Besides facilitating the shift in fashion from the block quilt to the crazy quilt, the ways in which women (and men) were using the sewing machine also led to a fashion for multiple borders, allowed for easier use of fancy stitches, and subsequently led to a change in the valuation of quality in quiltmaking. Whereas in the pre-sewing machine period, quality in quilting had largely been judged based upon the quality and evenness of stitches, especially quilting stitches, in the post-sewing machine period of the nineteenth century, quality was judged more upon design and the number and variety of different fabrics used (Brackman, 23).

The most vocal spokesperson for machine quilting in the early and middle twentieth century was a male quilter, Ernest Byron Haight, author of books and pamphlets such as "Practical Machine Quilting for the Homemaker" (1951). Frequently cited as the father of machine quilting, Haight was refused the opportunity to show his quilt in the Butler County Fair [Nebraska] because the judges argued that the machine-quilted pieces were "not art" (Brackman, 24). Pictured to the right is a machine-pieced and quilted quilt by Ernest Haight from 1933. Note the multiple borders and the extravagant use of many different fabrics.

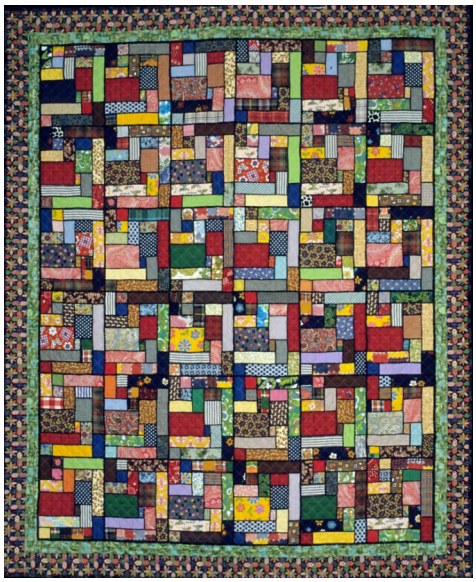

Fig. 4.2 Machine-Pieced and Quilted Quilt by Ernest Haight, 1933, image couresty of the *Quilt Index.*

Eventually, the Butler County Fair created a separate category for machine-quilted pieces, and fairs across the country followed suit. This segregation of judging categories still exists at many competitions today, however, with hand and machine quilters kept "separate, but equal."

Computerized of sewing machines, such as the Husqvarna Emerald sewing computer, which is discussed at length in Chapter Six, make possible techniques such as digital photo transfer directly onto fabric. Such a technique, even though it is a digital process, which makes it possible to include family photographs within a quilt, is highly valued by a quilting culture that emphasizes the importance of history and family. Judy Heim has defended the integrity of machine and computer-aided quilting this way, in response to a woman at a craft show who "claimed it isn't quilting unless you sew blocks with paper pieces" (Heim, 53):

> "So why even both sewing the quilt?" you ask. Why not let the computer just print a picture of it? Lest you fear, like the woman at the craft show, that quilt-making is getting too high-tech, rest assured that beyond the initial design stages, the relationship between you and your quilt has not changed.[9] You are still guaranteed hundreds of cozy hours with fabric piled on your lap and pins falling in the floor. Your cat will still ingest a half spool of expensive Mettler thread (Heim, 54).

Further, a landmark decision in 1989 in which the rather conservative American Quilter's Society gave top prize to Caryl Bryer Fallert's machine-quilted *CoronaII: Solar Eclipse* at their show in Paducah, Kentucky (Brackman, 25) is another indicator that the pendulum has again shifted and that quilters are once again recognizing the connection of technology and women's (and men's) voices.

Even in the early twenty-first century, the study of quilts and quiltmaking through

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[9] Though in the chapter on the networked quilter as 'womachine,' I will argue that this relationship *has* changed.

the lens of technology may seem counter-intuitive to many not familiar with the history of quiltmaking in America. "Still, it may seem odd that craftspeople, often engaged in a life-long project of metaphorically 'warming the world' through their work, have in recent years so dedicatedly embraced supposedly 'cold' computers and the communication technology they offer. Remember that in general, technological development has always been regarded as a threat to the crafts" (Jönsson, 247). Technological innovation has had a tremendous impact on quiltmaking—in terms of the visual appearance of quilts, the ways in which quilts were made, and the daily lives of quiltmakers. Much that has to do with quilting in the popular imagination, however, is rooted not in technology and the new, but in tradition, in the past, and in the handmade.

Artists, designers, and critics, not mill workers, were the true technophobes of the Victorian period, so much so, in fact, that today it would be more appropriate to call a technophobic person a 'Ruskin' rather than a 'Luddite.' The Victorians' aesthetic reaction to the marriage of art and science, to mechanized means of production, and to the erosion of the handmade was strong, and this artistic reaction to nineteenth century science and technology had broad effects upon the visual culture, especially the textiles, of not only the Victorian and Edwardian periods, but that of the late twentieth and early twenty-first centuries as well.

Elizabeth Cumming in her essay, "Pure Magic," notes that "the Arts and Crafts Movement is often seen as a romantic reaction to the Industrial Revolution" (Cummings, 173). Mechanization of industry, mass-production of household goods, and the rapid transition from stone to iron and glass in architecture, while seen as progress to some, seemed like ruination to others. The Crystal Palace, a sprawling temple to British

industry and empire erected for London's 1851 Great Exhibition, was the first iron and glass structure built for a public leisure function and thrust the new paradigm in construction into the spotlight. In response to such trends in material culture and the built environment, influential art critic John Ruskin wrote in *The Stones of Venice*,

> To watch the corn grow, and the blossoms set; to draw hard breath over ploughshare or spade; to read, to think, to love, to hope, to pray—these are the things that make men happy… The world's prosperity or adversity depends upon our knowing and teaching these few things; but upon iron, or glass, or electricity, or steam, in no wise (Ruskin, 35).

Ruskin's desire to return to a bucolic ideal when faced with iron, glass, electricity, and steam strongly recalls Hawthorne's journal entry. "If Ruskin stops short of finding art and science inherently antithetical, he does hold that advancement in science and manufacture typically entails an aesthetic deterioration" (Bizup, 51). Ruskin, however, used his influence as an arbiter of taste to call for arts that were divorced from machine production.

The Arts & Crafts movement is often dated to 1861, when artist and textile designer William Morris established his studio. Like Ruskin, Morris lamented the mechanization of the arts. His works were produced entirely by hand, using natural dyes, rather than the chemical aniline dyes which became widely available around 1860. Morris' works were typically medieval in inspiration, again hearkening back to a time which was seen as more ideal, pastoral, and authentic. Another proponent of the Arts & Crafts movement, Charles Eastlake wrote in his influential treatise on interior decoration, *Hints on Household Taste*, "The modern development of art is full of strange inconsistencies, and they are nowhere more apparent than in the connection of design with manufacture" (Eastlake, 199). By the late nineteenth century, the Arts & Crafts

movement had great influence on interior design on both sides of the Atlantic, even, ironically, upon mass-produced home furnishings and fabrics (Trestain, 93).

While the Arts & Crafts movement had an impact upon ideas about good (read: mechanized technology-free) design more broadly, the related Aesthetic Movement had a tremendous impact upon quiltmaking. Heavily influenced by the opening of Japan, and the subsequent exhibition of Japanese design at the Philadelphia Centennial Exposition of 1876, the Aesthetic Movement was fascinated by not only the quality and craftsmanship of Japanese decorative arts, but also by the free use of line and asymmetry. Crazy quilts were inspired by Japanese art and facilitated by the introduction of the sewing machine, which freed up women's time from mending clothing and household textiles and allowed them to concentrate on more fancy stitchery. The work of Britain's Royal School of Art and the illustrations of Kate Greenaway were also highly influential upon quilting in the period from roughly 1876 to 1910. The subject matter of such illustrations was reinterpreted into designs stamps which could be printed onto fabric at home. This led to a craze for embroidered quilts. As with the fashion for crazy quilting, the art needlework phenomenon was brought about by a simultaneous convergence of the availability of a moderately priced sewing machine for domestic use and the related aesthetic reaction to machine-produced material culture.

Redwork, a form of art needlework in turkey red[10] thread on a white or cream quilted ground, was the most common manifestation of the art needlework craze in quilting in the period. The embroidered designs on redwork quilts were typically whimsical or sentimental, often depicting subjects such as flowers, animals, children, or nursery rhyme characters. These designs were stamped or punched with equipment purchased from mail-order catalogs, and then hand-embroidered onto the quilt top. The sources for the designs were often found in women's periodicals of the day, or in specialty embroidery design catalogs. In *Red & White: American Redwork Quilts*, textile historian Deborah Harding documented this redwork spinning

Similar and identical images of spinning wheels were published in ads and in pattern catalogs in the mid 1880s. Bentley's sold one for a "working apron" with these words included.

Fig. 4.3 "Get Thy Spindle and Thy Distaff Ready,"
image source: *Red & White: American Redwork Quilts* by Deborah Harding.

[10] Turkey (named for the country, not the poultry) red refers a red dye made from the roots of the madder plant. Popular throughout the nineteenth century, turkey red was highly sought after because of its color-fastness.

wheel to have come from a *Bentley's* catalog from the 1880s. The irony of these and other redwork designs is that they came nearly entirely from mass-circulated periodicals and catalogs. Merchandise catalogs developed in the nineteenth century, playing an important role in the marketing of these new textile arts. Mass-circulated periodicals, funded in large measure by the advertising revenue of department stores[11] and mail order warehouses, exploded in the middle and late nineteenth century, with numerous titles on fashion and needlework which were aimed at women, including *The Delineator, Godey's Ladies Book, Harper's Bazar, Ladies' Home Journal,* and *Modern Priscilla*. The spinning wheel pictured on the previous page is particularly interesting because it depicts the earlier technology of the spinning wheel, which had long been replaced by the Singer sewing machine as the textile appliance of choice in American homes.

Victorian households reacted to the introduction of mass-produced goods and new technologies, such as the sewing machine, into the home by engaging in a collective nostalgia for pre-industrial material culture. Books such as Alice Morse Earle's *Home Life in Colonial Days* (1898), Marie Webster's *Quilts: Their Story and How to Make Them* (1915), and Ruth Finley and Ruby McKim's *Old Patchwork Quilts and the Women Who Made Them* (1929) reflected a yearning for an imagined pre-technological American colonial past. Laurel Thatcher Ulrich notes in *The Age of Homespun* that,

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[11] The department store was still a very new phenomenon in the 1870s. Its predecessor, the dry goods store (which flourished into the twentieth century in rural areas), had developed in the 1830s as the old guild system was dying out. Dry goods stores used adveritsing and competitive pricing to entice customers, a practice that the guild system had not allowed to flourish. The most obvious trend in material culture that aided the rise of the department store was the development of ready-made clothing. Whereas before stores sold fabrics, a totally new type of textile product, off-the-rack apparel, allowed for new types of shopping to emerge.

> In the last half of the nineteenth century, the mystique of homespun spread. It attracted social reformers, as well as conservatives, the arts and crafts movement as well as the colonial revival, and academic artists like Thomas Eakins as well as popular illustrators. By the 1890s, antique spinning wheels were everywhere, even in the mansion of a Montana mining magnate (Ulrich, 17).

Related to the Colonial Revival in the decorative arts and the broader rejection of machine-assisted means of production in the decorative arts was the disavowal of the utility of the sewing machine. In the April 1870 issue of the *Ladies' Friend* magazine, an editorial read, "The sewing machine, like a magician out of fairyland, turns off yards upon yards of flouncing, and ruffling, and fluting, and fureblows generally…so that at present it really seems that nothing was gained by this beneficial invention…The labor and weariness of the needle are not abated one bit" (Trestain, 68.) The sarcastic tone, describing the sewing machine as 'a magician out of fairyland,' figures the technology as an other-worldly trickster. Owing to the fact that sewing machine manufacturers and related companies accounted for much of their advertising revenue, such sentiments were perhaps less common in ladies' magazines than those in favor of the sewing machine.[12] Nonetheless, counter-arguments against the sewing machine reflect an unease with machine sewing.

The *Sun Sets on Sunbonnet Sue*, a quilt created over a century later in the midst of the American Bicentennial, another sentimental and patriotic revival, can be read as metaphor for the decline of women's sewing skills in America, as well as a document of technological anxiety. Created by the feminist quilting group, the 'Seamsters' Union,' in Lawrence, Kansas, in 1979, the quilt features several vignettes in which Sunbonnet Sue, a popular pattern in quiltmaking since the late nineteenth century, is killed in creatively

[12] Trestain notes that at the end of that very issue of *Ladies' Friend* are advertisements for Grovers and Bakers sewing machines, each for the price of fifty-five dollars.

macabre fashions. In the illustrations below, Sue dies from being crushed by a falling Skylab and from radiation poisoning from nuclear fall-out at Three Mile Island.

Fig. 4.4 *The Sun Sets on Sunbonnet Sue* details—"Skylab" and "Three Mile Island," by the Seamsters' Union, Lawrence, Kansas, 1979, image courtesy of the *Quilt Index.*

The death(s) of Sue are symbolic of the decline of hand sewing and death of the Cult of True Womanhood.[13] Further, in each of these two examples, Sue is killed by a technological accident. While humorous in their cartoonish absurdity, the images are nonetheless rather disconcerting. This is, I would argue, because of the '(sewing) machine in the garden' factor. These quilt blocks represent the incursion of futuristic technologies into the realm of the fabric arts, and all its associated cultural baggage of tradition, womanhood, the home, hand-crafts, and an imagined ideal American past.

While this is a general history of the Victorian aesthetic at the intersection of textiles and technology, and thus a history of the nineteenth century and postmodern

[13] Also known as "The Cult of Domesticity." In her essay "The Cult of True Womanhood: 1820–1860," Barbara Welter writes that the "True Woman" of the mid-nineteenth century was envisioned as being not only pious, pure of heart, and submissive, but also highly domestic, upholding the division between the home sphere and the outside world that was simultaneously constructed and threatened by the Industrial Revolution.

textile culture, several Modern twentieth century designers served as transitional figures, bridging the two centuries. In *Women's Work: Textile Art from the Bauhaus*, Sigrid Weltge notes that the weavers at the Bauhaus[14], despite working in an environment that highly regarded industry and mass-production as the future of material culture, were seen as second-class citizens by their male counterparts in supposedly more technologically-compatible disciplines. Weltge writes,

> The root of the conflict between handweaving and industry lay, at least in part, in their own uncertainty about their professional identity and also in the mixed messages they received from the masters, who saw weaving as women's work, and not part of a serious 'male discipline.' Industrial design, wedded to the 'machine aesthetic,' was just emerging in the mid-twenties and was, rightly or wrongly, often identified with the Bauhaus. Textile design, which shared equally in technological advances, consistently received, as it still does, little critical attention (Weltge, 98).

That many of their fellow designers at the Bauhaus could not appreciate the way in which the Bauhaus weavers were breaking down the old binary divisions between textiles and technology, women's work and men's work, and craft and the machine, speaks to anxieties about the Industrial Revolution and about the Cult of Domesticity that carried over from the nineteenth century into the twentieth, even into the Bauhaus itself.

Charles and Ray Eames are also highly transitional figures in the history of design and the pre-history of *Fiberspace*, and though they also worked to break down the barrier between textiles and technology in the public imagination, their artistic production can ultimately be read as post-Victorian. Though Charles and Ray Eames were trained in the early twentieth century and practiced throughout the middle of the twentieth century (1941-1978), they have, through their shared interests in digital technology, marginalized

[14] The Bauhaus was an influential German school, in operation from 1919 to 1933, that taught Modern design integrating both the crafts and the fine arts.

and non-Western populations, ornament, and vernacular culture, more in common with designers working in the period after 1975. Charles and Ray Eames had an extremely varied career, becoming distinguished in furniture design, architecture, toy design, graphic design, film, and new media. The Eames' were truly ahead of their time in both their look (if there was such a thing), the wide scope of projects handled by their office, and in their love of kitsch. The couple collected old mechanical toys, textiles and other artifacts from various non-Western cultures, and numerous random doodads, littering most of the floor of their home with their treasures. Obviously, such behavior flew in the face of the rules of aesthetics of the high-style Modernism of the mid-twentieth century. In their original House of Cards deck (1952), the pattern deck, each card was printed with a different pattern on its face, such as printed fabrics, Victorian découpage, or Asian papers. The second deck, the picture deck, consisted of cards with the faces printed with "good things," including sewing notions, such as thimbles (Neuhart, 169). In fact, postmodern architect Robert Venturi claims that the Eames' "reintroduced good old Victorian clutter to interiors" (Kirkham, 21).

Postmodern culture is both keenly aware of tradition and eager to challenge tradition. The Italian medievalist and semiotician Umberto Eco characterized "the postmodern attitude as that of a man who loves a very cultivated woman and knows he cannot say to her, *I love you madly,* because he knows that she knows (and that she knows that he knows) that these words have already been written by Barbara Cartland" (Eco, 530-1). The postmodern period is also witnessing the erosion of distinctions between high, folk and popular visual expression.

Fig. 4.5 *Tulips Aglow*, National Quilt Museum collection, image courtesy of the *Quilt Index*.

Very many divergent styles co-exist relatively peacefully within postmodern art and design; there is no longer domination by one or a few aesthetics. The Victorian aesthetic, however, plays a disproportionately large role in the culture of *Fiberspace*. An example of the convergence of several of these elements of postmodern, or post-Victorian, visual culture is "Tulips Aglow" (1989), shown on the previous page, a machine-pieced quilts made from reproduction William Morris fabrics, which can be found today in many fabric shops. Kucich and Sadoff argue that consumer culture uses the decorativeness and sentimentality of Victorian design to 'aestheticize contemporary reality.'

> Consumer culture has shared in postmodern nostalgia for the nineteenth century, but—in contrast to Himmelfarb's politicized nostalgia—it uses the Victorian past to aestheticize contemporary reality. Victorian fashions and furnishings are enjoying a resurgence that has spawned magazines such as *Victoria* and *Victorian*. Home-decorating books [much in the style of Eastlake's *Hints on Household Taste* from over a century earlier] and magazines teach twentieth-century homeowners how to load a mantle with curios and kitsch, people a wall with elaborately framed and sepia-toned family photos, and choose for the drawing room a patterned wallpaper or chintz (Kucich and Sadoff, xii).

The computer is the new machine in the garden. In the case of *Fiberspace*, where the cool, sleek, and technological attributes of computers and the Internet are often at odds with the fuzzy and homespun self-fashioning of the quiltmaking population, Victorian design sensibilities can serve as a means of further humanizing the digital. Thus, as Kucich and Sadoff note, "aspects of late-century postmodernism could more appropriately be called 'post-Victorian'" (Kucich and Sadoff, xiii).

Using the visual culture of the Victorian and Edwardian periods to 'aestheticize contemporary reality' is a crucial conceit in Judy Heim's *Needlecrafter's Computer Companion* (1995), an early guide to computers and the Internet for crafters.

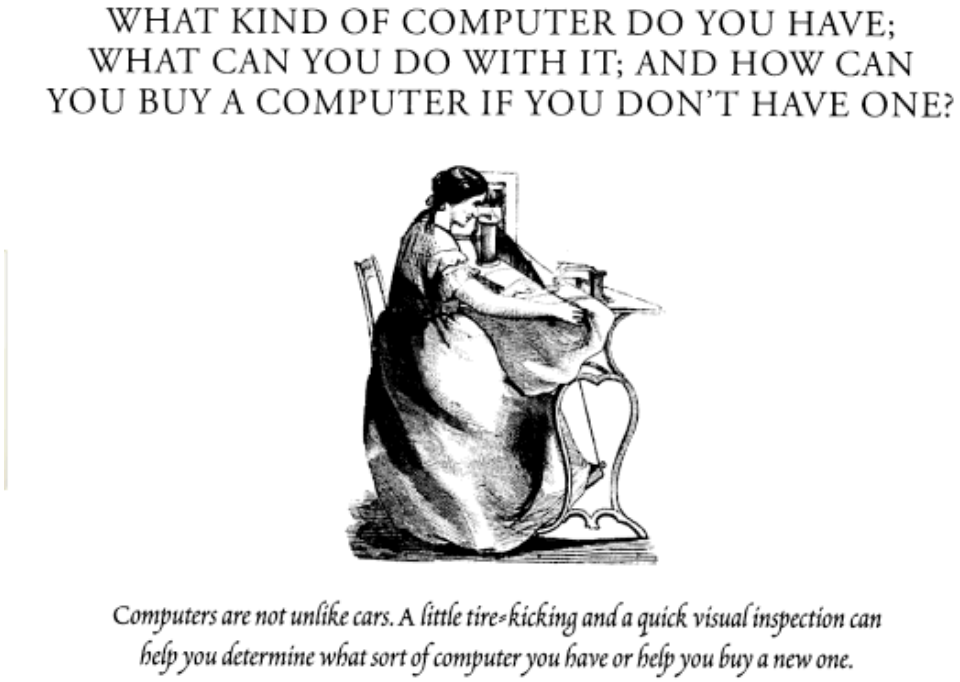

Fig. 4.6 "Computers are Not Unlike Cars," image source: *The Needlecrafter's Computer Companion* by Judy Heim. "Computers are not unlike cars. A little tire-kicking and a quick visual inspection can help you determine what sort of computer you have or help you buy a new one."

Each chapter begins with a Victorian-looking illustration—the very Victorian nature of the illustrations to the *Needlecrafter's Computer Companion* suggests that Heim understood a level of anxiety about technology amongst her readers. While Heim's text compares computers to automobiles in an attempt to

Fig. 4.7 Needlecrafter's Computer Companion Cherub, image source: *The Needlecrafter's Computer Companion* by Judy Heim.

make the computer seem more familiar, the illustration to her text compares depicts neither, but rather an even earlier technology—an early sewing machine. Taking the illustration into account, rather than reading, "Computers are not unlike cars," the text might read, 'Computers are not unlike early treadle sewing machines with a woman in nineteenth century garb seated serenely at them.' Throughout the book, Heim uses another visual device—the cherub.

Perhaps even more Victorianizing than the nineteenth century woman seated at the sewing machine are the cherub illustrations which can be found in each chapter of the *Needlecrafter's Computer Companion*. The cherubs are posed with neither computers, nor quilts, nor sewing machines, but rather with classical objects, such as this title page cherub's dramatic mask. Again, as with Luddites, Ruskin, and William Morris, the entrance of a new technology into the realm of textiles causes a disquiet that is allayed by what is seen as a return to the material and visual culture of a by-gone era in which the technology had not yet been created. What all of the plethora of Victorianizing illustrations in Judy Heim's *Needlecrafter's Computer Companion* have in common are the depiction of Victorian motifs as a means of humanizing, minimizing, and anachronizing the computer. Kucich and Sadoff write that "the technologies of postmodern media culture fetishize or are haunted by Victorian cultural documents" (Kucich and Sadoff, xxiii).

Fig. 4.8 Steampunk Wheelchair, image source: Etsy.com.

Related to the Victorian imagery in this computer guide for needlecrafters is historical costuming,[15] and especially the Victorian and Edwardian steampunks. Steampunk is a sub-genre of science fiction or fantasy that has had a cult following since around 1990. Steampunk fiction is set in Victorian of Edwardian Britain (when steam power was still prevalent), but also combines fantasy elements such as future technologies as Victorians might have imagined them. Babbage's proto-computer, the Analytical Engine, for instance, has figured prominently in works in the genre, in which "postmodern rewritings of the Victorian fascination with information technologies or proto-computers—with 'difference engines'—revisit a period when the boundary between science and culture was unstable, when new technologies 'troubled the human/machine interface" (Kucich and Sadoff, xxiii).

In the early twenty-first century, steampunk is not only a literary movement, but a live action role-play (LARP) movement as well. People craft Victorian clothing with future technological elements included for real-life conventions which they attend in character. Items crafted in the steampunk style abound, such as this post-Victorian power wheelchair available for $3,000 in August 2010 on Etsy.com, a popular site in which independent crafters market their works online. Such objects represent post-Victorian technologies anxieties as made manifest in material culture to the extreme.

Dressing up Victorian, Edwardian, or steampunk, and decorating ones home in those styles, is a common pre-occupation among those who choose to role-play in the virtual world *Second Life*. While an entire chapter is devoted to the *Second Life* later on

[15] Heim herself makes mention of online mailing lists for historical costumers, fantasy and science fiction costuming, 'serious' Halloween and Mardi Gras costuming, and finally, furry costuming (Heim, 371-3).

in this study, it bears noting here, in the context of the post-Victorian nature of *Fiberspace*, that much of the branding of quilt shops and other stores, such as antique shops, that sell virtual quilts in *Second Life*, is geared to cultivating an image of virtual Victoriana. Pictured on the following page is Griss' General Store, an "Authentic General Store with items for your RP [role-play], Victorian, or Antique home," according to their in-world profile. Not a true general store in the historical sense, the store sells finished crafts such as virtual quilts, clocks, furniture, and porcelain, rather than traditional dry goods such as flour or fabric.

Fig. 4.9 Griss' General Store, screenshot taken in *Second Life.*

According to Jennifer Green-Lewis, "visual culture has currently identified the be-whiskered, top-hatted, and hoopskirted Victorians as appropriate objects for accumulating and expressing postmodern anxieties about authenticity" (Kucich and Sadoff, xxiii). In the virtual world, in which interaction is through first a computer terminal, and then through an avatarized self, such anxieties about technology and authenticity are no doubt heightened, perhaps explaining the popularity of Victorian visual culture in *Second Life*.

The relationship between textiles and technology has brought fraught with anxiety since the early nineteenth century, when the historically infamous Luddites smashed the looms on industrializing woolen mills in northern England and Babbage and Lovelace worked on a proto-computer that used the punchcards of those looms to weave the digital. "Thus Victorian technical forms continue to rewrite the present even as some theorists have tried to close their history by affirming, in extravagant terms, the radical newness of postmodern knowledge and computing technology" (Kucich and Sadoff, xxiii). The incursion of technology into the realm of textiles and vice versa represents an incursion of technology into the home and the family, and a perceived threat to the quality and beauty of the decorative arts. In the nineteenth century, by clinging to an imagined past, filled with ideals of the pastoral and bucolic nature of the pre-industrial countryside and the pure and subservient colonial work at work at her spinning wheel, or in the present day, to the sentimental Victorians and their Arts & Crafts Movement, we alleviate our anxieties about the places where textiles and technology intersect. While this chapter has figured the pre-history of *Fiberspace* in the nineteenth century, this dissertation on *Fiberspace* is essentially a history of the present. The computer is the new machine in the garden, and the following chapters will explore the current borderland between textiles and technology, where folk art meets Web 2.0.

