ANIMATING FLATNESS: MOVING IMAGES IN AMERICAN ART, 1780-1895

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To Maddie and Dash

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ABSTRACT

ANIMATING FLATNESS: MOVING IMAGES IN AMERICAN ART, 1780-1895

Juliet S. Sperling

Michael Leja

Moving pictures became an integral feature of American visual experience more than a century before the emergence of cinema. Scholars tend to locate the history of animated images within the domain of screen projection, concentrating on illusionistic optical toys and immersive panoramas. In contrast, this dissertation argues that nineteenth-century audiences' interaction with moving image technologies primarily took the form of tactile encounters with a genre of intimately scaled, mass-circulated paper constructions that materialized in the United States by the late eighteenth century, especially layered anatomical illustrations, pull-tab prints, and manipulated books. These kinetic paper constructions beckoned viewers to their pliable surfaces, inciting beholders to lift flaps, open hinges, tug tabs, and glide slides into activated tableaux.

Mass-circulated, intimately scaled, and used in settings ranging from schoolrooms to surgical theatres, tactile images invite new questions about how senses beyond sight operated in the pursuit of knowledge. Three thematic case studies show how diverse audiences physically engaged with paper as a means of learning, reasoning, and negotiating issues ranging from control of women's bodies to the abstract value of financial credit, ultimately carrying those same corporeal habits to encounters with painting and sculpture (including works by Raphaelle Peale, Hiram Powers, and David Claypoole Johnston). Challenging entrenched narratives of passive spectatorship and binaries of pictorial surface and depth, tactile images become a lens through which to

understand questions central to art history: sensory reception, embodied viewing, and the cross-pollination of media.

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Figure 4.14. The Aquarium, from *The Little Showman's Series no. 1*, Published by McLoughlin Bros., New York, c. 1882.

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Figure 4.21. *The Aquarium* from *The Showman Series*, published by J.F. Schreiber, Esslingen, Germany, c. 1880.

Figure 4.22. Winslow Homer, *Mink Pond*, 1891.

Figure 4.23. *The Magic Mirror, or, Wonderful Transformations*. McLoughlin Bros., c. 1880.

INTRODUCTION

How to open a book

Our bodies react in reflexive, often unconscious ways to familiar structures, such as a folded and bound gathering of paper sheets. Imagine that the dissertation you are reading is not a digital file on a screen, but is instead bound in a run-of-the-mill library binding, standard white pages sandwiched between two sturdy covers. If you are a right-handed person holding the volume in both hands, you might balance the palm and thumb of your dominant hand upon its back cover, your remaining fingers curling around to support the spine. The left hand is tasked with moving through pages. Its thumb feels along the bottom edge of the page, pulling the surface up and outwards in a leftward-leaning arc. At this moment, the remaining four fingers are called into action, pinning the previous page in place to open the leaves to full view. Paying attention to these unconscious yet prescribed gestures reveals a complex and intentional rhythm, not unlike playing the keys of a piano.

This dissertation traces the dynamic exchange between book-like objects, the bodies of period viewers, and the broader visual cultural landscape of the United States during the long nineteenth century. It is driven by the idea that rote physical movements and contortions like those described above crystallize over years of repeated interaction with objects, a material culture-guided set of bodily techniques as real today as they were two centuries ago.[1] Handling thousands of objects from childhood onwards gives a user valuable information about structure that, in turn, shapes habits of physical behavior. For instance, one does not have to understand exactly how a binding is constructed to notice that turning a page's bottom edge too close to the gutter—that tight central space where recto and verso meet and melt into the spine—is more likely to result in a tear. Even without grasping the physics of binding stress, we learn to pull from the edge's center, based on signals from the object itself: a cracked spine, a torn sheet, a stinging paper cut.[2]

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[1] I refer to Marcel Mauss's notion of the social and cultural construction of bodily movement outlined in: Marcel Mauss, “The Techniques of the Body,” *Economy and Society* 2, no. 1 (1973): 70–88.

The notion that objects possess the power to shape human behavior is one with a long and complicated history in art history and the wider object-oriented disciplines (anthropology, archaeology), which I will not rehash in full here. From Jules Prown's poorly theorized belief that objects themselves can reveal "patterns of mind"[3] to later formulations of object agency by theorists including Gell, Latour and Bennett, scholars have tended to agree on one thing at the very least: that studying the multidirectional relationships between humans and the things we surround ourselves with can provide rich insight into notions of subjectivity and culture.[4] But what happens when objects don't behave as expected? As scholars of material culture have long noted, when objects are resistant to a viewer's learned habits, they force deviations that make one unusually aware of unconscious patterns. Much like Bill Brown's foundational assertion of Thing

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[2] Paper cuts are, according to thing theorist Bill Brown, a classic example of "the suddenness with which things seem to assert their presence and power." Bill Brown, "Thing Theory," *Critical Inquiry* 28, no. 1 (Autumn 2001): 3.

[3] Jules David Prown, "Mind in Matter: An Introduction to Material Culture Theory and Method," *Winterthur Portfolio* 17, no. 1 (April 1, 1982): 1–19.

[4] For an overview of how these ideas fit into Art History's version of a "material turn," see: Jennifer Roberts, "Material Turn, Transnational Turn," *American Art* 31, no. 2 (n.d.): 64–69; Alfred Gell, *Art and Agency: An Anthropological Theory* (Oxford ; New York: Clarendon Press, 1998); Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory*, Clarendon Lectures in Management Studies (Oxford ; New York: Oxford University Press, 2005); Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010).

Theory, that an "object becomes a thing when it stops working for us," disobedient objects have the power to make the familiar strange and illuminate the invisible. Disobedience, for Brown, was the stalled car or the filthy window, but might just as easily be the page that opens in a surprising way.

I recently encountered one such self-consciously stubborn object that caused me to reflect on what my fingers want to do when handling a book. *Gabberjabb #6* (Perishable Press Limited, 1988) is one of a series of eight *Interminable Gabberjabbs* created by Wisconsin book artist Walter Hamady between 1973 and 2005.[5] Hamady (b. 1940), an Emeritus Professor of letterpress printing at the University of Wisconsin-Madison and proprietor of the Perishable Press and Shadwell paper mill, creates artists' books that "bare the device" of the book form.[6] Artist's books that exhibit a self-conscious awareness about format and structure are the rule rather than the exception, but of course that awareness takes on a variety of different forms: meditation, enhancement, and in Hamady's case, obstruction.[7] The Gabberjabb series in particular was created to "parody the structure and parts of the book," as its official description attests.[8] Critics have noted many of the tongue-in-cheek mechanisms used by the artist to draw attention to codex structure, such as an illustration of anatomical innards wedged between two otherwise blank sheets—guts in the bibliographic "gutter," so to speak (Fig. 0.1). But the more complex structural play—pages that don't turn how they are supposed to, edges that don't end but rather loop back into the binding like a Mobius strip—has been largely ignored, perhaps because of its resistance to description.[9]

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[5] For more about Hamady, see Roy Behren's essay in: Walter Hamady, *Juxtamorphing (the) Space (in) : Works by Walter Samuel Haatoum Hamady : Being a Series of Autodidactic Tutorials Arranging Certain Things in a Certain Space with a Certain Aesthetic End in Mind as in a Timeline of Sorts Incorporating Books, Collage and Assemblage : On Display at the James Watrous Gallery of the Wisconsin Academy, 7 October through November 20, 2005.* (Madison, Wis. : James Watrous Gallery, Wisconsin Academy of Sciences, Arts and Letters, c2005.).

[6] Alastair Johnston, "Life & Death in Driftless, Wisconsin," *Parenthesis* 27 (Fall 2014), http://www.fpba.com/parenthesis/select-articles/p27_hamady_driftless.html.

[7] Johanna Drucker, "The Artist's Book As Idea and Form," in *The Century of Artist's Books* (New York: Granary Books, 1995), 4.

[8] Mary Lydon, "The Trojan Horse of Art: Walter Hamady, The Perishable Press Limited and 'Gabberjabbs 1-6,'" *Visible Language* 25, no. 2 (1991): 4.

The sixth of the Gabberjabbs' meandering full title is *Neopostmodrinism, or, Dieser Rasen ist kein Hundeklo, or, Gub*^{2}*rzub*^{2} *number 6, or, The incognita of Rita's deep time coexisting within central discoveries of the thermodynamic dichotomy of western thought : observed impregnant meanings & transhistorical justification* [sic], and exists in an edition of 125. I have had the opportunity to examine three of these, the first two in the Rare Book School collection at the University of Virginia, and the third at the Kislak Center for Special Collections at the University of Pennsylvania. Each edition varies significantly in terms of surface decoration—for instance, one of the RBS copies includes multiple messages scrawled in red crayon from Hamady to then-Rare Book School director Terry Belanger—but the idiosyncrasies of structural engineering remain consistent. From the first page, obstructions prevent the reader from operating the book in a familiar way. An overlaid sheet with a small notch cut like an arrow invites the reader to lift upwards, to reveal what is beneath (Fig. 0.2). Upon handling the book for the first time, I took its bait, sliding my right index finger through the notch and beneath the layered sheet, attempting to delicately leverage it upwards. But the flap refused to open, leaving me aware of the jarring interruption of what should have been a fluid turning motion. Other surfaces are tucked slyly in on themselves, bending outwards into accordion folds or surprise fore-edge constructions that defy the reader's expectations for the boundaries of planes and the limits of flatness. The final colophon is sealed shut by a strip of transparent tape marked "tamper resistant," revealing only evocative glimpses of its concluding prose – "…box elder bugs in anyone's memory and, the most colorful autumn ever…" – through gaps in the sealed bottom edge (Fig. 0.3). Here, the object taunts its frustrated reader, daring her to break both tape and reading room taboos to get at the text inside.[10]

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[9] Scholarly reluctance to parse Hamady's work may also owe to comments like these from the artist: "I would love it if some 'scholar-type' would go to the Gabberjabbs as if unearthing them from a tomb in Egypt. And record and document what they present etc. Then I could use that text as a text for another Gabberjabb with my notes and comments etc. as per how they got it all wrong." Quoted in Lydon, 156.

As the dates of 1780-1895 given in the title might suggest, this dissertation is primarily concerned with objects and their users in the United States from the Revolution to the Gilded Age, a centuries-past visual landscape that rebellious things like *Gabberjabb #6* have helped me see anew. I open with the anachronistic example of Hamady's work not to posit a direct lineage between contemporary artist's books and historical objects, although recent work by artists including Leslie Smith, Shawn Sheehy and Casey Gardner clamors for serious scholarly engagement on the subject (Figs. 0.4-0.6).[11] Rather, I think that the *Gabberjabbs* speak unusually lucidly about patterns of self-conscious interaction prompted by encounters with rebellious objects that historians of art have often left untroubled. In justifying his leveraging of bibliographic structure as a lens onto complex conceptual issues, Hamady has described the codex as "Trojan horse of art […] not feared by average people…it is a familiar form in the world, and average people will take it from you and examine it, whereas a painting, poem sculpture or print they will not." Indeed, the book's structural familiarity is at once soothing and disarming. Who can tell from the exterior what will be contained between covers? Surely not armies of Greeks lying in wait, but perhaps a mixture of delight and discomfort stemming from the surprise of pages that won't open as expected. The notion of format as bait for self-interrogation resonates strongly with the experience of viewers and readers in the past, even centuries before "artists' books" was a codified genre.[12]

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[10] No need to tamper: the curious reader can find the full colophon text transcribed in Kyle Schlesinger, "Letterpress Printing in the Postmodern Era: Poetry, Media, & Typography" (State University of New York at Buffalo, 2005), 460.

[11] There are many more contemporary book artists whose work engages with historic bibliography and the history of movable books in particular—for instance, Hedi Kyle and Julie Chen. I have named these three in particular because I find that their projects are especially in tune with the objects discussed in this dissertation. Leslie Smith's work echoes the formats of harlequinade or turn-up books like those discussed in Chapter One. She has spoken about layered paper as a metaphor for the overlapping and elusive arrangement of thoughts in the mind (Smith, Leslie. "From Wonder to New

Throughout the three chapters and epilogue that follow, I argue that eccentrically formatted books, prints, and paper constructions—a genre I term "tactile images" for their explicit invitation of hands-on physical engagement—functioned for their original users as clarifying agents. Borrowing Giuliana Bruno's conception of the material surface as a meeting place, I consider the dynamic and malleable paper surfaces of objects as

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Artwork." Paper presented on the "Materiality as Sustainable Humanistic Discourse" panel of the Bibliography Among the Disciplines Conference, Philadelphia, PA, October 2017.) Shawn Sheehy's botanical works imagine Early Modern herbiaries as vibrant, expansive pop-up dioramas. Casey Gardner, like Smith, is directly in dialogue with the history of format, particularly the layered anatomical flap print. More information about each artist is available at their websites: https://www.shawnsheehy.com/, http://www.leslie-a-smith.com/, http://setinmotionart.com/.

[12] In 1995, Johanna Drucker asserted "a single definition of the term "an artist's book" continues to be highly elusive in spite of its general currency and the proliferation of work which goes by this name." There has been more scholarship on the genre since Drucker's pioneering study, but this fraught definition stands even in 2017. In Drucker's definition, artists books are a genre that emerge out of the late nineteenth-century *livre d'artiste* tradition, but exist in a different relationship to market, production, and authorship. Artist's books are "Creations […]. Interrogations of [form's] conceptual or formal or metaphysical potential." Drucker, "The Artist's Book As Idea and Form," 4–6.

points of physical contact that highlighted sensory habits of vision.[13] The unique possibilities of touch-activated motion offered by tactile images' material format, such as the potential to individually rehearse, replicate, slow down, and speed up scenes witnessed in the wider world, marked these objects as critical points of mediation in the construction of visual knowledge. Just as *Gabbberjabb #6*'s sealed colophon made me aware of the habitual motions of my methods for reading and seeing, oddly formatted paper constructions including layered anatomical lithographs, planar lift-the-flap engravings, and collaged pull-tab ephemera provoked nineteenth-century Americans to reckon with the physical, tactile dimensions of their own interpretive experience.

Animating Flatness

Three freeze frames captured from the chapters ahead offer a sense of the scope and diversity of tactile images and their audiences:

In 1804 Virginia, a metamorphosis occurs before a young girl's eyes. She manipulates the paper planes of an engraved booklet with her fingers, setting off a linked chain of visual transformations: Adam into Eve into a mermaid; lion into griffin into roaring eagle. While lifting and closing the print's unconventionally layered panels, she concentrates upon memorizing its creases and folds to later construct a copy of her own.

Decades later, hundreds of Philadelphians watch, rapt, as an anatomical lecturer displays a brightly colored lithograph, sliced from a book's spine. Under his surgical touch, layers of paper flaps peel away like flayed skin, offering an illicit glimpse of a dissected human body.

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[13] Giuliana Bruno, *Surface: Matters of Aesthetics, Materiality, and Media* (Chicago ; London: University of Chicago Press, 2014).

Meanwhile, in Boston, an artist crouches over a stack of unsold political portraits. Tugging a paper tab transforms the expression upon the subjects' paper faces, but the joke has become stale since the last election. He scrapes, scratches, and collages the printed novelties' surfaces to be sold anew, coaxing fresh life out of old material.

In each of these vignettes, seeing alone was not believing. Rather, the hand allowed each viewer to push past deceptive or incomplete surfaces and to access new information from unprecedented depths. A robust and heterogeneous genre of tactile images tooled to this particular relationship between hand and eye emerged along the eastern seaboard of the United States by 1800: strange objects that included (but were not limited to) layered anatomical lithographs, spinning paper volvelles, engraved cards with pull-tab mechanisms, hidden-paneled pamphlets, and pop-up books. Produced for both instruction and entertainment and featuring subjects ranging from religious catechisms to undersea worlds, these paper constructions were unified as a genre by formats that required physical, bodily interaction from the viewer. Tactile images demanded corporeal engagement: they beckoned users to their manipulable surfaces to lift flaps, open hinges, flip sheets, and slide tabs into expansive, activated tableaux. This study centers on those ways of touching, concentrating closely on physical gestures and maneuvers as habits mirrored across perceptual experience. It shows that tactile interaction with paper constructions was a widespread, foundational feature of antebellum American visuality, a way of simultaneously seeing and sensing that viewers brought to bear on encounters with the wider visual landscape in which they lived.

Tactile images were not one-off productions. Rather, from the last decades of the eighteenth century onwards, they were produced in large numbers and multiple editions, and reached wide audiences diverse in terms of gender, age, and class. We know this not from data about print runs or circulation figures, but from the number of surviving specimens. As the chapters to follow will further explore, early American tactile images were often produced at the margins of print culture by little-known printmakers and publishers whose archives were either never retained or are now lost, and as a result, business records or other quantifiable information about print runs will likely remain unknown. But contrary to what one might expect of paper constructions made to be heavily handled, a staggering number of examples survive in varying condition in archives, museums, and private collections across the United States and beyond. Over the course of more than five years of research on this subject, I have visited dozens of repositories and viewed (in person and digitally) thousands of movable books, prints, and drawings. Judging by how frequently I still come across examples that are new to me, this seems to be only the tip of the iceberg of both what exists and what once existed.[14] The case studies outlined in this dissertation were selected in part because their central objects survive in particularly impressive numbers, suggesting historical popularity and wide dissemination that is further reinforced by compelling formal and cultural connections to other media: painting, sculpture, paper money. The study therefore does not attempt to present an exhaustive catalogue of moving images in early America, but rather a narrow selection intended to treat an understudied genre with depth of focus as opposed to encyclopedic breadth.

