

Technologies of Wonder: Rhetorical Practice in a Digital World

SECTION	Chapter 5
TITLE	Media Machines, Devices of Wonder
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OVERVIEW	<p>This chapter turns to the process of making new media as an epistemic practice, and recommends strategies for ethical rhetorical production of digital media that pay close attention to visual representation and the opportunities inherent in hypermediated arrangement. Returning to the wonder-inducing <i>techné</i> of the <i>Wunderkammer</i>, the chapter examines the habits of mind intrinsic to its construction—collecting, arranging, reflecting, and displaying—and demonstrates how they work together recursively as constructive knowledge-making spaces for students and researchers. Analyses of the assemblages of Joseph Cornell, Shelley Jackson’s “My Body . . . & a <i>Wunderkammer</i>” (1997) and Anne Wysocki’s “A Bookling Monument” (2002) offer old and new media examples of bricolage and juxtaposition that can be usefully applied to designing constructive, interactive, digital knowledge-making spaces. The chapter concludes with a discussion of digital arrangement in the classroom, focusing on visual strategies of invention and/as arrangement as they were deployed in two student projects in an intermediate writing course.</p>
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Media Machines, Devices of Wonder

Image: D. Winton, Astrolabe, 2004.

Above all, this chapter is about making: making hypermedia, making sense, making theory that explains and is explained by our making. Performative making answers Haraway’s call not only “for pleasure in the confusion of boundaries” between human and digital, mind and body, reason and emotion, personal and political, but also “for responsibility in their construction” (1991, p. 150). ¶ At this particular moment of remediation between print and digital media, the beliefs and ideologies that warrant claims for the primacy of linear alphabetic text in academic performances have become more visible, and are therefore more available for critique. Feminist analysis of these claims reveals that they attempt to limit the kinds of evidence and forms of representation that are acceptable, and thereby maintain a distanced disembodied standpoint from which a privileged few can claim to speak for all. Because of this claim of universal objectivity available to those few who have been able to set their material conditions aside, those who were less fortunate have long had difficulty gaining effective access to the public sphere. ¶ When rhetorical performance is deployed as a productive *technê* within networks of interactive digital multimedia and the social practices that inform their use, it uncovers the interests that are served by devaluing or excluding altogether visual argument and hypermediated linking as tools of scholarly pedagogical performance. Visual argument is an embodied practice that can literally reveal the particular circumstances of those affecting and being affected by various rhetorical positions. Bringing these material circumstances to light undercuts claims of privileged access to “universal truth” and substitutes in their place an array of situated knowledges through which to discover more egalitarian and inclusive positions as grounds for rhetorical action. Analysis of earlier, putatively objective, texts such as anatomical drawings, elocution manuals, and photographs of psychiatric patients demonstrates that these visual representations are in fact pedagogical performances that not only inform, but also convey specific social and cultural values and expectations. In the same way, many contemporary guidelines for visual rhetorical performance (e.g. Tufte, 1990, 2006; Williams, 2008) invoke an audience which values above all standards of brevity and transparency that efface the maker.

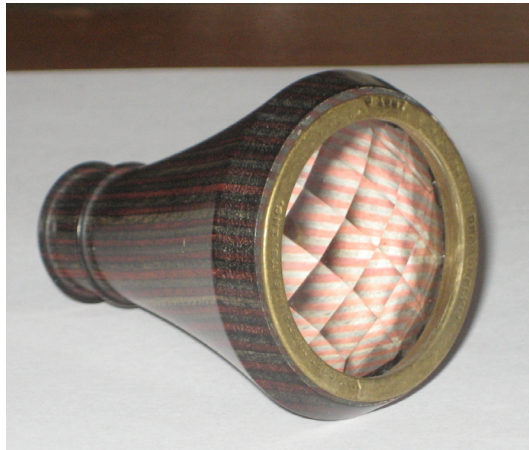


In addition to the use of visual representations in digital argument, hypermediated linking also undercuts positivist claims to universal truth by promoting associative, analogical knowledge-making much like that practiced by the makers of sixteenth-century *Wunderkammern*. When the canon of arrangement is re-imagined as an associative visual practice of arranging and rearranging evidence, multiple paths and places for rhetorical action emerge from which to choose; this discovery of a range of opportunities for intervention emphasizes a feminist regard for multiple perspectives and embodied subjectivities. And to reinforce the legitimacy of visual representation and of hypermediated linking as effective and appropriate *techné* of rhetorical performance, we can enact those performances in new media spaces.

Making constructive hypermedia is a process of mapping our physical and conceptual world in order to determine its meaning. Interactive digital media use the full potential of multimodal knowledge spaces where linked and movable words, images, sounds, animations, and other forms of information and evidence interact. I'm convinced of the importance of making as an epistemological act, the importance of visual and other sensory evidence as necessary to a full and fruitful epistemic space, and the necessity of embodiment as an ethical condition of the making and the made. Given these essentials, it is important that those of us who work with new media in our teaching and research represent ourselves and our scholarship *with* new media *in* new media.

In this chapter, I explore a range of digital technologies: hypermedia on the web; interactive CD-ROMs; computer-based image manipulation; animation software like Adobe Photoshop and Flash; and scientific devices for making and manipulating images. What these technologies have in common is that they all enable the design of scholarly

performances which embody theory, which articulate the confluence of visual arrangement and embodied practice. My goal is to call attention to how we may engage with these artifacts and the social technologies in which they are embedded through a practice of "critical wonder." I have argued previously that both users and designers should develop practices of embodied discovery by thoughtfully and imaginatively arranging and linking bodies of evidence. Therefore this section contains "small pieces loosely joined," a phrase David Weinberger (2002) used to describe the Web, but which is equally applicable to the associative knowledge-building spaces of physical and digital *Wunderkammern*. If, as I asserted earlier, *Wunderkammern* are productive objects-to-think-with about the process of associative linking as a material, embodied practice of ethical inquiry, then they can also be invoked as models for digital spaces where evidence can be manipulated and arranged toward those same ends of thoughtful inquiry and ethical rhetorical action. Beginning with an examination of the mechanical, optical, and electronic devices of wonder which, by making the familiar strange, help us see (and think) differently, I compare the visual tropes of reflection, refraction, repetition, distortion, and magnification deployed in both analog and digital *Wunderkammern* to their verbal rhetorical equivalents in order to expand our potential associative rhetorical strategies. Next, I explore the collages and assemblages of Joseph Cornell as analogical models for the principled construction of mobile, embodied rhetorical spaces. I conclude with a critical framework for embodying theory in professional hypermediated performances exemplified in "A Bookling Monument," an interactive digital project by Anne Wysocki (2002), and in "REFORM PUNISHMENT ART?" a multimedia classroom project by Austin Hart (2007).



▲ 5.1 Dioptric scope, 1987. Photograph by author.
Produced as an “optical amusement” by Van Cort Instruments, this lens multiplies images 24 times. The accompanying explanation reads in part: “You will find that there is an endless fascination to the multiple witness of simultaneous upright images . . . once, perhaps, unique only to a dragonfly.” The ability to optically manipulate and change objects creates new perspectives, and new opportunities for analogical linking, that are similar to those available through physical manipulation and arrangement.

Wunderkammer as Visual Practice

Until the end of the eighteenth century, wonder was considered “a form of learning—an intermediate, highly particular state akin to a sort of suspension of the mind between ignorance and enlightenment that marks the end of unknowing and the beginning of knowing” (Lugli, 1986, p. 123). And the process of assembling, examining, and arranging the contents of *Wunderkammern* (literally, chambers of wonder) epitomized this practice of wonder-induced learning. *Wunderkammern* are endlessly evocative. They speak to us of a sustained passion for imaginative discovery. They conjure up both broad obsession and meticulous attention to detail. I have discussed earlier the rooms and palaces given over to collecting, cataloguing, and displaying natural, artificial, and scientific wonders. But exquisite examples exist on a smaller scale as cabinets of curiosities that are no less compelling, small cupboards with doors and drawers and secret compartments filled with more diminutive delights. Of course, scale is one of the characteristics by which wonder is measured. Gigantic objects like skeletons of woolly mammoths and miniature accomplishments like portraits of Napoleon painted on grains of rice are equally evocative of wonder.

Of the *naturalia*, *artificialia*, and *scientifica* collected in *Wunderkammern*, *scientifica* are the most epistemically productive. While associative and analogical manipulation and interpretation of natural and man-made wonders led to significant intellectual projects (e.g. Linnaeus’ classification system), the scientific apparatus housed in *Wunderkammern* served not only as fascinations in themselves, but also as the means to examine and explore other objects. Tools for measuring, weighing, balancing, lifting, cutting, crushing, and joining were both objects for display and devices for experimentation; but of most interest to us in our investigation of visual technologies are optical devices such as telescopes, microscopes, and distorting lenses for magnifying, mirroring, multiplying, and otherwise manipulating the visibility and appearance of the objects on display. These devices served as the articulating link, the connection between macrocosm and microcosm, that constructed and transformed resemblance into generous understandings of the relationships of the cosmos.

5.2 Sebastian Delagrange wearing refracting spectacles, 2003. → Photograph by the author.
“Space Specs,” marketed in a science museum gift shop for play, not learning, promise to “simulate robotic sight” and “put things into funky focus.” They bear a remarkable resemblance to a pair of ca. 1650 “multiplying spectacles” in the collection of the London Science Museum, and to these nineteenth-century spectacles (right, origin unknown).