CHAPTER FIVE

FOLK ART AND WEB 2.0: QUILTMAKERS' OPEN SOURCE PARTICIPATORY CULTURE AND COLLECTIVE KNOWLEDGE

"The characteristic spirit, prevalent tone of sentiment, of a people or community; the 'genius' of an institution or system." This is how *ethos* is defined, according to *The Oxford English Dictionary*. Ethos is key to understanding why it is that quilters have come not only to use but also to embrace and rely upon Web 2.0. Key to the folk art ethos is a value on community. (This is in direct contrast to the archetypal *artist* in the Western tradition, which glorifies the cult of the individual.) Folk art traditions from Appalachian fiddle music to quiltmaking are rooted in community, with the art made, owned, critiqued and enjoyed by the group rather than the individual.

Quiltmaking communities historically have included round-robin pattern swaps in the mail and quilting bees. At these quilting bees, groups of people, most often women, gather together to piece, baste or quilt, sharing stories and working toward a common purpose, both artistic—the completion of the quilt—and social, for example, the creation of a wedding present for a young relative or the creation of a church or community fundraiser quilt. Quilt patterns, such "Log Cabin" or "Churn Dash," are not the property or invention of any one quiltmaker, but rather the collective property of the entire quilt world.

Those familiar with the characteristic spirit of Web 2.0 will well recognize the striking similarity here. The ethos of Web 2.0, with its emphasis on the power of online communities and social networks, its value on the collective knowledge of the group (as with the masses-edited *Wikipedia*) rather than the knowledge of any one expert

individual, is very much the folk art ethos. Far from strange bedfellows, folk artists, such as quiltmakers, and the champions of Web 2.0—bloggers, wiki editors, and the like—have the same base goals and values: to foster a community of makers, a participatory culture of meaning and meaning-making reminiscent of the nineteenth century days of quilting bees and front porch family sings.

Participatory culture can be defined as culture in which there are low barriers to artistic and civic engagement (Jenkins, *Engaging Art*, 174). What does the motto of the National Endowment for the Arts, "A great nation deserves great art," mean in this context? Is a log cabin quilt "great art"? Is *Harry Potter* fan fiction?[16] Is a handmade duck decoy, or a berry basket? Is the clothing I design for my avatar? "Great art" is hardly participatory culture.

Legal scholar Lawrence Lessig has described participatory culture and consumer culture as read-write and read-only cultures respectively (these terms referring to the levels of permission required for content creation in word processing and other computer programs). For Lessig, read-write culture, the ability to create as well as consume the culture around us, is a cultural right, a right which is constantly under fire not only from broadcasters of read-only culture, but also from the American legal system itself. A decline in participatory culture in music (a decline in listen-sing culture, if you will), precipitated by the adoption of new recording and playback technologies, similarly troubled John Philip Sousa a century ago.

In 1906, Sousa told the Congress of the United States that, "These Talking Machines are going to ruin artistic development of music in this country. When I was a

[16] This refers to original works of creative writing and multimedia created, and sometimes published on the Web, by fans of the *Harry Potter* series.

boy, in front of every house in the summer evenings you would find young people together singing the songs of the day, or the old songs. Today you hear these infernal machines going night and day. We will not have a vocal chord left" (Lessig, TED). Sousa's remarks were, in hindsight, quite prescient. The early twentieth century was a period of great flux in American arts participation.

In the nineteenth century, engagement meant playing the piano or acting in a home theatrical.

> Through much of the nineteenth century, the piano had served as the nation's archetypal cultural hearth, and images of a family sing or an informal after-dinner performance of a classical piece by a young student were staples of American domesticity. Then, the ability to sing or play music and, for that matter, drawing and the writing and recitation of poetry were considered everyday skills, integrated into family life as thoroughly as sewing or the canning of autumn garden produce (Ivey, 3).

In the twentieth century, however, engagement in the arts meant passive viewing and enjoyment of the "high arts" in a non-profit setting. One could argue that, rather than Americans ceasing to engage with arts, the very definition of what it means to be engaged changed instead. The nineteenth century definition of arts engagement in America—sewing, quilting, drawing, homemade music, and after-dinner theatricals—simply was not the twentieth century definition of participatory culture. In his introduction to *Engaging Art*, Bill Ivey, former Director of the National Endowment for the Arts, noted that 1909 was the "high water mark" for piano sales in America (Ivey, 3).

Ultimately, technology and commerce shape participation in the arts. The four great technologies of the early twentieth century, photography, film, radio, and television, do not require from the public that consumes them much participation, other than looking and/or listening over time. These top-down, read-only technologies allowed for easy

marketing to consumers in a capitalist society and easy control of the political and cultural information available to the masses.

A theory of arts participation proposed by arts researcher Alan Brown offers one means by which to understand the binary of read-write and read-only culture in terms of arts participation. Brown suggests a hierarchy of five modes of arts participation: ambient, observational, curatorial, interpretive, and inventive (Tepper and Ivey, 35-6). Ambient participation refers to unplanned arts experiences, such as happening upon a folk festival while walking downtown, whereas slightly higher upon the scale, observational participation includes planned arts attendance, such as attending the ballet or visiting a museum. Curatorial participation involves selecting and arranging works. Interpretive participation refers to performance of a pre-existing piece, such as a home theatrical of a published play or singing or playing an existing song. Finally, atop the hierarchy of arts participation is inventive participation, which involves the creation of original works of visual art, music, dance, theatre in various media and genres.
The ways in which people consumed these new technologies—photography, film, radio and television—changed the very notion of what it means to participate in the arts. Appreciation and consumption, not performance or invention or curation, became the dominant form of arts participation in twentieth century America

I must be careful here, before continuing, to point out that, though I argue that technology shapes arts participation, my view is far from technological determinism. Technological determinism fundamentally deals with causality. A technological determinist would argue that it is technologies, rather than social or cultural shifts, which drive history. In his book *Television, Technology and Cultural Form*, Raymond

Williams wrote of the dangers of such a view of history. Williams argued that rather than looking at effects (what social and cultural phenomena television may have led to), one should look at the causes of television—what social and cultural phenomena brought television into existence. This is very against the rhetoric of technological determinism. If television itself was the cause of social ills such as youth violence and rampant consumerism, then society could simply seek to modify its effects, but as the television is not a cause but a product of social forces, we must seek the causes of television (or video games or Internet media or any other technological form) within culture. While some social, religious, civic, and political leaders worry over the effects of television—sex, violence, political manipulation, cultural degradation, and like—these things are happening much more broadly in Western culture within the mass media. In essence, the determinist view is that if television (or any other technological form) had not been invented, then social change would never have occurred. A purely deterministic view belies the fact that technologies such as television, radio, the Internet and the automobile could have developed completely differently had other social, cultural, political and economic forces been at work. Rather than driving history, technological change, as noted by Carolyn Marvin in *When Old Technologies Were New: Thinking About Electronic Communication in the Nineteenth Century*, actually upholds social and cultural norms. Technologies, and the changes that they effect, are not put into motion by the "random autonomy of invention," but instead by shifting social norms and expectations that make those new technologies desirable.

Indeed, playwright Bertolt Brecht, a contemporary to this period of transition in arts participation, actually wrote in his essay, "Radio as a Means of Communication,"

that radio need not be merely a means for distribution of information and culture from one individual source to the masses. Anticipating the Internet by about sixty years, Brecht argued that technology need not determine the function and use of radio; that people could instead use radio for two-way broadcasting, not unlike "Broadcast it yourself," the slogan of user-generated video site YouTube.

> Nor does radio, in my opinion, suffice as a method of making the home cozy and family life possible again so we can cheerfully leave aside the question whether what it cannot achieve is in any case desirable. But quite apart from its dubious function (to offer a lot is to offer no one anything), radio is one-sided when it should have two sides. It is a pure instrument of distribution: it merely hands things out. And now to be positive, that is to say, to turn to the positive side of radio, here is a proposal to give radio a new function: Radio should be converted from a distribution system to a communication system. Radio could be the most wonderful public communication system imaginable, a gigantic system of channels - could be, that is, if it were capable not only of transmitting but of receiving, of making the listener not only hear but also speak, not of isolating him but of connecting him. This means that radio would have to give up being a purveyor and organise the listener as purveyor (Brecht).

In an ideal world, the individual, not some centralized source, is the purveyor of culture. Again, the ethos of the folk is the ethos of the Web.

However, as evidenced by the Survey of Public Participation in the Arts (SPPA), a survey of public arts participation in the United States conducted every five years by the National Endowment for the Arts, arts organizations have largely focused on the centralized sources of culture rather than individual creators of culture (Ivey, 1). The survey focuses on participation as attendance at cultural non-profits—museums, orchestras, ballets, theatres, and the like—rather than non-institutionalized grassroots efforts or lone individuals actively engaged in arts participation. While the SPPA may have been a fairly accurate barometer of arts participation, as it was conceived in the United States in the 1970s, when the survey first began, the idea of attendance at cultural

non-profits as the sole or even most important metric of arts participation is no longer an accurate measure in the early twenty-first century. With new digital tools on the Web, individuals can create everything from original music videos to digital quilts. Web 2.0 has not only impacted the means of production of culture, allowing for more active participation in the creation of culture on the part of individuals; it has greatly impacted the means of distribution as well. New media scholar Henry Jenkins has noted that Web 2.0 technologies enable unique new channels for the distribution of amateur artistic content, as well as new means by which to measure participation, including the number of hits to a Web page and the like (Tepper, 370). Ironically, it was technology that, in the early twentieth century, led to the decline of folk culture and the rise of a top-down mass broadcast culture.

> Much of it [folk culture on the Web] can be produced and consumed in the home; many people contribute and learn from each other (without necessarily considering themselves professional artists); and much of what gets produced is considered community property. From this vantage point, the next great transformation of America's cultural life feels more like a return to an earlier era of participatory culture rather than the onset of some new, unfamiliar form of postmodern cyberculture (Tepper, 371).

Far from an "unfamiliar form of postmodern cyberculture," folk participation in the arts and culture on the Web is, one could argue, a more authentically American cultural form than that surveyed by the SPPA.

Tocqueville, in *Democracy in America*, noted that, unlike any country in Europe, in America, people naturally formed and participated in organizations of all kinds, religious, political, cultural, and in *Engaging Art*, Ivey and Tepper describe a positive link between participation in the arts and culture and political participation. For a more active and engaged society, America needs participation in the arts. Ivey has advocated a

cultural voucher system in which citizens receive a voucher that pays for participation in museums and other arts and cultural events. This is one possible solution. The creation of a cabinet-level Secretary of the Arts, or a multi-agency White House office (structurally similar to the Office of National Security) would also be steps in the right direction.

Civic participation is strongly correlated with arts and cultural participation (Tepper and Gao, 19). Thus participation in the arts is integral to maintaining a creative and productive citizenry that can compete on the world market and world stage in the decades to come. In their analysis of demographic correlates to traditional cultural participation in the U.S., Tepper and Gao note that young people, the future of any society, have historically been left out of the arts (Tepper and Gao, 29-30). New forms of cultural participation online have already done much to change this; in fact, young people are at the forefront of much of the content creation on the Web today (Pew Internet). Today, art is much more likely to be actively integrated into young people's daily lives rather than a one-time event, such as a field trip or an evening at the opera with their parents. And it is not a bad thing that digital natives are more like to be engaged in the arts by creating a mash-up than attending the opera.

Appreciation of the arts, of course, does not only apply to the "high arts." The (re-)emergence of a do-it-yourself aesthetic online should ultimately be seen as a revival of folk culture. As I have already noted, just as it was at the turn of the last century with the rise of radio, film and the phonograph, arts and cultural participation is again in a state of transition. Folk art, from quilting bees to contra dances, is inherently participatory, and it is the folk arts, such as quilting, that kept truly participatory culture

alive through the twentieth century, and now, in the twenty-first century, quiltmaking and quiltmakers are on the vanguard of cultural participation on the Web, from quilt blogs and discussion groups to digital quilts and other textiles currently being made in virtual worlds such as *Second Life*.

In her sourcebook on African American quilting, *Black Threads*, Kyra Hicks published a study on how African American quiltmakers were using the Internet (2001). She found that African American quiltmakers were using the Web for quilt-related emails, quilt auctions, online fabric shopping, pattern swaps and round robins, sharing images of their own quilts with others, research on contemporary and historic quilts, and many other applications. Hicks noted that many of these activities have allowed for the creation of close-knit communities of African American quiltmakers online. The results of Hicks' research are echoed in the literary criticism of Elaine Showalter. In discussing Alice Walker's "Everyday Use," Showalter wrote, "Virginia Woolf's image of a room of one's own, so enabling for women modernists in England seeking privacy and autonomy, seems somehow isolated and remote for American women writers, especially black writers, today" (Showalter, 175). While the potential is there for the computer and the Web to be socially isolating, for many American women artists today—writers and quiltmakers alike—collaboration, community and collective knowledge are at the heart of the creative process, and as such, Web technologies that could, in the technologically deterministic view, have created an uneasy social isolation, an unwilling imprisonment in a room of one's own, have instead been used by communities of women online to make connections with those with common interests, build social networks, and share artistic and cultural knowledge.

I would now like to shift back to an analysis of young people, quiltmakers in their teens, 20s and 30s, a group that makes up a significant portion of the overall quilting population, as Web 2.0 users. Not surprisingly, quiltmakers who grew up with technologies like the Atari, the personal computer and the Nintendo Entertainment System, demand more from technology when it comes to quilting. This group not only wants to shop online and download patterns, but they want to blog quilting. Podcast quilting. Vodcast quilting. Network quilting. This is Quilting 2.0.

It is of tremendous significance that the content to be found relating to quilting on these kinds of Web 2.0 applications has been generated by the quiltmakers themselves to build the collective knowledge of the online quilting community. Content is driven by artists within the community. Rather than content being driven by corporations or Internet news media, it is driven by the artists within the community. The blog *Sew Chick: Art Quilt Adventurer*, for example, is perhaps the web's most prolific source for podcasts on quilting and related topics. Rather than simply podcasting about her own works and experiences, Sew Chick often takes on topics of interest to the broadest possible online audience with an interest in quiltmaking or quilt scholarship. A 2006 podcast reviews the national exhibition, "To Honor and Comfort: Native Quilting Traditions," organized by Marsha MacDowell and Kurt Dewhurst of the Michigan State University Museum, and promises an interview with one of the artists in a podcast to come.

Online social networks are another Web 2.0 platform in which quiltmakers share ideas and media content and meet fellow quilt enthusiasts. Two of the primary social networks in the United States as of the time of writing this dissertation are Facebook and

MySpace. While the popularity of MySpace largely waned in the years 2007-2009, with Facebook emerging as the dominant online social network amongst a broad cross-section Americans, MySpace is still quite popular among quiltmakers (this is evidenced by comparing the number of quilt-related groups on the two sites). This likely stems from the fact that Facebook, in its early history, required users to be affiliated with a particular school and to have a valid email connecting them to an educational institution. MySpace has never had such a requirement and, as such, has been popular with users outside the university setting and users older than the traditional college demographic. This is trend of independent social networks and the increase of user diversity, especially in terms of age, on social networks not only a national, but an international trend. Mixi, the Japanese social networking site, features several quilt groups, and like MySpace, is not affiliated with educational institutions.

Quiltmaking groups on MySpace run the gamut from traditional quilting groups, such as quilting bees, to groups that quilt for a particular social or charitable cause to radical, punk quilting groups. One interesting trend amongst quilting groups in MySpace is that of geographic identification. While one might expect that quiltmakers would use MySpace to meet and network with quiltmakers from across the country and around the world, several groups connect quiltmakers living in a particular city, state or region. For example, there are groups devoted to quilting in Nashville and Nova Scotia. This suggests that quiltmakers (and by extension general users) use online social networks to make connections in the brick and mortar world.

In his discussion of a feminist political ecology of cyberspace, Arturo Escobar noted that "it seems paradoxical to build a link between place and cyberculture"

(Escobar, 46), and yet building these connections between the two worlds is imperative for a number of reasons. First, as Escobar argues, the ability of women to connect with each other both online and in real life is key to women's political activism, especially in the developing world. Second, and perhaps most important to this discussion, is the notion of cyberspace as an embodied and highly liminal space. A quiltmaker can join a quilting group online, interact with fellow quiltmakers in cyberspace, and meet or exchange materials in the brick and mortar world. Similarly, a quiltmaker can go online, download a pattern, upload it to a sewing machine in real, physical space, use the machine to sew, and then upload images of the finished piece or new patterns to the Web, creating a continuous loop through which the quiltmaker effortlessly moves from machine to machine, through the virtual and the physical and back again.

Quilting, Bitch! is a MySpace group that seems to straddle the line between the traditional quilting bee and punk craftivism, and often traverses the liminal planes of cyberspace and real space. Members of this group, primarily women in their 20s, 30s, and 40s, post images of their work and give artistic feedback to other members, have pattern and fabric swaps via snail mail in the real world, including a recent fat quarter[17] swap, and generally rely upon each other for moral support in quilting as well as other aspects of their lives. Such groups have important, and often subversive, cultural functions that go far beyond quiltmaking. Of women's cultures in virtual worlds, Sadie Plant wrote, "Complex systems and virtual worlds are not only important because they open spaces for existing women within an already existing culture, but also because of

[17] A fat quarter is a one quarter of a yard piece of fabric that is cut 'fat' at 18" x 22" rather than the traditional long and skinny 9" x 44" quarter yard cut. Fat quarters are frequently used by quiltmakers in the pieceing of quilt tops.

the extent to which they undermine both the world view and the material reality of two thousand years of patriarchical control" (Plant, 170). Quiltmaking groups online not only offer critique as well as artistic and emotional recognition and support, but also work to subvert the patriarchy by providing safe fora in which women can question and complain about their domestic situations and the gendered domestic roles into which society has placed them.

Some quiltmakers use blogging to negotiate national identities within the global quilting community. The blog *Quilt Otaku*, maintained by an American woman, is the record of quilting and identity formation of a self-described "wanna-be Japanese quilting nerd." In contrast, *Taniwa! Japanese Quilt Fix from America* is maintained by a middle-aged Japanese woman living in America. These blogs are a perfect example of the globalization of quilting fostered by digital communications technologies. Globalization, as defined by Anthony Giddens, may be described as "the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa" (Giddens, 18). Both bloggers understand quilting, an art form indigenous to America, through the cultural and artistic lens of Japan. This interplay of American wanna-be Japanese and Japanese transplants among quiltmakers in the blogosphere points to a larger trend that can be termed "global delocalization" (Harcourt, 223). New migration patterns in the brick and mortar world combine with the fluidity of embodied border crossings online to create new transnational identities and conversations in the quilting community. Traditional boundaries of the nation state and of citizenship break down, creating conditions for quiltmakers to act as citizens of discrete communities within *Fiberspace*.

In *The Little Community: Viewpoints for the Study of a Human Whole*, Robert Redfield defined "the little community" as small, distinctive, homogenous, and self-sufficient organization of people (Redfield, 4). Quiltmakers and quilt-lovers on Facebook are indeed a small, distinctive, homogenous, and self-sufficient organization of people within the much larger human community of Facebook users. The "little community" of Quilters on Facebook also exhibits many other attributes of small communities as described by Redfield. As a community, they function within specific ecological systems, such as fan pages and social gifting applications. Within these ecological systems, social structures and social norms have developed, such as the types of comments posted on a wall or the frequency of posting by certain members of the group. The community of quiltmakers on Facebook has a history, or rather histories, and a fairly coherent ethos, or outlook on life. There are also communities within the "little community" of quiltmakers on Facebook, such as fans of specific pages, such as the Quilt Index, and those with common interests that appeal to a part rather than the whole of the group, such as players of the Facebook game application Farm Town.

Social gifting is a major component of the new social Web, as evidenced by sites which exist expressly for that purpose, such as Sendzy.com. Social gifts are image files, usually drawings rather than photographs, which are given by family, friends, and colleagues to one another via a Web 2.0 application for birthdays, to show affection, or "just because." Social gifts online are by nature virtual; that is, there is no tangible, analog gift that one receives in the brick and mortar world. Hundreds and perhaps thousands of unique social gifting applications exist on Facebook as of 2010. Popular types of social gifts include virtual alcoholic drinks, flair inspired by the film *Office*

Space (lapel buttons depicting pop culture images and slogans that one sticks on a virtual corkboard), flowers, chocolates, stuffed animals, political bumperstickers, and adult novelty gifts. There is even a gifting application on Facebook for academes, *Shite Gifts for Academics*, which features gag gifts for professors and graduate students, including virtual 4-4 teaching loads, overbearing and maladjusted colleagues, obsolete classroom technologies, idiot chairpeople, boring faculty meetings, etc.

Little scholarly research exists on social gifting online, owing to the fact that it is such as relatively new phenomenon. In one of the few articles on the subject, "The Shadow Side of Social Gift-Giving: Miscommunication and Failed Gifts," communications scholar J. D. Sunwolf argues that gifting is a cause of social anxiety.

> While Komter and Vollegergh (1997) have suggested that gift giving functions as the cement of social relationships, Sherry et al. (1993) maintained that relational gifting may also forge a painful juncture between separately-held personal myths about givers and receivers. Failed gifts, in fact, can trigger relational trauma. Givers may be reluctant, receivers ungrateful, or occasions poorly-defined. As a result, relational gift-giving and receiving may be accompanied by high levels of anxiety (Sunwolf).

In quilt-related gifting applications, however, online social gifting seems to be a source of warmth and comfort—what Komter and Vollegergh call "the cement of social relationships"—rather than a source of anxiety. The three main quilt-related social

Fig. 5.1 *Send Quilt Block of the Month*, screenshot taken in *Facebook.* "Send Quilt Block of the Month." "Make your own Gift App!"

gifting applications on Facebook are Send Quilt Block of the Month (pictured above), Hawaiian Quilt Patterns, and Quilt Block Party. Quilt Block Party, the interface of which is pictured on the following page, encourages the user to "wrap your friends in a virtual quilt," suggesting a level of warmth and intimacy in the online interaction.

Fig. 5.2 *Quilt Block Party*, screenshot taken in *Facebook*. "Quilt Block Party." "Make your own Gift App!" "30s Sugar Bowl, Latte, Amish Ohio Star, Breaking Free, Tulip Basket, Reverse Applique Butterfly, Scrappy Rail Fence, Pink Crazy Quilt Block, Quilt Jewels, Paper-pieced Crazy Basket, Zephirine Drouhin, Road to California."

It is hardly insignificant that one of Facebook's social gifting applications for quilts is called "Quilt Block Party." The block party conjures images of neighborhood get-togethers in the new American suburbia of the 1950s and '60s, of self-selected communities living within a new social and spatial form, getting together for barbeque, cocktails, and companionship, the latter being a highly valuable commodity in a potentially isolating new type of community. In the early twenty-first century, the new

social and spatial form is the online world, and this new form, as the suburb before it, can be a very lonely place indeed. However, social networks such as Facebook, MySpace and Twitter provide a kind of never-ending block party in this online world, and while companionship and community building over barbeque is necessarily out in the disembodied online landscape, new forms of the block party, including social gifting and social gaming, are in.

Groups and social gifting applications are but two of the means by which quiltmakers form communities on Facebook. Many quiltmakers connect with others who share not only their quiltmaking hobby, but also share an interest in gaming through one of Facebook's many games such as *Castle Age*, *Restaurant City*, *Zoo Sim*, *Farmville*, and *Farm Town*. Some Facebook games even feature virtual quilts as prizes for attaining certain achievements. For example, reaching level 50 of the Facebook game, *Farm Town*, allows the player to 'unlock' a virtual quilt that may be used to decorate their virtual farm. Popular among quiltmakers, as well as a broad-cross section of Facebook users, a Facebook group, Quilters on Farmtown, serves as a community page for quiltmakers who play the game. Their icon, below, is a *Farm Town* farm that has been designed and sewn (with virtual seeds) to look like a patchwork quilt with a central heart-shaped medallion.

Fig. 5.3 'Quilted' *Farm Town* farm, screenshot taken in *Facebook.*

The *Quilt Index* Facebook fan page is one of the Index's most successful social networking efforts.[18] The *Quilt Index* had 1,447 fans as of early October, 2010, up about 500 in the past six months. The Index is poised to reach 2,000 fans very soon, which is above the high-water mark according to Facebook's own research—only about 20% of the fan pages on Facebook have over 1,000 fans. According to AWstats, the number one website (that is not a search engine) that refers people to the *Quilt Index* is Facebook, with around 300 people accessing the *Quilt Index* site from Facebook per month. Facebook has proven a valuable tool in the audience development for the *Quilt Index*, particularly through internationalization. The Index's Facebook audience has become increasingly international since its inception in fall 2008. Below is a table showing the top countries, cities, and languages of *Quilt Index* Facebook fans in terms of population

[18] See http://www.facebook.com/quiltindex.

Top Countries		Top Cities		Top Languages	
United States	989	Seattle	28	English (US)	1,101
Canada	67	Holt	24	English (UK)	58
Italy	40	East Lansing	19	Italian	33
Australia	20	Washington	16	Turkish	19
Turkey	20	New York	15	Spanish	12
Spain	16	Atlanta	14	Traditional Chinese (Taiwan)	11
Taiwan	12	Austin	14	Spanish (Spain)	10
United Kingdom	10	Rome	14	Dutch	8
Indonesia	10	Boston	13	French (France)	7
Belgium	7	Chicago	13	Norwegian (bokmal)	5
India	7	Flint	13	German	4
South Africa	7	Houston	13	Indonesian	4
Israel	6	Southfield	13	Portuguese (Brazil)	4
France	5	Phoenix	12	Danish	3
Malaysia	5			Swedish	3
Pakistan	5			Catalan	2
Argentina	4			English (Pirate)	2
Brazil	4			Hebrew	2
Chile	4			Bulgarian	1
Netherlands	4			Finnish	1

Fig. 5.4 *Quilt Index Facebook* Insights.

as of August 2010. In addition to the countries listed above, there are dozens of countries for which we have one fan, including Ethiopia, Eritrea and Bangladesh. The Index's "Quilt of the Day" daily objects are very popular, getting several likes and comments per post. The graph on the following page shows total fan interactions with the *Quilt Index* Facebook page per day from September 2009 through July 2010, including comments, wall posts, and 'likes.'