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[14] These new "discoveries" are often enabled by collectors outside of public archives, museums, and library special collections. Only recently have institutions begun to collect movable paper, especially with regard to "medium rare" nineteenth-century American or children's materials. Collecting societies devoted to tactile images and optical devices are lively and active (especially the Movable Book Society and the Magic Lantern Society), and many of their members have generously shared their collections with me.

Questions of circulation, distribution, and the processes through which non-art images and fine art intersect in culture are critical to understanding the significance of tactile images. My arguments throughout this dissertation build upon theories of spectatorship and reception, most of all Michael Baxandall's notion of the period eye, and more recent work on visuality and the "period body," which have devoted insufficient explanation to the material presence of the objects (not paintings, but the tools of education and culture) that do the material work of forming patterns of looking.[15] These methods share an interest in the social construction of vision, as well as a guiding belief that acts of making and beholding works of art are informed by social experience. For instance, in Baxandall's *Painting and Experience in Fifteenth-Century Italy*, he draws a connection between the practice of gauging the contents of barrels using geometric formulas learned in secondary education—a "gauging sensibility"—and a certain pleasure that period viewers might take in gauging the voluptuous and twisting geometric forms in paintings by Piero della Francesca and Pisanello.[16] The relationship between artist, viewer, and painting is multi-directional, as artistic choices and acts of viewing are both products of the same period culture.

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[15] For "period body" as a direct response to Baxandall, see: Geraldine Johnson, "The Art of Touch in Early Modern Italy," in *Art and the Senses*, ed. Francesca Bacci and David Melcher (Oxford: Oxford University Press, 2011), 59; Michael Baxandall, *Painting and Experience in the Fifteenth Century Italy: A Primer in the Social History of Pictorial Style* (Oxford: Clarendon Press, 1972); Wendy Bellion, "Vision and Visuality," *American Art* 24, no. 3 (October 2010): 21–25, https://doi.org/10.1086/658207.

[16] Baxandall, *Painting and Experience in the Fifteenth Century Italy*, 92.

However, one aspect of this mode of relating cultural experience to the production and viewing of artwork has always troubled me: I want to know more about the mathematical manuals that taught those gaugers to notice and visually dissect areas of concrete mass, both out in the world as merchants and as beholders of a Ucello composition. What did those materials look like? How many were there? How and when did students handle them, and how frequently? In other words, how, precisely, did the transfer of knowledge from geometrical diagram to student's mind to painting actually occur? My goal, in the chapters to follow, is to particularize the physical, visual, and material processes by which the material culture of everyday experience (i.e. educational ephemera, newspapers, pamphlets, books, and so on) were brought to bear on other experiences in a spectator's life, including but not limited to looking at and making artwork. My analysis focuses only on the United States during the long nineteenth century, but I hope that the methods developed here might be applied to studies of reception and the entanglement of material culture and fine art across periods and geographies.

Tactile Images, Optical Histories

Tactile images have popped up only rarely in art historical scholarship, and occasionally in work on cinema or media archaeology.[17] Most recently, Suzanne Karr Schmidt's *Interactive and Sculptural Printmaking in the Renaissance* illuminated the landscape of paper engineering in sixteenth and seventeenth-century Europe, especially in Germany. Schmidt's study is exceptional in the historiography of paper engineering for its treatment of these objects as tightly entwined with social, political, and religious concerns of the day, rather than mere eccentric or novelty playthings.[18] Its focus on Early Modern Europe is in keeping with the remaining few examples of writing about tactile images, which are largely centered on the same area and period.[19]

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[17] Suzanne Kathleen Karr Schmidt, *Interactive and Sculptural Printmaking in the Renaissance*, Brill's Studies in Intellectual History, volume 270 (Boston: Brill, 2017).

Beyond scholarship on interactive prints in the Renaissance, post-seventeenth century tactile images (and non-printed tactile images, such as hand-constructed drawings with movable features) have suffered from historiographic neglect.[20] One clear reason for this is terminological. The objects analyzed in this dissertation can all technically be categorized as "moving images" because of their construction: flaps, folds, layers, and tabs that allow paper components to shift, slide, expand, and transform beyond the limits of what paper is normally expected to do. Libraries, archives, and museums usually catalogue them as “metamorphic images,” “metamorphic pictures,” or “movable books – specimens,” similarly implying a visual metamorphosis that is somewhat misleading (not to mention making qualifying objects difficult to locate). Both of these categorizations have led to muddying conflation with objects that are superficially similar, but historically and formally quite divergent. When discussed at all, tactile images are traditionally lumped in with illusionistic optical devices and immersive spectacles like panoramas, positioned as fumbling or naive experiments in a teleological march towards the better, supremely illusory technology of cinematic projection.

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[18] For an example of the latter approach, see: Sileas Wood, "Moving Pictures: Nineteenth–Century British Mechanical Prints," *Print Quarterly* XXXIII, no. 2 (2017): 162–76.

[19] A selection of examples include: Peter Haining, *Movable Books: An Illustrated History : Pages & Pictures of Folding, Revolving, Dissolving, Mechanical, Scenic, Panoramic, Dimensional, Changing, Pop-up and Other Novelty Books from the Collection of David and Briar Philips* (London: New English Library, 1979); Jacqueline Reid-Walsh, "Activity and Agency in Historical 'Playable Media' Early English Movable Books and Their Child Interactors," *Journal of Children and Media* 6, no. 2 (2012): 164–181; Meg Brown, "Flip, Flap, and Crack: The Conservation and Exhibition of 400+ Years of Flap Anatomies," *The Book and Paper Group Annual* 32 (2013): 6–14; Sten G. Lindberg, "Mobiles in Books: Volvelles, Inserts, Pyramids, Divinations, and Children's Games," trans. William S. Mitchell, *The Private Library* 2, no. 2 (Summer 1979): 49–82; James A Findlay, Ann R Montanaro, and Bienes Center for the Literary Arts, *Pop-up: Peek, Push, Pull, Scratch, Sniff, Slide, Spin, Lift, Look, Listen, Raise, Lower, Unfold, Turn, Open, Close : An Exhibition of Movable Books and Ephemera from the Collection of Geraldine Roberts Lebowitz : May 31-September 15, 2001* (Ft. Lauderdale, Fla.: Bienes Center for the Literary Arts, Broward County Library, 2001); Ann R Montanaro, *Pop-up and Movable Books: A Bibliography, Supplement 1, 1991-1997* (Lanham, Md.: Scarecrow Press, 2000).

[20] An exception is Mara Sarlatto, "Paper engineers and mechanical devices of movable books of the 19th and 20th centuries," *JLIS.it* 7, no. 1 (January 15, 2016): 89–112, https://doi.org/10.4403/jlis.it-11610.

Optical devices (sometimes referred to as optical toys or philosophical toys) such as the thaumatrope, phenakistascope, or zoopraxiscope rely on principles of persistence of vision to produce what we recognize today as the familiar blur of images in motion.[21] Tactile images depart from optical toys in terms of audience, mechanisms of movement, and most crucially of all, they do not seek to produce illusions of self-animated motion—in contrast, tactile images usually lay bare or even draw attention to their mechanisms of user-activated movement. Circulation, intended audience, and subject matter are also major points of separation. In addition to entertaining, tactile images’ structural adaptability served to solve epistemological problems, test and strengthen memory, and build complex visual arguments.

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[21] Scholarship that terms these objects “philosophical toys” rather than “optical devices” tends to prioritize the objects’ conceptual capabilities over material qualities: Karen Beckman, “Impossible Spaces and Philosophical Toys: An Interview with Zoe Beloff,” *Grey Room* (January 1, 2006): 68–85, https://doi.org/10.1162/152638106775434404; Tom Gunning, “The Play between Still and Moving Images: Nineteenth-Century ‘Philosophical Toys’ and Their Discourse,” in *Between Stillness and Motion: Film, Photography, Algorithms /Ed. by Eivind Rȩsaak*, ed. Eivind Røssaak, Film Culture in Transition (Amsterdam: Amsterdam University Press, 2011), 27–44.

Panoramas, too, diverge significantly from tactile images in terms of scale, circulation, and patterns of use. Especially in the last decade, panoramas have received more scholarly attention than tactile images and optical devices combined: examples include Erkki Huhtamo's *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles* (2013), and within the landscape of Americanist scholarship, Nenette Luarca-Shoaf's work on nineteenth-century panoramas of the Mississippi River.[22] While tactile images were small-scale objects intended for intimate use and re-use, often as stand-ins or simulations of real-world experiences that might be less easily accessed, these recent media archaeologies make clear that panoramas had quite a different relationship with temporality. The life-size moving pictures, which were often composed of massive scrolls of painted canvas and accompanied by fiery special effects, were truly spectacular. Many traveled from city to city, requiring tickets for admission, and visiting a panorama was often a once-in-a-lifetime experience that could not be easily replicated (although the always-savvy publishers of tactile images did indeed try to do so later in the century, resulting in several examples of "historiscopes," miniature panoramas for at-home edification).[23] In today's terms, if handling a tactile image was akin to watching sitcom reruns, going to see a Panorama was like getting tickets to see sold-out Broadway shows.

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[22] Erkki Huhtamo, *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles*, 2013; Nenette Luarca-Shoaf, "Excavating a Nineteenth-Century Mass Medium," *American Art* 27, no. 2 (2013): 15–20, https://doi.org/10.1086/673104.

[23] For more about the fascinating genre of historiscopes as a "hinge media," particularly Milton Bradley's *The Historiscope: a Panorama and History of America* (1870), see: Jennifer Lynn Peterson, "The Historiscope and the Milton Bradley Company: Art and Commerce in Nineteenth-Century Aesthetic Education," *Getty Research Journal* 6 (January 1, 2014): 175–84.

Jonathan Crary's *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (1990) was the first art historical work to take pre-cinematic moving images seriously, as sites in which a range of cultural priorities intersected: science, philosophy, entertainment, and theories of perception. The germinal study argues that European modernist painting of the 1870s and 1880s was symptomatic of a broader transformation in the character of vision that had begun to foment in the 1820s and 1830s, decades before photography arrived on the scene. New types of socially-constructed viewers began to emerge: embodied observers, unmoored from the binary interior/exterior relationships set in place by the previously dominant perceptual model of the camera obscura. With the limits of internal sensation and external world newly blurred, locating the viewer in time and space, and in a specific and regulated bodily relationship with the visible landscape, took on unprecedented importance. Crucially, Crary considers the then-understudied genre of optical devices as proof of this production of a new kind of observer in the early decades of the nineteenth century, in concert with period writing by Goethe and Schopenhauer. Mechanisms like thaumatropes, phenakistascopes, zellotropes, and later, stereoscopes are marshalled not as artworks in themselves, but as material evidence of new knowledge about the capacity of the human eye, the body, and the relationship of that knowledge to social power.[24] Crary reveals the specific circumstances under which these "optical toys" were invented, first as tools of scientific experimentation, and only after as popular entertainments.

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[24] Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, Mass.: MIT Press, 1990), 17.

This dissertation builds upon many of the generative arguments made in *Techniques of the Observer*, perhaps most of all that art history's focus on tracing transformations in representation and style, rather than changes in practices of viewing, has left the historical outlines of spectatorship dangerously under-interrogated. Indeed, narratives of artistic change that position representational styles as new, but viewers as blankly unchanged (as Crary argues of dominant narratives of modernist and avant-garde production), tell only one half of a story. Although art history's focus has shifted in many directions in the intervening twenty-eight years since the publication of *Techniques*, even new treatments of visuality and cognitive style often reproduce old-fashioned object hierarchies, centering painting and sculpture and treating non-art visual culture as a secondary support. However, the investigations undertaken here are equally animated by one of the book's central and most influential claims that I believe requires further complication and study.[25] This is the notion that the newly "embodied viewer" of modernism, for whom vision's relocation in the physical workings of the body itself led to a "prescribed system of possibilities" for viewing that enabled painting to engage with systems of power in new ways, simultaneously experienced *a loss of touch as a conceptual component of vision*.[26] As Crary accurately points out, tactility and sight had been closely interwoven in classical theories of vision that dominated enlightenment-era European culture.[27] Yet he identifies a "subsequent dissociation of touch from sight" that occurred “within a pervasive ‘separation of the senses’ and industrial remapping of the body in the nineteenth century.”[28] As a result of this “unloosening of the eye from the network of referentiality incarnated in tactility and its subjective relation to perceived space,” vision became measurable, quantifiable, and homogenized in its isolation.[29] Crucially, in his argument, the severing of tactility from sight was what allowed viewers to abstract themselves from their objects of vision—artwork, ephemera, commodities, even “the act of perception itself.” In other words, untangling vision from a “unified cognitive field” gave viewers the tools to recognize perception’s illusionistic power. As Caroline Jones’ *Eyesight Alone* argued, this reductive sensory separation—or “bureaucratization,” in her terminology—was a foundational trope to modernist critical discourse in the mid-twentieth century, which explains its persistence.[30]

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[25] For an overview of the importance of these ideas to the emergent field of media archaeology, see: Jussi Parikka, *What Is Media Archaeology?*, 1 edition (Cambridge: Polity, 2012), 30–35.

[26] Crary, *Techniques of the Observer*, 19.

[27] Though it is not overly specified, European materials are the study's overt focus. Crary, 19.

While the case studies in *Techniques* do indeed illuminate a world in which the hand and the eye were becoming significantly unbound, we must acknowledge that they are drawn from a selective cross-section of material culture—a specialized category of optical devices that held a unique relationship to practices of viewing, circulation, and use. What happens to this theory when we consider the broader landscape of sensory technologies with which nineteenth-century viewers most frequently engaged, which prioritized touch in ways that stereoscopes or thaumatropes did not? As it stands, Crary’s “embodiment” is fundamentally optical-centric and only involves a very small portion of the body: eyes connected to a thinking subject’s brain. If this spectator was defined by a constant awareness of his or her corporeal position in relationship to representation, what role did the remaining 85% of the body play in processing that information? This study pushes against the reign of the eye in narratives of perception by presenting a fuller picture of how a broader category of sensory devices (in which tactile images were encompassed) operated in the United States, a place that experienced the emergence of modernism quite differently than did Europe.

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[28] Crary, 19.
[29] This particular phrase, which gets at the author’s core argument about the disassociation of vision from touch, is one of the most influential and widely cited passages. Crary, 19.
[30] Caroline A Jones, *Eyesight Alone: Clement Greenberg’s Modernism and the Bureaucratization of the Senses* (Chicago: University of Chicago Press, 2005).

The following chapters show that the "disassociation of touch and sight" occurred on an alternate timeline in the United States. There is no simple answer as to why this trajectory played out the way it did. Rather than seek some unifying cultural mandate or major social shift that mandated tactility's continuing relevance in American life, this dissertation's primary aim is to identify forgotten ways of seeing and modes of interpreting art that enrich and diversify our understanding of intellectual history. I view this aim as in line with an emerging body of work on visuality in the Americanist field that includes recent scholarship by Rebecca Zurier, Jason Weems, Wendy Bellion, and others.[31] Of course, this is territory that extends far beyond the field of American art, including influential contributions by scholars including but of course not limited to Martin Jay (Downcast Eyes), Anne Friedberg (Window Shopping), and Tom Gunning.[32]

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[31] Rebecca Zurier, *Picturing the City: Urban Vision and the Ashcan School* (Berkeley: University of California Press, 2006); Jason Weems, *Barnstorming the Prairies: How Aerial Vision Shaped the Midwest*, 1st Ed. edition (Minneapolis ; London: Univ Of Minnesota Press, 2015); Wendy Bellion, *Citizen Spectator: Art, Illusion, and Visual Perception in Early National America* (Chapel Hill; Williamsburg, Va.: University of North Carolina Press ; Published for the Omohundro Institute of Early American History and Culture, 2011).

[32] Martin Jay, *Downcast Eyes: The Denigration of Vision in Twentieth-Century French Thought*, A Centennial Book (Berkeley, Calif.: Univ. of California Press, 1994); Martin Jay, "Returning the Gaze: The American Response to the French Critique of Ocularcentrism," in *Perspectives on Embodiment: The Intersections of Nature and Culture*, ed. Honi Fern Haber (Routledge, 2002), 165–82; Anne Friedberg, *Window Shopping : Cinema and the Postmodern* (Berkeley: University of California Press,

That said, the case studies that follow link the lingering importance of physical engagement in processes of judgment, reasoning, learning, and entertainment to specific cultural and social forces that reveal how the hand reinforced its own continuing relevance. These social forces include Early National educational systems that overtly valued the hand as a tool of physical judgment, which in turn produced a generation of Americans for whom tactile vision became a default mode of inquiry; tensions over professionalization amongst the mid-nineteenth century medical community that came to a head over the subject of proprietary tactile knowledge, such as the use of tools and surgical maneuvers; and a string of financial panics that prompted everyday citizens to consider the surfaces of untrustworthy paper bills with unusual care.

As these case studies demonstrate, the continued entanglement of hand and eye in American culture was far from an obstacle to the formation of complex and "modern" ways of encountering art. Viewers constantly engaged in situations in which physical interaction with objects produced an acute awareness of one's subject position in relation to representation at a high intellectual level. Untangling the notion of "embodiment" from optical-centrism is crucial in showing how in American intellectual history, knowledge was constructed in unexpected ways. My aim, in the investigation that follows, is to get to know these objects better by asking the following questions: How were they made? Who made them, and in relation to what other kinds of visual production? How were they used – not just in what contexts, but how were they physically handled? What kinds of bodily movements do they provoke, and how did those movements come to be echoed in

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1993); Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator," *Art and Text* 34 (Fall 1989).

other attempts to access knowledge across the visual landscape of early America? I also strive to upset the linear flow of time set up in the accounts cited here: that is, that rumblings of a shift in vision led to a sea change in art.