Many of the early “revealing technologies” (Stafford, 2001, p. 1) available to scientist and dilettante alike afforded the kinds of visual manipulations and arrangements made possible today with digital media. Mirrors and water globes provided additional illumination in often dim interiors. Convex and concave mirrors, lenses, and entire catoptric chambers which served to “enlarge, diminish, and distort the world” (Terpak, 2001, p. 256) appeared in many *Wunderkammern*. Magnifiers, spectacles, telescopes, and microscopes made previously imperceptible detail visible to the naked eye. Multiplying lenses, although often marketed as amusements, had the effect of making many figures of one, or one of many, functioning as visual synecdoches and reminding us that, as Hankins and Silverman (1999) note:

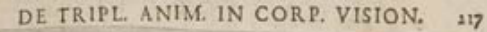
An instrument of natural magic may reappear as a philosophical instrument, as an instrument of entertainment, or as a practical “invention” in a new guise. To understand actual scientific practice, we have to understand instruments, not only how they are con-

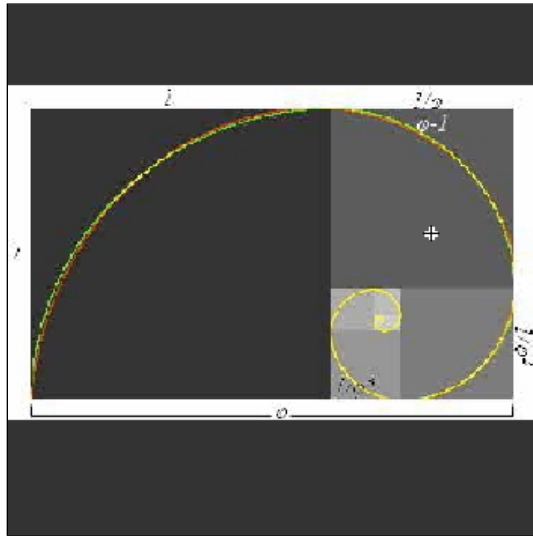
structed, but also how they are used and, more important, how they are regarded. (p. 221)

Wunderkammern as models of knowledge-making existed during the period when “natural magic” and experimental philosophy were practiced side by side. Optical “tricks” like prismatic lenses and anamorphic images were hawked by street vendors during the same period (1600-1670) that Galileo Galilei and Robert Hooke were developing their discoveries with telescopes and microscopes. Whether trick or scientific instrument, these were made from the same materials, often by the same craftsmen (pp. 4-5). In addition, natural magic and experimental philosophy were not mutually exclusive. Jean-François Niceron published *La Perspective Curieuse* in 1638 with illustrations of anamorphic images that required either optical instruments (mirrors and prisms) or specific physical positioning in order to observe their effects. His anamorphs were designed both to delight and instruct; for example, a drawing of twelve Turkish sultans, when viewed through a

The devices collected and put to use in *Wunderkammern* were deliberately employed for their optical effects, but we should not overlook serendipitous optical juxtaposition and association that took place through accidental reflection and refraction from the myriad surfaces of display cases, boxes, bottles, and apothecaries, and from the objects themselves. Indeed, the twentieth-century British painter Francis Bacon hoped to take advantage of this effect through the same mechanism; he deliberately framed his thickly pigmented portraits behind glass so that viewers might find their own faces superimposed on his paintings, just as creators and viewers of *Wunderkammern* often found themselves reflected in the displays. And today we too find ourselves juxtaposed through reflection with the images on our computer screens. Like the *scientifica* in *Wunderkammern*, digital media are “practical inventions,” imaginative descendents of instruments of natural magic, that we may use to multiply, magnify, mirror, and manipulate images and collections of images; at the same time they are also “philosophical instruments” which produce insight into the objects and concepts being explored through a rhetorical *techné* of manipulation and arrangement.

In this illustration, contemporary with the gradual transition from natural magic to the experimental method, it is the imagination (or wonder) that mediates between the world of the senses and the world of the intellect.





▲ 5.4 Spirals, 2008. Cyp, *Golden Ratio*, 2003; Virginia King, *Koru*, 2005; Loles, *Spiral Staircase*, 2006; NASA, *Galaxy*, 1997; Chambers Encyclopedia, *Archimedes Screw*, 1875; Stephen Arnold, *Medusa*, n.d.; Ethan Hein, *Nautilus*, 2008; Athanasius Kircher, *Selenic Shadowdial*, 1646; Josh Sullivan, *Spiral*, 2005.

Spirals, naturally occurring forms, have engendered a productive wonder with offshoots and applications in art, mathematics, mechanics, and mysticism.

Visualizing the Tropes

The making of knowledge through arrangement and visual analogy in a *Wunderkammer* is a process of analogical manipulation that is deeply rhetorical. Each arrangement of objects creates new taxonomies—based on materials, or seasons, or humors, or the four elements, or even size—that carry with them unique ways of seeing and understanding the world. Designing these arrangements calls for visual tropes that cultivate habits of mind required to engage with the rhetorical devices of metaphor, metonymy, synecdoche, hyperbole, antistasis, and catachresis (Burbules, 1998). Discovering the analogical properties of visual arrangements has the effect of “putting the visible into relationship with the invisible and manifesting the effect of that momentary unison” (Stafford, 1999, pp. 23-24). And because it focuses on affinity rather than on difference, it is more likely to produce rhetorical effects that are collaborative and communal.

Visual metaphor, metonymy, and synecdoche are practices that reveal in various ways similarities-in-difference, the critical linkages that Stafford identifies as the foundation for ethical action. Metaphor draws upon the participatory aspect of analogy, that if two things are similar in some ways, then it is likely that they will be similar in others, an insight that is critical to the formation of community. Metonymy and synecdoche are also participatory analogies, identifying affinity-through-juxtaposition and affinity as part of a whole. As with verbal tropes, the meaning of a visual analogy is not necessarily immediate or obvious, nor will it be identical for every viewer. The role of visual juxtaposition and manipulation is to provide an opportunity for the discovery of affinities, but chance, of course, favors the prepared; we must be looking in order to see.

Metaphor, metonymy, and synecdoche rely on visual arrangement and rearrangement as means of discovery. Hyperbole, antistasis, and the “vicious” trope catachresis require active visual manipulation for their effects; they bring into play the proportional aspect of analogy, which relies on ratios or degrees of difference which, as Stafford notes, first require a recognition of resemblance. Nicholas Burbules argues that it is difficult to think of hyperbole as a trope on the Web because the entire Web is hyperbolic, always claiming a comprehensiveness and reach it cannot fulfill. However, hyperbole, through visual exaggeration or magnification that often

focuses on scale or number, works to reveal subtleties that may have been overlooked, while at the same time its attempt to “fill our vision” throws what is *not* present there into even higher relief. Antistasis, because it relies on difference in context to reveal both gaps and affinities, is both participatory and proportional. Moving among visual contexts and groupings, and manipulating scale and other effects within a single context, antistasis uses both reflection and repetition to provoke insight.

Finally, catachresis, the (apparent) misuse of words and images, is perhaps the most fertile source of wonder of all, for it depends on the “Aha!” moment when two words, two objects that appear totally unrelated, absolutely irreconcilable with one another, are, through artful juxtaposition and visual distortion, suddenly joined. Burbules says this experience is the essence of the hyperlink:

Any two things can be linked, even a raven and a writing desk, and with that link, a process of semic movement begins instantaneously; the connection becomes part of a public space, a community of discourse, which, as others find and follow that link, creates a new avenue of association—beginning tropically or ironically, perhaps, but gradually taking on its own path of development and normalization. (p. 116)

Collin Brooke (2009) has cautioned against the “normalization” of metaphoric language which, over time, may be mistaken for the Truth of its subject, rather than a means to imagine one possible perspective among many. Yet metaphor, metonymy, and other figures of *speech* all began with *visual*, material comparison and reflection, and if the verbal tropes that resulted have lost their imaginative effect and become

stale, a return to the visual can restore their rhetorical weight. Take, for example, the synecdochic “head of state,” so transparent now through everyday use as a verbal trope that we scarcely give it a thought. Recollected as a *visual* figure, however, we can more readily explore what *kind* of head we are imagining as the locus of state authority. To consider just three cases previously cited: Is it the reflective head that filters sensory input through the imagination (Merian, 1619)? The architectural head whose eyes are “windows to the soul” (Kats, 1708)? Or perhaps the more computational head populated by busy mechanics and their machines (Kahn, 1926)?

[Click images to enlarge.](#)

The physical mobility of objects in a *Wunderkammer*, and the cognitive mobility that the process of analogical visual troping implies, both foster associative habits of mind that can be equally well employed in the construction and manipulation of digital media designed as technologies of wonder and discovery.

- ▲ 5.5 Darryl Erez-Hutchison, *The Narcissism of Small Differences*, 2007.
 In the short stop-motion film from which this still was taken, Erez-Hutchison explores the symbiotic relationship between the ambiguous figure and its shadow. Unlike the agonism Freud predicts between individuals and groups who perceive themselves to be *almost* alike, when this figure makes contact with its shadow, the walls fall away, and it discovers they are one and the same. [Click image to link to online video.](#)

Resemblance & Affinity

Analogy, like consciousness, is an embodied practice. Stafford (1999) associates visual analogy with somatic cognition, but points out that this embodiment of thought is based upon a simultaneously very old and very current view of the thinking process as combinatorial. This connection links the two ages of wonder and analogy: the time of the *Wunderkammer* and the time of the computer. During the period in between (from the Enlightenment to the recent present of the Modern), an abstract, computational model of the brain pertained that is only now being challenged by biologists, neurologists, linguists, and other cognitive theorists.

The difference . . . is difference. Whereas the computational brain was purported to work through the identification of minute and perseverating difference, the combinatorial brain works through homologies and affinities, through subtle and supple similarities-in-difference, a feminist-inflected affirmation facilitated by “revealing technologies.”

Interestingly, when we look at the early use of such technologies as microscopes, magnifying globes, and refracting lenses, we do not find the hard distinctions made today between scientific and personal exploration, or between demonstrations mounted for instruction and for amusement. Learning and play did not seem such different tasks. Today the line has been drawn so brightly that scholars in the humanities still argue over the merits of popular culture and media studies as legitimate fields of study, and look suspiciously on researchers who seem to spend all their time “playing” with computers.