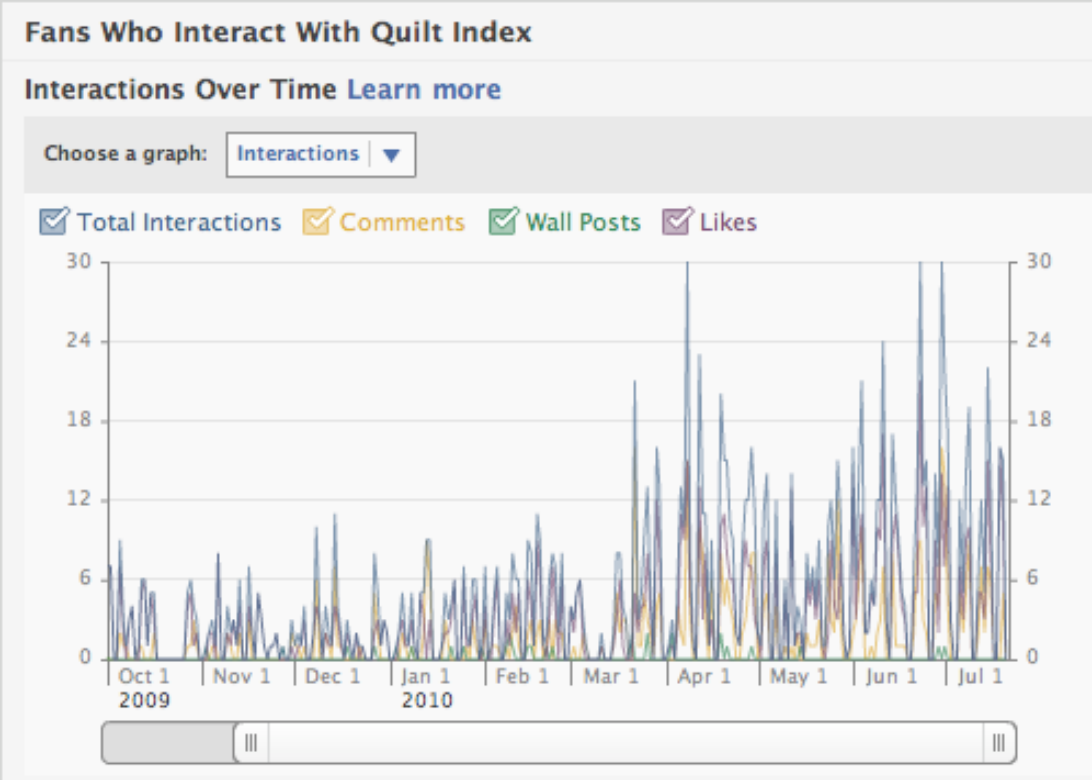

Fig. 5.5 *Quilt Index* Fan Interactions over Time. Interactions, including total interactions, comments, wall posts, and likes for October 1, November 1, and December 1, 2009, and January 1, February 1, March 1, April 1, May 1, June 1, and July 1, 2010.

Quilt Index staff often poll the fans for topics for future quilts of the day, effectively allowing the Index to engage in real-time content curation with this audience. In the example below, from July 1, 2010, each pattern was suggested by fans through posts on the *Quilt Index*'s 'wall.'

Quilt Index Thanks so much to all who submitted ideas for pattern themes! Here are the results:
July 6 – 9: Cherry and Berry Baskets
July 12 – 16: Drunkard's Path
July 19 – 23: Friendship Quilts
July 26 – 30: Wedding Ring
August 2 – 6: Mariner's Compass
August 9 – 13: Baltimore Album
August 16 – 20: Schoolhouse
July 1 at 10:05am · Comment · Like · Promote

Fig. 5.6 *Quilt Index* Fan-Suggested Pattern Themes.

Also, using an application programming interface (API) called Involver, *Quilt Index* staff are able to send posts made to Facebook directly to Twitter without any added staff time, reaching those who prefer to use Twitter rather than Facebook effortlessly.[19]

Fig. 5.7 *Quilt Index* Twitter Feed. "Quilt Index. East Lansing, MI. The Quilt Index aims to be a central resource that incorporates a wide variety of sources and information on quilts, quiltmakers, and quiltmaking." 539 following, 413 followers, 30 listed, 476 tweets.

While these disparate examples may seem to be related only in that they are examples of interactions of quiltmakers with and in Web 2.0, these anecdotes may be understood as a whole in the context of what cybertheorist Pierre Lévy termed "collective intelligence." In his theoretical work, *Cyberculture*, Lévy describes the collective intelligence brought about by online communication in this way.

> My hypothesis is that cyberculture reinstates the copresence of messages and their context, which had been the current of oral societies, but on a different scale and

[19] See http://twitter.com/quiltindex for the *Quilt Index*'s twitter feed.

> on a different plane. The new universality no longer depends on self-sufficient texts, on the fixity and independence of signification. It is constructed and extended by interconnecting messages with one another, by their continuous ramification through virtual communities, which instills in them varied meanings that are continuously renewed (Lévy, xiv).

In layman's terms, one can understand the collective intelligence of Web 2.0 quiltmakers in this way: No one quiltmaker knows everything, not even everything about quilting, and every quiltmaker actively uploading content to the web has something slightly different to offer the community. Some are good at podcasts, others at aggregating links and freely available patterns, others at preserving the early lore of machine quilting and still others at blogging and organizing swaps, meet-ups and social networks. All of the content uploaded by quiltmakers (and quilt scholars) amounts to the collective intelligence of the quilt world, a body of knowledge that no one quiltmaker or scholar can ever know in its entirety, for it is simply too vast. But collectively, quiltmakers have created a massive, fairly cohesive body of knowledge online.

To return to the example of Sousa, the singing of "the songs of the day and the old songs" can be read as an historical antecedent to user-generated videos, mash-ups, and other content that people, especially young people, are creating online today.

> Digital technology is the opportunity for the revival of these vocal chords that he spoke so passionately about. User-generated content, celebrating amateur culture. By which I don't mean amateurish culture, I mean culture where people produce for the love of what they're doing and not for the money. I mean the culture that your kids are producing all the time. For when you think of what Sousa romanticized in the young people together, singing the songs of the day, or the old songs, you should recognize what your kids are doing now. Taking the songs of the day and the old songs and remixing them to make something different. It's how they understand access to this culture (Lessig, TED).

"The world of Web 2.0 is also the world of what Dan Gillmor calls 'we, the media,' a world in which 'the former audience,' not a few people in a back room, decides what's important" (O'Reilly).

Technology, specifically the World Wide Web, has the power to connect with and be relevant to various communities, encouraging the public to actively participate in real-time content curation and other cultural activities. Videoconferencing and online collections allow a variety of cultural institutions to reach rural audiences who previously did not have such access, both in the United States and around the world. Social networking applications such as Facebook allow cultural organizations to build communities online and connect with a large population, especially people under 25, who might not become engaged without this new kind of Web presence. Social media also shifts the role of authority from being vested in a historical cultural domain, such as the museum, to a community or user-generated body of information that is critiqued within the community.

The young women in Louisa May Alcott's *Little Women*, Meg, Jo, Beth and Amy March, did not watch a DVD or made-for-TV movie production of *Pilgrim's Progress*. With their home as the backdrop of Bunyan's work, they put on the production of *Pilgrim's Progress* themselves, acting rather than watching.

> Do you remember how you used to play *Pilgrim's Progress* when you were little things? Nothing delighted you more than to have me tie my piece-bags on your back for burdens, give you hats and sticks and rolls of paper, and let you travel through the house from the cellar, which was the City of Destruction, up, up, to the housetop, where you had all the lovely things you could collect in the Celestial City (Alcott, *Little Women*, 14).

Of course, the video and communications technologies that make television and DVDs possible did not exist in the nineteenth century. In the nineteenth century, for the March

sisters to enjoy a production of *Pilgrim's Progress*, they had to put it on themselves as a home theatrical. Home theatricals fell from favor in the twentieth century, as people consumed radio, film and television productions. Folk life and homemade culture ebbed as mainstream, top-down broadcast culture flourished. However, this is not the whole story in the early twenty-first century. Web 2.0 technologies such as user-generated content uploading and social networks and Web 1.0 sites such as fanzines are a critical element for the revitalization of grassroots culture, of the handmade. It is tremendous significance that the content to be found relating to quilting on these kinds of Web 2.0 applications has been generated by quiltmakers, often younger quiltmakers, themselves to build the collective knowledge of the online quilting community. Content is driven by artists within the community, rather than by corporations or Internet news media.

User-generated content is the new folk art. As we shall see, this digital shift in folk culture raises important questions for museums, the academy, policymakers, and the legal community. What digital objects should be understood as material culture? How can digital material culture best be preserved, interpreted and exhibited? How does digital material culture fit into the larger history? How does working in digital media affect the relationship of the maker's body to the creation of the work? What should museums online do to attract and be relevant to youth? How can cultural non-profits such as museums, dance companies and orchestras prioritize the creation and performance of user-generated content? How can the system of arts funding in the United States be changed so that amateur artists are on equal footing with professional artists?

The digital handmade differs greatly from the nineteenth century version in the physical characteristics of its finished product. For example, a quilt made in the virtual world *Second Life* is binary code that can be rendered on a computer screen while a traditional quilt is made of fabric. The digital handmade and earlier forms of homemade culture are remarkably similar, however, in their uses and their ethos, just as similar, perhaps, as folk art and Web 2.0. In the following chapter on crafted objects in the online game *World of Warcraft* and in the chapters that follow, I will investigate various aspects of this digital handmade, the folk art made and consumed in the virtual spaces, the *Fiberspace*, of Web 2.0.

CHAPTER SIX

THE WOMACHINE AND THE DOMESTICATION OF THE INTERNET

"It's as if computers were made for creating beautiful quilts." – Judy Heim

This first half of this chapter focuses upon the physio-technological aspects of the networked quilter, the second half of this chapter focuses on socio-technological aspects on women in cyberspace generally, chronicling how the Internet transformed from a 'Wild West' largely inhabited by men to a domestic *Fiberspace*. I trace this history, beginning with an analog context to the gender shift on the Web, then moving from the Web as Wild West of the 1990s to the Web as domestic space of the late 2000s. I also examine the theoretical implications of domesticity, motherhood, and Web 2.0 technologies. It is important to remember, however, that the shift from Wild West to domestic space is only one history of gender and the Internet. There are early female adopters with any new technology; I conclude with a brief overview of this alternate history, a history in which the Wild West is either a fallacy, or in which there are a few female desperados. The story of *Fiberspace* is a story of how technology has affected women's bodies and women have affected the Web, how women are becoming womachines, and how the World Wide Web was "domesticated" and came to be a network in which there are low barriers to artistic and civic for women, even those in their nineties. It was this transformation of the Internet to a decidedly domestic space that sets the groundwork for the chapters that follow.

My Great Aunt is ninety years old. She lives in a town of about 2,000 in southern Michigan. It is a farming community. She lives in the house she and her husband bought in 1940; the house is about two miles from the house in which she was born. She has left Michigan only once in all these years—to go to Chicago on her senior high school class trip. This was in 1936. She still uses a rotary telephone. She loves Lawrence Welk, grows heirloom vegetables, and decorates graves on Memorial Day. She also quilts—a lot.

Obviously, this is the portrait of a woman whose lifestyle is in many ways more reflective of decades past than of the present. Indeed, in many ways, the twenty-first century passes her by. However, a couple years ago she bought a laptop and traded in her old sewing machine for a digital one. She uses the laptop only for quiltmaking purposes, downloading patterns posted by other quiltmakers and then uploading them to her sewing machine, making the process of stitching digitally assisted, much easier for gnarled, ninety year old hands.

Using the experiences of my own Great Aunt as a reference point, this chapter will look at issues of the human-computer interface as applied to a 'sewing computer,' and using Mark Poster's concept of the *humachine*, the relationship between the digital sewing machine and quiltmakers' bodies.

In their 1998 book, *The Quilter's Computer Companion*, Judy Heim and Gloria Hansen wrote, "If quilters are misunderstood, their use of computers is even more so. What possible use can an appliance that was born of the need to chart the distance between the earth and the moon have for people who spend their time sewing centuries-

old pineapple designs onto fabric" (Heim and Hansen, xiv)? Clearly, quiltmaker's expectations about the utility of computers in the context of quiltmaking have come a long way in the ten years since the publication of *The Quilter's Computer Companion*.

As with any industry, sewing machine manufacturers now have a huge online presence. A 2008 visit to the Husqvarna Viking website, (http://www.husqvarnaviking.com/us/), reminds one in many ways of a mid-range clothing retailer's site. A large flash movie takes up most of the real estate on the page, with a changing array of sleek, sexy new sewing machines and exclusive limited editions. Mauve flowers, red borders and images of smiling women ranging in age from 20-something to 70-something immediately cue the visitor to this site that Husqvarna Viking's target demographic for this site is women of all ages. Even though one cannot actually purchase a Husqvarna Viking online, (the customer is instead directed to a dealer in their area), one is certainly invited to browse, shop for 4-D software, sign-up for the email newsletter, watch the latest clip from *The Martha Stewart Show*, and much more.

Although cyberspace certainly has the potential for gender neutral, and even gender-free, disembodied participation, it is important to note that many sites, particularly corporate sites, rely upon a predictable gender binary. Finnish scholar Susanna Paasonen has noted the essentialism of sites for products targeted at women. "Women's web sites, in their attempts to address female Internet users, have relied on representational conventions familiar from women's magazines, while sociobiological models are employed in explaining the 'natural roots' of gendered interests…" (Paasonen,

236). This essentialism is clearly at work on the Husqvarna Viking site—think mauve and flowers. Such a representation of craftsperson and sewing machine creates a feminized, atechnological space online that not so subtly softens the company's new line of increasingly technological machines.

One of Husqvarna Viking's machines featured on the site is of particular interest in terms of digital cultural studies. That the Emerald 183 is heralded as "today's sewing computer" suggests that women, even into their seventies, are looking for sewing machines that do more than the backstitch. The site reads,

Fig. 6.1 Husqvarna Viking Sewing Computer.

> Experience today's sewing computer; the Emerald 183!
>
> The old-fashioned typewriter has its charm, but computers have made the world easier and more accessible – including the sewing!
>
> Emerald 183 from Husqvarna Viking is a user-friendly, computerized sewing machine. Not a mechanical knob in sight! All stitch selections are made with the touch of a finger and shown in the very bright, well-lit Infodisplay.
>
> The machine has 83 wonderful stitches that can be adjusted to your preferences then programmed and saved (Husqvarna Viking).

Clearly targeted at an aging audience, the ad reminds the reader that while the typewriter (and by extension, the old-fashioned sewing machine) are nostalgic, computers, with their buttons and Infodisplays, make work easier and more accessible to people like my Great Aunt, who can no longer do intricate handwork due to aging or another physical condition. This is not a sewing *machine* that requires physical labor, the ad suggests, but rather a sewing *computer* that allows one to sew with the push of a button.

High-end computerized sewing machines allow quiltmakers to upload patterns downloaded from websites or CDs directly into the machine, taking the guesswork out of appliqué and allowing for precise, professional-looking artistic outcomes (assuming one is proficient in using a sewing machine). For quiltmakers with poor eyesight or very arthritic hands, machine quilting, increasingly digitally assisted machine quilting, is vital alternative to hand quilting. Without the technology, some quiltmakers simply would no longer be able to make their work. Many other quiltmakers still feel today, however, that such technological enhancements are detrimental to the craft; they believe that a quilt made *on* a machine, especially a computerized machine, is really made *by* the machine. Quiltmaking and other crafts have been valued for generations as handwork and should remain such, they argue. "Instead of seeing what a magnificent piece it [*CoronaII: The*

Fig. 6.2 *Corona II: Solar Eclipse* by Caryl Bryer Fallert, image source: *Patterns of Progress*.

Solar Eclipse] was regardless of technique, many quiltmakers had trouble accepting the fact that it was machine quilted…I feel that we spend too much energy debating whether machine or hand is best" (Hargrave, 5). While such controversies will likely continue, it seems certain that the sewing computer is here to stay. Given that many quiltmakers will continue to augment their bodies through sewing technologies to quilt more precisely and

more efficiently, it is perhaps most important to investigate the implications of the convergence of quiltmaker and machine.

To investigate the relationship of the machine, and later, networked computing, to the quiltmaker's body, it is first necessary to define *cybernetics*. In "Five Decades of Popular Cybernetics," Paasonen notes that the prefix *cyber*, as in cyberspace, cyberculture, and cyberfeminism, has come to mean something much different in the English language than its etymology would suggest. The origin of this popular prefix comes from the word cybernetics, meaning "the science of communications and automatic control in machines and organic systems, and the study of messages in controlling machinery and society" (Paasonen, 11). This definition is taken from the writing of Norbert Wiener, the "father" of cybernetics.

There is yet another body of work and theory on cybernetics, popular cybernetics, which focuses on popular conceptions of the cyborg, especially as they are imagined in the popular media. It is from ideas of popular cybernetics that characters such as the Bionic Woman, the Stepford Wives, and Rosie, the robotic, yet loving maid in the animated series *The Jetsons*, have sprung. It is not insignificant that all of these are female characters. Of course, there are several examples of male cyborgs, often action heroes, that may be culled from television, film, and the pages of comic books. However, as Susanna Paasonen has noted, the historical objectification of women makes the feminine particularly interesting and appealing as cyborg. "Female automata—women as machines and machines as ideal women—have been imagined since at least the eighteenth century. The figure of the woman-machine has been used to articulate the machine-like

nature of the human, perhaps since the category of woman has been historically objectified (as dolls, machines, servants) in different ways than that of man" (Paasonen, 46). Women, doing physical work in tandem with a digital, networked sewing machine, having embodied interactions in cyberspace, may be read then as female automata. Terms such as cyborg and automaton are grounded in social and technological histories that are, in one important way, very much different from life in the present day, however. Both of these ideas, the cyborg and the automaton, were conceived before the widespread popular use of digital technologies and networked computing, specifically the World Wide Web.

In his 1964 book *Understanding the Media: New Extensions of Man*, media theorist Marshall McLuhan wrote that technology is simply anything that is an "extension or self-amputation of our physical bodies" (Paasonen, 52). From bifocals and breast implants to titanium golf clubs and sewing machines, people have been using technology to enhance their bodies or the functions that their bodies can perform for hundreds of years. While bifocals and sewing machines certainly seem harmless enough, advances in biotechnology, media representations of cyborgs such as the Bionic Woman and the Terminator, and the rapidly shrinking gap between in the human-computer interface brought about by technologies such as voice and fingerprint recognition have some scholars proposing that the twenty-first century human is actually a humachine.

In *Information Please: Culture and Politics in the Age of Digital Machines* (2000), Mark Poster notes a real newness, something that is radically different about the relations between humans, nature, society and technology, and this is, of course, digital technology and networked computing. Given the significant changes in cultural relations that this

technological shift has brought about, Poster uses the book, in his own words, "to pinpoint the places where cultural theory would benefit from alteration and revision by attention to new relations of humans and information machines" (Poster, 4). Central to these alterations and revisions is Poster's concept of the humachine, the idea that the twenty-first century human (in the developed world) relies upon digital technology as an amplification of the body, and to complete tasks basic to humanity, such as communication, at all times.[20]

To return to the example of my Great Aunt, even a ninety year old woman in an isolated rural community relies upon digital technologies as an amplification of her physical self in these ways, though she does not use the Internet for other purposes. Significantly, for her and no doubt many other aging women, it is quiltmaking that provided the impetus for her entry into this global system of the humachine. In the tradition of female automaton as ideal domestic laborer, perhaps it makes more sense in the case of my Great Aunt and women like her to describe this phenomenon of the networked quilter not as the humachine, but as the *womachine*.

The shift from a wild space primarily dominated by men to a more domestic space primarily inhabited by women (or *womachines*), in which even a rural ninety year old woman is an embodied participant in the digital culture, is indeed one of the many histories of the Internet (and more specifically, of the World Wide Web.) This Wild West

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[20] If this discussion of a global networked system of humachines begins to remind the reader of the Borg from *Star Trek: The Next Generation*, that is not the author's intent. Quite the opposite, actually.

did not appear from nowhere. Digital technologies, and even virtual spaces almost always have a direct analog antecedent not too far back in history. The Net has this history in common with many other technologies, for example, television and radio. Turn of the last century lantern lectures for the armchair tourist and games of Dungeons and Dragons played out in parent's basements in the late twentieth century, for example, are both examples of analog virtual worlds, direct ancestors of *Second Life* and *World of Warcraft.*

In *The American Technological Sublime*, David Nye argued that historically, it was only men who were felt to be able to truly experience the sublime. Women had an affinity not for the awe of the sublime, but for the quaintness of the picturesque. In nineteenth century America, women had an important role to play in the technological sublime, however. Women domesticated once sublime technologies, making men ready to experience and conquer new forms of the sublime. Electricity, once frightening, came to be represented allegorically as a goddess, the roar of the locomotive was somewhat muted when people spoke of the train in the feminine ('get on her'), and once monstrous factories were made into mothers, said to give birth to the steel. Each of these technologies was feminized over time. The same could be said for twentieth century technologies such as radio and television. In their earliest stages, these technologies were largely the preserve of men, tinkering away in their attics. When made available to consumers for the home, they were positioned at the heart of the living room, encased in wood cabinetry, and used to receive broadcasts of soap operas and the like for the women of the house. While this is certainly a gross over-simplification, there is truth to this narrative to be sure.

Much of the rhetoric surrounding the World Wide Web when it first emerged for the public in the early 1990s was that of a Wild West (Friedman), a new, lawless world to be conquered and populated by men. Indeed, for at least the first ten years of the Web, the most visited type of resource on the Internet was, not counting email, pornography.[21] Gambling (which conjures up images of saloons in the Old West) was another very popular use in the early days of the Web.

However, just as there have been women in the Wild West, as there were on every new frontier, there were female early adopters of the World Wide Web, and these female early adopters were largely figured as Other, as existing outside the normative social structure. There were websites (news, weather, stupid facts, useful facts, rantings and raving, etc), and then there were 'women's websites.' Of course, women used and enjoyed websites featuring news, weather, stupid facts, etc., but these types of sites would never have been seen as women's sites. Nor, interestingly, would they have been called 'men's sites.' Normal, plain-old websites were associated with male users, and sites specifically thought of as women's sites were something else, apart from the majority of experience of the Web, something Other.[22] In her chapter on websites by

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[21] Incidentally, pornography, and the desire to consume it in ever-more private and easily accessible way has been theorized to explain the success of many user-centered technologies. VHS, for example, caught on in large measure because it allowed people to be titillated in the privacy of their own homes, rather than in the movie theatre. While there are certainly women who access pornography, it is culturally constructed as a men's pursuit, and this gives further credence to the veracity of the male as early adopter in the history of the (digital) Wild West.

[22] For uses and definitions of the 'Other,' see the works of twentieth century continental philosophers such as Jean Paul Sartre, Simone de Beauvoir, and Jacques Lacan.

sanitary brands in her book *Figures of Fantasy: Internet, Women and Cyberdiscourse*, Susanna Paasonen argues that early websites by brands such as Kotex naively tried to build communities of users based solely of the commonality of menstruation and did this because women were seen to be such an isolated and cohesive group on the Web. (Paasonen, 131) Kotex.com was not the only imagined haven for women in the Wild West of the WWW.

The domestication of the Web began long before social networking and other Web 2.0 applications with personal sites that functioned very much as living rooms online. Personal webpages such as "Kathy's Geocities Guinea Pig Appreciation Webring Links Page" provided an outlet for women's (and men's) personal representation and networking from some the earliest days of the Web.

Men outnumbered women in Web 1.0 [reference] (though, I would argue, even more so in the public imagination than in actuality), but with Web 2.0, women have truly claimed the Web as their own. Social networking sites such as Facebook now account for greater Web usage than do pornography sites, and women outnumber men in these social networking web applications. Women are no longer the Other on the Web. Many of the hottest Web 2.0 sites,

Fig. 6.3 "Knit This," screenshot taken in *Second Life*. "Scripted knitting attachments and knitting bags. IM Ida Keen for demo."

such as Shutterfly and Blogher, are targeted to women. Advertising on the Web reflects

the large female Web user group. The Mommy Blogger, for instance, is now one of the most active types on the Net. Women are heavily represented in virtual worlds such as *Second Life*, with *Second Life* knitting groups and suppliers, such as Knit This (previous page), childcare, and the like. Women are even becoming a larger percentage of the population in violent (and nerdy) MMORPGs such as *World of Warcraft* (Corneliussen, 65).

So what, if any, are the implications of a Wild West conquered and domesticated by women? Mark Poster, in his chapter in *Information Please* titled "Psychoanalysis, the Body and Information Machines," argues that it was the introduction into the home of electronic media that brought down the way of life of the Victorian nuclear family.

> The child's space in the Victorian home lacked all the information technologies we assume today…By the early twenty-first century, the number and variety of information machines installed in the home has increased remarkably. Televisions, answering machines, fax machines, computers, electronic games, network connections, and so many other devices have made entry into the residence…The home has become infinitely permeable to the outside world, with the result that the coherence of the culture of the nuclear family has been fragmented into what I call the segmented family (Poster 191). Each member of the family now sustains a separate cultural world within the family (Poster 171-3).

Electronic media made the home much more permeable to the outside world, and segmented the family as each member of the family group was allowed to pursue their own interests. As a historical stereotypical example, a mother could listen to a soap opera, the children to Tom Mix, and the father to the news, without coming back together as a family. This brief sketch of the introduction of radio into the home certainly has parallels to technology usage in the home in the present day, but Poster's model of media

and the collapse of the family does not truly fit with the reality of what women are doing in online social networks and photosharing sites. What could be read from the standpoint of "family values" as most sinister in my theoretical example above is the fact that the mother may very well listen to her soap opera lost in reverie, unconcerned for her family, day-dreaming of something rather different from her situation in life. While the Web certainly does allow women to step out of their roles in real life for a time and try on different roles, and even different genders in virtual worlds and many online games, much of the work done by women in social networking sites is to share the experience of childrearing and family life with her friends and family. This sharing of experiences of family life is the very core of what it is to be a Mommy Blogger. My husband's cousin, for example, sends me pictures on Shutterfly of her daughter at t-ball; I write on my sister-in-law's wall on Facebook to tell her that I just saw the cutest picture of our niece on Shutterfly. The permeability of the home that the Web and social networking enables, rather than eroding family life, is actually strengthening it. This is not the ideal nuclear family envisioned in the nineteenth and twentieth centuries, but rather is a revival of the old extended family, with mothers, sisters, and aunts all Twittering, sharing and blogging, raising their families together online. All of this domesticity may give the impression that women are using Web 2.0 to uphold the patriarchy, and in many cases that may be true, but Mommy Blogging and social networking may also be read as subverting the patriarchy. Rather than looking only to the father/husband for guidance with the childrearing as in the Victorian or 1950s *Leave it to Beaver* model, women and men are building networks of friends and extended family with whom they can share the process

and look to for guidance. Mommy Blogging, social networking and other activities in Web 2.0 are actually incredibly empowering for women.