Chapter Descriptions

Of the multitude of tactile images produced in the United States from the late eighteenth century to the turn of the twentieth, I have identified four types that gained compelling cultural traction: the planar turn-up, the layered illustration, the pull-tab dual image, and the expansive pop-up tableau. The dissertation's three chapters and epilogue are each rooted in one of these mechanisms of movement. Organized in rough chronological order, each case study begins with the central object itself, and expands outwards into questions of social, cultural, and intellectual history. This method sometimes results in chronological overlap with a neighboring chapter, for instance in the case of chapters two and three, which both deal with the period between 1830 and 1850.

In organizing each case study not by shared subject matter but rather around a common manner of movement particularly attractive to a given period audience, I hope to locate broad conceptions of visual knowledge across a range of mass printed and fine art objects, lamentably still often segregated in art historical research. This method most frequently results in the coupling of books and prints with paintings, as in chapters one and the epilogue, although objects ranging from marble sculpture to paper money are also incorporated as points of knowledge transfer. By pairing unexplored movable images with familiar artworks, I seek to demonstrate that turn-of-the-century viewers conceived of the relationships among visual culture, material culture, and fine art as one of multidirectional exchange instead of the unidirectional paths of influence that are often posited.

The opening chapter, **"Learning by the Book in Early America,"** follows an early American "turn-up" book, *The Metamorphosis,* across time, space, and medium in order to define tactile images' patterns of distribution, circulation, and reception. Designed by Quaker schoolteacher Benjamin Sands in 1782, *The Metamorphosis* was the first popular movable image printed in the United States. The folded, recombinable harlequinade book quickly broke free of a singular format, multiplying in various print and manuscript iterations well into the nineteenth century. Considering this movement between engraved and handmade iterations, I contextualize the object and its fungible images in post-revolutionary systems of Rousseauvian education and sensory theory that valued tactility as an integral component of learning and judging. Asking who, exactly, the young audiences for this book were results in placing *The Metamorphosis* in dialogue with *Venus Rising from the* Sea (1822), an enigmatic "deception" made by Raphaelle Peale, who was a young student at the height of *The Metamorphosis*'s popularity. I ultimately suggest that thinking about Peale's provocatively creased and folded work in concert with the planar logic of the *The Metamorphosis* allows us to reread the painting as the very opposite of a trompe l'oeil.

Chapter two, "**Animating Anatomical Prints at Midcentury,"** considers a very different context for the layered, superimposed tactile image: emerging modes of scientific visualization in the antebellum era. Between 1833 and 1850, five editions of George Spratt's "dissected plate" anatomical text, *Obstetric Tables*, were published in Britain and the United States. The book's corporeal pictures fold depth and time into their structure by way of intricately overlapping paper flaps. *Obstetric Tables* joined a visual culture teeming with representations of the dissected human body across media: echoes of their excavative visual strategies are found in wax figurines, papier-mâché lecture aids, and even neoclassical sculpture from the same period. In this case study, I situate the book's tactile images in a context of midcentury American debates about the shifting role of bodily contact in accessing not only science, but a wider visual cultural landscape that included encounters with fine art such as neoclassical sculpture. Taking Hiram Powers' *The Greek Slave* as a point of comparison, the chapter considers how the practices of touching models of women's bodies encouraged in scientific culture might have diffused into ways of viewing women's bodies in other media.

Chapter Three, **"David Claypoole Johnston and the Economy of Surface,"** uncovers a series of pull-tab political portraits made by Boston artist David Claypoole Johnston between 1837 and 1863. Each paper card features a political figure, which a mechanical device allows the viewer to see in dual states both before and after a given historical event. The series emerged from the economic depression and financial panics characterizing the period between 1837 and 1840, during which time paper—its abundance, scarcity, material makeup, and surface iconography—took on particularly charged political and cultural meanings. The pull-tabs' visual and physical compression of multiple surfaces into a single material support made such anxieties about scarcity, excess, and value literal and tangible. This chapter considers how Johnston's practices of revision, recycling, and compression were not merely techniques employed towards the end of ephemeral novelties, but rather were a corporeal response to the tumultuous "hard times" of the period, and ultimately strategies central to the production and success of the mainstream printed works for which he is best known.

The flourishing of tactile print slowed in the years following the Civil War—a challenging time for experimental print practice—only to reemerge in turn-of-the-century visual culture with a new set of priorities. The Epilogue, "**When Tactile Images Went Underground**," traces the re-negotiation of hand-eye relationships in mass-produced moving images made during the period between the Civil War and the emergence of cinema circa 1895, at which point viewers' relationship to technologies of motion would once again undergo radical reconstruction. A case study about America's first true pop-up books, which were mass-produced by the McLoughlin Bros. Publishing Firm beginning c. 1882, reveals a preoccupation with the oscillation between two and three dimensionality, or between flatness and animation, all filtered through questions about what it meant to "Americanize" vision.

Studying ephemeral and mass-produced prints, drawings, and novelties entails methodological challenges. The objects and images marshalled in this dissertation typically lack direct written reception, which mandates taking seriously and probing the limits of the art historical belief in the object itself as historical evidence. Careful attention to processes of production and to the visual effects of the objects I study prove crucial, and as such I rely heavily upon technical and conservation-based approaches in conjunction with period sources that speak to aligned histories of education, display, social comportment, and scientific inquiry. By demonstrating that nineteenth-century audiences did not conceive of the flat and static surface as quite so flat and still at all, *Animating Flatness* reveals the insufficiencies of long-held narratives of modernism and flatness, surface and subject, in the study of nineteenth-century visual culture and art. Furthermore, in highlighting the concomitance of painting and visual culture in nineteenth-century America, this study displaces an artist-centric model prevalent in

Americanist art history not by turning its back on so-called high art, but by revealing the broader range of visualities from which it emerged.

CHAPTER 1: LEARNING BY THE BOOK IN EARLY AMERICA

Unfolding The Metamorphosis

On December 24, 1782, Virginia schoolteacher Benjamin Sands completed a prototype for what would become an American visual cultural phenomenon. The manuscript consists of four rectangular paper panels stitched together with green thread, likely added in a later conservation effort, covered on each side with neatly sketched figures and stanzas of a carefully lettered poem.[33] Moving clockwise from left to right, the first frame features a man surrounded by birds and trees; the second shows the same scene scaled larger; the third, a skeleton holding an arrow and an hourglass; and at the bottom left, an inverted heart topped with ribbons, a depiction of an abstracted coin purse (Fig. 1.1). Delineated in bold outlines without any shading or gesture toward three-dimensionality, the schematic drawings at once evoke the linear style of a printed image and the flattened planes of itinerant portraiture. A religious poem, which both narrates and provides the reader with instructions for physically engaging with the images, winds across the first and second panels and the bulk of the object's reverse side (Fig. 1.2).[34] Faint creases horizontally bisect each panel, indicating past folding of the yellowing paper. The artist completed his work with a looping inscription: "Loudoun County Virginia/December 24, 1782/Benjamin Sands Made This" (Fig. 1.3).

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[33] According to the antiques dealer who sold this manuscript to the Colonial Williamsburg Foundation, the threads are a later addition, intended to repair old tears. Sumpter Priddy et al., "Benjamin Sands' 1782 Partial Manuscript for Metamorphosis: Or, A Transformation of Pictures, Loudon County, Virginia," n.d.

[34] For a full transcription of the poem on the later printed editions, see Appendix B.

At first glance, it is difficult to see how these clumsily conjoined two-dimensional drawings could prefigure the nation's first widely produced movable image. Sands' multimedia experiment resists easy genre classification—it is more than a drawing; book-like, but not a bound codex. Yet the object plainly bears little material relation to the transparencies, magic lanterns, and panoramas that fill the usually-told stories of moving images' prehistory.[35] Opaque woven paper and stitching lock the pieces in place, resisting tricks of light and shadow or three-dimensional expansion. Its stubborn stillness further obstructs a direct proto-cinematic teleology. Lacking a spine or binding, its four panels, fused with thread and paste, lay two by two in a flat composition reminiscent of a printed broadside. Even the drawn figures, plants, and animals appear stiff and still, devoid of any gesture toward depth or shadow.

Sands' manuscript, which he would later title *The Metamorphosis, or a Transformation of Pictures*, might not independently produce animation from its own paper surfaces, but was full of motion all the same. Most visibly, the humble paper sketch acted as a point of convergence in a transatlantic flow of tactile images, both printed and handmade. Its flattened planes bear a concept design for a flap book, sometimes called a harlequinade or "turn-up," a category of tactile image with origins in seventeenth-century English print culture and theatrical pantomime.[36] Throughout this chapter, I will refer to *The Metamorphosis* using a range of descriptive terms alongside turn-up, including book, booklet, harlequinade, flap book, and pamphlet, in an attempt to capture the object's categorically liminal format. Turn-ups, of which many examples exist made both before and after 1782 on both sides of the Atlantic, are tactile paper objects that slip between categories of book, game, and performance. Unlike Sands' manuscript, however, turn-ups were made for motion. Clever folds and cuts convert a single sheet of paper into a lineup of discrete vignettes, each opening up onto a scene hidden beneath the flaps: a mechanism of movement fueled by repeated lifting and pushing, uncovering and concealing. Though the poems accompanying each picture direct the reader to "turn up" and "turn down" the flaps according to a determined narrative, readers could choose their own progression or controlled disruption, revealing absurd exquisite corpse-like combinations where religious, moralizing scenes should have instead appeared.[37] Sands' design was inspired by a widely circulated turn-up called *The Beginning, Progress, and End of Man,* first printed in London c. 1650.

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[35] Scholarship in cinema studies and art history alike tend to focus on this subset of technologies that produce images seen by multiple viewers at once, and therefore bear a closer relation to screen practices as we know them today. For an example from each discipline, see: Laurent Mannoni and Richard Crangle, *The great art of light and shadow: archaeology of the cinema* (Exeter, Devon: University of Exeter Press, 2000); Bellion, *Citizen Spectator*.

[36] Jacqueline Reid-Walsh outlines the English roots of *The Metamorphosis* in : Jacqueline Reid-Walsh, "Textual Travels and Transformations: Or, a Tale of Two Lives of The Beginning, Progress and End of Man (1650)," *Book 2.0* 2, no. 1–2 (2012): 101; Jacqueline Reid-Walsh, *Interactive Books :*

The 1782 manuscript *Metamorphosis*, which was altered and erroneously recombined sometime before entering the Colonial Williamsburg Foundation's collection, was likely also composed as a long horizontal strip before its panels were separated.[38] Some of the original panels have likely been detached and lost. Initially, it

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Playful Media before Pop-Ups, Children's Literature and Culture (New York and London: Routledge, 2018).

[37] Reid-Walsh notes that "unintended transformations are a continuation of the Medieval trope of the 'world turned upside down,' a seventeenth century print culture trend: Reid-Walsh, "Textual Travels and Transformations," 102.

[38] Email exchange with Laura Pass Berry, Juli Grainger Curator of Paintings, Drawings, and Sculpture at Colonial Williamsburg Foundation, November 13, 2015.

would have structurally resembled its English predecessor as well as the hundreds of printed and handmade American versions that began to appear just years after Sands signed his piece. Indeed, beginning around 1787, relief-printed *Metamorphosis* booklets bearing Sands' signature began to circulate in the mid-Atlantic region.[39] The book rode a wave of prominence that flowed well into the nineteenth century, with new editions cropping up as late as 1875.[40] Hundreds of printed *Metamorphoses* survive in special collections today, as do dozens of handmade versions, joined by an unknown additional number of each type in private holdings.

This chapter situates Sands' prototype *Metamorphosis* at the center of a network of entangled objects, cultural practices, and philosophical currents. It builds upon recently published research by education historian Jacqueline Reid-Walsh that situates the turn-up as a foundational format of what she terms "playable media," extending outward from the realm of education and childhood studies into questions of visual culture and intermedial reception.[41] I follow four of these threads emanating from the 1782 manuscript: moving chronologically, I begin by tracing the book's precedents, especially the English turn-up *The Beginning, Progress, and End of Man*. Examining the religious and cultural situation from which this early turn-up emerged complicates notions of copying in the transatlantic exchange of print. I then turn to the flap book's second life in America, rechristened as *The Metamorphosis*, following its boomeranging trajectory from manuscript to print and back again. A third section considers the print's interactive uses, arguing that its intended function as a didactic Protestant toy would have resonated both within this expected religious context as well as in a secular community interested in liberal educational philosophies. The chapter's fourth and final section asks how the fuller understanding of tactility's role in early American education that *The Metamorphosis* illuminates might cast new light on artworks and objects created by students trained within such a system.

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[39] Dating the earliest printed *Metamorphosis* is necessarily conjectural. Dates and publisher's imprints do not appear with the print until 1807. In this chapter, I have relied on D'Alte Aldridge Welch's proposed date of 1787, which he justifies at length in his descriptive bibliography of *The Metamorphosis*. Other early collectors, for instance A.S.W. Rosenbach, proposed dates of as early as 1775. To my knowledge, neither Welch nor Rosenbach knew of Sands' dated manuscript of 1782, and it is unclear how this information might have changed their dating of the earliest printed version. d'Alté A Welch, "A Bibliography of American Children's Books Printed Prior to 1821, S-Z," *Proceedings of the American Antiquarian Society* 77, no. 2 (October 1967): 300; A. S. W. Rosenbach, *Early American Children's Books,* (Portland, ME: The Southworth Press, 1933), 37–38.

[40] Copies of one 1875 version are held at Beinecke, Rutgers, The American Antiquarian Society, and the Library Company of Philadelphia. Benjamin Sands, *Metamorphosis; or A Transformation of Pictures, : With Poetical Explanations, for the Amusement of Young Persons.* (Pottersville, NJ: Wm. Hazen & Co, 1875).

[41] Reid-Walsh's book is the first sustained treatment of *The Metamorphosis* and its predecessors. Reid-Walsh, *Interactive Books*.

Eighteenth and nineteenth-century America's many *Metamorphoses* pose an intriguing problem: despite the technical limitations of mass-production in this transitional moment, the viral spread of *The Metamorphosis*—a particular set of images and textual fragments, united by a common mechanical format, but not a standardized image—puts pressure on long-held ideas about originality and the reach of print in a pre-lithographic moment. This chapter works towards a definition of a mass-circulated moving image by following *The Metamorphosis* across its many variants in the Early National United States.[42] What social and cultural conditions drove its intense popularity?

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[42] Throughout this dissertation, I will employ the terminology "Early America" and "Early National United States" to refer to the period between approximately 1776 and 1830. I want to acknowledge that this is a problematic designation, as America was only "early" to the multiple groups of imperialist colonizers—it was no such thing to the indigenous groups who had lived on the continent for far longer. While the term "New World Colonies" more accurately reflects this power dynamic for the period before the Revolution, I have not encountered an equivalent construction for the period that follows.

Who were its makers, readers, and users? Lastly, what can we learn about the coalescence of a visuality, a socially-conditioned and historically specific pattern of vision, from closely analyzing a single mode of physically-fueled movement? Flap motion, an age-old means of using a single surface to both reveal and conceal, remains a constant throughout *The Metamorphosis'* lifespan. I argue that the book owes its continued success to this mechanism of movement—the manipulation of planes—which resonated strongly with a culture whose systems of education and entertainment were predicated on tactility and maneuvering as teachers of judgment. Ultimately, faced with an image produced by masses if not *in* masses, *The Metamorphosis* demands a recalibration of long-held notions of visual culture's reach and relationship to other genres of art in the first years of the nineteenth century.

Part I: The Beginning, Progress, and End of Man

First issued by London printer B. Alsop in 1650 during the early years of the English Civil War, *The Beginning, Progress, and End of Man*, *The Metamorphosis's* predecessor, was configured as a long horizontal strip, folded perpendicularly into fourths.[43] Children represented just a fraction of the expansive audience for these cheaply sold, commonly available books.[44] In a pristine, partially uncut edition held at the British

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[43] The oldest known copy, in the collection of the British Library, demonstrates this simplified structure. Most editions of the print would have had vertical cuts separating each individual vignette, but this print's anomalous uncut state is likely why it was preserved. Reid-Walsh, "Textual Travels and Transformations," 104; Karl Josef Höltgen, "Emblem and Meditation: Some English Emblem Books and Their Jesuit Models," *Explorations in Renaissance Culture* 18 (1992): 55–92.