Computers, software, and the social technologies in which they are embedded are contemporary devices of wonder. Like *scientifica* in a *Wunderkammer*, they are both the means for examining, displaying, manipulating, and understanding other artifacts, and are themselves objects of fascination. Interactive digital media can be designed as technologies of wonder, epistemically active digital *Wunderkammern*, spaces where we can accumulate, explore, and make meaning from a superabundance of visual, verbal, and auditory materials in digital formats. As an example, Picture Projects, based in New York, uses sound recordings, photography, and video technologies to look at thorny social issues; among their ventures are the *Sonic Memorial Project* (2002-2006) a compilation of sounds and voices from 9/11 created for National Public

Radio, and *360 degrees: Perspectives on the U.S. Criminal Justice System* (2001-2009), which includes photographs, transcripts, interviews, historical background, statistics, and timelines to create a rich context for understanding the lives of inmates, relatives, friends, police officers, judges, wardens, lawyers, victims, and other individuals who become caught up in the criminal justice system. On the opening screen, five circles appear in sequence, each to the sound of a slamming cell door. Labeled “Stories,” “Dynamic Data,” “Resources,” “Timeline,” and “Dialogue,” they float slowly around the screen until the viewer moves her mouse and discovers that each circle is a link. Clicking on “Stories” reveals a row of eight unlabeled circles containing images of faces or buildings; choosing one face at random brings up a brief narrative of the drug possession conviction of Darryl Best, and the faces of five more people appear (see Figure 5.6). Each new face leads in turn to audio clips of interviews with two policemen who set up the sting operation which resulted in Best’s arrest; a lawyer who defends drug offenders; a judge who works for drug law reform; and Best’s wife, Wanda. Other links provide equally deep and rich information in words, numbers, images, and sound, and also the opportunity for visitors to contribute their own comments to the growing compendium.

360 degrees is a working model of a digital *Wunderkammer*, with evidence collected, manipulated, and arranged in such a way as to encourage critical exploration and thought. Like a *Wunderkammer*, this hypermediated Flash website contains “disparate objects, gathered

in different places and at separate times,” that must be “hyperlinked” through the viewer’s insightful ‘jumps’” (Stafford, 1999, p. 122). Their rhetorical effect will accrue from the rational use of historical and statistical information; the ethical use of an invitational structure that allows viewers to add their own interpretations, comments, and stories; and the empathetic use of images, voices, and embodied narratives.

This balance among kinds of evidence and the appeals they construct is essential to a structure of argument that values embodied persuasion and multivocal perspectives. Visual argument often contains a greater emotional component than verbal argument, but that cannot be a reason to exclude it, when both seeing and feeling are necessary for understanding and action. One of the enduring critiques of the use of

5.6 Screen shot from *360 degrees: Perspectives on the U.S. Criminal Justice System*. ➤

images in academic discourse is that images are inherently manipulative, that like Rose's landscapes (1993) or Berger's nudes (1972), they elicit both desire for the object and fear of contamination by it. It seems to be the particularity of bodies of evidence that raises fears about affective and emotional argument. For example, dispassionate statistics on the effects of mercury in industrial run-off or details about the number of single parents who are college students are regarded as acceptable forms of academic evidence; but graphic photographs of wildlife kills, video clips of a student-mother's day, or the images and voices from *360 degrees* are often judged to be cunning and inappropriate when presented as primary evidence for a principled position.

Feminist analysis shows the advantages of a disembodied rhetoric for those whose bodies are both privileged and "unmarked," and calls attention to the prerogatives that differentially accrue from the naturalizing of objectivist, dematerialized thought. But it is also important to make a direct case for affect and emotion as legitimate tools of a rhetorical *techné* to counter arguments against the use of images and other sensory evidence. The process of ideological formation works through the naturalization of what are actually cultural constructs; and once constructs such as the family, gender/sex, and practices of religion, education, and government have grown to be "givens," it becomes difficult or impossible to see or step outside of beliefs and behaviors authorized by those constructs without being labeled either pathological or criminal. Lynn Worsham (2002) asserts that, just as socially "acceptable" beliefs are learned responses to the prevailing ideology, so too acceptable emotional behaviors, and beliefs about emotions, are learned within the same ideological framework. Objections to visual argument in scholarly

performances are founded on learned beliefs about the inappropriateness of emotional appeals in academic argument that have their roots in a disembodied Cartesian duality. Refusing the ideological binary that "regards emotion as reason's other," Worsham argues that emotion is instead "a tight braid of affect *and judgment* [emphasis added] that is socially and historically constructed and bodily lived." She asserts that "ideologies of gender, race, class, and sexuality are properly understood, at least in large part, as ideologies of emotion; they provide the conditions in which a primary affective mapping of the individual psyche occurs, one that sets the stage for all subsequent socialization" (p. 105). Therefore racism, heterosexism, and other "disorders of affect" cannot be countered solely through rational argument; it is necessary to address the learned emotional dispositions that sustain these "pervasive affective attunement[s] to the world" so that we may recognize and interrogate the process through which emotional responses "support the legitimacy of dominant interests" (p. 106). Furthermore, reframing ideological formations as both cognitive and emotional also exposes the linking of emotion with the personal and private (rather than the political and public) as a cultural construction.

The cultural bias toward propositional logic foregrounds the need for the intellectual work of rhetoric and composition to theorize *pathos* as complementary rather than subordinate to *logos*, to recognize image as partner of word, and to re-embody rhetoric and rhetorical theory as materially embodied and political work. Embodied visual argument thus becomes the critical link between emotional and rational appeals in the "tight braid" necessary for ethical action. Digital media offer a venue for just such combinatorial practices.

Visual Alchemy & Joseph Cornell

I think a lot of these specimen cases, like those little vials and so on, these are the kind of very humble ingredients of a visual alchemist.
Walter Hopps (2003) on Joseph Cornell

As comprehensive and inclusive as *360 degrees: Perspectives on the U.S. Criminal Justice System* appears to be, the range of possible people, places, words, images, and sounds that were considered by the designers remains opaque to the viewer, as do the design choices they considered and rejected. While visitors may still constructively explore the website to develop a basis for rhetorical belief and action based on their own selections, comments, and interpretations of the material in *360 degrees*, their choices have already been limited in ways that they cannot see.

This gap is closed when readers become composers, when users become designers, and they construct for themselves both a digital *Wunderkammer* of evidence and the potential associative connections available through arrangement and manipulation of that evidence. Burbules (1998) argues that bricolage and juxtaposition can be employed in the making of constructive hypermedia, as they are amenable to the open, rhizomatic character of the Web (pp. 106-7, 117-20). They also intersect with other mechanisms of associative discovery in *Wunderkammern*. In a hypermediated bricolage of visual, verbal, and auditory texts, the *ethos* of the designer can be made explicit through the ready-mades and newly-mades she constructively juxtaposes, and the success of the project can be measured by the critical user's perceptions of the fluidity of the arrangement and the communicative weight of the associative links.

We can learn much about the reciprocal relations of reason and emotion, and about the epistemic nature of rhetorical arrangement, from the wonder-inducing box-logic of Joseph Cornell (1903-1972), the American assemblage and collage artist. Cornell's shadow boxes—

▲ 5.7 Joseph Cornell, *Cassiopeia #1*, front (top) and back (bottom), 1960.

As with many of Cornell's assemblages, every surface, inside and outside, is provocative of both wonder and delight, rewarding repeated viewings with analogical insights into the connections among, in this example, astronomy, travel, optics, maps, motion, and the ephemeral existence of soap bubbles. [Click images to enlarge.](#)

Wunderkammern in miniature—provide models for using bricolage and juxtaposition to create associative, multimodal environments that can be usefully applied to designing constructive, interactive, digital knowledge-making spaces. Cornell’s constructions were made of “found” objects; he haunted the bookstores and junk shops and street markets of New York City looking less for specific items than relying on the serendipitous discovery of artifacts he associated with his particular obsessions for maps, romantic opera, owls, the Medicis, and more.

Cornell’s themes appear eccentric and mysterious at first glance, and Joseph Janangelo (1998), like many people on their first encounter with his assemblages, found him “indiscriminate in his collections, recondite in his references, and arbitrary in his juxtapositions” (p. 32). Janangelo recognized a striking similarity between his first reaction to Cornell’s boxes and his initial resistance to hypertexts his students unexpectedly submitted instead of print-based papers. Upon further reflection, he noted that when considered as compositions, Cornell’s creative juxtaposition of objects within each box “signals a careful rhetor who researches his subject, composes with specific communicative intentions, and endows his text with a discernible coherence” (p. 40); and he proposed that “[Cornell’s] work and ideas about composing suggest a shaping strategy that can help authors [of hypertext] transform ready-made material into coherent and persuasive nonsequential text” (p. 31).

In this early piece on the relationship between hypertext and conventional academic composition, Janangelo is prescient in recognizing that teachers should be open to other demonstrations of scholarly understanding than those produced through traditional linear argumentation, and that “the act of selecting and linking texts is a challenging intellectual activity” (p. 27). In trying to come to terms with his first experience of student hypertexts and how they might be composed to

meet academic requirements for argumentative coherence, Janangelo suggested that an effective hypertext author should follow a rigorously minimalist process: student writers should not “indulge in casual accumulation and juxtaposition of readymade materials,” but instead “[engage] in attentive reading in order to develop a solid knowledge base, meticulous craftsmanship to insure that the links cohere, and careful revision in order to distill extraneous material from his work” (p. 40).

This is effective advice if the goal of the exercise were to reproduce the standards and strategies of a print essay. But I would argue that moving too quickly to eliminate what seems peripheral or superfluous, whether words or images, may prematurely put an end to the epistemic potential of ambiguity and excess that are not only significant attributes of Cornell’s work but also of fruitful *Wunderkammer*-like environments for exploration and discovery in new media. Furthermore, I believe that ambiguity is as generative for users of hypermedia as it is for their composers. New media explorations can be as provocative and persuasive as a Cornell box; their ambiguity encompasses the fluidity and uncertainty and provisional nature of any truly rhetorical situation, refusing to shut down what John Caputo (2005) calls the “condition of possibility of everything worthy and important” (p. 18).

Two strategies Cornell employed to maintain this provocative ambiguity included the use of “moving parts” and of accumulative visual layering that selectively obscured and revealed individual elements of his constructions. *Solomon Islands* (1940-42), one of a group of “travel boxes” that also includes the well-known *Object (Roses des Vents)* (1942-1953), shows both of these strategies in full bloom. *Solomon Islands* is a wide, flat box that, when first opened, reveals a printed map of the Solomons pasted to the inside of the lid and a flat board into which are set 20 small compasses, each surrounded by a cut-paper compass star.

5.8 In a Paris Arcade, 2010. Photograph by Lana L. ➔
An illustration of the productive relationship among accumulation, association, and the emergence of intelligible pattern is modeled in the interior of this Paris shop.