Generally speaking, yes, the history of the Internet is a history of male early adopters and then a colonization and domestication by women. Happily, many aspects of this domestication, especially social networking, have empowered women. However, some of the early adopters of the Internet and of various Web applications have been women. A parallel history to that above is that of the female early adopter. Both histories are correct, yet nether is complete without the other.

From a theoretical standpoint, it is not insignificant that women in the nineteenth century who were employed to perform complex calculations were in fact called 'computers.' Sadie Plant, in her book *Zeros and Ones,* a book that seeks to reclaim the place of women in the history of computing, makes extensive use of Ada Lovelace. The daughter of Lord Byron, Lovelace used her background, which afforded her much more freedom than the average young women in the 1840s, to study higher mathematics. Lovelace is celebrated by Plant and widely credited by many as being the first computer programmer. She wrote of the use of the punch cards of the Jacquard loom to program Charles Babbage's Analytical Engine, which was either the first computer, or a very close relative to it. Women had a voice in computing technology from the beginning.

There are sundry other examples of women as early adopters, even in computer games. That "girls don't really like computer games" has been proven a myth by "many research projects and surveys documenting that girls and women—in particular women over 40—enjoy playing computer games" (Corneliussen, 65). For example, I myself was

an early female adopter of *World of Warcraft*. *World of Warcraft* is a massively multiplayer online role-playing game (MMORPG) set in a vaguely medieval fantasy world rooted in a rich body of game lore, *Azeroth*. The game play in this world revolves primarily around the completion of quests and combat with monsters played by the computer and war set in battlegrounds and fought between two factions, the Alliance and the Horde, played by other players around the world. What one can do in the game is restricted by the class one chooses to play (warrior, hunter, mage, warlock, priest, druid, rogue, paladin, shaman, or death knight) and to a lesser extent the race that one chooses to perform—human, dwarf, gnome, night elf, dranei, and worgen for the Alliance and tauren, troll, orc, undead, blood elf, and goblin for the Horde. Despite the fact that the gender a player chooses to perform in Azeroth has no direct effect on game play. Female avatars can theoretically do everything that a male avatar can. Hilde Corneliussen, who has published extensively on the game, notes that gender histories from the "real world" have greatly impacted the game lore or narrative within *Azeroth*.

Fig. 6.4 Kylene, the Barmaid, and a Female Warrior Player, screenshot taken in *World of Warcraft.*

> The history of Azeroth is a story of endless battles between races and factions, staging the game play of *World of Warcraft* during an uneasy truce between the Alliance and the Horde. The history [the game lore of Azeroth, as created by Blizzard Entertainment] is mainly a "his-story" dominated by male leaders, driven forward by the deeds of males in the shapes of princes, kings, warlords, chieftains, and comrades, and with very few female participants. However, the females who are present take on prominent roles and rulers and war heroines (Corneluissen, 69).

Some of these characters include powerful human Lady Jaina Proudmoore, Ruler of Theramore, and a queen of legend, Queen Azshara of the Naga. Of course, many of the female non-player characters (NPCs) in Azeroth are demure wives and mothers, bawdy barmaids, and damsels in distress. However, female characters created and controlled by players are the war heroines rather than the barmaids. In the image on the previous page, Kylene, an NPC barmaid in the World's End Tavern, serves a player with a female warrior avatar.

My own character, Phaedre, is fairly powerful. She is currently level 80, the highest level possible in the game as of 2010, and has many "epic" items and can kill many of the other players in the game. Additionally, my account is on Medivh, a launch server. A launch server is a server that dates to the very beginning of the 'live' version of the game; as the population of *Azeroth* has grown, many additional servers have been added, and old, high population servers have sometimes been locked to newbies so that new servers may be populated. It is only in the past year or two that a large percentage of the inhabitants of *Azeroth* have been women (Corneliussen). There have always been many female characters, but in the early days, these were mostly played by men. Players would enjoy trying to spot those female characters who were actually played by women, using visual cues such as the wearing of a particularly 'pretty' piece of armor on a character whose class would not benefit from the magical buff that the armor provided. Now, with many more female players in-world, these issues of identity are less on the surface.

Phaedre (and I) and our experience in *World of Warcraft* can be seen an example of both of the histories of gender and the Internet, the primary history of a transition from male-dominated Wild West to domestic space, and the alternate history of the female early adopter. Both histories suggest empowered female users, and that women, as well as men, work on new frontiers in the digital humanities. One of these new frontiers is that of the *humachine*, and it is clear that women on the Internet are experiencing changing relationships to the bodies in the Digital Age, through the human-computer interface of a digital sewing machine or through play with an avatarized self in *World of Warcraft*.

CHAPTER SEVEN

WORLD OF CRAFT: CRAFTED OBJECTS IN *WORLD OF WARCRAFT* AS (DIGITAL) MATERIAL CULTURE

Much of the literature on online roleplaying games and virtual worlds has focused upon issues identity and user experience, rather than the (digital) material culture produced in such worlds. For example, in the two primary scholarly works on *World of Warcraft* to date, Hilde Corenliussen and Jill Walker Rettberg's *Digital Culture, Play and Identity: A World of Warcraft Reader*, and William Sims Bainbridge's *The Warcraft Civilization*, there are essays that analyze *World of Warcraft* through the lenses of in-game research, corporate ideology, identity, religion, learning, feminism, post-colonialism, death and dying, spatial practice, war and memory, among others, but none that deal with the vast material of the game world. This chapter seeks to fill a significant gap in the literature on massively multiplayer online role-playing games (MMORPGs) by examining the material culture of these worlds. While quiltmaking is not an aspect of the World of Warcraft, embroidery and the production and dyeing of cloth are, and I feel that for this reason, the material culture of this game world falls within the scope of a dissertation on technology and textiles.

After documenting some of the material culture produced by players in *World of Warcraft* (including objects made through processes of tailoring, dyeing, embroidery, leatherworking, and jewelcrafting), and the contexts in which such objects are made, I seek to answer some fundamental questions about such digital material culture, questions that will impact the future of museum practice and digital archives, and may well alter the very ways in which scholars define material culture in the twenty-first century.

Ultimately, I argue in this chapter that these digital crafted objects in *World of Warcraft* are objects of material culture, rather than simply representations of objects.

Tailoring, weaving, dyeing and embroidery. Skinning and leatherworking. Jewelcrafting. The practice of these and other crafts is a ubiquitous daily occurrence in *World of Warcraft*. According to the *World of Warcraft Master Guide*, an early published strategy for players, "Azeroth is full of many exciting discoveries and, for some, it comes in the form of its robust crafting system. Players can create various items and equipment as long as they have the right materials, tools and know-how… The obvious goal is to become the best crafter possible…" (Lummis and Kern, 246).

World of Warcraft is an MMORPG with approximately thirteen million subscribers. In the game, players create a character by choosing a class (such as hunter, warrior, or priest) and race (such as Human, Night Elf, or Troll). They then explore the world, known as *Azeroth*, and its four continents, battle beasts, enemy humanoids, and sometimes other players, complete quests given by NPCs (non-player characters) and gain levels based (currently up to level 80, with the latest *Wrath of the Lich King* expansion) on these experiences. Thousands of different items, including armor, potions, and food, can be looted from the

Fig. 7.1 Alexandra Bolero, Tailoring Supplies, screenshot taken in *World of Warcraft.*

corpses of slain non-player enemies. In addition, objects, especially armor and weapons, can often be earned from NPCs when one completes a quest. Objects of all kinds are also sold by NPC vendors, such as Alexandra Bolero (pictured on the previous page), a vendor of tailoring supplies in Stormwind City, though these tend to be of lesser quality than "drops" off of monsters and quested rewards. Objects of high quality, including armor, gems, and weapons, among other things, are sometimes sold by special NPC vendors, often called quartermasters, when a player has achieved a high reputation through quests with a particular faction, such as the Shattered Sun, Cenarions or Argent Dawn. The quality of the material culture of the *World of Warcraft* is determined by a color-coded system in which all objects in the game are classed. This rarity spectrum ranges from poor (grey) to orange (legendary). Uncommon objects (green), rare objects (blue), and epic objects (purple) are those most often used in the game. As a general rule, the higher the quality, the more powerful the magical enhancements, agility, spirit, intellect, stamina, strength, etc, on the object. It is worth noting that these color codes refer to the metadata about the material culture of *World of Warcraft* only, and not to the appearance of the objects. For example, an epic (purple) cloak, might actually be, say, red or black in appearance.

While most of the material culture in *World of Warcraft* is connected to everyday game play, there are also objects sold or rewarded by NPCs in connection with numerous seasonal festivals which take place on an annual basis in Azeroth. The Lunar Festival, which occurs each year in Moonglade, is one such festival.

Fig. 7.2 Phaedre in her Festive Purple Dress, screenshot taken in *World of Warcraft.*

Loosely based upon, and coinciding with, Chinese New Year, the Lunar Festival is celebrated by Tauren and Night Elf druids with fireworks, festival dumplings, and lucky red envelopes. By seeking out NPC elders throughout Azeroth during the Lunar Festival, one may earn coins of ancestry, which may be turned in for objects to be shown off in Nighthaven, the major town in Moonglade, during Lunar Festival. Festival attire that may be acquired through coins of ancestry includes red, black, teal and blue (appearance, not quality) pant suits for male characters and red, green, purple, and pink dresses for females. Pictured is my own character, Phaedre, wearing a festive purple dress. Unlike the everyday objects, these clothes associated with festivals are merely for show and celebration; they are not enchanted with magical attributes to improve a character's stamina, intellect or fighting prowess. Festival attire also diverges from everyday battle attire (which is completely unisex) in that is gendered both in terms of the colors (blue for boys, pink for girls) and construction (pants intended for males, dresses for females).

The study of festival culture in *World of Warcraft* is key to understanding the culture of objects in Azeroth as material culture. It is during festivals such as Lunar Festival, Midsummer Festival, Harvest Festival, Brewfest, Hallow's End, and the Feast of Winter Veil that culture in the *World of Warcraft* most closely resembles traditional folk culture in real life. The keeping of annual traditions through festival games, foodways and dress is an important aspect of life in Azeroth; festivals allow for times in which the community of gamers takes time off from battling the usual monsters to come together in the capital cities of Azeroth to celebrate the game world's lore.

How do these objects fit into the larger history of material culture? Let us begin to answer this question by looking at a fairly analogous example to the tailored objects of *Azeroth* from the art world (or least, from the 'high' craft world). In his essay, "Handmade Futures: The Emerging Role of Craft Knowledge in Our Digital Culture," Mike Press documents the digital work of British fabric artist Jane Harris.

> Jane Harris is using craft knowledge to define a new creative medium. She makes virtual textiles, which are viewed in the form of projected digital movies, the fabric flowing and twirling around disembodied human forms in a highly dynamic way. As she explains: 'The intention is to create an autonomous work, a highly 'crafted' digital piece, where the CG (computer graphics) medium truly evolves as a medium in its own right, the object remaining onscreen (Press, 259).

Press goes on to ask, "But can we classify a digital movie of swirling pixels as craft" (Press, 259)? The answer here, at least for Press, focuses upon the medium, rather than upon the finished object. If we take 'craft' to be working with clay or fabric or wood or paper or paint, and we extended that

Fig. 7.3 Jane Harris, image source: *NeoCraft: Modernity and the Crafts*.

definition to include working with computer graphics, then it would follow that doing computer graphics is craft. The position of the onscreen digital object is less clear here, however. Can it be, though, that the act of making is craft, when the product of the act of making is not? Is there a corollary between craft and art in the physical, tangible world and the digital world?

Turning now from the act of making to the objects themselves, digital objects are often read very differently (as are all objects) depending upon the environment and culture in which they were produced. It may well seem that a digital dress produced by a

textile artist in the context of a museum exhibition is indeed an object of material culture, while the status of a dress produced by a gamer within the context of an online game as material culture still seems somewhat dubious. Another way in which to determine the extent to which digital objects in *World of Warcraft* are material culture is to look to a definition of the term.

Jules David Prown and Kenneth Haltman defined material culture in their anthology, *American Artifacts*, as "the manifestation of culture through material productions" (Prown, 11). Prown went on to write,

> And the study of material culture is the study of material to understand culture, to discover the beliefs—the values, ideas, attitudes and assumptions—of a particular community or society at a given time. The underlying premise is that human made objects reflect, consciously or unconsciously, directly or indirectly, the beliefs of the individuals who commissioned, fabricated, purchased or used them, and by extension, the beliefs of the larger society to which these individuals belonged (Prown, 11).

Based upon Prown and Haltman's definition, one can certainly understand Phaedre's festive purple dress as material culture. By studying this object, this dress, and its use in game play, a scholar would have a lens through which to understand festival culture in Azeroth as a whole, a culture which is very much a celebratory, player-driven culture which temporarily downplays gaining levels in the game. One may well argue that the festive purple dress is not material culture because it is digital; it does not exist in the world outside the computer. Such an argument may be, at least in the context of Prown and Haltman's definition, relatively easily to dismiss. Nowhere do they state that an object must be *real* in the brick and mortar sense to reflect the values of its maker. Further, the dress fits with definition very neatly. The festive purple dress does indeed reflect the beliefs of the person who purchased and used it (me), as well as the beliefs of

the larger community (the community of *World of Warcraft* players who participate in Lunar Festival).

Slightly more difficult to defend is the objection that, according to Prown and Haltman, the underlying premise of material culture refers to objects which are "human made." To this objection, several arguments can be made. First, though the festive purple dress was acquired from a robot-like NPC, rather than made by a player, it was indeed still made by a human (assuming, of course, that the computer programmers at Blizzard Entertainment, *World of Warcraft*'s parent company, are human). Second, in the course of his discussion of material culture in *American Artifacts*, Prown amended the definition to include non-human made objects as well.

> What material do we study in material culture? Obviously we study things made by human beings—a hammer, a card table, a plow, a teapot, a microscope, a house, a painting, a city. But we also study natural objects that have been modified by humans—stones arranged into a wall, a garden, a prepared meal, a tattooed body. We may even study unmodified natural objects, as Cyril Stanley Smith has done, to understand better the relationship between the structure of human-made things and the structure of natural things… (Prown, 11).

Fig. 7.4 Kayaart, Journeyman Tailor, screenshot taken in *World of Warcraft.*

In light of these arguments, I hope that the reader will agree that Phaedre's festive purple dress is indeed material culture, an "American artifact" in the Prownian sense.

Thus far, my discussion of material culture in *World of Warcraft* has focused on objects which exist in the world without being created by players. For those still unconvinced, however, that the objects of *World of Warcraft* are indeed examples of material culture, I will now turn to another key component of the game, the professions, most of which are craft-based. It is through these professions, such as tailoring and jewelcrafting, that the player-crafted material culture of *Azeroth* is produced.

Besides armed combat, players in *World of Warcraft* also work in professions, tailoring, jewelcrafting, leatherworking, herbalism, and the like, to earn gold and create objects that will be useful to them in combat, such as a cloak with magical abilities to protect its wearer from general harm or from specific ills, such as fire or frost. The *World of Warcraft Master Guide* instructs that "Azeroth is full of many exciting discoveries and, for some, it comes in the form of its robust crafting system. Players can create various items and equipment as long as they have the right materials, tools and know-how… The obvious goal is to become the best crafter possible…" (Lummis and Kern, 246). The professions allow characters to make items that enhance their game play and to sell to other characters at the Auction House. A player learns their professions by paying gold to one of many profession trainers (Exodar tailoring trainer Kayaart pictured on the previous page). When a player first learns a profession, they are said to be an apprentice. From there, they progress to journeyman, and eventually, all the way to the status of grand master. The professions are jewelcrafting, mining, blacksmithing, engineering, tailoring, enchanting, inscription, herbalism, alchemy, skinning, and leatherworking.

Each player may choose any two of these professions, though some professions are quite dependent upon others. For example, jewelcrafters must also be miners (to get ore to prospect for gems) and leatherworkers must also be skinners (to get hides to tan). These professions are chosen in addition to cooking and fishing, which everyone may learn.

It is in these crafting professions, just as with the weaving and computer programming, that textile and technology, masculine and feminine converge. Hilde Corneliussen notes that gender assumptions from world outside the game are key to understanding how these crafts are practiced and understood by players.

> Most activities in computer games have traditionally been actions, deeds, adventures of storylines associated with men, male spheres of masculinity (Jenkins and Cassell 1998). Some of these are also important in *World of Warcraft*, like fighting warfare, and competition. You will not advance in the game without fighting. However, if we employ gender stereotypes from real life, there are also activities associated with women or femininity in *World of Warcraft*, like cooking, picking flowers, sewing clothes, and healing—all of which are skills a player [male or female] can acquire. The gender connotations of these activities also seem to be recognized by game designers, as indicated by one of the females' jokes: "Why does everyone always assume I know tailoring and cooking?" Picking flowers and sewing clothes are, however, given labels that decrease their feminine associations: herbalism and tailoring, the last pointing to a traditionally male-dominated craft (Corneliussen, 79).

As one of my primary goals in this dissertation is to theorize the connection of textiles and technology, I will look at the profession of tailoring in depth.

Though my own character, Phaedre, is a jewelcrafter, interaction with players who are tailors through game play has given me an insight into the profession. There are several varieties of cloth in *World of Warcraft*: linen, wool, silk, runecloth, mageweave, felcloth, netherweave, imbued netherweave, frostweave, and imbued frostweave. Linen is the most basic and may be collected by players at level one. As players gain levels in the game, and specializations in the tailoring profession, players gain access to the other

types of cloth. Once a tailor has achieved a skill of 355, tailors choose one of three specialties and gain access to unique types of cloth based upon their choice; primal mooncloth and moonshroud (for priests), spellfire cloth and spellweave (for magi), and shadow cloth and ebonweave (for warlocks and frost magi).

Fig. 7.5 Mana Loom, screenshot taken in *World of Warcraft.*

One type of cloth, imbued netherweave, must be woven by tailors at a special mana loom (pictured on the left). Unlike professions such as jewelcrafting and leatherworking, tailors do not need a special profession to find the cloth; it is simply dropped by humanoid NPC enemies.

While scraps of cloth are simply looted from the corpses of enemies, usable bolts of cloth must be crafted by a tailor player. Four pieces of a like type of cloth may be woven by a tailor into a bolt of cloth. To the student of textile history, tailoring in *World of Warcraft* can be understood as analogous to the fabric arts of the nineteenth century Upland South, rather than to the fabric arts in nineteenth century Pennsylvania or Virginia. In Pennsylvania and on the east coast, bolts of cloth were almost always purchased new from a dry goods store, whereas in Appalachia and the Upland South, bolts of cloth tended to be produced at home. In this light, cloth in *World of Warcraft* may be understood as the digital, twenty-first century version of homespun. The digital

homespun relates very much to participatory culture and Web 2.0, which we will return to in later chapters of this dissertation.

There are also several types of thread in the game: coarse thread, fine thread, silken thread, heavy silken thread, rune thread, and spellthread. These may be bought from NPC vendors. Tailors learn patterns, gained from a trainer, bought on the Auction House, or dropped by an enemy, and use that knowledge to create objects such as shirts, bags in which items can be stored, cloaks, and cloth armor out of their bolts of cloth and thread. Tailors can also craft attire for special occasions, such as wedding dresses, celebrated by players who role play, and flying carpets that only tailors may ride. As with all of the professions, as a player crafts more and more objects, they gain skill points, allowing them to unlock new and better patterns. For some patterns, tailors will need to incorporate gems or leather bought from other players. In addition to garment construction patterns, tailors can also learn embroidery patterns, often to be executed with enchanted thread, that add additional magical enhancements to the items they craft. With the exception of shirts, bags, and cloaks, which are used by all kinds of players, tailored objects can be generally be worn by mage, warlock and priest characters, and are typically used by the tailor who made them or sold on the Auction House. In addition, tailors can purchase various colors and qualities of

Fig. 7.6 "Simply Bovine," image source: Shirts by Niisha. "Cairne drives the ladies cow-razy in his Pink Mageweave Shirt. What's your shirt by Niisha?"

dyes from NPCs to dye their garments. Generally, the various dyes used to color fabric are purely aesthetic, and reflect the maker and the wearer's taste and personality, rather than the player's monster-slaying ability. In contrast, embroidery in the *World of Warcraft* is far from decorative; embroidery adds extra enchantments to a player's armor, giving them such attributes as a greater intellect, which helps to generate mana to cast spells.

Not only do tailor players make objects in *World of Warcraft*, some players also use the World Wide Web outside the game world to advertise their creations. A tailor known as Niisha created an ad campaign in the Fall of 2006 to advertise the various shirts that she makes in the game, using a combination of in-game screenshots and slick marketing, in the hopes that the campaign would drive up the price of her creations on the in-game auction house (Niisha). The suggestion that the Tauren male Cairne (previous page) "drives the ladies cow-razy in his Pink Mageweave Shirt" made by Niisha hints that objects crafted in World of Warcraft fulfill roles beyond that which Blizzard Entertainment had envisioned—namely killing things—suggesting that the objects are created by players in a much more authentic cultural environment than a

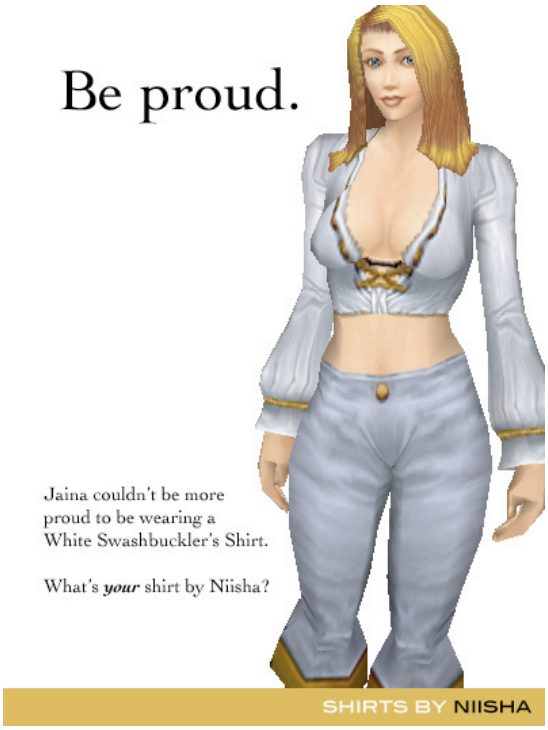


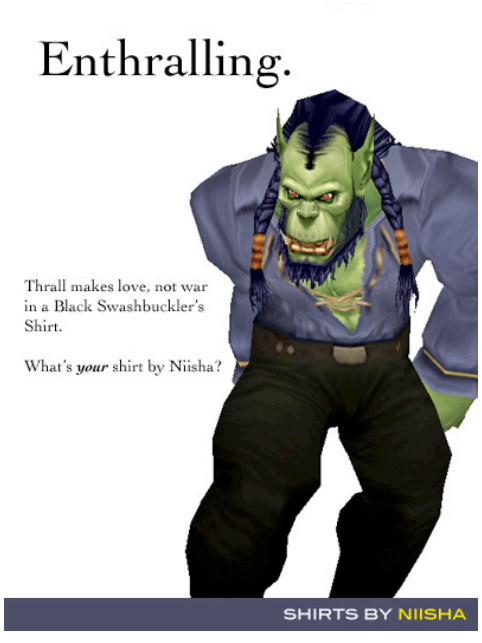
Fig. 7.7 "Be Proud," image source: Shirts by Niisha. "Jaine couldn't be more proud to be wearing a White Swashbuckler's Shirt. What's your shirt by Niisha?"

video game world might suggest.

Niisha's advertisements also make use of the shared knowledge of the culture of *Azeroth*. Only a player very familiar with the game world would know that the model in her ad "Be Proud" features that elite NPC Jaina Proudmoore, one of the legendary leaders of the human race in the game's lore, wearing a White Swashbuckler's Shirt made by Niisha. This is yet another example of the extent to which crafted objects in the game are embedded into *World of Warcraft*'s culture.

As with the "Simply Bovine" advertisement featuring the Tauren male Cairne, the remaining three ads from Niisha's 2006 campaign feature male characters wearing Niisha's creations to impress women in the game world. Jin'Do, a Troll male (trolls are roughly associated with Voodoo culture and Caribbean vernacular speech, the inherent racism of which belongs to another discussion) "puts a hex on the

Fig. 7.8 "Enthralling," image source: Shirts by Niisha. "Thrall makes love, not war in a Black Swashbuckler's Shirt. What's your shirt by Niisha?"



ladies" with his Stylish Blue Shirt made by Niisha. Similarly, the "Enthralling" Orc male Thrall "makes love, not war (war being the primary point of the game) in his Black Swashbuckler's Shirt and Human male VC "paints the town red and steals women's hearts" in a Red Swashbuckler's Shirt. These ads are important in the understanding of the non-game play related uses of objects in *World of Warcraft* because they reinforce stereotypes that online gaming is dominated by nerdy males

looking for romance. This is hardly the case in 2009--female players have actually outpaced males as gamers, with the average gamer being a woman of about 30 (Pew Internet).

Is a digital bolt of cloth in *World of Warcraft* a bolt of cloth? Both bolts of cloth can be dyed and turned, with the help of a pattern and thread, into a garment. Both the analog and the digital bolt of cloth are used in meaningful ways and reflect the cultural values of their makers and consumers, and by extension, the beliefs of their cultures as a whole. Given this, we can safely assert that these digital objects of *Azeroth* are to be understood as material culture, rather than simply *representations* of material culture (such as a photograph of a bolt of cloth or a quilt).