[44] It is difficult to know who bought these books, or to whom they were marketed. In several articles, Jacqueline Reid-Walsh makes the case that early English harlequinades were constructed for an implied child viewer. Considering they were sold by London publishers like Robert Sayer who had a corner on the market for children's print but also sold books and prints aimed at adults, it's likely that

Library, four images are spaced evenly across the horizontal strip in its closed "beginning" state, each captioned with a descriptive stanza (Fig. 1.4). The woodcut illustrations are lively and stylized. Weighted at varying points on each panel, they seem to tumble across the scroll, pushed along by bold, gestural curves and jolting angles. Each image is thickly outlined, especially evident in this well-inked version. Scarce hatching acknowledges shadow and volume, but the artist is not invested in naturalism. These images do not conjure a fantasy world, but instead are dedicated illustrations of the text—schematic visual definitions of the metamorphoses described therein.[45]

Reading the exterior panels from left to right (in contradiction to the poem's directions), Adam, holding an apple, "comes first on the stage" (panel 1). He is followed by a wide-eyed lion (panel 2); then a small man with a strange pyramid above his head who has "given his heart to gather gold" (panel 3); and finally, what appears to be the same man grown taller, who has lost his pyramid hat but has gained bags of gold and silver (panel 4). To move to the middle stage, the "progress of man," the user must lift up the top leaf, a direction explicitly given in the poem (Fig. 1.5). With top leaf raised and bottom leaf still in place, each figure undergoes a partial mutation: Adam becomes Eve holding an apple, the lion a griffin; while the small man gains a pot of gold, and his

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the flap books reached many non-child readers. Jacqueline Reid-Walsh, "Pantomime, Harlequinades and Children in Late Eighteenth-Century Britain: Playing in the Text," *Journal for Eighteenth-Century Studies* 29, no. 3 (September 1, 2006): 414; Jacqueline Reid-Walsh, "Eighteenth-Century Flap Books for Children: Allegorical Metamorphosis and Spectacular Transformation," *The Princeton University Library Chronicle* LXVII, no. 3 (2007): 751–90.

[45] For a short analysis of seventeenth and eighteenth-century practices of reading the Harlequinade, see: Alexandra Franklin, "Making Sense of Broadside Ballad Illustrations in the Seventeenth and Eighteenth Centuries," in *Studies in Ephemera: Text and Image in Eighteenth-Century Print*, ed. Kevin Murphy and Sally O'Driscoll, Transits : Literature, Thought & Culture (Lewisburg : Lanham, Maryland: Bucknell University Press ; Rowman & Littlefield Publishing Group, Inc, 2013), 171–72.

neighbor mutates into a skeleton-man (Fig. 1.6). A final turn clarifies these half-baked metamorphoses: at the "end of man," Eve gains a mermaid's features—the poem remarks that "the Mermaid's voice is sharp and shrill, as women's voices be,"—while the griffin takes flight as a fully-formed eagle, snatching up a baby as he departs. In the fourth frame, the once-rich man has become a skeleton, his wealth unhelpful in death. In a cut version of the print, separated panels would allow the user to move within each poem according to its own rhythm, without affecting the integrity of the remaining scenes.[46]

What may appear to the twenty-first century viewer as moralizing gibberish was a clear set of legible icons for Puritan and Protestant readers in eighteenth century Britain and colonial New England. Versions of each character and its transfigured states could be found in emblem books circulating in seventeenth-century England, for example, George Wither's *A Collection of Emblemes,* engraved by Dutch artist Crispin van de Passe.[47] The first panel, Adam and Eve's transformation into a Mermaid, would have signaled Genesis's original sin unfolding into a cultural icon of vanity and sexual licentiousness. Panel two trades the biblical for mythological: the baby-snatching griffin alludes to the tale of Zeus's abduction of Ganymede. Lily Higgins has compellingly interpreted the third panel as a tale of the heart—the body's site of spiritual power—upended and disfigured by material greed.[48] Finally, man's disintegration into a skeleton is recognizable even today as a memento mori, a reminder that all men must die.[49]

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[46] Some subsequent imprints include an additional panel inserted between Adam and Eve and the lion, showing the story of Cain and Abel. This fifth scene is occasionally reproduced in handmade copies of the book. Alexandra Franklin, "Cain in the Canefields," *The Conveyor: Research in Special Collections at Bodleian Libraries* (blog), October 8, 2009, http://blogs.bodleian.ox.ac.uk/theconveyor/2009/10/08/cain-in-the-canefields/.

[47] Several scholars have made the connection between *The Beginning, Progress, and End of Man* and contemporary emblem books like Wither's. See: Reid-Walsh, "Eighteenth-Century Flap Books for Children: Allegorical Metamorphosis and Spectacular Transformation," 756–57; Lily Higgins, "'A New and Stranger Sight': Allegory, Emblems, and Interactive Images in a Seventeenth-Century Puritan Toy Book" (University of Delaware, 2015), 14–18.

But the print was not simply a set of emblems rearranged. Rather, as it was reprinted well into the eighteenth century, it accrued associations with cultural practices such as pantomime theatrical performances.[50] Pantomime developed in England by the 1720s as a form of combined music, dance, and comedy. Its theatrical spectacles followed basic formulas, and consistently featured known archetypal characters, including the *Commedia dell'arte's* wily trickster-servant Harlequin, whose name became attached to this flap book genre. Harlequin played a magical and mysterious role in the pantomime: he used sleight of hand and spectacle to change himself and other characters into furniture, animals, and strangers.[51] Harlequin's powers were often explained in the play's narrative – in the 1723 performance of *Harlequin Doctor Faustus,* for example, the trickster gains his magical powers by signing a contract with Mephistopheles– but audiences remained in the dark about, and fascinated by, the mechanical sleights of stage design that allowed for simulations of harlequin's spells to enter their physical world.[52] By the 1770s, fashionable pantomime performances, and especially their harlequin-centric episodes, were often transferred to the printed flap mode used in *The Beginning, Progress, and End of Man* (Fig. 1.7).[53] "Harlequinade," in its very title, recalled the spectacular revelations of theatre, and in particular, the transformative subject matter of the pantomime genre.[54] Eventually, the term came to stand for all books and prints of this flap format, whether or not their content was drawn from the pantomime theatre.

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[48] Higgins, "'A New and Stranger Sight': Allegory, Emblems, and Interactive Images in a Seventeenth-Century Puritan Toy Book," 33–34.

[49] This paragraph summarizes Lily Higgins' iconographic interpretation of *The Beginning, Progress, and End of Man* in her Masters' Thesis on the Puritan contexts of the book. Higgins, 28–38.

[50] Reid-Walsh marks the end of the English harlequinade as a popular practice around 1816. Reid-Walsh, "Pantomime, Harlequinades and Children in Late Eighteenth-Century Britain," 415.

[51] John O'Brien notes that the few surviving firsthand accounts of eighteenth-century pantomime are full of rapt descriptions of Harlequin's metamorphoses. John O'Brien, *Harlequin Britain: Pantomime and Entertainment, 1690–1760* (JHU Press, 2004), 2.

[52] O'Brien, 94–95.

Where did *The Beginning, Progress, and End of Man* fit into the complex world of print production and consumption in seventeenth and eighteenth-century England? Roughly incised woodcuts and cheaply made paper (not to mention a low survival rate) testify that this was not a fine art print aimed at collectors.[55] Rather, *The Beginning, Progress, and End of Man* was an ephemeral entertainment, made to be repeatedly folded and unfolded, played with, ripped and torn and eventually tossed.[56] Because of its religious subject matter and its resonance with other common print subjects such as *The Stages of Life* and *The World Turned Upside-Down*, the harlequinade was able to capitalize on a liminal position between early modern England's bestselling genres.[57] Its value as a toy-like novelty linked to amusements in the broader cultural realm marks the broadside's crucial separation from its American offspring, which as I will show, belonged more to the educational than the theatrical. Though they included similar images, layout, and text, *The Beginning, Progress, and End of Man* and *The Metamorphosis* were put to use in remarkably different ways. Despite its moralizing content, the English book was received as a theatrical and trivial enjoyment by mostly adult users, stemming from a cultural association with the Harlequinade theatre tradition, while the American version was marketed from the beginning as a teaching tool made to be taken seriously by studious children.

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[53] Jacqueline Reid-Walsh, "The Late 18th Century Harlequinade: A Migration from Stage to Book" (MIT4: The Work of Stories, Massachussets Institute of Technology, May 5, 2005), 2, http://web.mit.edu/comm-forum/mit4/papers/reid%20walsh.pdf.

[54] Many pantomime performances featured adaptations of Ovid's *Metamorphoses*. O'Brien, *Harlequin Britain*, 3.

[55] Jacqueline Reid-Walsh describes *The Beginning, Progress, and End of Man* as falling somewhere between "the broadside ballad and the chapbook" on the scale of "cheap print." Reid-Walsh, *Interactive Books*, 62.

[56] Sheila O'Connell and British Museum, *The Popular Print in England: 1550-1850* (London: Published for the Trustees of the British Museum by British Museum Press, 1999), 167.

[57] O'Connell and British Museum, 187.

Part II: *The Metamorphosis* in America

Benjamin Sands' Visual Puzzles

Benjamin Sands, the author of *The Metamorphosis,* was born in Purcellville, Virginia, in 1748 or 1749.[58] Little is known about his life beyond a vague outline of locations, family members, and occupations patched together from tax and census records. His birthplace of Loudoun County, west of Washington, D.C., was home to a small but thriving community of Southern Quakers. Sands' parents, farmer Edmund Sands (1699-1773) and Rachel Clowes, hailed from Bucks County, Pennsylvania, but soon became well-established in Virginia as members of the Fairfax Monthly Meeting.

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[58] I am grateful to Jim Green of the Library Company of Philadelphia and Sumpter Priddy of Sumpter Priddy III Antiques and Fine Art for sharing unpublished research on this manuscript with me. Priddy et al., "Benjamin Sands' 1782 Partial Manuscript for Metamorphosis: Or, A Transformation of Pictures, Loudon County, Virginia."

Despite his parents' stature in the local Quaker community, a twenty two year old Sands was banished from Loudoun County for marrying a woman "out of unity" in 1771.[59] Disowned by his fellow Friends, Sands left Loudoun County for an unknown backcountry destination until working towards reinstatement, which he had apparently achieved by 1782, when he listed Loudoun County in the inscription on his manuscript of *The Metamorphosis.* He departed again by the late 1780s for Bucks County, Pennsylvania, and later Washington County, Tennessee, where he would eventually purchase land and raise three sons. Sands died not long after 1823.

Considering Sands' itinerant trajectory between Virginia, Tennessee, and Pennsylvania in the following years, it is especially interesting that he was able to see and study, and perhaps even own, a copy of *The Beginning, Progress, and End of Man*. Indeed, Sands was probably able to acquire a copy of the English print precisely because of this mobility between locations. Strong bonds between the Virginia Quaker community and the Philadelphia Monthly Meeting set Sands' community apart as a space between the advanced market of Philadelphia and the still-growing centers further south.[60] While booksellers like Robert Wells in Charleston and William Aikman in Baltimore were, by the years before the revolution, deeply invested in shoring up a local market for British imports, merchandise supply in Philadelphia and New England still far outpaced that in Virginia.[61] London stock would have been available in major Southern cities including the nearby Williamsburg and Baltimore, and it is possible that Sands could have come across the book there.[62] But perhaps it is more likely that the artist, whose family hailed from Bucks County, Pennsylvania, found a copy by way of Philadelphia, which by the Revolutionary period was the indisputable center of the American book trade. Sands was certainly aware of the advantages of the Philadelphia market, as he sought a Philadelphia engraver, printer, and publisher for his first mass-printed edition of *The Metamorphosis*, issued a few years after his manuscript was made.

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[59] The notation "mou" is a frequent sight in Quaker records, indicating that a Friend had married out of unity, or in other words, married a non-Quaker.

[60] Priddy et al., "Benjamin Sands' 1782 Partial Manuscript for Metamorphosis: Or, A Transformation of Pictures, Loudon County, Virginia."

Throughout these travels, Benjamin Sands worked as a schoolteacher and was evidently quite passionate about his work. Not a career author, he published just three works in his lifetime, all of which offered innovative visual and mnemonically-based methods for instructing children. After *The Metamorphosis* (which was issued in print sometime between 1782 and 1787), Sands published *A Key to the Impenetrable Secret,* printed by Joseph Gales in Northampton, Pennsylvania before 1799, which is now extremely scarce.[63] Inspired by a Horace Walpole work distributed under a similar title in England, *A Key* printed moral maxims in alternating red and black ink, a visual puzzle predicated on a memory exercise (Fig. 1.8).[64] The only known copy, held at the American

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[61] Calhoun Winton, "The Southern Book Trade in the Eighteenth Century," in *The Colonial Book in the Atlantic World*, vol. 1, A History of the Book in America (Chapel Hill, N.C.: University of North Carolina Press, 2009).

[62] Winton, 240.

[63] Benjamin Sands et al., *A Key to the Impenetrable Secret* (Northampton, Pa.: Printed by Joseph Gales, Northampton Township, Bucks County, 1799). American Antiquarian Society, Dated Pams.

[64] *[The Impenetrable Secret: a game, played with ten cards, each bearing a series of proverbs printed on both sides: invented by Horace Walpole, Earl of Orford.]* (Strawberry Hill?, 1780). British Library, General Reference Collection C.31.b.32.

Antiquarian Society, bears the inscription of its owner, "James Flack Junr. His book September 19th 1799," and is enclosed in a handmade stitched binding covered with James' faded scrawl. Similar to *The Metamorphosis*, the experience of reading the pamphlet is slightly upending. While the binding and a preface poem give the impression of a vertically-oriented text, the moral maxims are aligned horizontally, causing the reader to rotate her or his position throughout. This odd arrangement is clarified through comparison to Walpole's original c. 1760 work, titled simply *The Impenetrable Secret*, in which aphorisms were printed on double-sided loose cards. Sands' version attempts to reconfigure the experience of flipping a double-sided piece of paper on a two-dimensional surface through the use of dual-colored text.

Sands wrote his third work, *The Tutors' and Scholars' museum*, in Virginia during the 1780s—around the same time that he completed his manuscript for *The Metamorphosis.*[65] Less overtly morally driven than his other publications, the goal of *The Tutors' and scholars' museum* was one often attempted and rarely successful: to make math fun. The "great variety of amusing questions in arithmetic" enclosed within the hand-stitched pamphlet took two forms: "short method" addition and subtraction tables which taught students spatial tricks for memorizing calculation, and descriptive word problems, in which formulas were couched in descriptions of egg-selling and apple picking. At the close of the pamphlet, Sands included a lengthy letter of dedication to his

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[65] Sands did not publish this textbook until 1819. While it was published in Doylestown, PA, the author was living in Tennessee at the time. Benjamin Sands, *The Tutors' and Scholars' Museum:: Containing a Curious Short Method of Addition, Also, a Great Variety of Useful and Amusing Questions in Arithmetic. To Which Is Added, a Letter Written in Virginia, to the Author's Scholars in the County of Bucks, &c* (Doylestown [Pa.]--: Printed for the author, 1819).

Bucks County pupils within this arithmetic textbook, in which he expresses his views regarding the kinship between learning and a moral, happy life.

While *The Metamorphosis* is the only work by Sands to include illustrations (although *The Tutors' and Scholars' Museum* features a crude diagram), his methods of teaching were intrinsically visual and imaginative. In particular, both *The Metamorphosis* and *A Key* center on the physical and conceptual manipulation of the page: readers are expected not only to lift and turn in unconventional ways, for instance rotating the book between vertical and horizontal positions and turning pages out of the usual forward progression, but also to intellectually move between surfaces as they match and recombine terms, colors, and numbers. In *A Key to the Impenetrable Secret,* this process occurred mentally, as readers moved between quotes printed in black or red ink in hopes of imaginatively combining a single phrase, as if in possession of an invisible composing stick. Newspaper advertisements show that Benjamin Sands was not the first to recreate Walpole's *Impenetrable Secret* for American audiences—rather, that title went to Benjamin Franklin, whose firm Franklin & Hall reportedly had copies of the novelty for sale at the Philadelphia Post-Office in May 1749.[66] According to historian of magic Ricky Jay, Franklin's version of *The Impenetrable Secret* reproduced Walpole's card format, and functioned as a "pseudo-mind-reading stunt" used in conjuring performances, in which an audience member chose one of the aphorisms written on the cards and a showman attempted to "divine the selection."[67] By reconfiguring the dual-sided cards into a two-page book spread, Sands repackaged the somewhat mystical public novelty into a private memory game, in which the reader played the role of both all-knowing conjurer and naïve audience member. This particularly performative educational context for *The Metamorphosis* was not lost on its Early National American audiences, as I will demonstrate – readers and instructors embraced the correlation between physical manipulability and moral-intellectual instruction.

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[66] *Many Mysteries Unraveled: Conjuring Literature in America, 1786-1874* (Worcester, Mass: American Antiquarian Society, 1990), 1.

[67] *Many Mysteries Unraveled: Conjuring Literature in America, 1786-1874*.

***The Metamorphosis* in Print, 1787- 1875**

The Metamorphosis was an undeniable sensation. From the moment the print appeared in print on American soil, its spread became almost impossible to track. Despite what its enchanting title might suggest, it did not circulate by magic: instead, translating *The Metamorphosis* from manuscript to a published print involved an elaborate chain of production and labor. To begin with the images, close comparison of multiple editions reveals that all Philadelphia and most New York imprints issued between 1787 and at least 1824 used the same set of relief-cut illustrated blocks, designed by Philadelphia engraver and printmaker James Poupard.[68] Poupard's signature is visible at the bottom of most interior and exterior panels, but it is clear from consistent damage (a splotchy imperfection on the interior final panel, for example) that the physical blocks themselves were passed among a succession of printers and publishers, rather than simply copied between firms (Fig. 1.9). The first surviving edition to include a title page with author, printer, and publisher information dates to 1807 and was issued by Solomon Wieatt, who is listed as a bookbinder in the Philadelphia City Directory of the same year.[69] Initially, Wieatt and his successors Joseph Rakestraw and Jonathan Pounder both printed and published the book, but by 1813, partnerships between separate printers and publishers begin to appear. The majority of surviving editions were printed and distributed by Joseph Rakestraw, whose shop was then located at 190 North 3rd street in Philadelphia.[70] Beginning in 1814, Rakestraw partnered with New York publisher Samuel Wood, significantly increasing the book's circulation in the northeast.