Cornell used maps of the seas and sky in many of his constructions, providing an abiding trope of searching and discovery and a micro-macro contrast within the contents of each box. However it is often through the manipulation of these contents that the box's more complex associations begin to emerge. In *Solomon Islands*, each compass can be removed from the circular hole in which it sits, exposing tantalizing glimpses of images and objects—a cockatoo, a butterfly, a starfish, a coiled watch spring, two tiny packages tied with string—behind glass.

Many of Cornell's constructions made use of the evocativeness of the partly-seen, using screens with holes, frosted glass, layered paper and wood, sand, bottled objects, and mirrors to provide multiple perspectives while never revealing all, insisting that the viewer both accept the ambiguity and continue striving to construct meaning in the gaps. In *Solomon Islands*, removing the frame that holds the compasses reveals sixteen compartments whose layered contents are more or less visible behind clear or colored glass, and which contain microcosmic selections of *naturalia*, *artificialia*, and *scientifica* connected with the discovery, exploration, and mapping of the islands. Through their artful arrangement, Cornell employed a visual alchemy that had the metonymic effect of turning base materials into precious, the mundane into the meaningful.

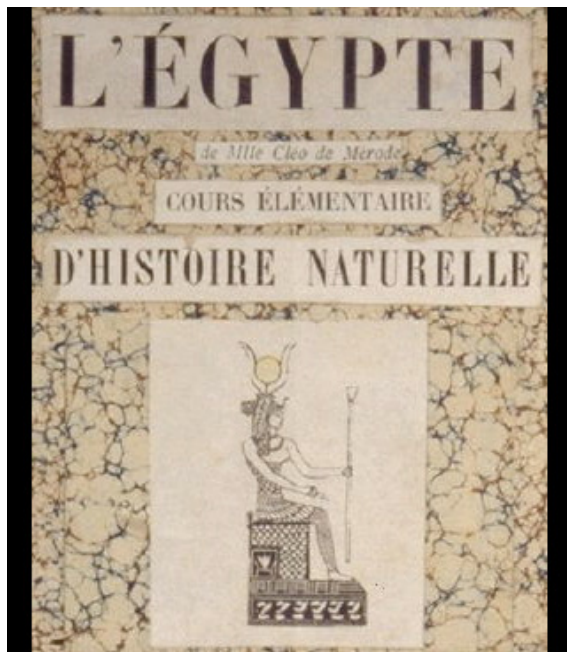


Cornell's many letters, notebooks, and journals survived him, as did the houseful of exhaustively catalogued boxes and cases and shelves of clippings, cuttings, prints, soap bubble pipes, wine glasses, shells, bottles of sand, cork balls, and thousands of other treasures he collected for possible use in his intricate constructions. Through this accumulation, we gain extraordinary access to the world of ephemera from which he chose his materials, and we are also given a model of the way in which material might be collected and arranged in an epistemically active and pedagogically performative space.

Another example of such a space appears on the DVD *The Magical Worlds of Joseph Cornell* that accompanies the centenary celebration *Joseph Cornell: Shadowplay, Eterniday*. Produced by the Voyager Foundation, it is an extravagantly detailed account of Cornell's work, interests, collections, and life. Images of Cornell's constructions can be digitally rotated and taken apart. Viewers can listen to the voices of friends, critics, and curators; watch the short films Cornell made; read his letters; and rifle through the boxes and files of photographs, programs, music sheets, shells, even a tin box labeled "Pulverizings/Dust" filled with vials and bottles of variously colored particles.

Yet—and this is what is important from a perspective that values the particularity of multiple and embodied perspectives—there is no definitive path through the material on this DVD, no overarching ideological or interpretive scrim through which the viewer is directed to understand Cornell's work. It is a stunning, excessively rich, visual, auditory, and verbal space, an exemplar for combinatorial, knowledge-making pedagogical performances in manipulatable, multilinear, new media.

Still, by concentrating primarily on Cornell's obsessive collecting, we risk succumbing to a version of aesthetic masculinity (Rose, 1993)



5.9 Joseph Cornell, *L'Égypte de Mlle Cléo de Mérode*, 1940.

Like so many of Cornell's assemblages, *L'Égypte* insists on interactivity, requiring that the box be opened and the objects within taken out, handled, and viewed from every angle in an unfolding experience of intellectual and sensory/sensual discovery.

in which intellectual fascination and a desire for possession are the sole ambitions. The significance of Cornell's work lies in the selection and arrangement of the *objets trouvés* from which he painstakingly chose materials for his collages and boxes; it is that bringing-together which, through analogical association, produces the visual alchemical effects and the discovery of affinity and meaning among disparate things. We and our students can select from the abundance of material evidence we collect in the same way, then arrange those selections in interactive digital media to activate the discovery of similarities-in-difference that produce rhetorical grounds for action.

We may also take a second lesson from Cornell, a lesson about re-arrangement and re-vision. Like many artists, he worked in series, producing variations on the themes of soap bubble toys, Medici Slot Machines, and celestial navigation, a model for us of the visual tropes of repetition and small variation, and the reason we should seek mobility in multimediated spaces. It was also his habit to revise individual works, sometimes asking people to whom he had sold or given boxes to return them for changes, certainly a model for introspective wondering over time.

Finally, we must not lose sight of the fact that Cornell's constructions were "ground[ed] in the actual and the concrete," and that "Cornell's interpretation of found objects was distinctive because it also

encompassed information—fact upon fact upon fact—that he accumulated about people, events, places, and phenomena" (Hartigan, 2003, p. 24), a reminder that we must begin with a productive excess of material evidence for our embodied digital projects.

Cornell's work reinforces the connection between making and knowing that is central to the *techné* of arrangement in composing interactive digital media. Designing visual spaces is a process of discovery through arrangement. And so is viewing them. Cornell did not expect his assemblages to sit on dusty shelves; he hoped that they would be handled and explored. (We know this because he sometimes provided "instructions" for their use.) This shifts the obligation to learn by doing to the viewer, whose responsibility it becomes to make sense of each object and text. This is no less so for complex digital media pieces. Viewers, like the owners of Cornell's boxes, must bring to the work a desire to manipulate and understand the visual on its own associative terms, just as they would expect to engage with the persuasive qualities of more familiar written argument. The habits of mind developed through designing and viewing interactive digital *Wunderkammern*—habits of patient exploration, slow rumination, and a tolerance for ambiguity—encourage the growth of "fine-grained formulations of resemblance and distinction" (Stafford, 1996, p. 30) that inform a heuristic, situated, mobile, and ethical *techné* of visual arrangement.



▲ 5.11 Andrea K, Self-portrait, 2007.

↑ this can. For Mitchell, these “pictures about pictures” place the complex relationship between images and their referent in high relief, and raise important questions about the nature of visual representation. Not that there are “real” answers to these questions. Rather the images themselves point to the dialectical nature of images and words, of the seeable and the sayable, that suggests the necessary instability of their meanings and relationships. And if these metapictures are themselves both the beginning of a theory of pictures and an embodiment of that theory manifest in the perceptual oscillation that they bring about, then we might also say that both

Embodying Theory

In *Picture Theory*, W. J. T. Mitchell (1994) argues that we can make all kinds of claims with words about what pictures are and what they do, but the doubly connotative gesture of “picture theory” conjures up both “theory about pictures” and “pictures of theory” in a way that is unavailable through words; in other words (Mitchell’s words), rather than attempting to “master the field of visual representation with a verbal discourse,” we should disrupt the received “power relations of ‘discourse’ and ‘field’” and instead try to “picture theory” (p. 9). As examples, Mitchell draws on what he terms “metapictures,” including Saul Steinberg’s “New World” and Alain’s “Egyptian Life Class,” both cartoons drawn for the *New Yorker*; fort-da images like the variously rendered duck-rabbit; Velasquez’ *Las Meninas*; and Magritte’s *The Treachery of Images*.

Of course, this list of iconic images that the reader can neither see nor perhaps imagine or clearly remember, stands as evidence that names or descriptions of pictorial representations do not *mean* the same as the pictorial representations themselves, and no description of, for example, Andrea K’s self-portrait of herself taking a photograph of herself taking a photograph of a mirror-windowed building, can explain the complicated dance of photographer and her art in the same way that

Wunderkammern and the work of Joseph Cornell bring about similar oscillations, and have a similar *meta-* effect, in large part because of their interactive mutability. *Wunderkammern* are “worlds about worlds,” demonstrating through re-arrangement and reflection the partiality of any one view; and Cornell’s boxes are “art about art,” embodying perspectives on materials, mobility, metaphor, and use.

Given the rich potential of approaching a theory of pictures through “picturing theory,” and theories of world-view and art through the media of *Wunderkammern* and art itself, it seems reasonable to make the same gesture with new media and attempt (and Mitchell agrees that it is always only “an attempt”) to find a way toward a theory of embodied digital representation through “embodying theory” in new media. An early example to point to is Shelley Jackson’s *Patchwork Girl* (1995), a hypertext fiction created in Storyspace. Jackson fashions Mary Shelley’s monster as a woman and her maker, not Dr. Frankenstein, but Mary Shelley . . . and Shelley Jackson. Jackson’s dark drawings and accompanying GarishMonde text use “stitching” as both metaphor and hypermediated technique to comment on the multiple subject positions the viewer is called upon to occupy. In *My Body . . . & a Wunderkammer*, a web-based hypertext published in 1997, Jackson conducts a similar exploration of identity through the associations and narratives connected to the parts of her own body, which the viewer enters by clicking a full-screen, labeled, white-on-black, sgraffito map (Figure 5.12). Choosing the toes leads to a reflection on Jackson’s childhood fantasy of toe-dancing: “If other bodies could do things, magical things, that I couldn’t even approximate, then a body was like a [cabinet of wonders](#) inherited from a great-aunt.” She continues:

As a matter of fact, I am making a replica of this text: a huge wooden chest in the shape of my body, with innumerable drawers in which I will store my findings. Some of the drawers will be large and capacious, some smaller than matchboxes. Some will be *disguised*, some will be *booby-trapped*. I will hide secret buttons, levers and locks in my carved folds and crevices. You will have to feel your way in. (n.p.)