Thus far, I have argued at length that these digital objects in *World of Warcraft* are indeed *objects*. However, it is important to note that, while I read these digital crafted objects as material culture, representations of objects can be equally as compelling as the objects themselves. As Susan Sontag argued in *On Photography*, "Photography is the reality; the real object is often experienced as a letdown" (Sontag, 147).

These objects raise many other critical questions for museum professionals and historians of material culture as well. How can such objects best be interpreted and exhibited for the public? In her essay, "Redefining Digital Art," Beryl Graham proposes a taxonomical binary of digital art in museums. Digital objects in museums can either be used to interpret traditional, analog objects, or they can be exhibited as objects in their own right (Graham, 94). These ideas will be explored in more detail in my analysis of quilt exhibitions in the virtual world *Second Life* in the following chapter.

Digital objects create not only new curatorial challenges for museums, but preservation challenges as well. What are the preservation challenges of digital objects of material culture? In her essay, "Preservation," Abby Smith noted that while preservation by benign neglect can work fairly well for paper documents and some kinds of material culture (great grandmother's letters and sewing notions forgotten in the attic in the 1940s, for example, can be found there today in reasonably good condition, assuming there was no water or pest damage), preservation of digital objects cannot occur by benign neglect. One would not expect screenshots I have taken of *World of Warcraft* and saved to my laptop in the course of researching this chapter to be easily accessible or well-preserved for people who happen upon my laptop in the attic seventy years from now. According to Smith, it is ideal for digital objects to be optimized for preservation at the time of their creation (Smith, 583). Besides a more active preservation being essential for digital objects, such as Phaedre's lavender mageweave shirt, digital objects present other preservation challenges as well. Media degradation and the obsolecence of hardware and software significantly challenge the future history of digital material culture.

The belief that objects of digital material culture are *permanent*, that is, that they can be preserved and accessed for an inconceivable amount of time to come, is key to the understanding of these objects as material culture in the traditional sense of the word. "The common perception that digital creations are not permanent is among the chief obstacles to the widespread adoption of digital publishing, and few scholars are rewarded and promoted for their work in this area" (Smith, 576). Published five years ago, this perception is still, regrettably, a popular one among academics. The acknowledgement of

the permanence of digital artifacts generally (including online journal articles) is one of the most important mental leaps that scholars will make in the early twenty-first century. It is my hope that understanding digital material culture, such as the crafted objects of *World of Warcraft*, as true material culture, will provide a useful analogy for the understanding of digital scholarship as true scholarship. Just as the volume of digital material culture produced around the world will only increase, so will the volume of digital scholarship. University tenure requirements should reflect that twenty-first century culture is fundamentally a digital culture.

In this discussion, I have sought to suggest that the crafted objects produced in these worlds are material culture just as much as a whitework quilt stitched in New England in the late eighteenth century or a nineteenth century porcupine quillwork basket. The transition in computing from text-only interfaces to graphical user interfaces (GUIs) and from the 2D to the 3D Web has made the creation of digital material culture possible from a technical standpoint. As the Web moves from Web 2.0 to Web 3.0, the Semantic Web, and beyond, the significance, number and variety of digital crafted objects will only increase. Historians, curators and archivists must begin work now to preserve and tell the stories of these digital bolts of silk cloth and virtual quilts. Ada Lovelace, who theorized the connection of weaving and computing in the nineteenth century, would certainly recognize the importance of the mana loom in the *World of Warcraft*.

CHAPTER EIGHT

ADVENTURES IN FIBERSPACE: QUILTS AND QUILTMAKING IN SECOND LIFE THROUGH THE VIRTUAL EYES OF IONE TIGERPAW

Techne is not episteme, but the ability to craft.
--Tom Boellstorff

Ione Tigerpaw is an avatar in the virtual world Second Life. She has existed since February 2008, though she has existed much longer in the sense that she represents certain facets of my own personality. She can fly, but then again, so can all avatars in Second Life. Ione sometimes appears in the guise of a woman in her sixties (below),

Fig. 8.1 Ione Tigerpaw, screenshot taken in *Second Life.*

slender, gray hair, capri length blue jeans, and a green or orange or rose cardigan. At other times Ione looks very similar to the way I do in real life, about 30, dishwater blond hair, with big hips and thighs. In this case, she is clad in capri length blue jeans and a t-shirt and wears no make-up. Often, Ione appears in the guise of a young female, about 20

years old, thin, with long auburn hair, bright t-shirt that exposes her mid-riff, dark fitted pants, and bright lipstick and heavy eye make-up. I have since been informed that these three guises—aging woman, woman in her prime, and young woman—represent the three aspects of the Triple Goddess in Wicca, though this was certainly not my intent when I gave form to her personas. No matter how she looks, her identity as Ione Tigerpaw remains fixed, and through all these guises, her chief interest is the quilts and other textiles produced within her world, and she spends her time in *Second Life* primarily as a virtual cultural tourist, visiting the shops, galleries and museums that display these digital quilts.

Just as there has been a dearth of focus in academic literature on quilts and quiltmakers in the digital age and upon digital material culture produced in game environments such as World of Warcraft, so have academics been slow to document and interpret the culture of material culture in *Second Life*. For example, in his cyberethnography, *Coming of Age in Second Life*, anthropologist Tom Boellstorff focuses primarily upon the self, specifically the avatarizing of the self, and the meaning of being human in a virtual world, rather than upon the objects crafted within the virtual world. Though *Coming of Age in Second Life* is a groundbreaking work in many respects, more ground now needs to be covered. This chapter sets out to explore some of this new territory, this *Fiberspace* at the intersection of real and virtual, quiltmaker and computer, fuzzy and non-tactile. I begin with an auto-ethnography of my own (a textile historian's) cultural experiences of quilts and quiltmaking in *Second Life*, including visiting virtual quilt shops and galleries, then explain some of the mechanics of how quilts are made and look in *Second Life*, look at a case study of a collection of quilts in *Second Life*—the real

life quilts of the Fenimore Art Museum collection in their home in the virtual Folk Art New England Museum, and finally explore the experiences of real world quiltmaker Lidlfish and her avatar Audrey Fotherington, as described in Lidlfish's out-of-world blog. At the end of this chapter, I use this data to explore the ramifications of this *Fiberspace* within *Second Life* for museum practice and the study of material culture.

Fig. 8.2 "Free Quilt of the Week," screenshot.

Second Life is a massively multiplayer online virtual world in which one creates one or more avatars and uses them to make or maintain friendships and romantic

relationships, attend events from pub crawls to museum exhibits, explore hobbies, and engage in free choice learning. The architecture of *Second Life* allows for a great deal of social interaction and for the creation of material culture, known as builds, including digital homes, furniture, clothing, and even sewing machines and quilts. Every interest and pursuit that exists in real life exists in *Second Life*, and is a popular forum in which people make and share information about quiltmaking and the other fabric arts. As Tom Boellstorff wrote in *Coming of Age in Second Life*, "That's the dirty secret of virtual worlds; all people end up doing is replicating their real lives" (Boellstorff, 239). This is perhaps especially true of quiltmakers. For online quiltmakers, social interaction sometimes centers on the exhibition, sale or exchange of these digital artifacts in *Second Life*. One such event is called "Free Quilt of the Week." Every Thursday afternoon in *Second Life*, an avatar called Lady Dawn Starbrook hosts this event in the area known as Nedben. A must attend for quiltmakers in *Second Life*, this exhibition allows any avatar to take home a digital copy of the 'quilt of the week.' For example, a blog post advertising the quilt for June 11, 2009 featured a blue and white cornerstones quilt, the design of which 'suits both modern and Victorian [virtual] homes.' The weekly event, which Ione Tigerpaw has attended many times, is sponsored in part by Becky's Quilts, whose slogan is "low prim, low price, big impact." While it is unclear whether Becky is herself an avatar, or whether Becky is in fact the real life name of Lady Dawn Starbrook, these transactions raise important issues about the economics and entrepreneurship of women in virtual (and real) worlds.

It is here at Becky's Quilts where Ione Tigerpaw's story begins. This is because she is a virtual squatter. Ione does not own or rent land upon which she can set a home,

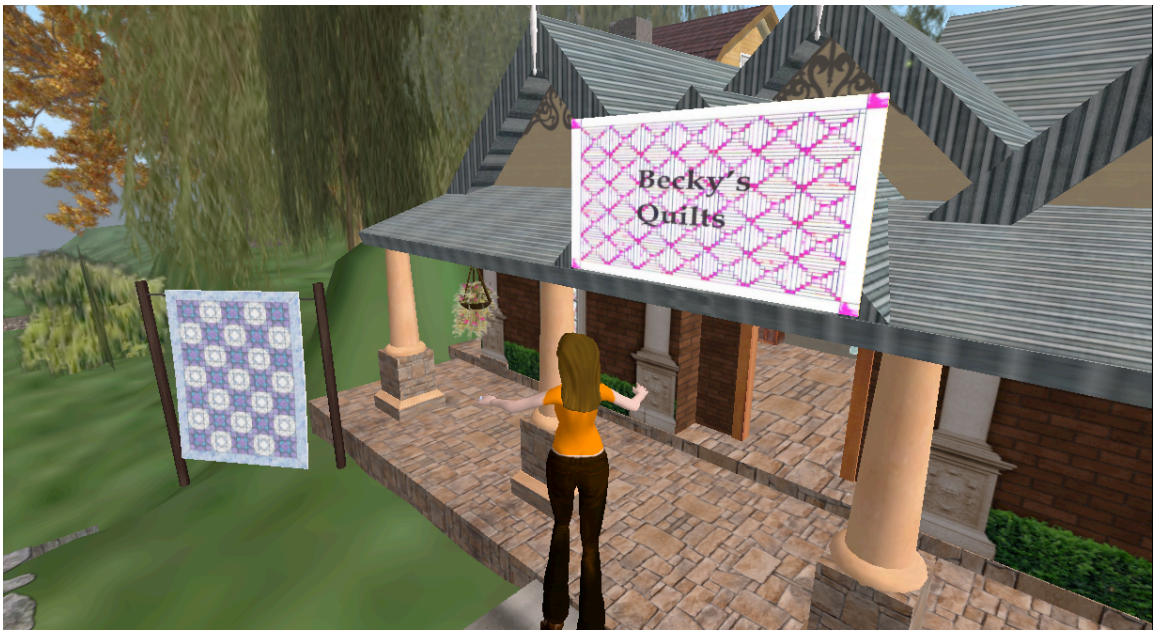


Fig. 8.3 Becky's Quilts, screenshot taken in *Second Life.*

so she 'lives' at Becky's Quilts, logging in and out from that location. Ione *could* build herself a house, but without land, she would have to put the house back in her inventory, almost as if stuffing her residence in her pocket each time I logged out. She is in the homeless state because of Lindens. Lindens, the currency of *Second Life*, are required to buy or rent land, and the two ways by which one can acquire Lindens are to purchase them with real world money from Linden Lab, the creators of the virtual world, or to receive Lindens from other avatars in exchange for goods or services. Finding neither of these options particularly appealing, Ione lives at a quilt shop, Becky's Quilts. It is from Becky's Quilts that I choose to log in and out of *Second Life* because, while there are certainly many quilt shops in this world (and I have attempted to visit them all), Becky's is one of the oldest and most established, its share and share alike ethic of giving away free quilts each week appeals to me, and there is simply something genuine about the

place, a quality that is definitely lacking in much one finds in a virtual world, where so much so the activity involves trying on personas apart from one's own.

Users find places, such as Becky's, for their avatars to visit either by the recommendations of friends or by searching for a word or phrase such as 'quilt.' In these search results, each listed location has provided a short description to let the user know information such as what their place is like, for example, if it has a particular theme, and what one can buy or do there. The description for Becky's Quilts reads: "Quilts, quilts, quilts! Becky's is one of the first quilt stores in SL. There is always a free quilt out and a small yard sale on the patio. Closed Sabbaths [Saturdays]." Typically, one can find out a great deal of cultural information from these short owner-submitted descriptions. We know that 'Becky' has been in *Second Life* for a relatively long time and that she is a religious Christian avatar in *Second Life*, and quite possibly a religious person in real life as well, closing her shop and potentially missing out on some virtual customers to keep the Sabbath. The interior of Becky's shop also features signs advertising in-world group Bible study, which corroborates these assumptions.

ZhuQuilts is another shop in *Second Life*. The shop's description reads, "RL quilts come to SL! Bedquilts, comforters, wall hangings, flexiquilts, all based on RL quilts. Custom quilts available for you [sic] SL (or RL!) home. Conveniently located on Route 8." This statement from ZhuQuilts slips effortlessly from the 'real' to the virtual and back again, touting the fact that their digital quilts are modeled on real world examples. We can infer that ZhuQuilts is a maker of both real world and virtual world quilts and believes that an analog in the real world gives digital objects added credibility and value. The name Zhu suggests that the avatar might be of Chinese descent, and

indeed the real world user might be as well, while the use of a location called 'Route 8,' which is not an official area within *Second Life*, but rather a place name of the user's invention, conjures images of the heyday of the blue highway in the United States.

The description of Granny Gruppman's QuiltBoutique (pictured below), a small

Fig. 8.4 Granny Gruppmann's QuiltBoutique, screenshot taken in *Second Life.*

shop on Red Rock Mesa, a community for "Native American Indian and Southwest Arts," perhaps reveals the most ethnographic data of any shop in *Second Life*.

> Granny Gruppman told Grandson, Boon, to make her a shop so the neighborhood Ladies' Quilting Bee could sell their beautiful handiwork. Full perm textures to make yer own quilts too.

While this quilt shop is located in a Native American themed community within *Second Life*, we can infer from the language use (Boon, yer, etc) that Granny Gruppman has chosen to take on the persona of an aging Appalachian woman and to cultivate an image of what eminent material culture scholar Henry Glassie called "old-timey stuff." Whether Granny Gruppman is indeed a grandmother, or Appalachian, or even female, is impossible to tell, but the persona that she has chosen to fashion is quite clear. Though

her shop description seems one the one hand very explicit and direct, it raises more questions than it answers about the participants in *Fiberspace*. Why did she choose this Appalachian persona? Is that where she lives in real life, or does she simply think that such characterization will help her to sell more virtual quilts, or does she enjoy trying on the persona of the Appalachian just as I sometimes enjoy appearing in the guise of a woman in her sixties?

This description also muddies the distinction between the real and the virtual in a fascinating way. Is there even a neighborhood Ladies' Quilting Bee? If there is, are these women her neighbors in real life, or are these female avatars her neighbors in Red Rock Mesa in *Second Life*? Merely calling the output of the Ladies' Quilting Bee, (which must necessarily be digital in nature, made of prims rather than fabric), *handiwork* suggests that Granny Gruppman believes at some level, that these virtual quilts are indeed material culture in the old sense of the word, a statement that has far-reaching consequences for the study of material culture. Finally, Gruppman's statement seems contradictory in her level of technical mastery of *Second Life*'s software and user tools. One the one hand, she volunteers the information (which may well be simply be part of the persona) that her grandson had to help her create her shop within *Second Life*. This could be rooted in many people's assumptions that older people are not as capable with technology as younger people. However, she closes her description by advertising her "full perm textures." Clearly, this person knows the language of the technical building blocks of *Second Life*. In the twenty-first century, the average person in the developed world has multiple cultural affiliations in the *real world*. These cultural affiliations are made much more complex in the virtual world, where cultural identity is totally self-

determined, yet mediated by real world expectations and stereotypes and the retention of cultural baggage from the real world.

Despite the fact that I have participated in multiple online virtual environments for some time, despite being a textile historian and having much first-hand knowledge of quilts and quiltmaking, and despite sometimes crafting my avatar to look like a woman in late middle age or early old age, I cannot help feeling somehow that I am the Other in this world (Boellstorff, 157). This is, I should mention, in direct contrast to my experience in real life, in which, as a Caucasian woman living in the Great Lakes region of the United States, I cannot really say that I have ever felt like an outsider in the place where I live. Perhaps I have perceived this Othering to occur in *Second Life* because there is no established norm or power structure. People try on and take off political and cultural affiliations, genders, races, and even species at will, often living in themed communities with like-minded avatars. No one is the Other in this world, and yet, simultaneously everyone is the Other. This detached feeling may also stem from the way in which I relate to the virtual world. While I have participated in, even thrived in, virtual environments such as *World of Warcraft* and *Second Life*, environments predicated upon their high degree of sociability, I choose in these worlds to very much be the 'loner.' I have attended 'Free Quilt of the Week' gatherings and other informal gatherings if great quilts were involved, and joined Quilters in *Second Life* and Art New England, a *Second Life* group dedicated to New England folk art and artists, but making friendships with others through the virtual world has not been my own personal interest; the quilts themselves have been my interest. The loner may be the true Other in virtual

environments, the loner, the solo player. In *Coming of Age in Second Life*, Tom Boellstorff did find some people who preferred a solo experience in the virtual world.

> Some residents did not seek friendship online; their sociality was oriented around what they saw as superficial shopping or entertainment, meaningful but solitary creative activities like building or designing clothes, saying things like "I've been trying to keep 'knowing someone' down to a minimum here." For most residents that I encountered during my fieldwork, however, friendships were a primary reason for their participation (Boellstorff, 157).

The loner or solo player has been under examined in the literature on virtual worlds and massively multiplayer online games thus far.

Thus far, the discussion has focused mainly upon these places and cultures in which one can find quilts in *Second Life*. Now, I shift from where and in what circumstances they can be found and bought to how they look, how they refer to and differ from quilts in the real world, and how these digital quilts are made. As Rebecca Tapley writes in *Designing Your Second Life*, "Let's take virtual scissors, needle and thread" (Tapley, 64), and now explore quiltmaking itself.

Quiltmaking in the real world could be said to begin when one gathers together some fabric, chooses a pattern, turns on the sewing machine, or takes up a needle. Quiltmaking in *Second Life* begins when one clicks the 'build' button at the bottom of the user interface (as does every other conceivable craft in this virtual world). Once in 'create' mode on the 'object' tab, quiltmakers create a prim, short for primitive. Prims are the basic matter of *Second Life*, the stuff of which most things within the world are made. The quiltmaker then switches to 'edit' mode, the mode in which prims can be changed by the maker into any shape or size imaginable. To make a quilt, logically, the prim is made to be rectangular and flat and sized to fit well on the average avatar's bed.

All prims begin with the approximate look and texture of a honey oak wood panel. So, thus far, the quiltmaker has made something more akin to a large piece of plywood than a quilt. Whereas fabric in real world quiltmaking has its color, texture and pattern before ever coming together into a whole, color, texture and pattern can be applied to a quilt in *Second Life* only after the quilt has essentially been made. Another key difference between the processes of the quiltmaker in the two worlds is that in the real world, quilts may be wholecloth (one piece of cloth decorated with quilted or appliquéd designs) or pieced (several pieces of fabric sewn together to comprise a patchwork top and then quilted). In *Second Life*, almost all quilts are by necessity wholecloth. One large rectangular prim is made. Theoretically, quiltmakers could make several small square or rectangular prims and arrange them side by side, but each *Second Life* region is, as of 2008, only allowed 15,000 prims (Weber, 22), leaving individual prims at quite a premium. The explains the motto of Becky's Quilts, "Low prim. Low price. Big impact." While almost all quilts in Second Life therefore begin their lives as 'wholecloth' prims, just as texture and color are used to change to look of the prim from wood to cloth, texture, color and pattern are used to give the illusion of a pieced quilt when that is what the maker desires.

Prims in *Second Life* are virtually endlessly customizable, and may be given a wide variety of textures and colors, levels of transparency or opacity, brightness or darkness, shininess, bumpiness, etc. Colors are chosen with a color picker that allows for precise RGB values and hue, saturation and luminosity values, permitting the maker to replicate with precision the color of any real life object. Textures generally already have colors attached to them and may be derived from digital photographs taken in the real

world or hand-drawings. A quiltmaker desiring to make a vintage, Depression-era quilt in *Second Life* could, for example, scour real world fabric stores and antique shops for real examples of fabrics from the period, photograph them at high resolution on their digital

Fig. 8.5 Caravane City Quilt Village, screenshot taken in *Second Life.* "Manquilter's Custom Long-Arm Quilting Shoppe."

camera, and then import those fabrics as textures into the virtual world. Another type of texture, procedural texture, is created by an object's maker within Second Life using a mathematical algorithm (Weber, 61). All of these textures can be enhanced by visual light and shadow effects. Shadows built into the texture itself as said to be "baked" into the texture. Advanced programming, known as scripting, can be used to animate quilts in *Second Life*, though this is not commonly seen. This scripting can be used for various operations, such as causing rhinestones, beads or other attachments to sparkle or twinkle, appearing to catch the virtual light. Obviously, quiltmaking in *Second Life* requires a rather different skill set from quiltmaking in the brick and mortar world. However, there are many quiltmakers who have mastered both skill sets and excel in quiltmaking in both worlds. And while the skills and processes used in making quilts in the two worlds may differ dramatically, ideas about quality and craftsmanship have remarkable similarities.

The lines between quiltmaking in the brick and mortar world and Second Life are further blurred by the desire of many *Second Life* quilters to buy and sell virtual goods and services relating to the skills, materials and processes of real world quiltmaking. Caravane City Quilt Village is a kind of virtual mega-mall for quilters interested in creating a virtual quilting experience more attuned to analog quiltmaking. Retail shops in the outdoor mall include a long arm quilting service—curiously named "Manquilter's" — and Quilt Country, a fabric store.

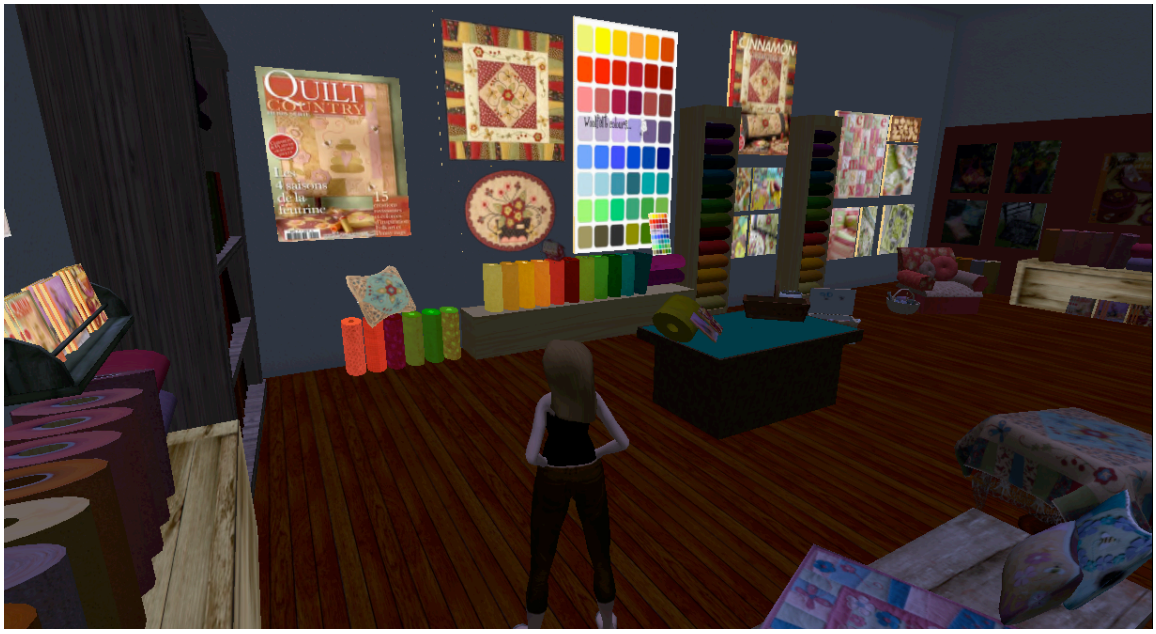


Fig. 8.6 Quilt Country, screenshot taken in *Second Life*. *Note: it is not mandatory that text in this figure be read.*

As with all material culture that has not been mass-produced, individual objects, such as quilts, can be judged by the quality of their craftsmanship in *Second Life*. "Hand-drawn stitching", "realistically draped or folded swathes of cloth," and "highlights

Fig 8.7 Gallery Inside Folk Art New England, screenshot taken in *Second Life.* Below each quilt reads, "Touch quilt for notecard."

shadows and wrinkles in the cloth that 'catch the light'" (Tapley, 60) are some common standards of quality for digital fabric objects such as clothing and quilts. Some of the 'best' quilts that I have seen in *Second Life* based on this set of values were modeled on real life quilts held in the collection of the

Fig. 8.8 Lone Star Quilt, Folk Art New England, screenshot taken in *Second Life.*

Fenimore Art Museum of Cooperstown, New York, one of which is pictured above. A comparison of the Lone Star quilts in the screen captured image from *Second Life* with a photograph of the actual Star of Bethlehem quilt upon which the *Second Life* example

was modeled gives a more concrete idea of the extraordinary quality of these reproductions. The avatar maker(s) of these quilts (I use the phrase 'avatar maker' to avoid confusion with the real world quiltmaker) are curatorial staff at the Fenimore Art Museum in the brick and mortar world. From within *Second Life*, what we can learn about the quilts beyond the visual through information provided by the avatar maker(s) on the 'notecards' for each quilt, which contain the museum description and accession number for each quilt.

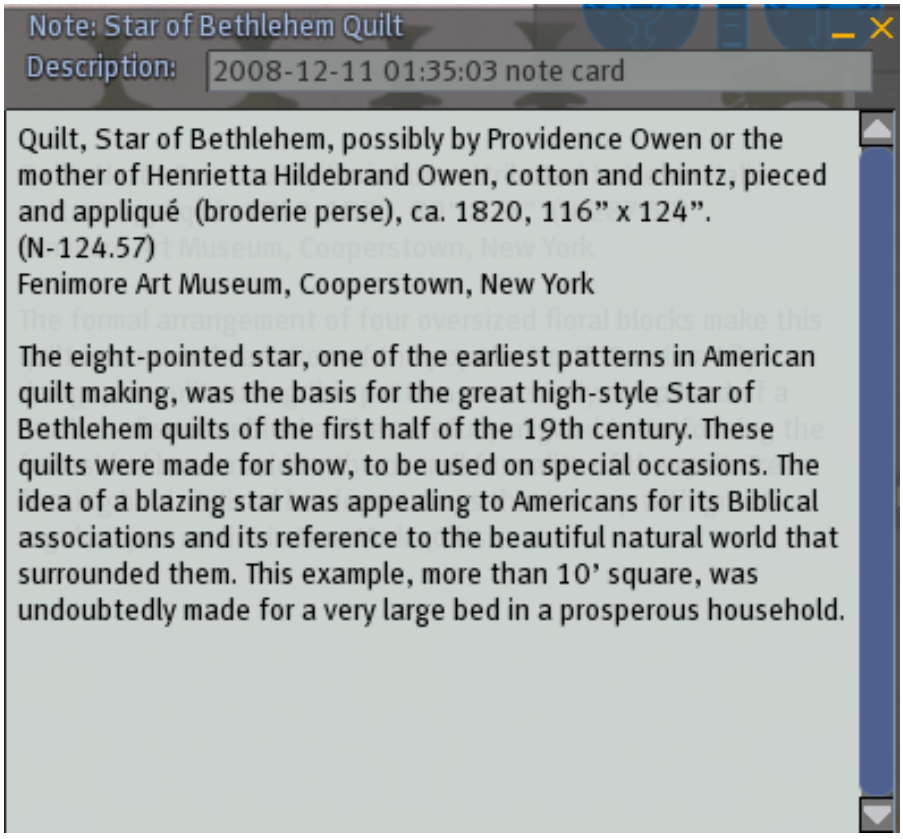


Fig. 8.9 Star of Bethlehem Quilt Exhibition Card, Folk Art New England, screenshot taken in *Second Life*.