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[68] It is difficult to discern whether these are wood engravings or metal cuts. Bibliographies and catalogue notes refer to them as both interchangeably. Welch calls them metal cuts because "some of the rules are bent, or have a curve in them." I have arrived at the conclusion that the same Poupard blocks were used through consultation with Jessica Linker and examination of multiple editions dating from 1787 to 1875. d'Alté A Welch, *A Bibliography of American Children's Books Printed Prior to 1821, S-Z*, n.d.

The Metamorphosis's standard Philadelphia chain of production wove together Poupard's cuts; a printer's imposition made up of set moveable type, printer's ornaments, and the occasional cast ornament of a schooner or a youth reading under a tree (printed together on a common press); and a publisher's distribution scheme. Editions that fall outside the Philadelphia-New York loop are doubly complicated. No doubt attracted by the book's high sales, publishers from Cheshire, Connecticut to Cadiz, Ohio created their own copies, mimicking Poupard's cuts with varying degrees of success (Fig. 1.10).[71] The

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[69] *The Philadelphia Directory* (Philadelphia, 1803), 309, http://archive.org/details/philadelphiadire1807phil.

[70] By 1821, Joseph Rakestraw's printing business had expanded: in the 1821 directory, he listed himself as a printer and bookseller with offices at 254 and 256 North 3rd street. (add 1821 cite) *The Philadelphia Directory* (Philadelphia, 1810), 229, http://archive.org/details/philadelphiadire1807phil.

[71] To name a few examples of editions with non-Poupard illustrations that fall outside of the Philadelphia – New York center of production: Benjamin Sands, *Metamorphosis, or, A Transformation of Pictures : With Poetical Explanations* (Cheshire, CT: Shelton & Kensett, 1807); Benjamin Sands, *Metamorphosis; or, a Transformation of Pictures, with Poetical Explanations, for the Amusement of Young Persons.* (Frederick Towne, MD: Matthias Bartgis, 1813); Benjamin Sands, *Metamorphosis; or, A Transformation of Pictures, : With Poetical Explanations, for the Amusement of Young Persons. : Also, an Alphabet of Large and Small Letters to Aid Females in Marking Linen, &c.*,

Pennsylvania Dutch in the Philadelphia and Harrisburg areas had enjoyed German-language versions of the booklet since 1793, both with Poupard's blocks and newly cut illustrations (Fig. 1.11).[72]

By the beginning of the nineteenth century, as the distractions of Revolution began to wane, multiple editions were issued yearly. These various copies differ from one another in the subtlest ways, and one must look closely for the smallest deviations (the number of dots studding a corner ornament, for instance, or the length of a publisher's imprint measured in millimeters) to discern the difference between print runs.[73] While we do not have the necessary publisher's records to estimate the book's distribution—such archives would be a rarity for this period, especially for a toy book—the high number of surviving copies are strong evidence of its wide circulation. Hundreds of printed *Metamorphoses* remain preserved in special collections libraries: there are

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Welch 1163.29 (Wilmington, Delaware: Robert Porter, no. 97, Market-Street, 1814); Benjamin Sands, *Metamorphosis* (Cadiz, Ohio: H. Anderson, 1836).

[72] While German-language Metamorphoses are known as early as 1793, the first German imprint with publisher's information attached is: Benjamin Sands, *Metamorphosis; Oder Eine Verwandlung von Bildern, : Mit Einer Auslegung in Versen, Zum Vergnügen Junger Leute.* (Hannover, PA: Starck und Lange, 1814).

[73] James d'Alté Aldridge Welch (1907-1970), a collector of early children's books from England and America, is responsible for what is still the most comprehensive descriptive bibliography of American children's books before 1821. Welch's bibliography, which he created in collaboration with the American Antiquarian Society, includes an eighteen-page descriptive bibliography of the versions of *The Metamorphosis* known to Welch at the time of his first publication in *The Proceedings of the American Antiquarian Society* in 1967—far fewer than are known to exist today. In the traditional bibliographic style, Welch's descriptions of the varying editions consist of intensive visual and material analysis condensed into a formulaic code, tracking the number of printer's type ornaments; breaks in separating bars; spaces between decorative rulings measured to the millimeter. Welch's bibliography, like many traditional, technical descriptions of the minute differences and identifying features of books printed in multiple editions, are of great use to the bibliographer but can be barely legible to scholars engaged with questions beyond the object itself. d'Alté A Welch, *A Bibliography of American Children's Books Printed Prior to 1821.* ([Worcester, Mass.: American Antiquarian Society, 1972).

more than fifty at the American Antiquarian Society alone, while the Library Company of Philadelphia, Beinecke Library, Princeton Library, Winterthur Library, Library of Congress, and their peer institutions each hold multiple, and sometimes dozens, of copies. An unknown number of others belong to individual collectors. Viewing any of these copies in person makes immediately clear how remarkable it is that so many survive to this day. Even the well-preserved *Metamorphoses* in archives like the Library Company of Philadelphia show signs of use and wear: pages are torn and stained, engravings sloppily hand-colored, children's names scrawled across their surfaces. The folded panels are weakened and separating at the creases from repeated play. These cheaply produced books were not meant to last, and the specimens that made it to the twenty-first century represent only a small fraction of what originally existed.

Because this chapter cannot serve as a full descriptive bibliography, I will treat Rakestraw's 1814 *Metamorphoses* as representative examples of the print, with the understanding that every impression differs minutely (Fig. 1.12).[74] *The Metamorphosis* peaked in production with a slew of editions issued by Rakestraw in that year, all of which use Poupard's relief blocks. Poupard began advertising his services as an "engraver, jeweller and goldsmith" in the *Pennsylvania Gazette* in December 1772.[75] Originally of French descent, he may have been acquainted with the harlequinade print from his time in London, where he lived before coming to America by way of Martinique. He had also worked as an actor, before marrying an American woman of devout Methodist faith, thus leaving his theatre days behind.[76] Poupard's experience in both the world of theatre and the print culture of London made him an ideal translator of Sands' sketches: the stage-curtain-like mechanism is enhanced by his clean connections of the lines stretched between head and foot flaps, while the newly added decorative borders and registers depicting sampler embroidery suggest the object's crystallizing kinship with images circulating in wider Atlantic visual cultural world. While still maintaining ties to the English Harlequinade legacy in format and content, *The Metamorphosis* began to blend into its adopted visual cultural climate as early as 1787.

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[74] Welch, *A Bibliography of American Children's Books Printed Prior to 1821, S-Z*, n.d., 316.

[75] "Poupard, James," *The Pennsylvania Gazette*, December 9, 1772.

Reading *The Metamorphosis* begins with a small rectangular folded packet (Fig. 1.13).[77] A title page decorated with a cast ornament vignette of a fountain initially disguises the print as a book. However, engaging it as such immediately ruins the illusion: upon grasping the paper's edge to turn the page, a shift in the surface's texture and weight calls attention to the unusual formatting hidden inside. The plane is thicker and heavier than expected of a book's page, and once set in motion, gravity separates the reverse side into two distinct halves (Fig. 1.14). As the reader gradually unfurls and flattens the elongated print, four familiar scenes fall in to place. Unlike the English editions, each illustration is contained within a ruled border. Above every boxed-in image, decorative printer's ornaments enclose a stanza of the poem that runs throughout the print.

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[76] A. S. W Rosenbach, *Early American Children's Books,* (New York: Kraus Reprint Corp., 1966), 38.

[77] Depending on the condition of the object, *Metamorphoses* are preserved in a variety of ways, occasionally as a flat print.

Publishers began to number the poem's many stanzas from the 1792 edition onwards, making the complicated flow of the text much simpler to follow.[78] Nevertheless, the long, winding poem convolutes the book's physical structure, as it snakes around the perimeter of the images and coils around itself once more. While the intended stanza order shifts slightly from the first half of the book to the second, in general, *The Metamorphosis* is designed to be read from top to bottom, exterior to interior, before shifting over to repeat the process with the next panel to the right. For the first two vignettes, one begins reading the outside of the top flap, then the interior of the top flap, and finally the interior of the bottom flap. Though its overarching narrative is set up as a forward thrust, that linear motion is undercut by a constant spiraling that seems to invite the confusing, even intentionally subversive, opening of the panels out of order. Despite the illusion of progress, viewers find themselves constantly returning to the beginning: fittingly, the biblical story of Genesis.

This first panel depicts an androgynously rounded man holding an apple (Fig. 1.15). He stands beside a leafy tree ripe with forbidden fruit and a serpent coiled around its trunk. Stanza one identifies the man as Adam and instructs the reader to "turn up" to see his bride, Eve. Raising the top flap sets off the first metamorphosis: Adam's head is replaced with Eve's, and the Serpent's hissing head emerges from the branches of the tree. This turn also gives the reader a first peek at one of the American editions' most interesting innovations upon the English prototype, a strip of letters and numbers that emulate embroidered marking samplers and provide a visual buffer between the illustrations and the text (Fig. 1.16). As I will discuss in further detail in Part III of this chapter, the embroidery strip provides a clue toward the book's intended audience and visual cultural context it seeks to occupy: a mixture of domestic and educational settings, in which children were taught what Jacqueline Reid-Walsh has termed "stitchery literacy."[79] The poem's verses continue on the interior of the top flap, and stanza two directs the reader to open the lower flap to see something strange. This second metamorphosis transforms Eve into a mermaid, half-submerged in the sea. A comb and mirror replace the apple that she once held, but half of the tempting tree lingers as a means of linking this symbol of female vanity to Eve's original sin.

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[78] Welch, "A Bibliography of American Children's Books Printed Prior to 1821, S-Z," October 1967, 304.

Scene two commences with "a lion rousing from his den" (Fig. 1.17. Upon lifting the top flap, his roaring face is replaced with that of a crowing bird—a griffin, when joined with the lion's haunches. The poem pledges that turning down the lower leaf will create a "stranger sight" than this mythical figure, and it delivers on this promise. The griffin becomes an eagle, who grasps a human infant in its outstretched claw. "He is prepar'd to fly," remarks stanza six of the poem of this frightening vignette. As scholars have pointed out, the lion and griffin appear frequently in period emblem books, as does the story of the abduction of Ganymede by Zeus disguised as an eagle.[80]

The book then progresses from biblical lore and classical myth to contemporary earthly themes of greed and piety (Fig. 1.18). The third panel's opening composition is confusingly disjointed, unlike the coherent scenes that surround it. A gentleman holding a cane and standing in a garden occupies the lower half of the panel, while in the image's top half, a portion of a rounded shape is visible, topped with an ornate curtain. Above this, a Stanza seven of the poem identifies this man as the baby from the previous panel, who has escaped the eagle's claws and devoted his life to gathering gold. A new order of operations clarifies this mysterious arrangement: the poem instructs the reader to open the bottom flap first this time. Upon doing so, a large heart is revealed, arranged between four columns and the curtain as if on a theatrical stage. What salve can cure the heart's troubles, asks the poem? Opening the top flap reveals the answer: wealth, of course. As the gentleman sits at his desk weighing his gold and silver, the perceptive reader senses moral troubles to come.

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[79] Reid-Walsh, *Interactive Books*.

[80] Ganymede is usually shown as a prepubescent boy, but is occasionally shown as a baby, for instance in Rembrandt's *Abduction of Ganymede*, 1635. Higgins, "'A New and Stranger Sight': Allegory, Emblems, and Interactive Images in a Seventeenth-Century Puritan Toy Book," 31.

In the book's final scene, the gentleman stands with his cane against an empty background (Fig. 1.19). "Now I've got gold and silver store / Bribes from the rich, pawns from the poor, / What earthly cares can trouble me?" he inquires. Turning down the bottom leaf divulges his ultimate downfall—sickness and death. The first stage of this metamorphosis positions the gentleman standing over his own sickbed, an hourglass perched ominously at the corner of the frame. He begs for his money to save him from his fate, but finds it useless. Upon lifting the top flap, his destiny is revealed. Where the gentleman once stood, a menacing skeleton towers over his sick, mortal body, grasping an arrow that will usher the miserly man into finitude. Audiences would have recognized the iconography of hourglasses and skeletons as death allegories from both emblem books and their common adaptations in colonial gravestone carving (Fig. 1.20).

Death is not the end of *The Metamorphosis*, however. Upon reaching the final visual transformation, the poem directs the reader around the page once more, beginning with stanza 13 at the top left corner of flap one and ending with stanza 21 on the booklet's verso. *The Beginning, Progress, and End of Man* and *The Metamorphosis* are unusual cases as rare books: they have been studied far more for their visual and material features than for the ample text they contain. Despite this pattern of interest in the book's images, the narrative poem stands as a dominant visual feature of the composition. One dozen four-line stanzas cover *The Beginning, Progress, and End of Man*: one on each exterior top flap, and two on each interior panel, above and below the woodcut image.[81] The narrative encourages the reader to progress through the transformations, urging him or her to "unfold and see it strange again;" to "delight" at "a stranger sight." But what exactly is changing is given only cursory description. Only the final panel suggests a moral, exclaiming, "Vain was my hope in Gold, / Vain was my foolish bragging. / For I must to the mold, / And thou com'st after wagging." Ultimately, these lines simply explain and summarize, rather than expand upon, the metamorphoses they accompany.

Brevity and simplicity went out the window as the book hit American presses. *The Metamorphosis* more than doubles the amount of text found within its English model, featuring thirty four-line stanzas grouped into twenty-one numbered sections. Drafts of these extended verses appear, for the first time, cramped within Sands' 1782 manuscript (Figs. 1.1, 1.2). Sections one through twelve are, more or less, updated versions of the same lines in *The Beginning, Progress, and End of Man*—a simple summary of the changes occurring in the illustrations. Sands augmented these familiar lines with a lengthy string of verses that weave through the print's interior and spill onto its verso.

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[81] See Appendix A for a transcription of the text in *The Beginning, Progress, and End of Man.*

If the traditional verses (one through twelve) are a gloss on the images, then Sands' extension (verses thirteen through twenty one) offer a scriptural analysis. In a similar rhythm to its gradual procession of increasingly more serious images—griffins, mermaids, and flying babies usher young readers gently into *The Metamorphosis*'s moral story, where skeletons and decay later await—the gradual complication of the text first playfully teaches the reader how to use the book, and then gets down to business. The most intense messages are confined to the later verses, which are visually separated from the book's illustrations by a wavy border that splits each text block in two: descriptive stanzas abut each image directly, while higher-level ideas remain a level removed.

Splayed open, *The Metamorphosis*'s visual and textual relationship with its English predecessor begins to come into sharper focus. The floating, expressive woodcuts of the London print have become weighty, detailed, and crucially, set in natural spaces. Adam stands on a strip of soil, rooted firmly to the same ground from which the tree of life grows (Fig. 1.15). The serpent also clings to the physical landscape, winding a tight coil around the tree. In the next panel, the lion poises to pounce from the rocks beneath his feet. Beside him, a youth pauses in a manicured garden, surrounded by neat rows of trees and classical railing. He stares at a small fox, who regards him in turn from his perch atop a columnar pedestal (Fig. 1.18). As the flaps open and close, natural settings, architectural interiors, backgrounds and foregrounds, and cast shadows continue to impress the images' existence in a world like the reader's own. The text, too, has sprouted roots. What begins as light, lyrical description gains a gradual weight and real-world application as it evolves into a treatise on sin and morality. As the reader opens and closes according to the poem's directions, he or she loosens a series of quite serious moral concepts from their playful, teasing coverings. *The Metamorphosis*'s movement and progression from whimsy to gravity emphasizes contrast and dissonance between outside and in.

Handmaking a *Metamorphosis*

As printed *Metamorphoses* spread across the Northeast, some also made their way south. Sally White (1794—1836), a young girl living in Albemarle County, Virginia—not far from Sands' birthplace of Purcellville—acquired one in or before 1805.[82] That year, she decided to create a handmade copy of her printed booklet (Fig. 1.21). On a piece of cream laid paper, doubled and creased to produce the turn-up's characteristic folds, four familiar scenes play out in faded watercolor. Adam, Eve, the serpent, and even the lion appear rounded and smiling, enclosed by tidily ruled line borders and panels of text in cursive script. While Sally clearly embraced her artistic license and made the illustrations her own, certain details suggest that she looked to one or more printed *Metamorphoses* for reference. In the first panel, her plump mermaid hovers next to a tree truncated in midair—an idiosyncratic feature of Poupard's plates that does not appear in *The Beginning, Progress, and End of Man*. Sally was eleven when she made her manuscript as part of her primary domestic education, which was complete upon marrying 22-year-old Nelson Dawson four years later at age 15.

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[82] Mary Roy Dawson Edwards, "A Beginning ... a History of the Dawson Family of Virginia" (University of Virginia, Albert and Shirley Small Special Collections Library, 1970). See also Mary Roy Hedian Dawson's geneaological research available here: http://www.pnautilus.net/gedview/individual.php?pid=I667347250&ged=Nau-Dawson-Haase&tab=0.