5.12 Shelley Jackson, Whole Body (detail), 1995.
Click image to visit website.

Jackson takes full advantage of the potential for linking chunks of text, using words to carry the weight of her theoretical position on embodiment (which was most often the case with early hypertexts). Yet she works skillfully with small graphic “body parts” and shifts in color, color inversion, size, font style, and positioning of her text to push the viewer toward seeing the words as rhetorically active images. (One of Jackson’s more recent projects, begun in 2003, is a 2095-word fiction titled *Skin*, each word of which is tattooed on the body of a different person who becomes, not the carrier or field for the word, but its embodiment. While not a digital project, *Skin* is most emphatically new media.)

Each of Jackson’s works is an embodied example of what Mitchell calls “imagetexts, . . . composite, synthetic works (or concepts) that combine image and text” (89n), which Mitchell differentiates from “image/text,” a gap in representation such as that between the images and text of William Blake’s *Songs of Innocence and Experience*, and “image-text,” which refers to “the *relations* between the visual and verbal.”

One of the most fully realized instances of interactive digital media in which the visual representations of both images and words embody theory is Anne Wysocki’s “A Bookling Monument” (2002), which appeared in a special issue of the online journal *Kairos* on teaching

←
5.13 Anne Wysocki, opening screen of
“A Bookling Monument,” 2002.

Click image to view “A Bookling Monument” in *Kairos* (Adobe Shockwave Player is required).

and learning in virtual spaces. This is a new media text, a scholarly pedagogical performance about words in books. The perspectives of Lev Manovich (2001), Judith Butler (1993), Don Ihde (2002), James Elkins (2000), Manuel Castells (2004), N. Katherine Hayles (1997), and others are called upon to “theorize with words” the embodied existence of the book and its insistent influence on the ways we “see” ourselves, physically and cognitively. We read Wysocki’s words too, but as reflective and curious, rather than argumentative or summative. What Wysocki shows us, though, is what we cannot see in words on a page—what we literally read between the lines in her text, and also what we learn about bodies and/as texts through her image-making *that could not mean the same in words*. In fact, there is no verbal equivalent, no alphabetic “first draft,” for the shape and content of Wysocki’s work in “A Bookling Monument.” I will explore more thoroughly two aspects of the text—a visual trope that binds much of her argument and an animation that enacts it—but first, an overview.

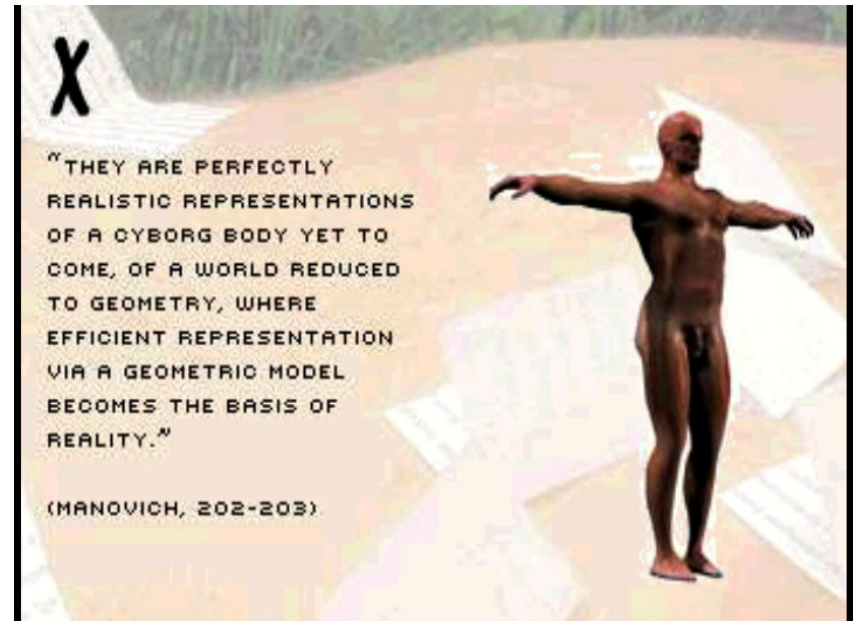
The opening screen (Figure 5.13) depicts a tight close-up of bare skin, perhaps a back, or a stomach. Above and behind we see tangled, weedy grass. Twelve loosely folded slips of paper, and a housefly, are scattered across this naked surface. The anomaly of this setting disturbs our sense of public and private, inside and outside. Whose is this naked body? What is it doing outside? We feel the tickle of the paper . . . and the fly. Moving the cursor over this screen reveals that each slip of paper and the fly are links; two hidden links also appear—an eye and a scar on the flesh. The movements of the papers and the appearance of the eye and scar provide more tangible evidence of materiality: we “touch” the eye with the cursor, and it moves, it changes, it looks back. If we click on the scar, it opens like a trapdoor and reveals a pulsing, beating tongue. The body speaks.

Wysocki’s words, quotations, and images develop several interconnected assertions that reflect on the relationships of books to bodies in an age of remediation. As we explore, we gradually uncover her claim that traditional books, whose contents are contained and unified between two covers, inflect our sense of our unified selves, with our subjectivity neatly packaged inside our skin. We also discover that representing this binding of book to body visually on a computer screen leads us to feel less comfortable with this representation. Through analyses of four hypermedia projects—*Myst* (1994), *Throwing Apples at the Sun* (1995), *Red Riding Hood* (2000), and *The Disease Manifesto* (1999)—each of which uses the book as a controlling trope while undermining our sense of what can be contained within its covers, Wysocki asks us to see books as potentially possessing a “less orderly, less fixed set of characteristics” that might cause “discomfort, if not anxiety, about diffuse, fragmented, flowing, non-fixed bodies and subjectivities that digital practices seem to be calling forth” (n.p.).

There is much more to “A Bookling Monument”; the paragraph above touches only glancingly on the imagetexts that open up behind two of the slips of paper in the opening screen. No map suggests which of these papers comes first, or second, or last. Nor are there hints in the work of the order of its making. However we may focus on two visual devices to demonstrate how Wysocki’s work “embodies theory.” The first is a visual trope I will call “in-between-ness” that unfolds in various ways throughout the piece. In one section, pages populate a book, but as the book is completed, it slowly dissolves into a lively vibrating network of nodes and lines. Touching a node reveals a text, but it is hard to keep it on the screen; we are in the process of changing the way we read, the way we “hold our place” in a text. In another section, streams of letters and numbers run through the fingers of a shimmering X-ray hand, but

we must touch between the writing/written fingers to read Silvio Gaggi (1997), Elkins, Castells and others on the fluid indeterminacies that literally and figuratively support our material sense of ourselves. In a third segment, fragmentary grey lines of text on a page are obscured by slashes of color moving rapidly back and forth across the screen, although we can catch phrases: “only visible in certain lights,” “written on the body,” “the palimpsest so heavily worked.” Touching the spaces between these lines activates moving text that speaks to new ways of reading and representation on the screen, and new patiences and practices of memory that we might need to develop, and we realize that the grey text and moving slashes are themselves the experience of in-between the page and the screen.

The second visual embodiment that demonstrates the incommensurability of images and words while at the same time arguing for their obdurate equivalency as rhetorical strategies appears in a small, semi-transparent rectangle overlaying the main screen. The first screen (Figure 5.14) contains a quote in block type from Manovich (2001): “They are perfectly realistic representations of a cyborg body yet to come, of a world reduced to geometry, where efficient representation via a geometric model becomes the basis of reality” (pp. 202-203). To the right of the quote stands a naked man, arms outstretched. Touching him with the cursor causes him to arch his back; when we click, he arches forward, sits down, pulls his knees apart with his hands, and, as he does so, he morphs into the book we have seen on other screens. I use the word “click” here, but because the cursor is that small white hand, and, as with the earlier example of the scar, I am touching a body when I point to it with the cursor, my clicking feels uncannily like pushing or poking a person, rather than merely clicking a mouse button. Neither a description, nor the series of screenshots reproduced on the next page,

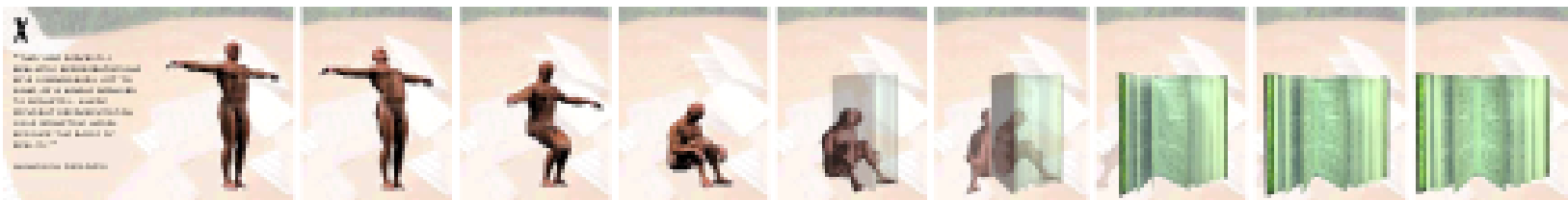


▲ 5.14 Anne Wysocki, screen motion capture from “A Bookling Monument,” 2002.

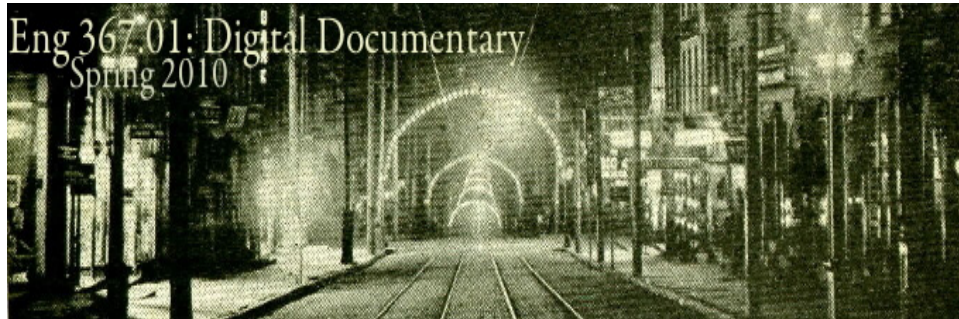
nor a detailed analysis of the scene, can convey the same deep sense of the imbrication of books and bodies as this juxtaposition of words and animated images.