Fig. 8.10 Folk Art New England, screenshot taken in *Second Life.* Banners in front of the museum read, "Folk Art New England."

These quilts are housed in *Second Life* at Folk Art New England, which is the virtual home of the highlights of the real life collection of the Fenimore Art Museum. Ann G. Older, Chairperson, of the New York State Historical Association noted that the Fenimore Art Museum in Second Life project allowed the museum to connect with new—and younger—audiences.

> This new web is very different from the one we are used to; it is social and encourages contributions from many different users to create a vibrant online community. Social networking sites such as Facebook and MySpace offer museums the opportunity to create and foster communities of interested people and get them involved in the activities of their institution. There are also many other new technologies that make websites more interactive and attractive to younger audiences. Over the course of the past several months, we at NYSHA [New York State Historical Association] have been exploring the new web to find opportunities to connect with more people. Two specific initiatives are underway: we are planning to institute cell phone tours at the Fenimore Art Museum in 2009; and we have a significant presence in the popular virtual world Second Life®. Second Life® is a 3D virtual world with more than 13 million registered users worldwide, each represented by individual "avatars" that walk, fly, or teleport through a digital environment created by its residents. Our Curatorial staff has built a museum and installed several virtual exhibitions on this site, and these efforts are connecting us with a whole new audience (Older, 2).

Digital quiltmaking in virtual worlds is not the exclusive preserve of Generation X and Millennial quiltmakers, however. Older quiltmakers, too, are using Web 2.0 applications such as *Second Life* for artistic and social purposes. Cathy Stevenson is a quiltmaker of about 50 who maintains a blog about her health, her family, and her experiences with quiltmaking in this world and in a virtual world called Second Life. In her blog, Stevenson, known as Audrey Fotherington in *Second Life*, negotiates quiltmaking in these two worlds.

> To square off the photos I have cropped it, but I promise there are a few more inches worth of border and the quilt is square in real life. On the other hand, in Second Life I can force my quilts to be square! LOL Audrey has been building a treadle sewing machine and she attended a quilters meeting. At her very first meeting, she won the draw and is being sent 48 reels of Aurofill [sic]!!!!!!!!! Real Life ones! (Lidlfish's Quilting Days).

Stevenson notes that the challenges of quilting in the brick and mortar world and quiltmaking in a virtual world are in many ways different. For example, one can more easily make a quilt perfectly square in *Second Life* than in the real world, even if one is an experienced quiltmaker. Some of the things that Stevenson does in *Second Life* as Audrey, such as attending meetings of fellow quiltmakers, can be done in both worlds, but some other activities, such as building a sewing machine from scratch, while difficult, if not impossible, for quiltmakers in the real world, are easy enough for quiltmakers in a virtual world. Further, Stevenson not insignificantly refers to Audrey in the third person, talking about her avatars life in terms of "she attended" rather than "I attended." This language suggests that Stevenson views her avatar as a different individual, separate from herself. This is further complicated by the fact that when writing as "Lidlfish," the username of her blog, she seamlessly switches back and forth between blogging about Stevenson's life and blogging about Audrey's life. In the diegetic environment, who is

Stevenson? That is, when is she Cathy Stevenson or Audrey Fotherington of Lidlfish (Rehak, 112)? Rather than a *double* life that one might live in the real world, for example having a secret family in Cleveland while living with one's wife in Battle Creek, the use of the third person suggests a truly *second* life.

While Cathy Stevenson is still far from elderly, one senses in her online writing that participation within a community of quiltmakers on *Second Life* greatly enhances her quality of life and sense of self-actualization. In her blog posts, she is quite proud of the accomplishments of her avatar, Audrey, reflecting upon them perhaps as a proud mother might speak of their child's accomplishments.

> She [Audrey] entered her treadle in the Newbie Show and Tell at NCI (New Citizens Inc) where she mostly hangs out learning how to build in graphics. She got third place but I personally feel she was ripped off! LOL Here are some piccies of Aud's Gorgeous house that she has built herself. She doesn't have any land, so when she building, she has to pack it back into her inventory and save for another day.
> She has a cutting table with mat, ruler and Olfa cutter. A small stash of bolts. What you don't see is all the mess I am sure she would make if I let her make a quilt from scratch!
> See the fire place? The flame in the fire flickers semi realistically. And the treadle foot plate and needle go up and down in time with each other when you touch the machine!!! Ok... if you don't know Second Life, this may no [sic] seem amazing... but to an old chook it is very exciting to be learning so many new things (Lidlfish's Quilting Days)!

There is a sense of pride in ownership and in manufacture—the house is gorgeous and she built it herself. The use of the permissive language, "if I let her make a quilt from scratch," again suggests this parental approach to her avatar. However, it is clear that Audrey is not the child of Stevenson because Audrey shares all of Stevenson's passions and pursuits. Most precisely, Audrey represents Stevenson in an ideal world of her own making. In this virtual world, Stevenson is a buxom teenager, or perhaps in her early twenties. She goes to holiday parties as well as sewing circles. She has her own darling

little house complete with fireplace, where she quilts and displays her work, stores her tools and bolts of digital calico.

The division between these two worlds, between physical, or analog, material culture and digital material culture, is a much smaller gulf than one might presume, however. For example, a quiltmaker can win a drawing for a brick and mortar prize, the 48 reels of Aurofill, at a meeting in a virtual world, but then claim that prize in the real world. Certainly, in real life, quiltmakers use fabric, batting and thread to make quilts, and in *Second Life* they use code, but in both media and both worlds, they are quiltmakers. One could argue that a fundamental difference between quilting and quiltmakers in the two worlds is that there are some quiltmakers in *Second Life* who have never made quilts in real life. Granted, it is highly likely that several people who have made quilts out of code with digital menus in *Second Life* cannot even sew in real life. However, an exhibition in *Second Life* answers this question about the importance of sewing as the hallmark of the quiltmaker and the division between quiltmaking in brick and mortar and virtual worlds.

Fig. 8.11 Audrey Fotherington in her Studio, screenshot taken in *Second Life,* image source: *Lidlfish's Quilting Days.*

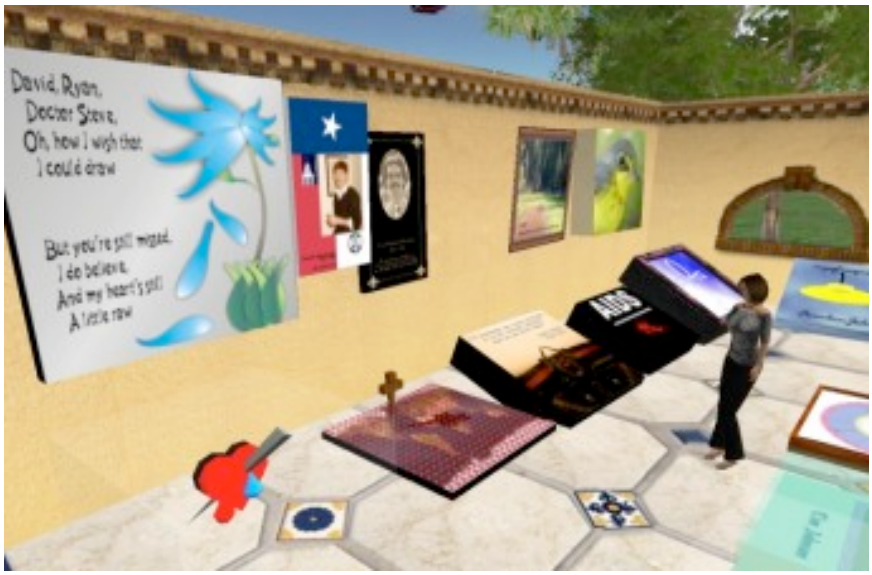


Fig. 8.12 NAMES Project in *Second Life*, screenshot taken in *Second Life.* Poem reads, "David Ryan, Doctor Steve, Oh, how I wish that I could draw, But you're still missed, I do believe, And my heart's still, A little raw."

In the brick and mortar world, people personally touched by HIV-AIDS sometimes make quilts for the NAMES project to honor a loved one who has battled the disease. Usually, these are people who have never quilted before. They become quiltmakers for a specific purpose, to make work to honor a specific person and raise awareness about a specific issue. This does not only apply to the NAMES project. There are people who use quiltmaking as a form of expressive activism to speak out on other issues. For example, volunteers with the Ugly Quilt Project make quilts and quilted sleeping bags for the homeless, often with no prior knowledge of quiltmaking, let alone sewing. Avatars volunteering at the Second Life HIV Prevention & Education Center and avatars with the Chilbo Community Building Project have organized the making of several digital quilts by avatars throughout the virtual realm of *Second Life* to commemorate lives (and avatars) lost to AIDS, both in real life and in *Second Life*. In terms of both creativity and poignant expression, these digital quilts equal those real,

tactile quilts made for the NAMES Project. At this virtual exhibition, the liminal gap between real life and *Second Life* closes before one's eyes. Clearly, the demographics and motivations of quiltmakers online are strikingly similar to those of people who make quilts in real life. The question remains, though: What is the true difference between the code of quilting with prims in a virtual world such as *Second Life* and the way of quiltmaking on a sewing machine (or a sewing computer)?

As Tom Boellstorff wrote in *Coming of Age in Second Life*, "Culture is our killer app; we are virtually human." (Boellstorff, 5) Traveling to new worlds, new places, even virtual ones, not broadens a person's world view through the introduction to new ways of life and new ways of doing and making things. This statement is just as valid for journeys through Second Life as it is for a journey through an unfamiliar country in the brick and mortar world. The virtual world allows one to look at human culture and cultures with fresh eyes.

Quilt-oriented virtual tourism in *Second Life* has, besides giving me hours of personal enjoyment, allowed me, through the eyes of my avatar Ione Tigerpaw, to see many different kinds of virtual quilts in many settings and has ultimately given me a new perspective on quilts created in "real life." These cultural experiences have been invaluable to me, the textile historian. A quilt manipulated from a prim is, to me, as much a quilt as one pieced from calico now. It is my hope that academics especially will pay a visit to *Second Life* and explore their field of study—be it quilts or chemistry education or musical theatre or museums or whatever. Looking through the eyes of an avatar allows us to see that which we think we know very well in a new light.

CHAPTER NINE

THE AURA OF THE QUILT IN THE AGE OF DIGITAL REPRODUCTION: DIGITAL IMAGES, CULTURAL AUTHORSHIP, AND THE SCALABILITY OF *FIBERSPACE*

> The uniqueness of a work of art is inseparable from its being embedded in the fabric of tradition. – Walter Benjamin

Using Walter Benjamin's seminal essay on post-photographic visual culture, "The Work of Art in the Age of Mechanical Reproduction" (1935), as a point of departure, this chapter explores the ways in which the technologies underlying the *Quilt Index* are shaping quiltmaking and quilt scholarship, including issues of cultural authorship, scalability, and the impacts two technologies—photography and high performance computing and machine intelligence—upon material culture scholarship. Ultimately, I seek to answer the question: what has become of what I call (borrowing from Benjamin) the aura of the quilt in the age of the *Quilt Index*, a digital repository with images and metadata for over 50,000 quilts and counting? The answer, which would not surprise Benjamin, points to the increasingly political nature of quilts, and folk arts broadly, in the digital age.

While photography was invented in the 1830s,[23] its influence on quilts and quiltmaking came much later than did that of the sewing machine, which was made available to the American public by Isaac Singer in the 1850s. Though documentary photography and 'art' photography both have their origins in the nineteenth century, it

[23] The first fixed photographic image that did not fade was created in 1839 by Louis Daguerre, almost exactly a century before Benjamin wrote "The Work of Art in the Age of Mechanical Reproduction."

was in the twentieth century that photography really shaped quiltmaking. Documentary photography preserves and disseminates images of quilts and their makers. In contrast to art photography, which tends to fictionalize the visual world, documentary photograph seeks simply to document visual fact.[24] Cultural documentary photography projects such as the Farm Security Administration's photographs of rural life during the Great Depression or the American Folklife Center's *Blue Ridge Harvest: A Regions Folklife in Photographs* captured and preserved visual data about quilts, quiltmakers and communities that would otherwise have been lost. Beginning in the early 1980s as part of a movement of regional documentation projects, photography has become one of the most important research tools for quilt historians. State, regional, and local quilt documentation projects take at least one archival photograph of each quilt documented to preserve the visual data for researchers. Quilts themselves are large, cumbersome, and easily damaged. Often it is more practical to do research using photographs of the objects rather than use the quilt objects themselves.

Photography also permits for the dissemination of quilt designs and quilt research through books, magazines, the Web, and exhibition catalogs. Photographic evidence of quilts exists in newspapers from the Colonial Revival period and even earlier. While documentary photographs are often created for dissemination in books and online media rather than through exhibition in galleries, the power of documentary photography is nonetheless immense. In *On Photography* (1977), Susan Sontag described the power of the photographic document thus:

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[24] In *Documentary Expression and Thirties America,* William Stott defines the documentary in photography in two ways, as the presentation of fact, and as the "human documentary," which visually presents human emotions about real life events. For the purposes of this study, I use "documentary" in the former sense.

> Between two fantasy alternatives, that Holbein the Younger had lived long enough to have painted Shakespeare or that a prototype of the camera had been invented early enough to have photographed him, most Bardolators would choose the photograph. This is not just because it would presumably show what Shakespeare really looked like, for even if the hypothetical photograph were faded, barely legible, a brownish shadow, we would probably still prefer it to another glorious Holbein. Having a photograph of Shakespeare would be like having a nail from the True Cross (Sontag, 154).

What Sontag is describing about documentary photography relates to Walter Benjamin's idea of the *aura* of the work of art, a concept to which we will return shortly.

Photography has also allowed quiltmakers to become familiar with a plethora of quilts and quilt designs made around the world. The dissemination of photographic images of works particularly highly-regarded by scholars and critics has also allowed for the creation of an emerging canon of 'great works' in various media, including painting and quilts. The first book to reach a mass audience with quilt images was Safford and Bishop's *America's Quilts and Coverlets* (1972). The photographs of the quilts in the catalog of pioneering quilt history scholar Cuesta Benberry and Joyce Gross' exhibition, *20th Century Quilters: Women Make Their Mark*, have reached infinitely more quiltmakers and scholars than did the actual quilts themselves. Cyril Nelson's quilt engagement calendars, which also pre-dated the Internet, did much to disseminate photographic images of quilts to a large audience and create a popular canon of quilt images.

In his essay, "The Work of Art in the Age of Mechanical Reproduction," Walter Benjamin theorized what the photograph and the multiplicity of images has done to the original object. "Technical reproduction can put the copy of the original into situations which would be out of reach for the original itself. Above all, it enables the original to meet the beholder halfway, be it in the form of a photograph or a phonograph record.

The cathedral leaves it locale to be received in the studio of a lover of art; the choral production, performed in an auditorium or in the open air, resounds in the drawing room" (Benjamin, 36). Through photography, and its dissemination in print and online, the quilt leaves the exhibition, museum, or the private home of a stranger, to be viewed by the quiltmaker, student, or scholar, in their home, office, or thanks to smart phones and other mobile devices, anywhere in the world. Furthermore, according to Benjamin, photography and its dissemination has not only altered the ways in which people consume quilts and other works of art, but has also fundamentally changed the nature of the creative process, as well as the nature works of art themselves.

It is necessary to back up a bit before proceeding, however, and say a few words about the work of art before the age of mechanical, photographic, or digital reproduction—about the work of art in the age of hand-made reproduction. Walter Benjamin noted early on in his essay that reproductions of works of art were not a new phenomenon, even in the nineteenth century.

> In principle a work of art has always been reproducible. Man-made artefacts could always be imitated by men. Replicas were made by pupils in the practice of their craft, by masters for diffusing their works, and, finally, by third parties in the pursuit of gain. Mechanical reproduction of a work of art, however, represents something new. Historically, it advanced intermittently and in leaps at long intervals, but with accelerated intensity. The Greeks knew of only two procedures for technically reproducing works of art: founding and stamping. Bronzes, terracottas, and coins were the only art works which they could produce in quantity. All others were unique and could not be mechanically reproduced. With the woodcut graphic art became mechanically reproducible for the first time, long before script became reproducible by print (Benjamin, 35).

Photography, most obviously, transformed the artistic process by allowing for the quick and veracious reproduction of works of art, as well as scenes from the world in which we live. "For the first time in the process of pictorial reproduction, photography freed the

hand of the most important artistic functions which henceforth devolved only upon the eye looking into a lens" (Benjamin, 35).

Besides changing the ways in which art and reproductions of works of art are made, reproductions and multiples have also changed the context in which works of art are understood, the exhibition value of quilts and other art works, and transformed the significance of works of art from a ritual to a political value. Photography and the mechanical and digital reproduction of images renders the work of art atemporal, which can mean that the context of the viewer is radically different than the context in which the work was originally created. As with the previous example of hand-made replicas of Greek statuary, this is not necessarily a new phenomenon. "An ancient statue of Venus, for example, stood in a different traditional context with the Greeks, who made it an object of veneration, than with the clerics of the Middle Ages, who viewed it as an ominous idol" (Benjamin, 36). What mechanical, and now digital, reproduction has done, however, is dramatically quicken the pace at which images of works of art created across all geographies and moments in time are consumed.

The dissemination of reproductions of photographic images precipitated the exhibition value of works of art. Artistic works no longer needed to be created to serve a religious, political, or domestic function. Instead, a new social function—simply to be seen—emerged. This led to the idea of "Art for art's sake" among late nineteenth century artists working in a broad range of disciplines. *L'art pour l'art*, or more specifically for our purposes, *Le quilt pour le quilt*. Quilts created for exhibition or artistic expression often lack what Benjamin calls the ritual value of historic and traditional quilts. Rather than being made as a warm bedcovering, or for a trousseau, such quilts are more

consciously made to be seen. Essentially, Benjamin's reference to the change in use and meaning of photographs can be applied to the change in use and meaning of quilts. "With the different methods of technical reproduction of a work of art, its fitness for exhibition increased to such an extent that the quantitative shift between the two poles [cult value and exhibition value] turned into a qualitative transformation of its nature" (Benjamin, 37). Benjamin's essay is first and foremost a political piece, and his interest in the shift away from the ritual value of the work of art to the exhibition value chiefly lies in the political nature of the art exhibition. Works of art created to be viewed by the public often serve as social commentary, in addition to their aesthetic or visual function.

> For the first time in world history, mechanical reproduction emancipates the work of art from its parasitical dependence on ritual. To an even greater degree the work of art becomes the work of art designed for reproducibility…But the instant the criterion of authenticity ceases to be applicable to artistic productions, the total function of art is reversed. Instead of being based on ritual, it begins to be based on another practice – politics (Benjamin, 36).

What are the politics of the image of the quilt in the digital age in America, a time and place experiencing a return to participatory culture in the arts?

The essential principle of the individual work of art, the work's sense of gravitas, and that which connects the viewer to the maker (at least to the Modern Western notion of the maker) is what Benjamin called the *aura* of a work of art. This aura was both destroyed and created by the ways in which people consumed and understood mechanical photographic reproductions—destroyed because the reproduction breaks the physical connection with the maker and created because the idea of the veneration of the presence of the maker within the work of art was inconceivable in the time before mechanical reproduction, before artist and art work were estranged from each other by photography. Indeed, for Benjamin, "The presence of the original is the prerequisite to the concept of

authenticity" (Benjamin, 35). Thus, reproductions and multiples, through photographs, actually *add* to the aura of quilts and other works of art.

What exactly *is* the aura of the quilt, specifically, as opposed to that of, say, the painting? Beyond the definition of aura put forward by Benjamin for works of fine art such as paintings and statuary, the concept of the quilt's aura must also take into account the ways in which the quiltmaker often diverges from the Modern notion of the artist, as well as the qualities of warmth and belonging traditionally associated with quilts, what Benjamin would call the quilt's ritual function (Benjamin, 36). The aura of the quilt is thus an aura of softness and comfort, motherhood and sisterhood, tradition and community, adhering to perceived and accepted boundaries of form and function. Such an aura is already quite at odds with that of the Modern painting, which can often be said to carry an aura of genius and individualism, sometimes even angst or madness, and a breaking of expectations of form and function. As with the notion of *Fiberspace* itself, if the aura of the quilt is at odds with that of the modern painting, it seems at first thought that the aura of the quilt might be even less at home when conveyed through a digital photographic reproduction. How does this already complicated concept of the quilt's aura relate to digital photographic reproductions of quilts, such as those on the Quilt Index?

The Quilt Index,[25] www.quiltindex.org, is a vast online digital repository storing and serving images and metadata for tens of thousands of historic and contemporary quilts. The digital quilt records are contributed by dozens of institutions throughout the United States and are not housed in any single location. Rather than a brick and mortar quilt museum, the Quilt Index serves as a virtual museum for quilt images and histories, as well as essays, galleries, and quilt lesson plans. This mass of digital quilt

Fig. 9.1 Broderie Perse Quilt Possibly Attributed to Abigail Adams, image courtesy of the *Quilt Index.*

images both demonstrates the power of the photographic document, and as Benjamin would have argued, raises the exhibition value of quilts, both photographic copies and original objects. Put another way, the Quilt Index and its digital reproductions have enhanced the aura of American quilts.

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[25] The Quilt Index is a joint project of The Alliance for American Quilts, MATRIX: Center for Humane Arts, Letters and Social Sciences Online at Michigan State University and the Michigan State University Museum. The project has been supported in part by major grants from the National Endowment for the Humanities and the Institute for Museum and Library Services.

Two of the many of quilts on the Quilt Index that may be said to be 'rich' in aura are a late eighteenth century *broderie perse* quilt (right) that may be attributable to Abigail Adams, wife of U. S. President John Adams, and *Girls of the Golden West*, a contemporary art quilt created by fabric artist Jean Ray Laury (pictured on the following page). Both of these quilts carry an aura because of the notoriety of their makers—a founding mother of the United States and a well-known quilt artist of the late twentieth century—and because of this emphasis on the artist, the aura of these quilts in reproduction is much the same as that of works on fine art in reproduction. While viewing the quilts online is not as exhilarating as viewing the original objects in person, the fact that there are multiple images of the quilts serves to heighten the mystique of the originals.

Much of the body of quilt data on the Quilt Index refers to quilts in common patterns made by ordinary people whose names might have otherwise been lost to history or by anonymous makers. These quilts might largely be called 'traditional' quilts.

Fig. 9.2 Girls of the Golden West by Jean Ray Laury, image courtesy of the *Quilt Index*.

When experiencing these traditional quilts in person, the aura largely lies in the perception on the part of the viewer of the warmth and comfort that the quiltmaker might have imbued in the object. What becomes of this aura of the warmth and comfort of the solicitous quiltmaker in the age of not only multiple photographic reproductions the quilt, but also of thousands of digital reproductions of quilts housed in a database? Does the vast number of digital copies cancel out the warm and hand-made qualities of the originals in the viewer's mind or, as with the previous examples, does this enormous

body of digital multiples actually enhance—perhaps even create—the aura of the American quilt?

While digital reproduction is changing the ways in which we understand, appreciate, and interact with works of art such as quilts, it is also changing the ways in which research them. Perhaps ironically to some, technological means are now being used to authenticate original works of art, and the computer will ultimately prove a better connoisseur than even the most practiced human eye.

> We now find ourselves at a point where it may be possible to bring to bear many new mathematical ideas on the analysis of art and the particular problem that underlies authentication – that of the quantification of artistic style. The "problem" of style quantification is one that is well-posed generally throughout the arts, whether it be in literature, music, or the visual arts. It finds its roots in the search for methods for quantifying literary style, a challenge that was first stated at least as far back as 1854 by the mathematician Augustus De Morgan. In 1897 the term *stylometry* [emphasis original] was coined by the historian of philosophy, Wincenty Lutaslowski, as a catch-all for a collection of statistical techniques applied to questions of authorship and evolution of style in the literary arts (Mao, et al, 1).

In the article, "EMD Analysis for Visual Stylometry," a team of mathematicians from Michigan State University, Dartmouth College, and the Santa Fe Institute put forward a model for machine intelligence in the identification of authorship for artistic works. Again, we find a convergence of quilts and mathematics in the digital age. Using paintings and drawings by the Northern Renaissance artist Pieter Bruegel the Elder (c. 1525/30-1569) as their test case, Dong Mao, Daniel Rockmore, Yang Wang, and Qiang Wu used empirical mode decompression (EMD) to determine whether or not works were indeed created by Bruegel the Elder. The key feature of EMD is the feature vector, a multi-dimensional vector made up of values that stand for aspects of a particular type of a work of art (Mao, et al, 6). As a simplified example, one might let C = color, B =

brushstroke, and son on, for a vector that would read, [*C*, *B*, …….]. The computer learns to work with the feature vector over time. This machine learning process involves learning set, in which the computer is given a set of paintings to identify, some of which are obviously Bruegel's—that is, they exhibit many of the features that are unique to Bruegel's painting style in terms of brushstrokes, color palette, etc.—and some that are obviously not by Bruegel, very different works perhaps not even by a Northern Renaissance painter. Pictured below is *Path through a Village* from circa 1552, a known Bruegel. Once the computer has mastered this learning set, works to be authenticated are tested against known works by Bruegel.