Sally White's handmade harlequinade is one of dozens of manuscript *Metamorphoses* that remain preserved to this day. These hand-crafted reinterpretations of Sands' flap book are frequent finds in special collections, loosely disguised by the same title as their printed counterparts and distinguishable in a catalogue record only by their "manuscript" designation.[83] Mentions of manuscript *Metamorphoses* in individual collections are sprinkled throughout bibliographies, and are frequently listed at auction. Anecdotal evidence also attests to their widespread cultural magnetism. The Free Library of Philadelphia, for instance, owns a manuscript version which the donor, William McIntire Elkins, attributes to William Makepeace Thackeray. Elkins attests that the novelist created the flap book to please the children of William B. Read, his friend and host of his first visit to the United States.[84] It appears, from these survivals, that making a *Metamorphosis* with one's own hands was a common activity in late eighteenth and early nineteenth-century America, and had traction with children and adults alike. In the action of re-creating the printed book, its title becomes a genre. Appeal across ages is visible both in variations in technical skill, and in information provided in inscriptions. For instance, one Katherine Fisher of Dedham, Massachusetts, inscribed her work as

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[83] To better understand the format's mechanics, present-day readers might easily create their own turn-up template in five minutes or less armed with only a standard 8 x 11 sheet of printer paper and a pair of scissors. **Step one**: position the sheet of paper horizontally. **Step two**: fold the long bottom and top edges inwards so they meet at the sheet's center and form a horizontal opening. **Step three**: fold the strip in half vertically so that the short left and right edges meet. **Step four**: fold vertically once more. **Step five**: partially unfold the strip so it resembles the horizontal strip made in step two. It will now have three perpendicular horizontal creases, dividing the strip into four evenly spaced sections. **Step six**: using scissors, cut along each horizontal crease, moving outwards from the opening where the long edges meet. Stop cutting when the fold at the top or bottom edge is reached, leaving the interior panel intact. Each of the four sections should now feature a movable top and bottom flap.

[84] Ellen Shaffer, "Portrait of a Philadelphia Collector" (The Free Library of Philadelphia, 1956), https://libwww.freelibrary.org/dickens/Elkins_Portrait_Essay.pdf.

"Designed by Katherine Fisher 18 years of age 1789." Eight years later, at twenty-six, she created another, and signed it "Drawn by Katherine Fisher of Dedham June 23, 1797."[85]

Katherine, a young adult in the eyes of early Republican New England society, likely made her turn-up at school or in a domestic setting. Adult makers constructed the books with their children, or women may have engaged in the activity as a domestic entertainment, alongside quiltmaking, embroidery, or sampler making.[86] While Katherine's *Metamorphosis* is in an individual collection, a manuscript in the Beinecke Library at Yale also appears to be the work of an adult (Fig. 1.22). Yale's unattributed manuscript, created sometime between 1790 and 1820, was clearly crafted with great care. The first panel, in which Adam transforms into Eve, and then into a mermaid, reveals faintly sketched preparatory outlines (Fig. 1.23). The artist took care to differentiate the pale tones of flesh from the cream of the thick paper: he or she has touched the figures' skin with tones of rosy pink, and modeled its three-dimensionality in chiaroscuro shadows.

Poupard's engravings altered the floating figures of the English predecessor by vaguely siting each scene in space, and this unidentified artist expands on those metonymic suggestions of place, developing an individualized landscape for each panel. Adam and Eve stand beside a clear blue stream in an aptly Edenic landscape, lush with emerald green grass, a weeping willow, and rolling hills in the background. At the moment of final metamorphosis of Eve into Mermaid, green hills give way to a painstakingly handled blue sea. The artist capitalized on the negative space of bare paper, kept dry from the watercolor pigment through a blocking technique, to evoke light and movement on the water's surface. As a finishing touch, the artist used a straight edged object to trace ruled lines, guiding the text into precisely spaced stanzas, which tweak the language slightly to clarify the loose thread of narrative. The delicate care devoted to these objects may explain why so many survive.

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[85] Welch, "A Bibliography of American Children's Books Printed Prior to 1821, S-Z," October 1967, 300.

[86] Reid-Walsh, *Interactive Books*, 30–53.

Turn-ups subtly tinkered with memory, afterimages, and optical illusion—all effects made possible by the book's specific means of moving, the manipulation of flat planes. This non-sequential continuity between flap states allows for the gradual unfolding and building of sophisticated ideas and intellectual puzzles. For instance, in the final chapter of this *Metamorphosis,* a wealthy miser become a skeleton (Fig. 1.24). As he watches his beloved gold turn to dust in the final scene, the image and text together provoke a rumination on the importance of religion above earthly possession. In the panel's initial closed state, the sharply dressed man stands outside of a white house with a red door and blue roof. He holds his helpfully labeled bag of gold aloft proudly, as he gazes out at a ship on the water—shorthand for the trade and commerce that made him wealthy. Yet as the figure transforms, significantly, so does the world surrounding him. Where the white house once stood, a new but recognizable structure occupies its place. Just as the house, it has white walls and a red door, but its deep blue roof has become a steeple, indicating a church rather than a private home. By using an identical color scheme and compositional placement, the artist suggests a continuity between flaps that is linked though not time-based. Like an afterimage that remains burned on the retina even after its source has disappeared, the trick of *The Metamorphosis* depends on the ghostly presence of the half-image that was there before the flap was turned—not as a material trace, but as a fresh presence in the user's memory. Every act of opening expands upon an increasingly complex idea, each stage dependent on a memory of the last.

While it is often unclear whether handmade copies are after the American editions of *The Metamorphosis* or the English *Beginning, Progress, and End of Man,* a few examples in Princeton's Cotsen Children's Library explicitly reference the earlier print. One turn-up carefully rendered by one Thomas Whitfield in 1745 includes a title page fashioned in flourishing script and mimicking the layout of a printed version (Fig. 1.25). Another, made by John Sutton in 1720, includes the Cain and Abel scene idiosyncratic of certain British editions, as well as a scene of Actaeon and Diana, one of many mythological tales included in Ovid's *Metamorphoses* (Fig. 1.26). If Benjamin Sands' precedents for the American *Metamorphosis* included such an Actaeon and Diana panel, it may explain the origins of the American book's title.

Children's artistic attempts, adorably simplistic when paired with these more skilled works (potentially the work of older children, or adults), maintain the same visual language of accumulation of knowledge embedded in the original print's structure. See, for instance, two works by young Esther Carpenter and Henry Perkins, probably created around 1800, also in the Beinecke's collection (Figs. 1.27, 1.28). Esther and Henry both struggle with scale and placement; their tiny mermaids and bug-like skeletons do not offer the same smooth continuity as the printed or adult manuscript versions. Another small maker, whose particularly sassy mermaid is preserved in Penn State's Eberly

Family Special Collections Library, used scroll-like decorations, reminiscent of Pennsylvania Fraktur flourishes, to join the spaces between scenes (Fig. 1.29). But despite each child's creative additions and diversions, the final effect is preserved: in creating their own *Metamorphoses*, the children must materially and physically process complex notions of change and growth. Planar manipulation allowed artists and users to recombine images while maintaining a flat ground and an elastic narrative framework, as each stage in transformation relied on the physical outlines of the preceding image.

Part III: Using *The Metamorphosis*: Manipulation and Education

Pre-cinematic moving images in America have been discussed largely in relation to their European counterparts. Often, such comparison is vital. *The Metamorphosis,* for instance, did not appear out of nowhere, and no analysis of the book would be complete without discussion of *The Beginning, Progress, and End of Man* (see Part I). But considering the rarity with which these ephemeral objects are given sustained attention, the cast shadow of European innovations has overwhelmingly obstructed their American-made counterparts from clear view. And while objects may look alike, or be modeled from the same template, the worlds in which they circulated and were used matters a great deal to a fuller art historical account. As I aim to show, basic similarities in style, content, and structure do not translate to equivalent contexts of use. In this chapter, I want to stress that book's complex history of transmission to and recreation in the United States justifies a closer look: its familiar emblematic subjects and core text took on new meanings and associated practices under American conditions of philosophically-fueled mass reproduction.

In the United States, the conditions for reception of *The Metamorphosis* began with cultures of learning. The turn-up was received as an essential component of the American educational landscape, which was far from a unified entity during the height of the book's popularity, roughly 1780-1820. Though still mostly religious in nature, schooling of children and young adults during the Early National period took on many forms, and the booklet's success grew from its ability to resonate with most. Didactic, moralizing print for Protestant audiences was expanding at rapid rates, while on a seemingly distant plane, liberal theories of free-form learning espoused by philosophers such as Jean-Jacques Rousseau took strong hold in urban centers among upper-class groups. *The Metamorphosis* not only fit, but reinforced, the core ideals of each divergent theory of learning.

Religious Contexts

The early national period witnessed the emergence of several new categories of visual culture defined by widening viewership as well as technological advancements in reproduction. Unsurprisingly, religious communities were quick to seek innovative ways to engage these growing mass audiences. Undeniably Christian in content, *The Metamorphosis* was incorporated into a fast-growing world of Protestant didactic imagery made for children.

The book changed denominational hands often between 1650 and the mid nineteenth century. First conceived by an unknown Puritan author as *The Beginning, Progress, and*

End of Man, the English turn-up was likely consumed by Puritans and Anglicans alike in London; brought to Colonial America by Puritans; and recreated as *The Metamorphosis* by a Quaker for a mostly Protestant readership. While its core illustrations and narrative arc remained mostly constant between England and America, tweaks in layout, decoration, and language reveal how each cultural group adapted the book to different purposes. Specifically, two major alterations made to the first American editions highlight a shift in use from an adult's playful novelty in England to a serious tool of religious, mnemonic, and even physical instruction across the Atlantic, making painfully obvious in the latter what the former had left implicit. As I demonstrated in the previous section, Benjamin Sands nearly doubled the poem's length, adding numbered stanzas that snake through the print's interior panels to speak of sin, Satan, and salvation—explicit language entirely absent from the *Beginning, Progress, and End of Man*. Second, the addition of decorative page breaks evocative of embroidered marking samplers demonstrates how *The Metamorphosis* became, for many American readers, part of a lineage of interactive images meant to instruct through memory, both intellectual and tactile.[87]

Playing with Protestant Pictures

In the antebellum period, Americans witnessed an explosion of mass-produced religious print for children issued by groups like the American Tract Society.[88] "Didactic images," or illustrations understood as contingent on and meant to work in tandem with an evangelical text, formed a distinct category of this new Protestant visual production.[89] Illustrated prints including hieroglyphic bibles, picture books, spelling books, and more were intended not only to proselytize, but also to train memory for the goal of eventually properly absorbing scripture. *The Metamorphosis*, introduced to American children as the revolution in Protestant print began to simmer, used a complex combination of text and image to train memory in an especially tactile and participatory way.

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[87] Kyle B. Roberts, "Rethinking The New-England Primer," *The Papers of the Bibliographical Society of America* 104, no. 4 (December 2010): 489–523.

[88] Morgan, *Protestants & Pictures: Religion, Visual Culture and the Age of American Mass Production*, 202–203.

The majority of Protestant mnemonic prints associate simple images and bold alphabetical symbols with pithy, descriptive sentences.[90] Primers, textbooks filled with visual learning exercises in this vein, were ubiquitous objects in Colonial American education. These books often combined spelling lessons and reading instruction with catechisms, or simplified summaries of Christian religious principles outlined in a question and answer scheme.[91] Beginning in the late seventeenth century, imported English spelling books were increasingly replaced with American imprints.[92] Perhaps the best known among them was the *New-England Primer,* a title which refers to a cluster of printed books issued by various publishers across the colonies throughout the eighteenth century (Fig. 1.30).[93] These teaching tools designed memorization as a process of communication between text and image. As historian of religion David Morgan notes, religion entered into the equation at a fundamental level: as young readers memorized the alphabet, they learned that "A" stood not simply for "Apple," but for the much more explicit apple-encompassing "In Adam's Fall, We sinned all."[94] In other genres such as hieroglyphic bibles, images functioned as triggers for pre-memorized scripture verses. These heavily abridged biblical texts replaced every few words with an emblematic picture, turning the chore of bible reading into a game of recall and guesswork (Fig. 1.31). A 1794 edition states its goal "to imprint on the Memory of Youth, by lively and sensible images, the sacred and important truths of Holy Writ," a frequently expressed belief throughout the nineteenth century.[95]

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[89] Morgan, 201, 203.

[90] Morgan, 203.

[91] E. Jennifer Monaghan, *Learning to Read and Write in Colonial America* (Amherst; Worcester: University of Massachusetts Press ; American Antiquarian Society, 2005), 92–93.

[92] These include Franz Daniel Pastorius's *New Primmer or Methodical Directions to Attain True Spelling, Reading and Writing of English,* printed in New York by William Bradford in 1698 but surely circulated in the Philadelphia area, as Pastorius taught school in Germantown (though Monaghan believes the eccentric book was "dubiously marketable"), PA; and Society of Friends founder George Fox's *Instructions for Right-Spelling, and Plain Directions for Reading and Writing True English. With several delightful Things, very Useful and Necessary, both for Young and Old to Read and Learn*, reprinted from a 1673 London edition in Philadeplhia by Reynier Jansen perhaps on behalf of the Philadelphia Friends Quaker community. Monaghan, 92–93.

The Metamorphosis operated similarly to these mnemonic pictures, but with the added component of tactility. Its flap design combined the benefits of several object genres. On each panel, poem and image work much like a complex version of the alphabet prints, as the reader relates basic moral concepts with emblematic images. Flaps allow the reader to test his or her own recall by predicting the next stage in the transformation – a game that becomes increasingly satisfying with repeated play.

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[93] The earliest surviving copy was printed in Boston in 1727, but the title was advertised in Almanacs as early as 1690. Monaghan, 98.

[94] Isaac Watts et al., eds., *The New-England Primer Improved.: For the More Easy Attaining the True Reading of English.: To Which Is Added, the Assembly of Divines Catechism, &c* (Boston: Printed by W. M'Alpine, about mid-way between the governor's and Dr. Gardiner's, Marlborough-Street, 1767). American Antiquarian Society.

[95] *A New Hieroglyphical Bible for the Amusement & Instruction of Children; Being a Selection of the Most Useful Lessons, and Most Interesting Narratives (Scripturally Arranged) from Genesis to the Revelations. Embellished with Familiar Figures & Striking Emblems Elegantly Engraved. To the Whole Is Added a Sketch of the Life of Our Blessed Saviour, the Holy Apostles, &c* (London, G. Thompson, 1794), http://archive.org/details/hieroglyphbible00unknuoft.

Stitching Samplers

The American editions incorporated another conspicuous innovation: decorative page breaks in the style of embroidered marking samplers (Fig. 1.16). Marking samplers, pieces of fabric stitched with alphabetical symbols, numbers, designs, and short phrases, have been a component of women's domestic training since the early seventeenth century.[96] Originally a space in which skilled needleworkers could test out or save patterns for later reference, by the eighteenth century, samplers became learning exercises meant for final polished display.[97] Many students sewed their samplers while enrolled at a dame school like Leah Galligher Maguire's in Lancaster or Harrisburg, Pennsylvania, where they were taught to create "fancy" works from printed pattern books (Fig. 1.32).[98] Of all forms of needlework, marking samplers were thought to have a practical purpose: they taught young women to "mark linen," or embroider the home's textiles with monograms or other identifiers so as not to be lost by the "careless laundress" or sticky-fingered household thieves.[99]

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[96] Victoria and Albert Museum, "A History of Samplers," The Victoria and Albert Museum, September 6, 2013, http://www.vam.ac.uk/content/articles/h/a-history-of-samplers/.

[97] Victoria and Albert Museum.

[98] Leah Galligher's (1764-1830) school was just one of many that American girls attended during the early national period. The samplers themselves are the best documentation about these schools – many girls stitched the names of their schoolmistresses and even the addresses of the schoolhouses on their samplers. For more on Galligher's school, see: Jennifer Van Horn, "Samplers, Gentility, and the Middling Sort," *Winterthur Portfolio* 40, no. 4 (2005): 220; Monaghan, *Learning to Read and Write in Colonial America*, 30.

The book's resemblance to this commonplace type is hidden beneath its exterior flaps. Visible only when the flaps are opened, the central interior illustrations are bordered by eight rectangular registers – one above and below each of the four images. Each strip is ruled with perpendicular horizontal lines, or in the terminology of weaving, wefts.[100] Beginning at the top left and continuing from the bottom left, the weft-ruled sections spell out the letters of the alphabet from A to Z, and numbers 1 through 9 followed by 0. "B. SANDS" caps the final panel at the lower right. These letters, numbers, and symbols do not resemble the set type of the poem above and below, but instead are schematic and pixelated, borrowed from the squared-off lettering of the needlework samplers.[101] Because alphabetical symbols were often copied from printed patterns and are therefore somewhat standardized, it is possible to date a marking sampler by the letters it includes. In *The Metamorphosis,* several letters are duplicated to show fancy and less fancy typographies, and a missing "j," barred "i," and ornate "A" and "T" reveal this object's kinship with embroidery patterns of the early eighteenth century.[102] One 1814 edition published by Robert Porter in Wilmington, Delaware referenced the visual connection explicitly, attaching "Also, an alphabet of large and small letters to aid females in marking linen, &c." to the book's title.[103]

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[99] Mrs. Jenny June Croley (ed.), "Work Table. Hints on Linen Marking.," *Godey's Magazine*, January 1888, 177.

[100] In weaving a textile, "warp" and "weft" refer to the two directions of fiber woven together to create fabric. Warps run vertically or longitudinally and wefts run horizontally or latitudinally.

[101] There is no shortage of scholarship on women's needlework in early America. However, it is rare to find work on embroidery that connects the hugely popular activity to other forms of visual culture, whether in terms of making or viewing. For a selection of sources on embroidery and samplermaking, see: Van Horn, "Samplers, Gentility, and the Middling Sort"; Betty Ring, *Girlhood Embroidery: American Samplers & Pictorial Needlework, 1650-1850*, 1st ed (New York: A.A. Knopf, 1993); Carol Humphrey and Witney Antiques, *Friends. A Common Thread: Samplers with a Quaker Influence* (Witney, Oxon. [Great Britain]: Witney Antiques, 2008); Margaret Berwind Schiffer, *Historical Needlework of Pennsylvania* (New York: Scribner, 1968); Susan Burrows Swan, *Plain & Fancy: American Women and Their Needlework, 1700-1850* (New York: Holt, Rinehart and Winston, 1977).