Depending on what we have already seen and read, or on what we bring with us to the work, we may connect this imagetext to the in-between-ness we have seen in other sections; to our identification of our selves with the unity of the book; to the nakedness we feel in representing ourselves visually to others as an open book; to the postmodern cyborgian relationship between the technology of the material body and the technology of the machine-made book; or to the tensions between or the identification of maleness with textuality, rationality, and the fixity of the book. Each of these visual associations and analogical moves embody theory in their foregrounding of the multiplicity and indeterminacy of the screen, and the resultant richness of our interpretive

forays. “A Bookling Monument,” anatomical drawings, elocution manuals, clinical photographs of mental patients, graphic design manuals, and *Wunderkammern* together constitute pedagogical performances of the relationship between embodiment and visual/verbal texts, between the explicit or implicit body on the page and the social and cultural contexts within which it is embedded, and of which it unavoidably speaks. Unlike those texts (with the possible exception of the *Wunderkammer*), “A Bookling Monument” functions as a self-conscious technology of wonder that slowly and patiently reveals, for the viewer to arrange and piece together, the connections between book culture and its material effects on our embodied sense of self. Making hypermedia with our students and as part of our own academic performances promotes a similarly productive *techné* of embodied inquiry.



Digital Arrangement in the Classroom



▲ 5.15 Main Street, Mansfield, Ohio, ca. 1900.

How do digital visual arrangement and “critical wonder” translate into classroom practice? My students in Intermediate Writing on a regional campus of The Ohio State University focus specifically on the concept of visual arrangement as a *techné* to develop plans for civic participation and advocacy. Students investigate their own environment; they collect, arrange, and manipulate evidence to gain multiple perspectives on a single building in their post-industrial downtown area; and they use this evidence to compose nuanced proposals for the use of urban space.

In the process, they become advocates for change and gain a sense of their own ability to bring about that change. Arrangement thus functions as both a method of invention and a means of intervention, situated squarely on the streets and sidewalks of their home town.

I’ve always been interested in the rhetorics of civic participation, but most of the students on the campus where I teach are first-generation, working-class students with few external models for how to translate the work they do in the classroom into plans for civic action in the worlds of work, worship, family, and community that they inhabit beyond their academic environment. Influenced by the consumer model of education that is so prevalent today, many see their education as primarily a credential, and perhaps a set of functional skills, rather than as the acquisition of habits of mind and thought. They tend not to see the structure of the world they live in as changeable; furthermore, many do not see their world as in need of change, and even if they do, they don’t picture themselves as agents of that change. Matthew Levy (2005) maintains that this cynicism comes from a peculiarly postmodern detachment from a world whose social and cultural institutions seem warped and dysfunctional, while at the same time participation in them remains singularly alluring. A learned survival strategy, this sort of cynicism manifests itself in the form of “a melancholy or boredom that leads people to neglect or underestimate their powers and to facilitate their own manipulation” (p. 349).

In the classroom, student cynicism often takes the form of resistance to critical pedagogy, a cynicism that both “presupposes and disarms critique” (p. 347). Students react negatively (and perhaps rightly so) to overtly political curricula of institutional critique. My previous assignment sequence in this course, which asked students to choose a local social issue, research it, and produce a public service announcement, often resulted in trite, clichéd videos that could have been about anyone, anywhere. As Levy notes, students remain detached from such assignments because they “learn very quickly that ideological examination devastates their belief structures, their libidinal wants, and the means that their culture uses to provide for their material needs” (p. 349-50). In addition, political and cultural critique often fails to provide a solution for students to the newly discovered cracks in their own belief systems. “It should not be surprising,” concludes Levy, “that many of them are turned off by a heuristic that reveals their participation in something ugly and then leaves them in that ugly place” (p. 356).

Nevertheless, I’m committed to a pedagogy that encourages civic advocacy and action, which implies that there are conditions in civic life that need to be fixed, and beliefs and actions that need to be advocated for. Yet critical pedagogy can have the effect of placing the teacher in opposition to her students, because it seems to suggest that they are not as “enlightened” as she. Perhaps, with my PSA assignment, I was jumping too hastily toward that critical default position in my classes without allowing the need for such advocacy to emerge (or not) from within the content and context of class inquiry. If critical pedagogy is “radical democracy in action,” then how might I shift my pedagogy to make legitimate democratic space for my students to give voice to their current values and beliefs? Patricia Bizzell makes this point when she argues that a teacher can persuade students “only insofar as she builds

her case on the values her students already hold” (cited in George, 2001, p. 108).

So I asked myself what would happen if I didn’t foreground civic participation? What if I didn’t do my “future leaders” speech? What if I provided my students with the opportunity to investigate topics from multiple perspectives, in both space and time; to build personal workspaces where they could wander among and manipulate the visual, verbal, and auditory manifestations of their subject; and to come to their own conclusions about whether a problem exists that requires action?

Working tentatively toward an embodied pedagogy of place, I designed an assignment sequence in which my students conducted primary research in their urban environment: interviewing, drawing physical maps and use-maps, taking photographs and video, and conducting archival research to document these lived spaces. They then worked individually and in groups to consider how changes in these environments might have material effects on the people who inhabit or use those spaces.

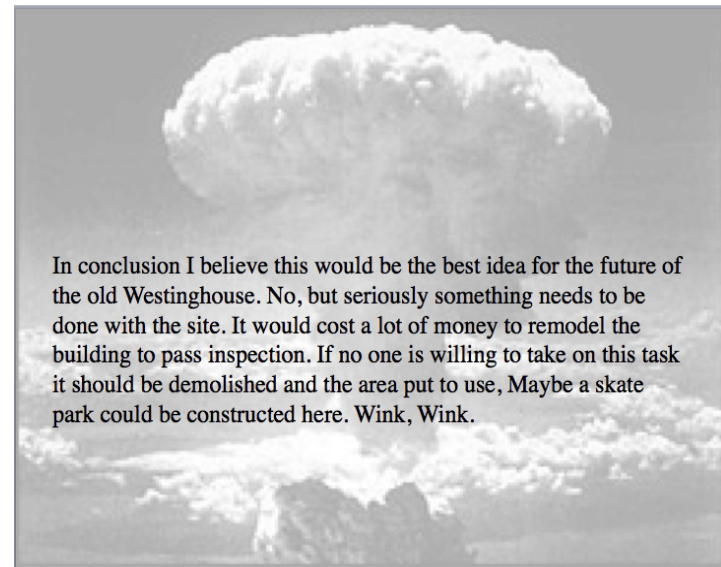
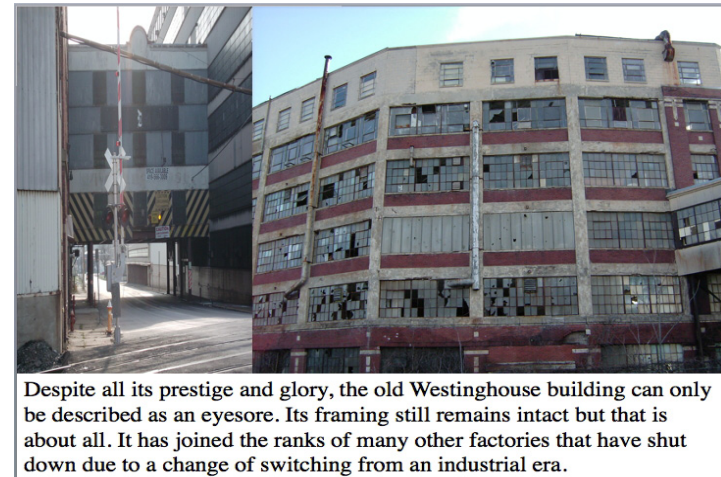
Several class members stood out from the beginning as the kind of student with whom I was having difficulty connecting. J. P., for example, was 24, from a working-class background, a first-generation student. He worked full time loading freight, and arrived for class twice a week at 5:30 p.m. without stopping for dinner. He was no slacker: never missed class, always did the reading, participated smartly in discussions. But he frankly had no patience with the whole plan of the class. He was not interested in digital media. He just wanted to write (“This IS a writing class, right?”), and he most definitely wanted nothing to do with the kind of “field work” implicit in the research for this project.

The first assignment, a photo essay, asked students to choose a building in Mansfield and collect primary archival evidence about its history: photographs, postcards, letters, maps, deeds, advertisements, newspaper clippings, etc. Using these materials and working in Powerpoint, they created a chronological narrative of the building's history. If this assignment sequence is collectively about the story of a building in space and time, this is the "time" assignment, and introduces the first possibility for arrangement of evidence. From a feminist perspective, this is also a disembodied and conservative approach in the "history is told by the winners" sense. Material of the sort J. P. and his classmates sought is ephemeral, and what remains survives primarily because of its connections to the "establishment": the city's business owners, bankers, landlords, politicians, and professionals. Little survives that relates to the daily lives of the ordinary men and women who lived, worked, or conducted their own business in these buildings.

Mansfield is a post-industrial town with 50,000 residents; the city shows both the scars of manufacturing flight and the tentative signs of a retail renewal centered on a full-scale carousel and repurposed Main Street buildings. For his building, J. P. chose what's known locally as "The Westinghouse": a complex of decrepit industrial buildings covering several acres along the railroad tracks. He grumbled loudly—in class—about the project and produced a single-sourced Powerpoint presentation that on the final slide advocated . . . the nuclear option.

"You want a suggestion for the building?" he asked rhetorically. "Well, take this!" Obviously, for J. P., this was a pointless exercise.

5.16 Two slides from "Every House Needs Westinghouse," J. P.'s photo essay, 2007.



The second assignment, which focused on the contemporary state and use of the building, also raised his hackles. Students took their own photos and conducted at least one interview with someone currently living, working, visiting, or otherwise associated with their building; using their interviews, they then composed audio essays that told the story of their building's present through the voices of the people who currently inhabited it. This is a "space" assignment, designed to uncover the material embodied effects of that space on its current occupants and surroundings. In terms of arrangement, this assignment invites either a spatial or thematic organization, focusing on different parts of the building or on specific issues related to its use. J. P. again vocally objected to the field work: "If I'd known what this was going to be like, I would have picked my mother's house and interviewed her." He also argued that interviewing would not only waste his time, but also the time of the person he would interview.