Similar projects using different techniques including fractal-based authentication (Jackson Pollock), wavelet-based authentication (Vincent Van Gogh), and sparse coding have been conducted by other research projects (Mao, et al, 2).

Fig. 9.3 *Path Through a Village*, Pieter Bruegel the Elder, c. 1552, image source: "EMD Analysis for Visual Stylometry."

Fig. 9.4 *Willows at Sunset*, Vincent Van Gogh, 1888, and the Same Painting When Reduced to Its Brushstrokes, image source: The Van Gogh Project.

There has been some controversy over whether these other techniques for visual analysis are as accurate as EMD. "In the case of visual media, while all analysis derives from pixel information, there are a much wider range of first order analytic tools from which the classifiers are built (e.g., pixel information, Fourier spectra, wavelet spectra, etc.) so that in short, there is much less agreement on the fundamental analytic elements and the search for and development of new analytic tools for classification is ongoing" (Mao, et. al, 1). Pictured above is a detail of Van Gogh's painting *Willows at Sunset* (1888), and the same detail, after an algorithm has isolated Van Gogh's brushstrokes.

While thus far the use of EMD analysis for visual stylometry has focused upon so called 'great master' works in Western painting, EMD researchers are now testing the use of quilts, and the implications for the authentication of authorship of quilts here is immense. These 'anonymous' works may be found to be 'authored' or created by

individuals whose names or at least styles will be known and quantified. A computer could be trained to recognize one maker's quilting stitches from another, or one dye lot of turkey red or indigo from another, or find exact matches of obscure quilt patterns. Given the different natures of painting and quiltmaking in terms of cultural history and praxis, however, the nature of authorship of the painting and the quilt can be quite different. While some quilts, especially art quilts, bear the unique and unmistakable style of their makers, many quilts display cultural rather than individual authorship.

In a discussion of the ideological foundations of modern authorship, literary scholar Klaus Benesch notes the role of technology in the formation of ideas about authorship during the Romantic movement in America.

> American Romanticism must be treated also as an attempt to negotiate the contested cultural authority of two rival ideologies: the modern notion of authorship and the evolving concept of the machine as all-encompassing technological system. The artistic-project of negotiating the divergent forces of modernization involved technology on a number of different levels. In his famous lecture on authorship,[26] Foucault insisted that an author is not simply the historical person who has produced a written [or quilted] text but also in a very literal sense an ideological product. As a discursive figure, he or she is *authorized* [emphasis original] by various interacting ideological positions, one—and certainly the most influential—of which is the idea of the author as "genius, as perpetual surging of invention" (Benesch, 13).

There is, then, a connection between aura and authorship, whether it be an individual writer or quiltmaker or cultural authorship, for in both constructs, one glimpses the seemingly everlasting essence of the work, what Foucault calls the "perpetual surging of invention." Further, "If we follow Ross's[27] discussion of eighteenth-century print culture, to be *printed* now becomes the primary marker of cultural authority. It is

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[26] See Foucault's, "What is an author?," pg. 159.

[27] Here, Benesch refers to Marlon Ross's article, "Authority and Authenticity: Scribbling Authors and the Genius of Print in Eighteenth-Century England."

therefore no longer the text as such that, by way of its sacrosanct mythopoetical origins, lends power and esteem" (Benesch, 14). In other words, prior to the large-scale dissemination of the printed text and images in the early modern period, the authority, and by extension the aura, rested within the texts[28] themselves. In the Romantic era, about which Benesch was writing, the Modern notion of the author as the authority became dominant through the cultural reception of new technologies. In the early twenty-first century, an era marked by personal wireless communications technologies and social media, I would argue that the culture itself is largely replacing the individual author as the textual authority, which has given rise to the crowd-sourcing and so-called smart mobs discussed at length in the previous chapter. This notion of cultural authorship is not new, however. In fact, it is perhaps especially well-understood within the field of quilt studies.

Visual stylometry could also answer questions of cultural authorship, identifying, for example, quilts (left) made by the Illinois Amish, who chose their fabrics from a dark and distinctive color palette, from those made by Pennsylvania Amish. For the quilt scholar,

Fig. 9.5 Illinois Amish Quilts from the Digging Into Data Project, image courtesy of the *Quilt Index.*

[28] By 'text,' I mean not only literary works, but am also referring to works of art and material culture as texts.

another question, related to questions of aura and cultural authorship in an age of digital reproduction, is simply raised by the presence of so many digital quilt records. How *does* one research tens of thousands of quilts?

The Digging Into Data project[29] seeks to further develop visual tools such as EMD to answer authorship-related humanistic questions[30] about quilt image data on the *Quilt Index*. The staff team of the Digging Into Data project have defined cultural authorship as follows,

> In the past, authorship has been explored in terms of attributions, typically of either individual masterpieces or small collections of art from the same period, location, or school. Due to these localized strategies of exploration and research, commonalities and shared characteristics are largely unexplored. The DID project will go beyond this by using image analyses to studying the problem of authorship applied to very large collections of images and evaluated in terms of accuracy over diverse datasets (Quilt Index staff team).

Now with over 50,000 unique quilt images, and poised to exceed 100,000 soon, the sheer vastness of the amount of visual data on the *Quilt Index*, more than one scholar could realistically study in a lifetime, makes scalability a problem for the twenty-first century

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[29] The Digging into Data Challenge is an international grant competition launched in January 2010 by four leading research agencies: the Joint Information Systems Committee (JISC) from the United Kingdom, the National Endowment for the Humanities (NEH) from the United States, the National Science Foundation (NSF) from the United States, and the Social Sciences and Humanities Research Council (SSHRC) from Canada. The Digging into Image Data to Answer Authorship Related Questions grant team is (Dean Rehberger and Wayne Dyksen, Michigan State University, NEH; Peter Bajcsy, University of Illinois at Urbana-Champaign, NSF; Peter Ainsworth, University of Sheffield, JISC). This project will take three specific resources (manuscripts, maps and quilts) and develop tools to analyse and identify authorship of visual images.

[30] DID humanities-based research questions include: What are the distinct characteristics of an individual quiltmaker or relevant quiltmaking group's choices of pattern selection, fabric and color choices, execution of measurement, layout, needlework and craftsmanship of the pattern design, and, most interestingly, original deviations from traditional patterns? To what extent are quilt patterns regional and to what extent national? To what extent can quilt patterns from the North and South be differentiated?

quilt historian. Use of computer analysis, which has been in use in literary studies for decades now,[31] will allow scholars of material culture to conduct research on vast amounts of quilts at once. While these new tools will undoubtedly further quilt history, they also further complicate the relationship between the quilt, its aura, and individual and cultural authorship.

Writing in 1843, four years after the invention of the camera, Ludwig Feuerbach wrote in the preface to the second edition of *The Essence of Christianity* that, "our era prefers the image to the thing, the copy to the original, the representation to the reality, appearance to being" (Sontag, 153). This seems quite prescient given the proliferation of digital images in the early twenty-first century, and their use in many facets of daily life, from entertainment to scholarship. Today, this fascination with digital images is so pervasive that contemporary textile designer Dionne Yang titled one of her characteristically quirky fabric designs, "Digital Image," pictured on the following page. The motifs were hand-drawn, but digitally printed onto silk chiffon (Cole, 103). The use of a digital technique for printing a complicated multi-color pattern on silk decidedly recalls Jacquard's use on punchcards to print a complex rose pattern on silk brocade two centuries earlier.

[31] See Susan Hockey's, "The History of Humanities Computing."

Fig. 9.6 Digital Image, Dionne Yang, image source: *Textiles Now*.

While we might not yet prefer the digital quilt image to the original textile, the vast multitude of digital images available certainly opens a broad array of questions that

scholars could never before ask, at least never ask about such a large body of quilts. With advances in technological tools from digital photography to high performance computing and EMD, the aura of the American quilt can now be seen in new contexts. Visual stylometry will allow for the scalability of *Quilt Index* in the face of massive amounts of quilt data, enabling scholars and quiltmakers to make new meaning out of a vast collection of quilts. The authentication of individuals' styles in traditional quiltmaking with begin to break down the binary between traditional quilts and art quilts, and between form and function in quiltmaking. At the same time, however, the ideological shift from individual authorship to cultural authorship precipitated by digital reproduction and advanced by Web 2.0 socio-technologies (discussed at length in Chapter Five) such as crowd-sourcing and social tagging is very much in line with the traditionally communal ethos of quiltmaking. The aura of the *Quilt Index*, like that of *Fiberspace* itself, is thus an aura of both communal and individual accomplishment and identity, tradition and future technology.

CHAPTER TEN

CONCLUSIONS: LOCATING *FIBERSPACE*

Writing in 2001, weaver W. Logan Fry declared in his essay, "Fiber in Cyberspace," which appeared in the journal, *FiberArts*, that, "Fiber artists have reached the digital divide. Some are embracing digital technology with enthusiasm. Others, like a recent seminar participant in New York, thrust their hands in the air and defiantly proclaim, 'These are the only digits I need!'" (Fry, 40). In the ten years following this rather prescient article, fiber in cyberspace, or simply *Fiberspace*, has become multi-modal virtual landscape in which digital textiles are created, shared, analyzed, and consumed. In this dissertation, I have defined *Fiberspace* as the liminal spaces in which textiles and the digital intersect, especially in online environments. I have also explored three broad questions[32] or areas, namely, the binary nature of both the theory and praxis of textiles and technology, the relationship of Web 2.0 to the revitalization of folk art and quilt culture specifically and of participatory culture generally, and the nature of truly digital textile objects created in virtual worlds and online games and the problems and opportunities that these objects pose for the future of humanities scholarship and museum practice.

The digital, or binary, nature of textiles is a simple but very important point of departure for scholarship on textiles and technology such as *Fiberspace*. Further, digital textile culture often exists at the intersection of other binaries, such as male and female, art and craft, and technology and textile. Cybercultural theorist Sadie Plant views these

[32] Refer to pages four and five of this dissertation for the full articulation of these questions.

binary oppositions as an indication that human *techne* and *epsiteme* are really just complex machine processes. Textile artist and theorist Ingrid Bachmann explores these binaries through a study of discourse and rhetoric. She asks,

> What is the gap between a technology's apparent role, history, perceived use, its expected user, and its actual role, function and history? Why is weaving considered antiquated, artisanal, slow, gendered female? Conversely, why are computers considered fast, new, state of the art, virtual, gendered male? The currency or, more accurately, lack of currency of textiles as a technology is rather pointedly illustrated in a recent advertisement in *Wired* magazine for an Internet provider. In the ad, a sexy redhead poses provocatively against a computer. The accompanying copy reads, 'Let's just say that you won't find me on the knitting newsgroup.' Clearly, knitting is for doddering old grandmothers, not for foxy cyberbabes or hip infobahn warriors (Bachmann, 25).

One of the major projects of this dissertation has been to deconstruct such binaries and dispell many of these gendered myths. Women, including young women, are actively engaged in a plethora of craft-related activities online. Indeed, many young women became early adopters of the Internet in the 1990s *because* of their desire to join others in spaces such as the sorts of quilting and knitting newsgroups about which the advertisement so derisively jeered. Further, textiles *are* technologies, and vice versa.

Significantly, the first proto-computer program was born from the translation of warp and weft to zero and one in the punch cards of the Jacquard loom. When Ada Lovelace translated the Italian engineer Menbrea's paper on the Analytical Engine and its programming, she wrote in her extensive notes to the translation of the Analytical Engine's *weaving algebraic patterns* (Essinger, 141). The inner functioning of the first computer was conceived of as a kind of weaving. The metaphor of technological process as needlecraft technique works on many levels, from the weaving of code to the motherboard or database as an intricate tapestry to the idea of online communities as being woven, stitched, or quilted together.

The metaphor of the quilt is a particularly powerful one. It conjures images of community-building, historical self-consciousness, and gender empowerment. Because of the implicit connections of communities embedded in the process of quilting, the metaphor of the quilt and quilting often accompanies technological discourse. For example, in noted technophile Howard Rheingold's *Smart Mobs: The Next Social Revolution*, one of the chapters is entitled "Virtual Quilts." Facebook and MySpace groups, Facebook fan pages, Twitter, blogs, podcasts, and digital pattern swaps for computerized sewing machines are themselves a body of virtual quilts, connecting quilters, warmly wrapping them in communities in which artistic, emotional, and social support abounds.

The computer is not a cold, ominous 'machine in the garden' that is the home quilt studio, but rather, has been transformed by quiltmakers into an extension of their quilt work and even their own bodies. A far cry from the metaphor of the Wild West used so often to describe the Internet in the 1990s (Friedman, 171, 174), the Internet has become an increasingly domestic space. "They [craft-related social media] also, as cultural theory acknowledges, establish an ideal—a realm or space, in which shared beliefs relating to an understanding of what knitting [or quilting or weaving] *is*, based on experience and expectation, can be explored and realized" (Turney, 151). *Fiberspace* is the sum of these spaces; a virtual quilt in which women can collaborate, create and share their work and their lives.

Scholars such as Billy Ivey, Steven Tepper, and Lawrence Lessig[33] have noted that participatory culture, which thrived in the nineteenth century in America through

[33] See Chapter Five for a discussion of the writings of these and other scholars on participatory culture.

media such as homemade music and home theatricals and then languished in the twentieth century with the rise of mass media and emphasis on art appreciation rather than participation, is making a comeback in the early twenty-first century in part because of Web 2.0 applications and the broader read-write culture of the World Wide Web. The participatory nature of quiltmaking and other folk art-making practices are very much at home with the crowd-sourced, open access ethos of what Simon Bronner calls the new transgressive folk Web (Bronner, 22). The popularity of quiltmaking and other fabric arts online, accompanied by this revival of participatory culture and the plethora of Victoriana and Steampunk in various regions of *Fiberspace*, have combined to create a decidedly post-Victorian sensibility within several of the sites, groups, pages, and worlds of *Fiberspace*.

Quiltmakers have not only used computers and the Web to change the ways in which they access and share quilt-related information, they are also making use of these new technologies to change the ways in which quilts are made. There are now high-end, fully computerized sewing machines available to consumers (Husqvarna Viking actually has a machine on the market, the Emerald 183, that the company is calling a "sewing computer") that allow a quilter to take a quilt pattern downloaded from the Web and upload it directly to their sewing machine through a USB cable. The machine 'learns' the pattern that the quiltmaker wishes to create. While some purists may feel that this is somehow 'cheating,' that it cheapens quiltmaking as both art and craft, such machines are a boon to aging quilters who, due to physical conditions such as loss of eyesight or debilitating arthritis, can keep quilting in some form through the use of a sewing computer.

Massively multiplayer online virtual worlds such as *Second Life* and *World of Warcraft* are also changing the ways in which textiles are created. William Sims Bainbridge, author of a more quantitative study on player culture in *World of Warcraft*, *The Warcraft Civilization: Social Science in a Virtual World*, notes that "the most popular pure crafting profession [in the game] is tailoring" (Bainbridge, 153). Most textiles created by players in *World of Warcraft* function within the world to further gameplay by augmenting attributes of the player's avatar, such as intellect, strength or stamina. Other textiles, such as attire for in-game festivals or weddings, reflect the rich cultural life of Azeroth. Both types of objects can be sold by players to other players through the auction house, creating an economy of DIY production and consumption. To these ends, millions of players engage in digital tailoring, weaving, and embroidery in *World of Warcraft*. While many of the places in which textiles and technology intersect online are to be expected (such as Facebook and blogs), *World of Warcraft* has transformed a large and extremely diverse population into digital crafters online. By contrast, many participants in the virtual world *Second Life* are quilters, either in both real life and *Second Life*, or only in *Second Life*. Quilts and other avatar-crafted textiles in *Second Life* are ubiquitous, as evidenced by the screenshot of quilts "hanging out to dry" in a farmyard in *Second Life* below.

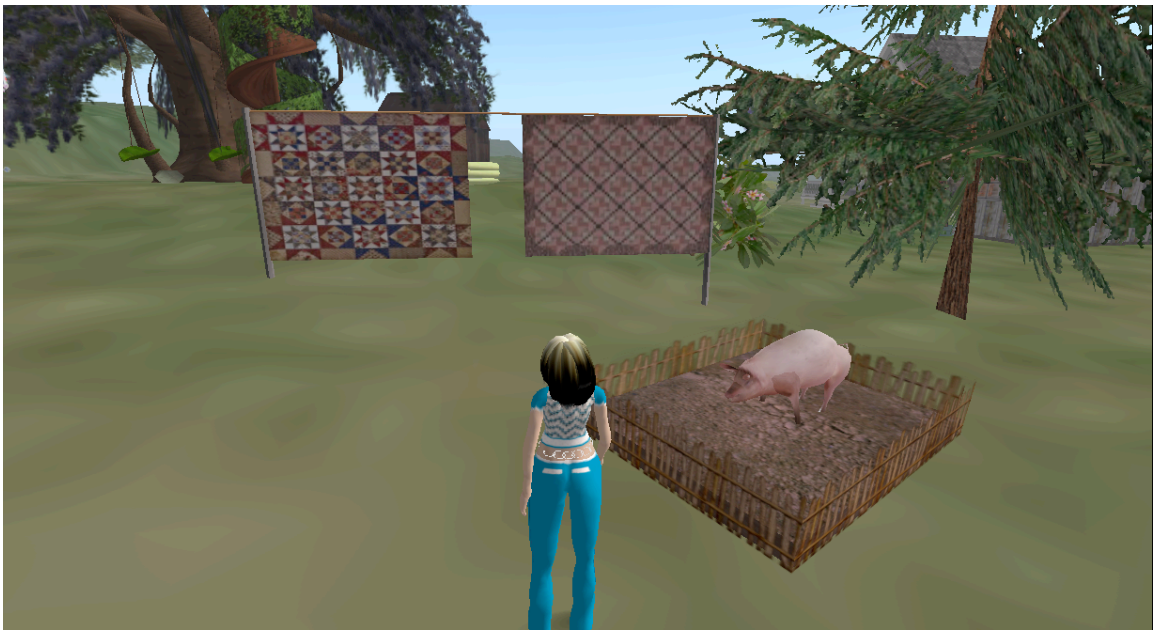

Fig. 10.1 Quilts in a farmyard, screenshot taken in *Second Life*.

Avatars in *Second Life* use code and prims to create various (virtual) objects of material culture for use in their online lives, from buildings and modifications to the virtual landscape to clothing, foods and household goods. As anthropologist Tom Boellstorff noted in *Coming of Age in Second Life*, texture plays a vital role in the production and consumption of all objects in *Second Life*, perhaps especially quilts. "Textures were aesthetically important; additionally, a good texture (say, a brick pattern) could make an object appear to be composed of more prims than was the case, reducing download time. Textures exemplified the implicit visual economy of surfaces in Second Life: meaning was located primarily on the surface of objects" (Boellstorff, 98). While the techniques for quiltmaking in the brick and mortar world and quiltmaking in *Second Life* are markedly different, this gap is bridged through the incorporation of real world quilt products used by avatars entirely for show, such as virtual Aurifil or a script that runs a long-arm quilting machine.

A testament to the popularity of quiltmaking in *Second Life* is the weekly free quilt giveaway hosted by an avatar called Lady Dawn Starbrook. Echoing the community and sense of coming together often fostered by quiltmaking in the real world, this avatar invites members of the virtual public to her island in *Second Life* once a week and gives them a free copy of a (virtual) quilt that she has created. As participation in virtual worlds gains in popularity, quilt scholars may well debate whether the creation of code for these virtual quilts constitutes a form of quiltmaking and whether these digital objects are worthy of study and documentation within the discipline of quilt history.

The various humanities disciplines into which the subject matter of this dissertation falls are not the only institutions that must change in response to these purely digital objects. All aspects of museum work, from exhibition design and informal learning to conservation and preservation[34], will need to change as digital objects make their way into collections. In her essay "Redefining Digital Art," Beryl Graham describes digital media in the museum as forced into binaries of object for interpretation or object on exhibition (Graham, 94). Further, while digital objects as interpretive tools have been much studied in the museum technology community, digital objects as works in museum collection have been studied to a lesser extent. "As reflected in this book [*Theorizing Digital Cultural Heritage: A Critical Discourse*], digital interpretation is relatively well researched, has international standards, and benefits from regular expert conferences such as ICHIM and Museums and the Web. The same cannot be said for digital art" (Graham, 94). Museums such as *Second Life*'s Folk Art New England are already making forrays into this new area of museum practice and scholarship, blurring

[34] See Abby Smith's essay, "Preservation."

the lines between interpretation and art by creating a space in which digital quilts function as both.

Museological issues surrounding digital technology existed before the problem of the display, interpretation, and preservation of digital objects, however. For more than a decade, the Web had already been playing a role in a shift in the display of analog textile objects. As Fry noted, in the pre-Internet era, museums, working within the spacial constraints of the museum building, focused of the exhibition of the so-called "fine arts" such as painting and sculpture. The virtual exhibition space afforded by museum websites allowed, for the first time for many museums, the exhibition of their textile collections, including the works of contemporary fabric artists.

> Historically, museums have buried their textile collections in storage vaults, with only a few select pieces from antiquity on display. One obvious reason is that space is at a premium, and museums need to show their Rembrandts and van Goghs. The digital revolution is changing all of this…Once a museum learns how to puts its Manets online, very little effort is needed to add it's textile collection as well, including the work of contemporary textile artists (Fry, 40-41).

Thus, the way in which museums used the Web to put collections online actually served to elevate the place of the museum textile collection. The *Quilt Index*, an online database devoted to the preservation and access of quilt images and metadata, epitomizes the new life of the textile collection online. The *Quilt Index* provides researchers, students, and quiltmakers with free access to over 50,000 historic and contemporary quilts online as of January 2011. Pictured on the following page is an image of the *Quilt Index* website displaying a grid view of quilts made from 2006 to 2010 for contest challenges for the Alliance for American Quilts.

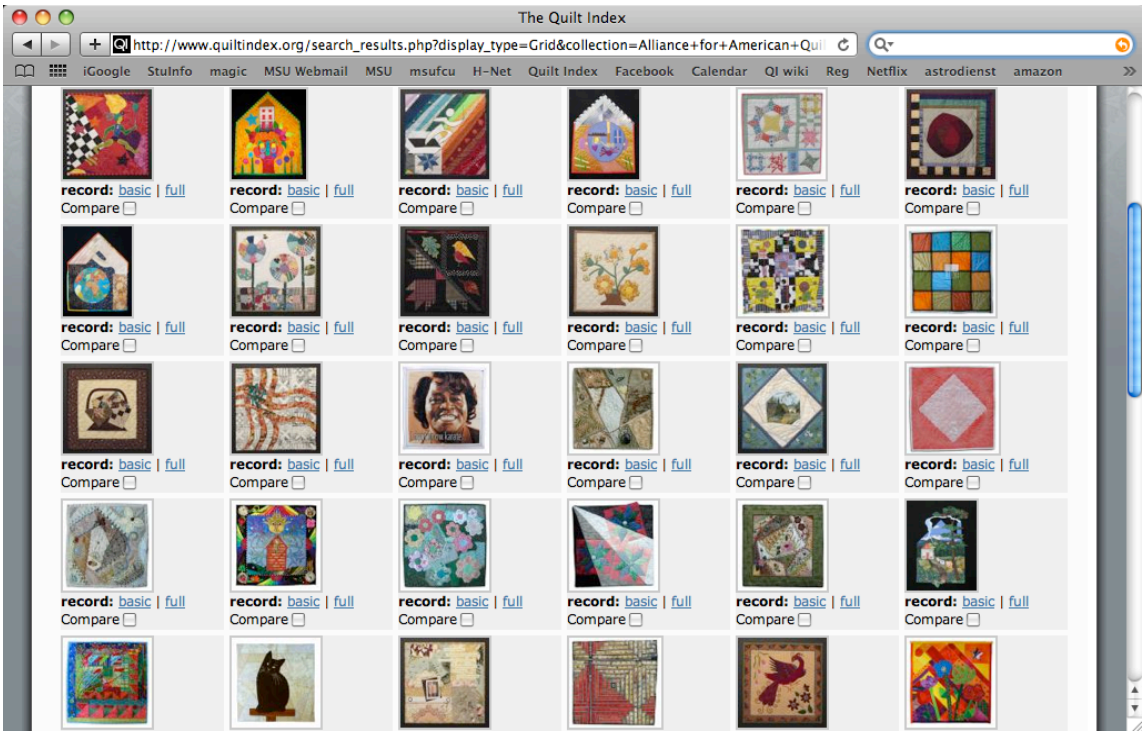

Fig. 10.2 Alliance for American Quilts contest quilts, screenshot taken of the Quilt Index website, www.quiltindex.org. "The Quilt Index." The url reads, http://wwwquiltindex.org/search_results.php?display_type=Grid&collection=Alliance+for+American+Quilts." Below each quilt reads, "Record: basic | full. Compare."

Rich search and browse features and essays, galleries, and lesson plans make the quilts more accessible to the general public. The *Quilt Index* Wiki provides a means by which quilt scholars and quiltmakers can access, create, share knowledge about quilt documentation projects and quilts in museums collections throughout the United States and around the world. The *Index* also connects to audience by means of an integrated social media campaign through daily curated objects of the day and opportunities for the submission of user-generated content. The increasingly international Web 2.0 audience, especially in the British Commonwealth countries[35], mirrors the *Quilt Index*'s effort on

[35] According to the analytics application Facebook Insights, as of January 2011, roughly 7% of the *Quilt Index*'s total fans on Facebook are from the British Commonwealth,

its main site to internationalize through the ingestion of quilt records and documentation project from outside the United States.

High-performance computing is now in use by scholars at Michigan State University, the University of Sheffield in the United Kingdom, and the University of Illinois at Urbana-Champaign to answer questions about large masses of visual data. The *Quilt Index*'s Digging Into Data project and the use of visual stylometry to answer humanities questions about the over 50,000 (and counting) quilts held in the *Index*'s database is yet another example of the vast opportunities for new directions in scholarship created by textile collections online. Another result of the multiplicity of online quilt images in the age of digital reproduction is a fundamental shift in what Walter Benjamin called the *aura* of the work of art, that "the work of art [in this case, the quilt] reproduced becomes the work of art designed for reproducibility" (Benjamin, 36).