The Metamorphosis's graphic alphabet did not simply make reference to the textile genre. Instead, the pattern was meant to be actively used for sewing a sampler through a counted cross stitch method.[104] No cutting or pinning was required: using the guiding warp lines for reference, the sewer moved visually between the print and a piece of linen, counting out a perfect copy stitch by stitch. Including the embroidery pattern offered the added bonus of marketability towards both girls and boys, for inclusion in co-ed schoolhouses, as the objects created by both young men and women that were included in the 2015-16 Metropolitan Museum of Art exhibition "American And European Samplers 1600-1900" attest.[105] As historians including Mary Kelley have shown, even if embroidery began to slip in its central position as the landscape of women's education in the postrevolutionary and antebellum period began to change, learning to sew was still a critical skill that held importance for far more than just domestic activity. Women's sewing circles or sewing societies were one of the most viable sources of activism during this time.[106] In this way, *The Metamorphosis*'s interactive possibilities extended beyond manuscript copying to other forms of tactile production.

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[102] I am grateful to Amelia Peck, Marica V. Vilcek Curator of American Decorative Arts at the Metropolitan Museum of Art, for lending her sharp curatorial eye and deep knowledge of embroidery in conversations about this object. See also Ring, *Girlhood Embroidery*.

[103] Benjamin Sands, *Metamorphosis; or, A Transformation of Pictures, : With Poetical Explanations, for the Amusement of Young Persons. : Also, an Alphabet of Large and Small Letters to Aid Females in Marking Linen, &c.*

[104] For more information on printed patterns for needlework in this era, see: Davida T. Deutsch, "Needlework Patterns and Their Use in America," *The Magazine Antiques*, February 1991.

[105] The exhibition "American and European Embroidered Samplers, 1600-1900" took place at the Metropolitan Museum of Art between November 16, 2015-February 15, 2016. The objects included in the show are archived at the following link: https://www.metmuseum.org/exhibitions/objects?exhibitionId=74d331ac-483c-41e1-babd-7a6015db21fd. For more about co-ed schoolhouses in the postrevolutionary period, see: Margaret A. Nash, "A Triumph of Reason': Female Education in Academies in the New Republic," in *Chartered Schools: Two Hundred Years of Independent Schools and Academies in the United States, 1725 -1925*, ed. Nancy Beadie and Kimberly Tolley (Routledge, 2002), 64–86.

What, then, did *The Metamorphosis* teach? In the end, its lessons reached far beyond its Protestant catechisms to instill something much more abstract: perceptual habits. In particular, a structure of gradual revelation and a constant urging to grasp, open, and uncover trained its users to seek and expect hidden information from the material world using senses beyond sight. If hand-constructing the book's interrupted images helped makers tacitly and materially process complex notions of change, readers who maneuvered the planar flaps of the printed Metamorphosis according to its directive poem absorbed the same lessons by muscle memory. Half a century later, "object lessons" would dominate American classrooms, and children would learn from sensory engagement with things rather than by memorizing from books.[107] But before these theories took hold, early Americans were primed to inspect surfaces for more than what initially met the eye.

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[106] Mary Kelley, *Learning to Stand & Speak: Women, Education, and Public Life in America's Republic* (Chapel Hill: Published for the Omohundro Institute of Early American History and Culture, Williamsburg, Virginia, by the University of North Carolina Press, 2006), 246.

[107] The Swiss educational theorist Johann Heinrich Pestalozzi is more often associated with the American interest in learning directly from objects. However, as Sarah Anne Carter demonstrates in her dissertation, the phenomenon of "object lessons" was truly developed in the latter half of the nineteenth century. Pestalozzi, who was strongly influenced by Rousseau's *Emile,* was not actively writing until the latter part of the period I discuss in this chapter. Sarah Anne Carter, "Object Lessons in American Culture" (Harvard University, 2010).

Educational Philosophy in Early America

The Metamorphosis's tactile dimensions also appealed to an Early Republican culture steeped in Jean-Jacques Rousseau's philosophy of education, particularly his 1762 treatise, *Emile, or On Education (Emile, ou De L'éducation),* which circulated widely in Revolutionary and Early National America.[108] Touch and manipulative movement are central to its theory of childhood development: for Rousseau, knowledge is derived from "looking and feeling" together.[109] The flap book, which conveys its lessons through the repeated and experimental manipulation of planes, makes Rousseau's theory of the transfer of knowledge material and tangible.

Emile was published in France in 1762, and distributed in English translations in both England and the United States soon after. Despite evidence of the work's healthy circulation across the Atlantic, the author's American reception has been characterized as "indirect and undeclared," overshadowed by John Locke's weighty presence in the political and pedagogical philosophy of the Early National United States.[110] Local writers like William Cadogan and William Buchan, who read and reinterpreted Locke for eighteenth-century American readers, propelled this spread.[111] For Michael Baxandall, Locke's diffuse currency represented a convergence of common belief England—there was no need for individuals to read Locke's primary texts to be influenced by the ideas held within; rather, "the culture was Lockean," the writer's ideas an underlying presence in the collective conscious.[112] The same might said for Rousseau's wide but often unacknowledged recognition in the United States.[113] While Locke's philosophically moderate writing constituted a significant break from conservative tradition, Rousseau's theories were perceptibly more liberal, even radical.[114]

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[108] Alexander Nemerov, *The Body of Raphaelle Peale: Still Life and Selfhood, 1812-1824* (Berkeley: University of California Press, 2001), 40; Paul Merrill Spurlin, *Rousseau in America, 1760-1809.* (University: University of Alabama Press, 1969).

[109] Jean-Jacques Rousseau, *Emile*, trans. Barbara Foxley (London; New York: Dent ; Dutton, 1974), 24.

[110] Karin Lee Fishbeck Calvert, *Children in the House: The Material Culture of Early Childhood, 1600-1900*, 1992, 60.

Education was a problem in post-revolutionary America. While cultural leaders agreed that a democratic nation must be educated in order to function, no codified public education systems existed. As political leaders pushed for formation of a public university, the American Philosophical Society sponsored a contest offering a cash prize for the best essay on "a system of liberal education, and literary instruction, adapted to the genius of the government, and best calculated to promote the general welfare of the United States." The APS's contest was a bust—it received only seven submissions, two of which the journal published only reluctantly.[115] But as contributors fought to no avail over the relevance of dead languages for elite students and the possibility of tax-funding schools, children still had to learn, and parents turned to natural, trial-and-error philosophies as accessible frameworks. Immersed in this climate, middling and upper-class Americans—especially Philadelphians, where Rousseau's *Emile* enjoyed greatest circulation—integrated elements of Rousseau's educational theory into daily practice as the young nation remained indecisive regarding its official stance.[116] This influence may have been "indirect," but it was declared loudly in the visual patterns that appealed to those invested in pedagogy.[117] In reassessing the impact of Rousseau's philosophy on Early National education systems, the importance of tactility to visual knowledge emerges as a key cultural concern in the United States.

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[111] Calvert, 60.

[112] Michael Baxandall, *Patterns of Intention: On the Historical Explanation of Pictures* (New Haven: Yale University Press, 1985); Peter Mack, Robert Williams, and Alex Potts, *Michael Baxandall, Vision and the Work of Words*, 2015.

[113] Karin Calvert notes that Rousseau's reception in the United States tended to be "indirect and often undeclared." Calvert, *Children in the House*, 60.

[114] Gillian Brown has written on the connection between Locke's philosophies of childhood education and movable books in the eighteenth century. See: Gillian Brown, "The Metamorphic Book: Children's Print Culture in the Eighteenth Century," *Eighteenth-Century Studies* 39, no. 3 (Spring 2006): 352.

A pedagogical treatise in a novel's clothing, *Emile* outlines Rousseau's philosophy of childrearing by following the growth of its titular character from infancy to adulthood. Ideal citizen Emile, who is strong, sensitive, curious, and clever, is molded into his upstanding moral state through an instructional program that relies on manipulation by both parent and the child. As the parent coaxes Emile into adulthood through a series of experiential lessons, steering him to learn what he wants to learn rather than what is forced on him, Emile manipulates the world around him with his hands.[118]

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[115] Benjamin Justice, "'The Great Contest': The American Philosophical Society Education Prize of 1795 and the Problem of American Education," *American Journal of Education* 114 (February 2008): 191–213.

[116] Spurlin, *Rousseau in America, 1760-1809.*, 72.

[117] Jennifer Monaghan's rich study *Learning to Read and Write in Colonial America* makes no mention of Rousseau, but instead concentrates on similar premises from Locke, for instance his interest in manipulation through play. Art historians have been more willing than historians to accept Rousseau's influence on American education. Such was one premise for the 2006 exhibition *American ABC* at Stanford's Cantor Center. Claire Perry, *Young America: Childhood in 19th-Century Art and Culture* (New Haven [Conn.]: Yale University Press in association with the Iris & B. Gerald Cantor Center for Visual Arts, Stanford University, 2006), 2; Monaghan, *Learning to Read and Write in Colonial America*.

Touch is the key to Rousseau's system: physical, tactile movement and interaction is stressed even from infancy, when the baby is left unswaddled, and gradually chooses a specialization (Emile, for one, is encouraged to take up a manual trade like carpentry in his young adulthood):

> In the dawn of life, when memory and imagination have not begun to function, the child only attends to what affects its senses. His sense experiences are the raw material of thought […] He wants to touch and handle everything; do not check these movements which teach him invaluable lessons. Thus he learns to perceive the heat, cold, hardness, softness, weight, or lightness of bodies, to judge their size and shape and all their physical properties, by looking, feeling, listening, and above all, by comparing sight and touch, by judging with the eye what sensation they would cause to his hand. It is only by movement that we learn the difference between self and not self; it is only by our own movements that we gain the idea of space.

Yet for Rousseau, it is not just physical contact with the broader world that educates, but repetitive, sustained touch. "To train the senses," he writes, "it is not enough merely to use them; we must learn to judge by their means, to learn to feel, so to speak; for we cannot touch, see, or hear, except as we have been taught."[119] Emile's physical lessons range from feeling surfaces to learn to judge temperature, to creating roughly drawn sketches and polished geometrical designs, both of which Rousseau advises hanging on the wall in gilt frames as artwork.[120] Drawing, in particular, takes a central place in his curriculum: "all children in the course of their endless imitation try to draw; and I would have Emile cultivate this art; not so much for art's sake, as to give him exactness of eye and flexibility of hand."[121] Drafting objects and settings from life taught children to estimate size and distance, compare parts and wholes, approximate perspective, and ultimately, gain a "clearness of sense-perception."[122] Manipulation of fingers, surfaces, and instruments, in this system, teaches judgment: tacitly, optically, morally, and then finally, emotionally. Maneuvering the planar flaps of *The Metamorphosis* according to its directive poem—or better yet, taking quill to paper and committing the morality tale to muscle memory—functioned in exactly this way: through a series of physical decisions, the user unravels and becomes complicit in its lesson.

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[118] Rousseau, *Emile*, xvi.

[119] Rousseau, *Emile*.

Rousseau's insistence on physical freedom and tactile curiosity collided with a late eighteenth century America in which movement's meanings were in flux. With the caveat that what we know about childhood in early America is mostly culled from the histories of families with a certain amount of wealth, the children of white, relatively wealthy, and usually British-descended Colonists had been tightly wrapped, bound in corsets and swaths of hot fabric, stiffly propped into wooden braces, led around by leashes, and generally sequestered from the world and its elements.[123] Because crawling was considered repulsive and animalistic, cage-like furniture called “walking stools” kept babies imprisoned and immobile, but with two feet on the ground (Fig. 1.33). Parents feared the dangerous possibilities of free movement, and protected their offspring with a series of experiential straitjackets. Swaddling clothes, walking stools, go-carts, and “leading strings” ensured that adults could manage children’s every move, staving off both curiosities and weak spines. And when children did finally move, parents padded their babies in “puddings,” makeshift padded headgear not unlike football helmets that kept children from feeling a thing when they inevitably stumbled.[124]

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[120] Rousseau, 109; Donna Darling Kelly, *Uncovering the History of Children's Drawing and Art* (Greenwood Publishing Group, 2004), 17.

[121] Rousseau, *Emile*, 108.

[122] Rousseau, 108.

[123] Calvert, *Children in the House*.

By 1750, though, the deep freeze of colonial parenting began to thaw in favor of natural, rational theories. Vestiges of confinement methods lingered in the postrevolutionary period, but on the whole, enlightenment approaches that designated nature as teacher were increasingly adopted. It seems likely that Benjamin Sands, the Quaker schoolteacher who designed the American *Metamorphosis*, was interested in newer methods that stressed curiosity, modesty, and morality. As previously mentioned, Sands’ two other works, *A Key to the Impenetrable Secret (*c. 1799) and *The Tutor’s and Scholars’ Museum* (written c. 1780, published 1819) were designed as a series of puzzles and codes for the young reader to crack—a challenging approach that depends on students’ natural curiosity. Practice with Metamorphoses and making them fit seamlessly into this educational climate that prized the combination of vision and touch as an ideal means of learning to reason. As the user lifts and lowers the paper squares into new arrangements, she controls the unfolding morality lesson—even more so if she copies it with her own brush and slices its flat surfaces into place.[125]

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[124] Calvert, 35.

However, *The Metamorphosis's* movable planes, so exemplary for filtering lessons through a user's fingertips, had an unintended secondary effect. A flap book is never completely flat – rather, when laid on a horizontal surface, its surfaces separate ever so slightly, drawn apart by the weight of the paper. Often, through these small gaps, the underlying layers peek through (Fig. 1.34). The close looking and physical attention the object demanded simultaneously trained its audiences to seek such visual hints that might reveal the hidden planes' contents. Viewers sought peeking shapes, overextended outlines, stray threads, and suspicious folds spilling ever so slightly beyond the overlaid paper surface. Searching for these elements was one way to optically feel for the book's edges, the first step in playing *The Metamorphosis.* Much like Baxandall's classic example of the churchgoing, dance-loving businessman who scans Botticelli's canvases for the rhythmic, sinuous lines of his favorite hobby, Early National Americans who learned to make visual discernments through the manipulation of planes sought suspicious splits and openings across their scopic fields.

Whether or not it was Benjamin Sands' intention, seeking out the cracks in solidity was a gesture that resonated with Protestant disavowal of the material in favor of disembodied spiritual reality. Throughout *The Metamorphosis*, but in the final two vignettes especially, exterior panels that highlight human materialism and affluence disguise an internal core that engages with themes of death and spirituality. For instance, in the fourth panel, the exterior scene features a neatly dressed man, whom we are meant to recognize from the previous panel, where he is shown standing in a manicured garden—its opulence is denoted by classicizing features such as a pilaster. In some versions, the man is shown holding a bag of gold to further stress his interest in material wealth. Inside these external flaps, as if a warning, waits a picture of what such materialist greed might produce: the specter of death, a constant reminder that the only reality is spiritual and intangible. Seeking out the cracks in materialist surface would allow the viewer to see through to the Godly truth.

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[125] David Rosand's *Drawing Acts*, in particular theories of processes of making as a transfer of knowledge, has directed my thinking on this point. David Rosand, *Drawing Acts: Studies in Graphic Expression and Representation* (Cambridge, UK; New York: Cambridge University Press, 2002).

Part IV: Learning by the Book

Charles Willson Peale's American Emiles

On October 27, 1775, Charles Willson Peale (hereafter, "Peale") wrote in his diary that his only child, "Raphiel," was sick with a "Bad Lax" and needed constant attention.[126] Less than one week after a long night spent dispensing "Grains of Tarter Emetic" to the colicky 2 year old, Peale visited his friend Robert Edens and borrowed two volumes of Rousseau's *Emile,* perhaps in want of some childrearing advice. It comes as no surprise that one of Early National Philadelphia's vanguard thinkers structured his parenting, views on public education, and even systems of exhibition according to

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[126] Charles Willson Peale et al., *The Selected Papers of Charles Willson Peale and His Family* (New Haven [Conn.]: Published for the National Portrait Gallery, Smithsonian Institution by Yale University Press, 1983), 152. Vol 1

Rousseau's writings.[127] Peale's personal copy of *Emile* (purchased after borrowing Edens' copy) is underlined and annotated in the owner's hand, including marking a passage that encourages teaching from objects themselves, rather than substitute representations: "nature should be his only teacher, and things his only models."[128] A great deal of scholarship on the Peale family has focused on its patriarch as an educator, disseminating a complex enlightenment vision to both his family and a broader American public through his museums and other endeavors.[129] I will conclude this chapter by inverting this narrative and considering instead how schooling like the kind Peale provided his children paid off: that is, how these methods of learning shaped students' eventual artistic production and viewership. Raphaelle Peale (whom I will refer to as Raphelle, to avoid confusion with his father) was trained within the very systems *The Metamorphosis* exemplified.[130] By examining Raphaelle's paintings and printed *Metamorphoses* as objects co-existing in a shared culture—not necessarily exerting a direct influence on one another, but both occupied with the same set of insistent cultural concerns—I hope to shed new light on each. In the case of Raphaelle's deceptions, resonances with *The Metamorphosis* suggest that print-savvy Philadelphia audiences (the younger artist himself among them) understood flat, planar surfaces in both painting and print as sites of didactic potential to be accessed manually.