But on the day the audio essays were due, J. P. met me on the stairs and walked me to class. He couldn't stop talking about all the things he learned that he hadn't known about The Westinghouse, even though he had lived in its shadow his entire life: about how helpful "the guy" he interviewed was, and what a "regular guy" he was, and how they talked for hours after the interview, and how "the guy" said, "Come back any time." "The guy" was the Economic Development Director for the city of Mansfield. J. P.'s audio essay was rough (primarily because he had put off his interview until the last minute), but the experience of gaining access to one of the city's movers and shakers was a revelation for J. P. For the final assignment—a video proposal that answered the question: "What future use and development of your building would be best for the people who use it, and for the city of Mansfield?"—J. P. developed a proposal that the Westinghouse complex, currently under-used for

contract re-packaging and re-mailing, be renovated as an urban center for the Mansfield campus of The Ohio State University, a project which would in turn help to revitalize the entire downtown area.

Some students, like J. P., made bold, change-the-face-of-the-city projections; others were content that the future of their building be an uncritical continuation of its present. Some plans required a radical shift in the power balance between citizen-entrepreneurs and the entrenched downtown property owners; others identified the established power structure itself as a source for positive change. What seems important in terms of countering cynicism and encouraging civic participation is that these multiple perspectives and conversations were making it apparent to many of my students that local contexts are "accessible and tangible. [The local] can be changed; and those changes can be felt" (Levy, p. 361). I think that's a good result.

Whether participants accept and reflect identities, roles, and places "assigned" to them (either by themselves or others), or resist normative roles in favor of more nuanced, more fluid identifications, is not the question. Some will accept, and some will resist. But each student will have used the project to actively investigate both the physical "place" of their building in space and time, and their own "place" in the current and future life of their community. The decisions they make as they construct their final video proposals will be conscious and reflective. Furthermore, they will develop their proposals within a collaborative affinity group that consistently provides points of entry into issues, (power) relations, and the extent to which place informs identity and action.

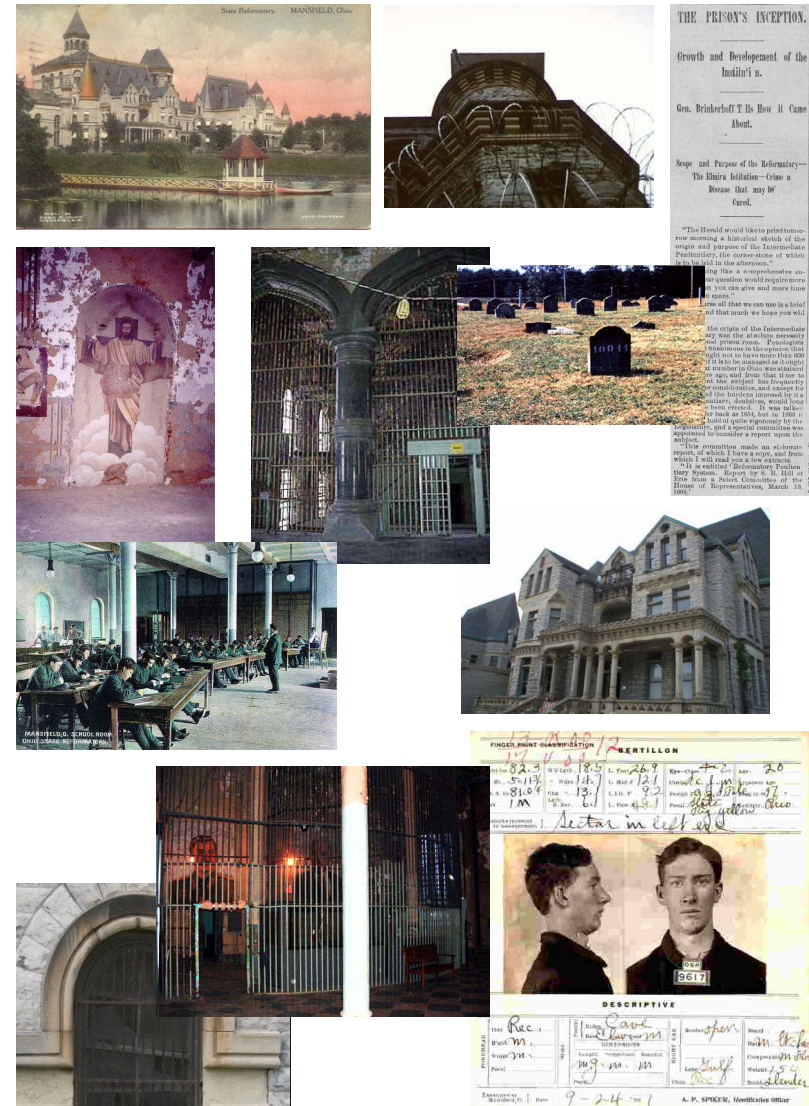
The final assignment—the video proposal for the future use of their building—began with a review of all of the materials students had collected so far: historical and current photos and other images; audio

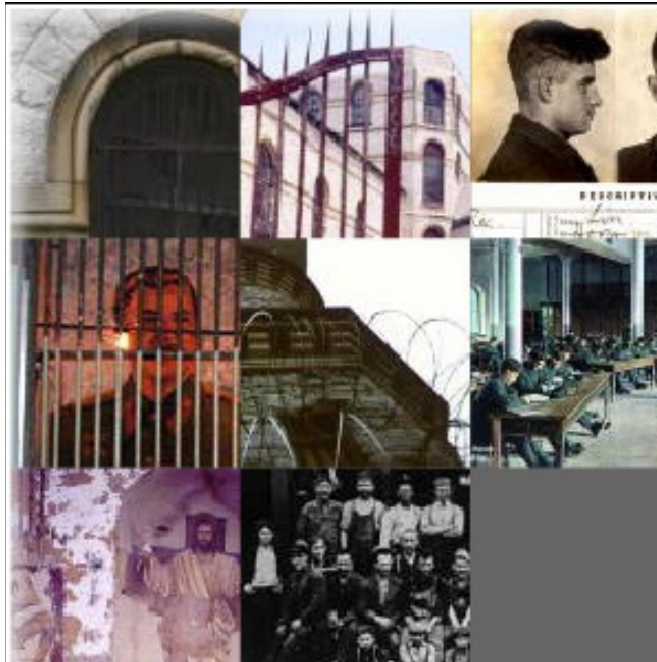
interviews; print records and ephemera; and assorted field notes. Then they played, working in twos and threes, and experimenting with as many possible arrangements of their collections as they could together imagine. The model for this activity, of course, is the *Wunderkammer*, in which new arrangements and unexpected juxtapositions of the artifacts help students to discover alternative ways of seeing and understanding their world.

The choices of *schema* students chose for arrangements ranged from the silly (color, size) to the sublime (aesthetic properties); but by trying out alternatives, and then testing the most interesting to see how the groupings might map onto the interests of the city and its citizens, the students came to the realization that each arrangement/map involved material consequences for its various constituents.

The video proposal of another student, Austin Hart, illustrates this process. Austin chose as his site the old Ohio State Reformatory, a mass of looming limestone buildings on the western edge of the downtown area. The Mansfield Reformatory Preservation Society has a rich archive of documents and photographs, and Austin collected digitized images of the Gothic architecture, cell blocks, chapel, yard, and cemetery; photographs of guards, inmates, and wardens; postcards from 1908 to the present; newspaper clippings and annual reports; and memorabilia of the prison's "second life" as a movie set. He also took his own photographs and interviewed the president of the preservation society.

5.17 Ohio State Reformatory, Mansfield, Ohio, ca. 1900; barbed wire; Ohio Memory Project, The Prison's Inception, 1866; Rebecca Muller, Jesus painting, 2007; Main hall; grave marker, inmate 10011; OSR schoolroom; Administration building; West gate; Lenin and Stalin; Mug shot, 1917.





5.18 Images of the Ohio State Reformatory.

Austin created half a dozen arrangements of his evidence, focusing first on a chronological narrative of the prison, then centering his arrangements successively on the inmates, the architecture, the contrast between reform and punishment, and the use of the prison as a movie set for *Shawshank Redemption* and other films. As with the *scientifica* in early *Wunderkammern*, Austin's computer served as a "scientific instrument" through which to view his artifacts. He and his classmates developed multiple strategies to mix and manipulate their media. They composed collages in Microsoft Word and experimented with image

manipulation in Photoshop. They used the Albums feature of iPhoto as a light table on which to spread out, examine, and re-arrange their materials. Although at the time the class and I did not have the expertise to design a database to deliver groups of images randomly, we did build a working prototype of a manipulatable grid in Flash that worked on the principle of a tile game (Figure 5.18).

Madeleine Sorapure (2005) notes that complex meanings develop in multimedia projects when the relationships among words, images, and sounds are both metonymic and metaphoric. This is also true of other analogic tropes like hyperbole, antistasis, and catachresis. While my students did not use these terms, they asked the following questions of each arrangement:

- What are the predominant similarities? differences?
- What seems to "go" with what? why?
- What doesn't fit?
- How are different media related?
- What is unexpected in this arrangement?
- What is missing?

Austin initially believed that the current multi-purpose use of the reformatory—as a tour site, an occasional movie set, and a venue for events like weddings, reunions, and "ghost walks"—was best for Mansfield. But as he worked with his materials, he became interested in

the original “inmates,” boys who were often wards of the state and who were sent to the reformatory to literally re-form them into productive members of their communities. He saw the value of reform over punishment in the images of those boys, and decided that his proposal would emphasize a productive, re-formative use of the prison buildings. He was also intrigued by the unexpected appearance in the cellblocks of art: the remnants of a painting of Jesus and glimpses of Gothic lettering on the peeling walls in the chapel, and two large wall paintings of Lenin and Stalin that were remnants of a movie set. This catachresis—the disjunction between images of the boys in their schoolrooms and the art on the walls—and the competing visual metaphors of punishment and reform both shaped Austin’s final project.



Austin composed his video proposal in iMovie. He used images of the exterior architecture and interior cell blocks, examples of prisoner art, excerpts from his interview with a member of the Preservation Society Board, and a bridging soundtrack of the Soggy Bottom Boys singing “You’re in the Jailhouse Now,” all held together by his own narration. Interestingly, because he saw the audience for his proposal as more concerned with looking forward than backward, he did not include the images of boys and art that originally informed his proposal. In his final video, Austin proposed that plans for an Ohio prison museum (already in the works) continue, but that the planned museum should also include cell-block “galleries” devoted to art created by prisoners around the United States.