Together, the ways in which computers and the Web have been used by quiltmakers and quilt scholars have impacted the way that quilts look, the ways in which quilts are made, the economic and social lives of quiltmakers, the ways in which we value quilts, and the ways in which we research and document quilts in academia, museums, and in lay scholarship. In the case of the "sewing computer" and virtual quilting in *Second Life*, quiltmakers' uses of these technologies challenge the very ways in which we define 'quilt' and 'quiltmaking.' Technology is an inexorable part of almost every aspect of the quilt world. While this dissertation has described in detail the past and present of this *Fiberspace*, the future of digital quilts and digital quilt images seems very bright for both scholars and quiltmakers. In the age of digital reproduction, the quilt

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inclusing large followings in Canada, the United Kingdom, and South Africa, among others.

will continue to remain at the forefront of new advances in Web 2.0 social media and machine intelligence and high-performance computing applications.

Fiberspace exists at the intersection of textiles and technology online. In locating *Fiberspace*, one must look at a variety of spaces, both on and offline, including websites, blogs, social media, digital games, virtual worlds, quiltmaker-sewing machine interfaces in the home, and scholarship conducted in museums and digital humanities centers. In doing so, I have explored *Fiberspace* through the lenses of participatory culture and the Web, the digital object, and the museum and scholarship. *Fiberspace* is simultaneously made up of commercial, museum and academic, and private interests, sites, often collaborative and participatory in nature, of production and consumption of textile images and information, as well as of digital textile objects themselves. Both textiles and technology, quilts and computers, are often popularly imagined as inherently binary in nature. While basic binaries relating to structure and process, warp and weft, zero and one, do indeed describe textile and technology, others should at warm and cold, female and male, quaint and modern, are much more problematic. This dissertation has set out to unpack and dismantle these binary oppositions that do reflect the realities of *Fiberspace* culture.

APPENDICES

APPENDIX A

Fiberspace: Primary Websites Referenced

The Electric Quilt	http://www.theelectricquilt.com/
Etsy	http://www.etsy.com
H-QUILTS (H-Net)	http://www.h-net.org/
Husqvarna Viking	http://www.husqvarnaviking.com/us/
Lidlfish's Quilting Days	http://lidlfish.blogspot.com/
MySpace	http://www.myspace.com
NAMES Project	http://www.aidsquilt.org/
The Quilt Index	http://www.quiltindex.org/
Quilting, Bitch!	http://groups.myspace.com/
Quilt Otaku—Japanese Quilt Blog	http://quiltotaku.blogspot.com/
Second Life	http://www.secondlife.com
Sew Chick—Art Quilt Adventurer	http://sewchick.blogspot.com/
TAFA: The Textile and Fiber Art List	http://www.tafalist.com/
Taniwa—Quilting Fix from America!	http://tttl1998.blogspot.com/

Fiberspace: Extended Listing of Web Sources

Blogs:
Developing Your Quilting Blog (not a blog, but a how-to on blogging)
Julaine in Fiberspace—Quilting Arts Blog
Patchwork Und Quilten E-Magazin
Quilt Index News Blog
Quilt Maverick's Blog Ring
Quilt Otaku—Japanese Quilt Blog
Quilters' Showcase
Sew Chick—Art Quilt Adventurer
Taniwa—Quilting Fix from America!

Clubs & Personal Networks:
Black Threads—1.9 Million African American Quilters
Canadian Quilters Online
East Bay Heritage Quilters (Kensington, CA)
The Electric Quilt
London Friendship (London, Ontario)
Nimble Fingers
Piecemakers
Quiltguilds.com (clubs by state)
Southern Mississippi Quilters

Educational Resources:

American Folklife Center
The Center for the Quilt Online—Alliance for American Quilts
Europeana
Great Lakes Quilt Center
International Quilt Study Center – Quilt Explorer
Mississippi Cultural Crossroads
NAMES Project
The Quilt Index
Smithsonian Quilts

Index / Links Pages:
Nina's Quilt Index
The Quilt Index Wiki
Quilting—about.com
The World Wide Quilting Page—Quilt.com

(List-Based) Discussion Groups:
Arachne's Web
Bernina Fan Club
Featherwight Fanatics
FiberNet
H-Quilt—scholarly list from H-Net
Pfabulous Pfaff Pfan Club
Pfaffies
QHL—Quilt History List
Quilt Art
Quiltbee
Quiltbiz
Quiltopia—Planet Patchwork
TAFA: The Textile and Fiber Art List
Viking Venerations

Marketplaces:
Etsy

Mom and Pop Shops:
Arlene's Calico Country
Grandma's Attic Quilting
Jack & Susie's
Nancy's Notions

News:
QNN-TV
Quilt Channel
Quilter's Buzz

Podcasts:
Annie's Quilting Stash
Crafts Podcast Directory
Driven to Quilt

Sewing Machine Information:
Bernina Sewing Machines
Husqvarna Viking
Online Antique Sewing Machine Resource
Pfaff Sewing Machines
Singer

Social Networks (MySpace and Facebook groups):
Blanket Hugs
Creative Young Mommas
CrzyQuilt
Nashville Craft Posse
Quaint Quilters
Quilters Guild
Quilters in Time
Quilting
Quilting, Bitch!
Sippers and Stitchers
The Tri State Area Punk Rock Quilting Circle

Social Networking (blog posts and popular articles):

Social Networks geared to Generation Jones, Boomers and/or Seniors

- "Social networking sites take notice of seniors" http://www.iht.com/articles/2007/09/06/technology/websocial.php?page=1
- Eons.com
- Boomj.com
- "More than Half of MySpace Visitors are Now Age 35 or Older, as the Site's Demographic Composition Continues to Shift" http://www.comscore.com/press/release.asp?press=1019
- NPR: "Social Networking Sites for Boomers Blossom" http://www.npr.org/templates/story/story.php?storyId=14465186
- "Study: Baby Boomers Love Social Networks Too" http://www.brandweek.com/bw/content_display/news-and-features/digital/e3i651eebcf2abebf4377e6383007dbecd8

'Niche' Social Networks

- "Do you quilters want an online community you can call your own?" http://pickledish.kcstar.com/?q=node/404
- Designs to Love: A Social Network for Crafters http://www.designstolove.com/

- "Social Networking Goes Niche" http://www.businessweek.com/technology/content/mar2007/tc20070314_884996.htm
- "Niche Social Networks Will Continue To Be Hot In 2008" http://social-media-optimization.com/2008/01/niche-social-networks-will-continue-to-be-hot-in-2008/
- "The Nearly Never Ending Market for Niche Social Networks" http://www.readwriteweb.com/archives/niche_networking.php
- "Social Networking is a Lot More Than MySpace and YouTube" http://www.informit.com/articles/article.aspx?p=1218143

Museums and Social Networks

- "Brand Recovery in the Social Networking Era" http://reachadvisors.typepad.com/museum_audience_insight/2008/09/brand-recovery-in-the-social-networking-era.html
- "Does you museum needs its own social network?" http://museumtwo.blogspot.com/2008/01/does-your-museum-need-its-own-social.html

Virtual Worlds (all in Second Life):
Becky's Quilts—with Free Quilt of the Week hosted by Lady Dawn Starbrook
Caravane City
Folk Art New England
Granny Gruppman's
Quilters in SL
The Quilter's Laboratory
Stitcher's Guild Sewing

Zines:
Nine Patch News
The Virtual Quilt Newsletter

APPENDIX B

Chapter Lists for *The Needlecrafter's Computer Companion* and *The Quilter's Computer Companion*

The Needlecrafter's Computer Companion

1. What Kind of Computer Do You Have; What Can You Do with It; and How Can You Buy a Computer If You Don't Have One?
2. The PC in the Sewing Room
3. Old-Fashioned Quilts from Computers
4. More Ways to Use Your Computer in Quilting
5. High-Tech Toys for Cross-Stitchers and Other Embroiderers
6. How to Design Great Coss-Stitch Charts on a Computer
7. Amazing Feats of Star-Trek-Like Computer Wizardry Involving Yarn
8. Exlporing the Knitting Machine-Computer Connection
9. The Very Best Thing You Can Do with Your Computer is Get on the Information Highway
10. Setting Up Everything to Communicate with Crafters Around the World and Calling a Computer Service for the First Time
11. A Treasure Trove of Free and Nearly Free Craft Information Awaits You on Computer Services
12. CompuServe is King When It Comes to Crafts
13. Link Up with the Stitching Sisterhood on Prodigy
14. Needlecraft Klatches Bloom on Hip America Online
15. Cross-Stitchers, Quilters, and Other Fiber-Folk Have a Blast on Delphi
16. Quilters Around the Globe Call GEnie Home
17. Microsoft Network Welcomes Quilters, Sewers, and Other Fabric Junkies
18. Internet Is for the Wired Crafter
19. A Guide to the Best Needlecraft-Related Computer Bulletin Boards
20. Can Your Craft Business Make Money on the Information Highway?

The Quilter's Computer Companion

1. A Quilter's Computer Store Adventures
2. A Quilter's Computer Store Adventures, Continued: Why You Should Buy Software and How
3. Quick-Start Tips and Sneaky Ways To Draw Quilt Blocks with Quilt Design Software
4. How to Set Up Your Drawing Area and Draw a Quilt Block with Drawing Software
5. Beyond Pale Lines
6. Patches, Patches and More Patches!

7. Moving Patches Around Your Screen to Create Bigger Designs
8. Use Computer Tools to Transform an Old-Fashioned Quilt Block Into Something Really Cool
9. The Log Cabin Block: A Case Study
10. Exploring Shadow, Shade and Color
11. Good Stars Above!
12. More Marvelous Design Ideas
13. Old-Fashioned Appliqué from Quilt Design Software
14. Marvelous and Painless Ways to Draw Appliqué and Stencil Patterns
15. How to Turn Photos, Drawings and Other Art Into Appliqué Designs
16. Putting Fabric in Your Computer
17. How to Use Your Computer to Print Photos and Other Art on Fabric
18. Use Your Printer to Create Stencils and Negatives for Fabric Printing, Sun Printing, and Blueprinting
19. Gloria's Gallery: Patterns for Many of the Quilt Designs in This Book
20. A Quilter's Guide to Cyberspace
21. Index: The Quilter's Internet Yellow Pages

APPENDIX C

Niisha's 2006 Ad Campaign

Fig. C.1 "Simply Bovine," image source: Shirts by Niisha.

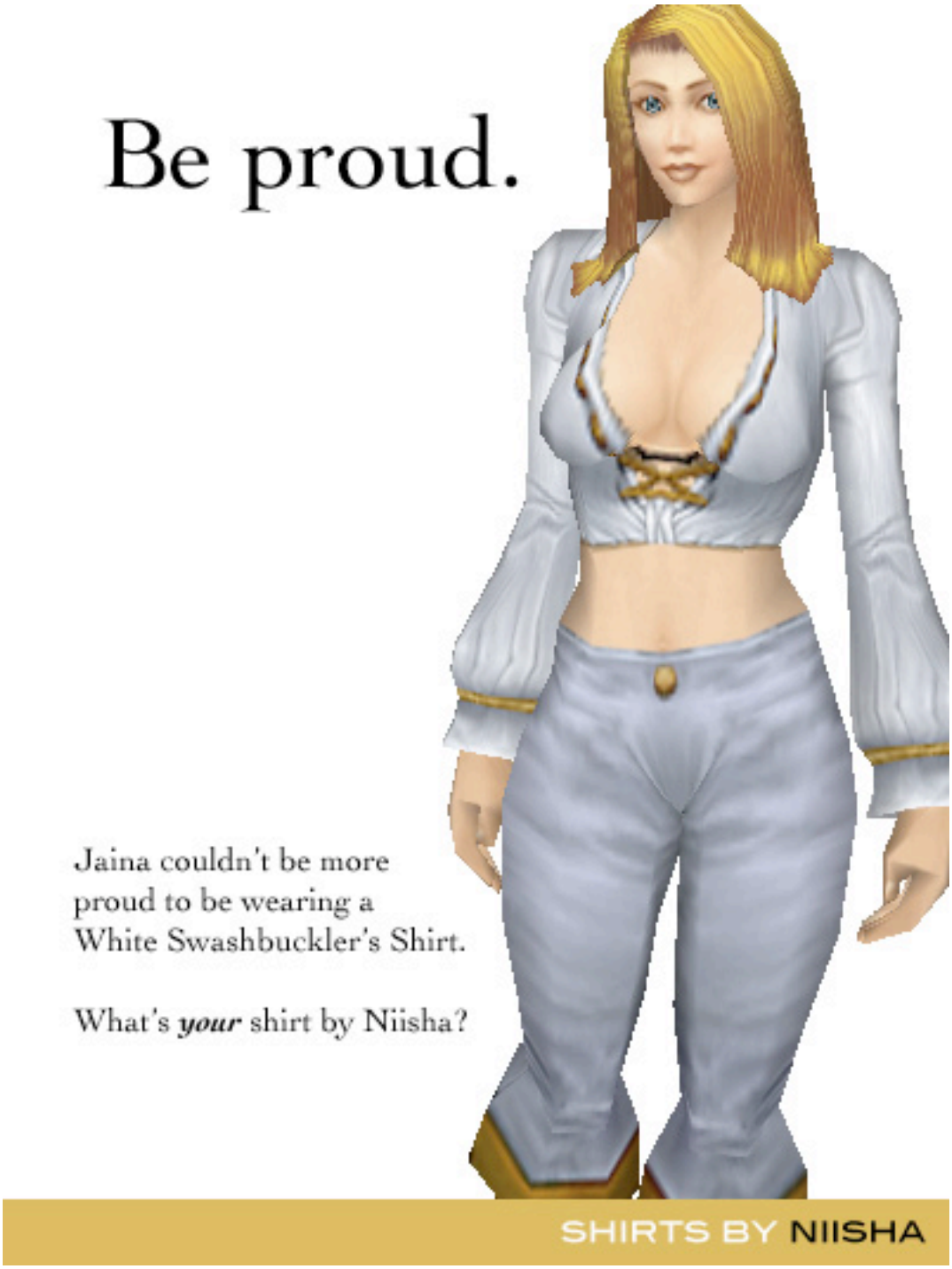

Fig. C.2 “Be Proud,” image source: Shirts by Niisha.

Fig. C.3 “Put a Hex on the Ladies,” image source: Shirts by Niisha

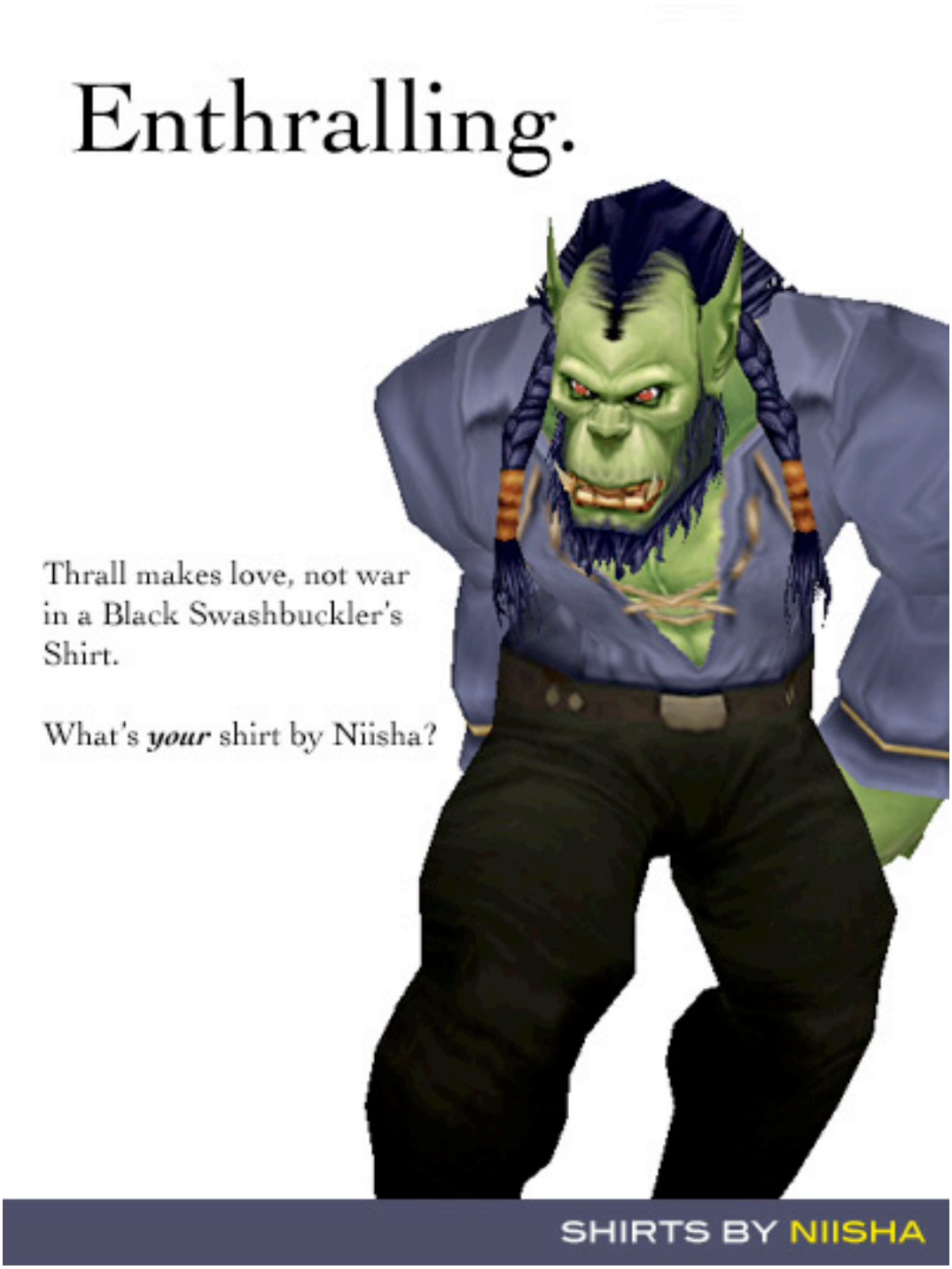

Fig. C.4 “Enthralling,” image source: Shirts by Niisha.

Fig. C.5 “Paint the Town Red,” image source: Shirts by Niisha.

APPENDIX D

Primary Quilt-related Research Sites in *Second Life* for this Dissertation

Site	Location in *Second Life*
Becky's Quilts	Klebb, 233, 184, 100 [Formerly in Nedben]
Caravane City Quilt Village	Caravane, 174, 153, 30
Folk Art New England	Mystic, 52, 60, 24
Granny Gruppman's Quilt Boutique	Native Lands, 42, 49, 22
SL HIV Prevention and Education Center	Snowlion Mountain, 186, 147, 23 Madhupak, 44, 201, 90 [Also formerly in Chilbo]
Zhu's Quilts	[No longer available]

APPENDIX E

Selected Quilt-related Online Social Networks as of Fall 2009

Facebook Quilting Groups:

Group: Quilting and sewing entusiasts!
- Size: 1,245 members
- Type: Common Interest - Hobbies & Crafts
- New: 16 More Members, 2 Wall Posts

Group: Quilting Bee
- Size: 1,073 members
- Type: Common Interest - Hobbies & Crafts
- New: 5 More Members

Quilt Guild
- Size: 1,327 members
- Type: Common Interest - Hobbies & Crafts
- New: 4 More Members, 1 Wall Post

Group: For ppl who wish they had a quilt, make quilts, or have quilts.
- Size: 346 members
- Type: Entertainment & Arts - Fine Arts
- New: 2 More Members

Group: Women who quilt
- Size: 333 members
- Type: Common Interest - Hobbies & Crafts
- New: 4 More Members

Group: Quilting & Patchwork
- Size: 763 members
- Type: Common Interest - Hobbies & Crafts
- New: 4 More Members, 1 Wall Post

Group: People who love quilting
- Size: 259 members
- Type: Common Interest - Hobbies & Crafts
- New: 9 More Members, 1 Board Topic, 1 Wall Post

Many other much smaller groups

MySpace Quilting Groups:

Quilting, Bitch! (Public Group)
- It's a quilting bee and you're invited!
- Founded: Dec 31, 2004
- Members 2,023

Quilters Guild (Public Group)
- Welcome Quilters!
- Founded: Aug 26, 2005
- Members 1,129

Crazy Home Makers (Public Group)

- For my fellow crazy homemakers. Sewing, crocheting, knitting, quilting, cross-stitch, etc.. Or just bored out of your mind. Want something to do or learn to do?? Welcome!
- Founded: Sep 18, 2005
- Members 651

Quilting freaks! (Public Group)

- For anyone who loves to quilt or can appreciate quilts, quilting or quilter's Join Group
- Founded: Oct 10, 2005
- Members 249

Creative Young Mommas (Private Group)

- Painting*Scrapbooking*Drawing*Writing*Soapmaking*Knitting*DIY*Crocheting*Sculpting*Basketry*Beading*Candles*Ceramics*DollMaking*Jewelry*Needlework*Mosaics*Metalcraft*RubberStamping*Pottery*Papermaking Join Group
- Founded: Aug 7, 2005
- Members 175

Crazy Quilters (Public Group)

- For learners as well as old hats. Quilting is so much fun to share with others who love it as well. Come with your questions and we'll give you some answers.
- Founded: Aug 15, 2006
- Members 93

Social Networks geared to Generation Jones, Boomers and/or Seniors

- Eons.com
    - Group: quilting
        - This is a group for anyone who loves to quilt!
        - Members (18)
    - Group: Quilting
        - I would like to have a group about quilting. It would be fun to chat with people about the art of quilting. I have been quilting since 1984. I have been sewing since I was 16 years of age. Not many people in my area quilt so I believe this would be a way to get in touch with other quilters.
        - Members (21)
    - Group: Quilting
        - A chance for folks who like to quilt to share ideas and patterns. You don't have to be an expert, members can be beginners to pros.
        - Members (249)
    - Group: quilters passion
        - We are a group that loves quilting of any kind, any experience level, It's fun to share ideas, tips, patterns etc. It is fascinating to see the sameness and differences of quilters all over the USA and the world. Pull up a chair and share!
        - Members (145)

'Niche' Social Networks

- Ning.com: Create your own social network
    - Quilting Friends http://quiltingfriends.ning.com/
- Quilt Circles: A Social Network for Quilters http://quiltcircles.com/

APPENDIX F

Topics of Discussion in Online Quilt-related Lists

H-QUILT

1. Queries about potential research projects about to be undertaken
    a. whether or not anything similar is being done
    b. where to find good research materials
2. queries about research in progress
    a. specific books/articles that would be helpful to a project
    b. specific quilts that would be good to include in an upcoming exhibition
3. questions about historical people / events in the quilt world (example of the 1976 National Quilt Registry)
4. surveys / grant-related queries
5. requests to borrow research materials from others—sharing
6. advertisements / publicity / new resources
    a. new books
    b. new exhibitions
    c. new stuff on the Index / new Alliance stuff
    d. upcoming conferences / symposia / lectures (as well as solicitations for ideas for other places to publicize such events)
    e. degree programs (faculty publicizing them)
    f. people trying to unload materials / quilt-related periodicals, research materials free to a good home
7. quilt documentation projects
    a. new projects
    b. ideas for conducting a documentation project
8. questions about degree programs / students looking for a program
    a. especially history programs
    b. textile programs
9. obituaries
10. other people news
    a. professional accomplishments / new leadership roles
    b. personal accomplishments

Quiltart

i. Festivals / challenges / contests
    a. what's coming up, where and when
    b. who will be there

ii. collaboration / ideas / practical considerations / advice
    a. encouragement and discussion of others' work
    b. ideas for one's own work
    c. ideas for teaching workshops -- what works & what doesn't
    d. best brands / products to use (these people love Aurifil)

    e. help with color / pattern / fabric selection
    f. best practices for setting up a studio / sewing room
    g. digital / technology issues
    h. best practices for photography / documenting one's work
    i. getting the word out about one's work / establishing a web presence
    j. dealing with business aspects of professional quilting
    k. best magazines / periodicals to read
    l. giving one's work as gifts
iii. degree programs
    a. especially mfa programs
    b. textile programs
iv. people news
    a. professional accomplishments
    b. personal accomplishments
    c. new blogs / new personal webpages

Quilt History List (QHL)

i. Heated discussions / Controversies
    a. traditional vs art quilting
    b. role of men in quilting
    c. debates about books, articles
ii. research tools, especially online
iii. practical questions from educators
    a. not so much about teaching quilting itself as with the quiltart list, but for teaching about quilts in a history, language arts or social studies setting
iv. discussions about AQSG
v. professional networking
    a. professional accomplishments
    b. personal accomplishments
    c. new blogs / new personal webpages
vi. announcements
    a. contests
    b. books
    c. exhibitions
    d. festivals
    e. new tools
    f. new articles

APPENDIX G

Quilt Index-related 'Role Model Tags,'
Classified by Anticipated User Groups

Professional Interests:
documentation projects
oral history
state history
public history
local history
women's history
children's history
rural history
genealogy
folk art
folklife
textile history
museums
libraries
archives
historical socities
museum education

Quilt and quilt history-related interests:
traditional quilting
art quilting
antiques
sewing
feedsacks
African American quilting
redwork
Gasperik
Mary Schafer
contests
newspaper patterns
quilt guilds
quilting bees
crazy quilts
bicentennial
sunbonnet sue
whitework
American Indian quilting
Native Hawaiian quilting

Pennsylvania German quilting
colonial history
nineteenth century
Civil War
feminism
Amish quilting
homespun

Tech-related interests:
Matrix
social networking
social tagging
technology
Web 2.0
wikis

Institutions:
Alliance for American Quilts
American Folklife Center
American Quilt Study Group
DAR Museum
Illinois State Museum
IQSC
Mountain Heritage Center
MSU Museum
National Quilt Museum
New England Quilt Museum
Rocky Mountain Quilt Museum
Smithsonian
Winedale
Winterthur

Professions / roles:
curator
educator
grad student
historian
K-12
professor
teacher
undergraduate student
university

Quilts and social justice:
arts and social justice
arts and community

NAMES project
AIDS awareness

U.S. States with documentation projects represented or soon to be represented in the *Quilt Index*:
Connecticut
Florida
Hawaii
Illinois
Iowa
Kentucky
Kansas
Maine
Michigan
Minnesota
Nebraska
New Jersey
North Carolina
Rhode Island
Tennessee
Texas
West Virginia
Wisconsin
Wyoming

Countries outside the U.S. with quilt documentation projects:
Australia
Austria
Canada
Finland
France
Germany
Ireland
Italy
Japan
Netherlands
New Zealand
Norway
Poland
South Africa
Sweden
Switzerland
United Kingdom

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