In this classroom, then, visual arrangement functioned as a *techné*, a productive intermingling of theory and practice. It was heuristic: students were willing to spend time not-knowing; they considered alternatives and deferred making claims until the evidence pointed them in a particular direction. It was situated: the evidence—photographs, newspaper clippings, maps, objects, etc.—remained insofar as possible in its original form, or a simulation of its original form; it was not prematurely distilled through the filter of words, and so retained the material characteristics of its appearance and context. It was strategic: by reflecting on multiple associative schema, students made the possible meanings of each connection explicit rather than tacit, and could more easily consider the potential rhetorical effects of each. Finally, it was ethical: students saw themselves as change-agents, artfully deploying their visual, verbal, and audio proposals in persuasive, multimediated digital *Wunderkammern*.



5.19 Austin Hart, REFORM PUNISHMENT ART? 2007.

[Click image to play.](#)

- ▲ 5.20 Room with simulated *camera obscura* image of the Brooklyn Bridge, 2006.
In 2004, I came across the photographs of Abelardo Morrell, who uses a *camera obscura* to project outside images onto the walls of hotel rooms, offices, and domestic spaces.
I return to his haunting, wondrous black-and-white (and more recently color) images again and again as a guiding metaphor for a wonder-induced *techné* of visual arrangement and discovery in the “borderlands of surmise” (Liu, 2008) between print and digital multimedia. (Click on image to enlarge. Click [here](#) to go to Abelardo Morrell’s photographs on the web.)

Afterimage

This chapter has focused on the *techné* of visual representation and arrangement in art, in a range of interactive digital media, and in the classroom. But I hope that the theoretical perspectives rehearsed in the previous chapters will also be seen as examples of “knowing practice,” scholarly pedagogical performances that enact a *techné* of digital inquiry and discovery motivated by wonder.

Technologies of Wonder is a single snapshot: one suspended moment in the expanding ecology of digital, visual rhetoric. It is an experiment in design that uses one subset of digital and rhetorical technologies to both argue for and enact an ethical, embodied, visual canon of arrangement grounded in hypermediated linking and associative thinking. Although the current pace of change, as new digital media emerge along with new possibilities for their use, suggests that the peculiar combination of text, image, and digital arrangement staged here may seem quaint in just a few years, I would like to use the metaphor of the *camera obscura* to revisit some key terms and ideas that I hope will remain central to rhetoric and digital media studies.

A *camera obscura* is a room or a box in which images of external objects are cast, through a pinhole or a lens, onto an interior surface. Unless first reflected by a mirror, the images are upside down. The principle of the *camera obscura* was known in ancient Greece; Aristotle is said to have noticed that the crescent-shaped image of a solar eclipse was projected onto the ground multiple times through the lattice formed by the leaves of a tree. The instrument came into more general use as both an optical toy and a drawing instrument in the sixteenth century (Terpak, 2001, p. 308), and was the proto-mechanism adapted to fix images on reactive surfaces by both Louis Daguerre (copper plates) and William Fox Talbot (film) (p. 313). The *camera obscura*, and the images it casts, are objects-to-think-with about the evolving nature of knowledge production in new media, and the productive potential of the dance between old and new.

Wonder. I have proposed here a process of visual rhetorical inquiry that is motivated by wonder. Philip Fisher describes wonder as the “pleasure of radical surprise, a novelty of material and effect” (p. 4), and the first exposure to an image projected by a *camera obscura* produces just such a response. The elements are all familiar—a chair, flower-patterned wallpaper, the Brooklyn Bridge—but the context, the juxtaposition, and the orientation are totally unexpected. We know that there must be an explanation, a logic to the image, if only we can find the right key(s) to decipher it. This suspension between knowing and not-knowing is wonder, a productive tension that on the one hand seeks resolution, while on the other delights in the shock of the new. Although age and experience reduce the capacity to find things wonder-full, Fisher points out that explanations contain within themselves mechanisms for preserving wonder, including experiments with repetition, substitution, scale, time, and space (pp. 119-120), all of which can extend the productive state of making the familiar strange and lead to further discovery and insight. In digital media, the piling up of print, image, sound, pattern, movement, and association can be as unsettling as the juxtaposition of flowered wallpaper and the Brooklyn Bridge—and as potentially productive.

Techné. The sense of wonder that an image from a *camera obscura* calls forth expands to include the instrument itself. As in a *Wunderkammer*, the scientific instruments that were used to reduce, enlarge, distort, project, and otherwise manipulate the objects in the collection were themselves objects of fascination. The *camera obscura* is just such an instrument; in the hands of skilled and thoughtful practitioners, it participated in a *techné* of astronomical and anatomical invention and discovery. And long before color photography and film, the *camera obscura* projected full-color moving images in darkened rooms, inspiring

both awe and the artistic invention and production that led to photography and motion pictures.

Today the *camera obscura* and its images continue to appeal both to our fascination with “natural magic” and to our interest in instruments of a more “philosophical” imagination, and this is also true of digital media, now and in the forms they will take in the future. We can sit back and let them amaze us, or we can use them as inherently flexible,



▲ 5.21 English *camera obscura*, early nineteenth century. Photograph by Stefan Kühn.

malleable instruments of a rhetorical *techné* that encourages invention and ethical intervention. *Techné* rescues our work with digital media from any merely instrumental interpretation and also, because *techné* involves both making and a maker, it reminds us that the work we engage in is an embodied, material art.

Arrangement. A visual canon of arrangement, used as a *techné* of inquiry, relies on a slow accumulation of associations, of cognitive links between disparate objects and ideas. Instead of pursuing a linear sequence of logical supposition, arrangement in digital media wanders down an “electronic path of inference from thing to thing” (Ulmer, 1994, p. 195). Even before electronic media routinely included images and other media, Greg Ulmer imagined a digital invention that was unequivocally material, a process that deferred closure while exploring as capacious a collection of evidence as possible. Insight may come through the slow emergence of pattern or, like the startle of a *camera obscura* image, from the sudden recognition that something doesn’t fit. In either case, it is the layering, juxtaposing, manipulating, arranging, and re-arranging into complex sets that engages both the imagination and intellect. I believe that attention to this process of engagement and prolonged discovery is important and necessary intellectual work that is often overlooked in favor of scholarly demonstrations that begin where invention ends.

New ideas, new solutions, new ways of looking at and acting in the world, don’t come from out of the blue. They emerge from the superabundance of the already-thought, from what Stuart Kauffman calls the “adjacent possible” (cited by Johnson, 2010, pp. 29-42). This model of the evolution of ideas (and organisms) says that at any point in the maturing of an idea, a limited number of “next steps” or choices are possible; taking one step, making one choice, opens up a new set

of available “next steps.” The evolution of single-celled life forms into higher organisms was not a single leap, but a series of incremental steps. So too with ideas: invention occurs incrementally (although not necessarily slowly, depending on the number of thinkers working on the same problem) through choices among “adjacent possibles.” The mobility of digital visual arrangement materially increases the number of those “possibles,” and with it the available opportunities for rhetorical invention, in the same way that the layering of new images on new backgrounds in a *camera obscura* incites the imagination. The multiple navigational possibilities of interactive digital media have thus reinvigorated the canon of arrangement as a lively, material practice which had been subdued by handbook traditions of organization.

Feminism. For me, the value of feminism as a lens is that it has always been acutely attuned to questions of power: Whose interests are being served by specific textual or visual representations? Who is diminished, devalued, or (more insidiously) left out? Feminism pays attention to equality and justice, to difference and empowerment, to access, to gender, but also to race, class, ethnicity, religion, ability, and other categories in which individuals or groups are under-represented, mis-represented, or not represented at all. In a profoundly visual world, feminism is a digital *camera obscura* whose mirrors, lenses, and surfaces throw all of these concerns into high and often surprising relief, while at the same time providing the means to produce new, more equitable, more inclusive representations.

Of course, these are not only the concerns of feminist scholars. Who would argue against equity and empowerment? Nevertheless, it remains necessary in digital media studies to point out the “interestedness” of perspectives that represent themselves as neutral or

universal, and to promote heterogeneity, multivocality, and multiple perspectives in both analyzing and making new media scholarship. Access to new media is about having the tools, both technical and personal, to participate. Inaccessible media would not only include a website that a blind person could not see and that had no other accommodating entry point, but also a site that had no “way in,” psychologically or culturally, for the user. Feminism stages “critical cyberfeminist interventions” (Blair, Gajjala, & Tulley, 2009, p. 17) to create invitational digital structures and practices through which others can in turn stage their own hypermediated, multimodal representations.

Vision. This project begins and ends with vision, an embodied capacity with which we make sense of the world. Barbara Stafford says that “we realize something constructive when we see. We do not merely illustrate or copy what is given, but give birth to something that would



not otherwise exist. Seeing is about being struck that something is, or can be, connected to something else” (1999, p. 138). Vision is an engine of wonder; it is a tool of *techné*; it is the discovery of resemblance and affinity in associative arrangements; it is an intervention in the tyranny of abstract thought. Here again we may turn to the *camera obscura*. The up-turned jugglers in *David Hockney’s Secret Knowledge* (Figure 5.22) enchant us, mystify us, and challenge our perceptions of physical space, laying the groundwork, as such experiences do, for productive exploration and invention. We *know* juggling. We *know* gravity. But the *camera obscura* image makes us see new possible realities in the gap between what we see and what (we think) we know.

Wonder, *techné*, arrangement, feminism, and vision furnish the conceptual framework for my claims here, but it is the restoration of the image as a legitimate form of rhetorical argument and knowledge-making that will have the most long-lasting consequences for scholarly analysis and production in rhetoric and composition. Interactive digital media have vigorously asserted the meaning-making properties of images, navigation, and design, and these will become more and more prevalent as we find new ways to put them in productive conversations with our words and sounds.



5.22 Clip from *David Hockney’s Secret Knowledge* (Wright, ca. 2002), a documentary on his controversial theory that Western artists have used optical devices as part of their technique since the sixteenth century.