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[127] Charles Willson Peale's affinity for Rousseau's works, including *Emile*, is well documented. For a few examples, see: Roger Cardinal, *Cultures of Collecting* (Reaktion Books, 2004), 209; Lillian B Miller et al., *The Peale Family: Creation of a Legacy, 1770-1870* (New York: Abbeville Press in association with the Trust for Museum Exhibitions and the National Portrait Gallery, Smithsonian Institution, 1996), 41, 102; Nemerov, *The Body of Raphaelle Peale*, 158; Charles Coleman Sellers, *Mr. Peale's Museum: Charles Willson Peale and the First Popular Museum of Natural Science and Art* (W. W. Norton & Company, 1980), 101.

[128] Sellers, *Mr. Peale's Museum*, 101. This passage is not identified in Sellers, nor is the volume in question listed as part of an archive—Mr. Sellers only says that the volume belongs to "an heir." Without any concrete evidence before me, I would venture a guess that Peale underlined the following passage: "Let him draw a house from a house, a tree from a tree, a man from a man; so that he may train himself to observe objects and their appearance accurately and not to take false and conventional copies for truth. I would even train him to draw only from objects actually before him and not from memory, on his imagination, for fear lest he should substitute absurd and fantastic forms for the real truth of things, and lose his sense of proportion and his taste for the beauties of nature." Rousseau, *Emile*, 108–9.

[129] How and where the Peale children were educated remains unclear, and in general, scholarship on education in early America is limited. What exists is mostly outdated work from the 1960s, and tends to focus on the formation of public and tax-funded educational systems. Rubens Peale writes about making "little progress at school" because of his bad eyesight, but that could refer to either homeschooling or education outside the home. Of Elizabeth de Peyster's children, Sybilla attended a "country school," and Linnaeus and Franklin went to a private school of some kind before engaging in apprenticeships. It is safe to say, however, that Charles Willson Peale instilled a strong at-home curriculum for all of his children, regardless of additional educational outsourcing. As Lillian B. Miller puts it, "Essentially Peale was an educator, a man who sought order and organization in his own life and felt impelled to teach others the important lessons he had learned. His lessons were derived from nature, which to Peale was beneficent and life-enhancing" Nicolai Cikovsky et al., *Raphaelle Peale Still Lifes* (Washington: National Gallery of Art, 1988), 84. " Edgar Preston Richardson, Brooke Hindle, and Lillian B Miller, *Charles Willson Peale and His World* (New York: H.N. Abrams, 1983); Bernard Bailyn, *Education in the Forming of American Society; Needs and Opportunities for Study.* (Chapel Hill: Published for the Institute of Early American History and Culture at Williamsburg, Va., by the University of North Carolina Press, 1960); Wilson Smith, *Theories of Education in Early America, 1655-1819.* (Indianapolis: Bobbs-Merrill, 1973).

It is possible to take up Peale's children as case studies because of the wealth of archival and artistic evidence attached to the family—we know, for instance, that their father used *Emile* as a parenting guide from both a copy's survival and Peale's own writing about Rousseau; and have plentiful documentation about issues of construction of visual knowledge, display, and artistic production from numerous family members. But while the Peales were an exceptional family, their educational experiences mirrored everyday (if less grandiose) practices of people of their class. The proliferation of *The Metamorphosis* in print and manuscript, as I hope I have shown, attests to the importance of numerous tenets of Rousseauvian education in everyday American life, in common families whose archives never existed.

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[130] Molly Nesbit's exploration of Marcel Duchamp's primary education in geometrical and mechanical drawing is an inspiration for the approach I take in this section. Molly Nesbit, "Ready-Made Originals: The Duchamp Model," *October* 37 (Summer 1986): 53–64.

We might imagine Charles Willson Peale's many offspring as a wily clan of American Emiles—a pack of children trained to experience the world through trial and error, to learn to see by touching and drawing, and to grasp high-level rational concepts by manipulating ideas physically, as flat, recombinable possibilities. Raphaelle Peale, the eldest Peale son to survive infancy, would have been thirteen when printed Metamorphoses began to appear in his Philadelphia hometown. Despite the book's resonance with his schooling, we do not know if Raphaelle owned or made a Metamorphosis himself. But it matters little whether or not he did: the flap book owed its enormous popularity to a culture that taught a tactile investigation of the visual world through multiple vehicles.

For instance, we might look to other moving images that surrounded the Peale children as reconfigurations of those same values. In May of 1785, eleven year old Raphaelle may have stood in a Philadelphia theatre and watched an unseen mechanic manipulate screens and curtains "movable by lines and springs" to reveal his father's show of "Moving Pictures with Changeable Effects," glowing transparencies lit from behind by Argand lamps.[131] The successful moving picture shows continued for years, and on May 16, 1787, Peale wrote to George Washington to invite him to a 4:30pm showing (Washington declined to attend).[132] As large-scale transparency screens slid and shuffled within the walls of the Exhibition, miniature-planed Metamorphoses, fresh from the printing press, were being passed around in the streets and storefronts outside.[133]

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[131] Peale et al., *The Selected Papers of Charles Willson Peale and His Family*, 428. Vol 1

[132] Peale et al., 477–78.

Manipulable planes—folded squares, creased panels, and overlaid flaps—are a dominant feature of the Peales' world of moving images. This format transcended scale, appearing in larger than life spectacles like the moving picture show, as well as scaled-down everyday note-taking, for instance in Charles Willson Peale's memorandum book kept between 1794 and 1820.[134] Two pages, in particular, contain unusual folded features (Fig. 1.35). The entries, which record progress made in Rembrandt Peale's experiments with the encaustic medium, scramble the text of the top-secret recipes with a simple code. Each page is divided at a vertical crease, which bisects one-half of a page written in normal English script, and a second half written in gibberish. When the page is folded back upon itself at the crease, the language resolves itself and the recipe is revealed.[135] A viewer versed in *The Metamorphosis* and trained to seek suspicious folds would have easily caught on to Peale's tricks.

Moving pictures controlled by shifting planes surrounded young Raphaelle, whose trial-and-error education taught him to process questions of vision through touch: by reaching, pulling, turning, or tracing on paper. Years later, this deeply ingrained tendency to approach the visual world as a series of manipulable flat surfaces emerged in the adult artist's paintings.

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[133] Peale's eidophusikon is well-known but little analyzed. Erkki Huhtamo's recent media archaeology contextualizes the spectacle's European roots, while Wendy Bellion's article on Peale's panoramic print contraptions helps to situate the moving picture shows in technological experimentation. Huhtamo, *Illusions in Motion*, 103–4; Wendy Bellion, "'Extend the Sphere': Charles Willson Peale's Panorama of Annapolis," *The Art Bulletin* 86, no. 3 (2004): 529–49.

[134] Charles Willson Peale, "Memorandum Book (B P31 #8a)" (Peale-Sellers Papers, American Philosophical Society, c.1820 1794).

[135] Peale.

Venus Rising from the Sea – A Metamorphosis

Raphaelle Peale's late-life masterpiece, *Venus Rising from the Sea* (1822), has long been understood as a picture about surfaces (Fig 1.36). Just two feet wide by two and a half feet high, the diminutive painting appears simple enough at first glance. A crisply creased piece of linen hangs from a piece of white tape affixed to the top edge of the canvas. It is a heavy piece of cloth—a towel, napkin, or kerchief, perhaps—and its weight pulls the slackened ribbon downwards just enough to reveal a figure peeking out from beneath.[136] One milky limb grasps bronze hair above, as a single foot balances on a bed of flowers below. A dark background surrounds the covered beauty. An intensity of illusionistic detail, high contrast and shadow, and the curtain well-known from the Zeuxis-Parrhasius myth all designate this object as a trompe l'oeil, or in the Peales' language, a deception.[137]

Like the Peale family's other illusionistic "deception" paintings—for instance *Staircase Group* or *Catalogue Deception*—Raphaelle's image manipulates perspective, depth, and lifelike textures in order to toy with a viewer's optical perception (Figs. 1.37, 1.38). These paintings may not have been intended to literally "fool the eye," as the trompe l'oeil moniker promises, but rather coaxed viewers into imaginative thought about the boundaries of representation and reality.[138] While ample ink has been spilled over the painting's primary surface—its illusory mixture of oil paint upon a canvas support—I am interested in its secondary surface and main subject, the depicted cloth, which has been all but ignored. It is not surprising that this detail has been neglected in scholarship on the painting: the job of the crisply folded fabric is to playfully block a traditional narrative. This slippery barrier was inserted to call attention to the obscured picture beneath and the material architecture of illusion—pigment, varnish, brushstroke, and frame—that rest above it like a sedimentary layer. Confronting Raphaelle's creased cloth not for *what* it covers, but *how* it covers, is key to understanding how this painted operated in a broader cultural context than is usually discussed. For in this buckling, bulging drape, two worlds converge: the individual sphere of the artist, and the artwork's more expansive surroundings of a print-centric emerging mass visual culture.

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[136] Footnote 54 in the following citation provides a full history of the identification and mis-identification of this scrap of cloth. Lauren K. Lessing and Mary Schafer, "Unveiling Raphaelle Peale's 'Venus Rising from the Sea--a Deception,'" *Winterthur Portfolio* 43 (August 2009): 247.

[137] Wendy Bellion summarizes the importance of the Zeuxis-Parrhasius myth to American trompe l'oeil practices in: Bellion, *Citizen Spectator*, 92.

Categorizing Raphaelle's painting as an illusionistic trick—a game fueled by the surface's deceptive flatness—distracts from a self-conscious engagement with object's tangible, sculptural depth. Stare at *Venus* long enough, and ghostly shapes begin to emerge from the darkness surrounding the cloth. In the upper right corner, a circular object rests between two thick parallel lines, while in the bottom left, a cluster of angular shapes nestle beside the napkin's edge. These faint forms filter through the wash of dark pigment, offering a glance of crimson or swipe of peach that just as easily fade into the mottled backdrop. Scholars noticed these pentimenti, or artistic changes that gradually emerge as pigment ages and is otherwise degraded, as early as 1967, and conservators eventually confirmed underdrawing and painting beneath the final composition.[139] In 2009, art historian Lauren Lessing and conservator Mary Schafer collaboratively confirmed that Raphaelle's initial composition was a partial copy of a known work—Charles Willson Peale's portrait of Raphaelle of 1817—covered with the same creased cloth (Figs. 1.39, 1.40). While Raphaelle did not copy the whole picture, he suggested the framed still life at the upper right, and a slice of palette and paintbrushes at the bottom left.[140] What had been a prank at the expense of his father took on new shape when Raphaelle decided to abandon the earlier composition, [141] likely to increase the painting's public marketability.[142] When he displayed the newly finished canvas at the 1822 Pennsylvania Academy of Fine Arts exhibition, Raphaelle covered the remnants of the elder Peale's portrait with the Venus we see today, a copy of James Barry's 1722 *The Birth of Venus* (Fig. 1.41).[143]

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[138] William H. Gerdts, "A Deception Unmasked; An Artist Uncovered," *American Art Journal* 18, no. 2 (April 1, 1986): 5–23; Lance Humphries, "A Trompe L'Oeil for Peale's Philadelphia Museum: 'Catalogue Deception' and the Problem of Peale Family Attributions," *American Art Journal* 32, no. 1/2 (January 1, 2001): 5–44.

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[139] Mary Schafer and Lauren Lessing, "Unveiling Raphaelle Peale's Venus Rising from the Sea—a Deception," *Winterthur Portfolio-a Journal of American Material Culture* 43, no. 23 (2009): 229–59.

[140] Bellion, *Citizen Spectator*, 316–320; Schafer and Lessing, "Unveiling Raphaelle Peale's Venus Rising from the Sea—a Deception," 241.

[141] Bellion, *Citizen Spectator*, 319–20.

[142] Lauren Lessing and Margaret Stenz, "Raphaelle Peale: Venus Rising from the Sea -- A Deception, c. 1822. (Still Life--A Deception--Venus Rising from a Bath; After the Bath--New England; After the Bath)," in *The Collections of the Nelson-Atkins Museum of Art.*, ed. Margaret C Conrads (Kansas City, Mo.; Seattle, WA: Nelson-Atkins Museum of Art ; Distributed by University of Washington Press, 2007), 436–38.
Bellion, *Citizen Spectator*, 320.

[143] Dorinda Evans, "Raphaelle Peale's Venus Rising from the Sea: Further Support for a Change in Interpretation," *American Art Journal* 14, no. 3 (1982): 63.

While there has been copious writing about Raphaelle's painting, no scholar has ever firmly addressed whether Barry's painting toured in the United States, perhaps at the Pennsylvania Academy of Fine Arts, or whether the American artist's familiarity with the composition came from a mezzotint engraving by Valentine Green after the Barry original (Fig. 1.42).[144] In any case, disguising a concrete reference with a covering to be pulled away is as much an allusion to the illusionistic genre's founding mythologies as it is a Metamorphosis-like memory game. Like the planar flaps of the turn-up, visually seeking out the edges of the image beneath the folds would have prompted viewers to ask themselves where they had seen that delicate foot or plait of copper hair before. *Venus Rising from the Sea* is, materially speaking, a series of planes, of flat possibilities created and subsequently recombined by its maker. The painting's primary joke may rely on its convincing two-dimensionality, but its thickness and accumulation is equally important.

The gleaming panel that screens nude Venus from view is designed to tantalize the viewer's sense of touch. As a historical narrative of trompe l'oeil would have it, the spectator—enticed by the flash of dainty toes and copper locks—would impulsively reach out to pull back the dangling covering in hopes of catching the goddess fully exposed, only to be rebuffed by unrelenting two-dimensionality. But it is difficult to ignore how poorly Raphaelle's cloth fits with the lush velvet curtains and gauzy drapes that typified the illusionistic genre by the nineteenth century, including several examples by members of his own family, for instance his father's *Artist In His Museum* (Fig. 1.43). Instead, Venus is obstructed by a symmetrically folded and layered piece of smooth—

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[144] In the course of personal correspondence, Hugh Lane Deputy Director and Head of Collections confirmed that the object file for Barry's painting does not include an exhibition history. Margarita Cappock, "James Barry," December 20, 2017.

even papery—fabric. Placed next to the curling pages of *Catalogue Deception*, it's unclear which the covering resembles more: either the hundreds of thousands of pounds of cloth rags sold to Pennsylvania papermakers each year, or the fruit of those labors, the paper sheets themselves. In any case, the drooping textile is meant to be unfolded, opened and closed like the pages of a book; not quickly pulled aside.

It is difficult to avoid seeing shades of *The Metamorphosis,* the flap book that would have been ubiquitous in 1822 Philadelphia, in the provocative creases and folds of the painting's cream-colored woven covering. Draped crisply from its pins as if just unfolded, the sheet is arranged into three horizontal sections. The top layer hangs over the central swath, while the bottom piece hangs open, tempting the viewer to fold it upwards and see what might be printed on its backside. Like a paper *Metamorphosis*, the covering is divided into four vertical sections: we might imagine Adam and Eve at the far left, and at the very right, man's disintegration into death, just over Raphaelle's neat signature. Scanning the surface for splits and cracks, as one might do with the folded paper booklet, becomes a search for indications of the curving volumes of a concealed nude body. Fine red weaving, as thin as a true thread, dot the sheet's borders just as printer's decorative ornaments frame each page of the print (Fig. 1.44). Even its creamy linen fabric could easily be mistaken for the cloth-like paper made from boiled cotton and linen rags at the nearby Wissahickon paper mill.[145] To urban viewers like those in Philadelphia, who knew that the rag-and-bone man's calls of "any old rags? Any old bones?" signaled the eventual recycling of their cloth scraps into paper pages, the connection between textile and text would have been obvious.[146]

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[145] Cathleen Baker's excellent study of the complex production of paper throughout the long nineteenth century outlines the transformation from rag to paper with unprecedented detail. Chapter two, Rag Preparation, explores the different fibers that would have constituted paper before the mid-nineteenth century. Linen scraps formed the majority of rag papers from this period, though cotton and sometimes wool were also included. Cathleen Baker, *From the Hand to the Machine: Nineteenth-Century American Paper and Mediums: Technologies, Materials, and Conservation* (Ann Arbor, Mich: Legacy Press, 2010), 20–33.

Why did Raphaelle paint the illusionistic drape in such an unusual way—that is, why suggest paper, when velvet would do just as well? The Peales paid attention to the specificity of textiles, as shown by the backdrop of *Catalogue Deception,* the nubby green texture of which was meant to mimic the green baize of the Peale Museum's walls.[147] Whether consciously or unconsciously, as an active participant in early America's visual and tactile culture, the haptic potential of paper surfaces was of considerable interest to Raphaelle and his peers. And by subtly confusing the boundaries of text and textile, of surface and subject, in the service of this interest, the artist ushered the deception genre into uncharted territory. In this work, the two-dimensional surface emerges as an artistic tool to be deployed self-consciously. But unlike the constructs of pictorial flatness that would emerge in twentieth-century art criticism, in which flatness called attention to the artifice of painting itself, *Venus* instead put flatness itself in the hotseat. If deceptively planar surfaces that expanded into hidden flaps were so successful that they governed a generation's perceptual training, it followed to expect a smooth canvas to contain hidden depths.

Venus's hidden depths take numerous forms: the physical layers of its underdrawing and painting; the tricky folds of its depicted cloth. But there are biographical depths to plumb as well. Just as *The Metamorphosis's* players and makers transformed Adam into Eve by manipulating paper flaps, Raphaelle's layered painting fossilizes the conversion of an intimate autobiographical image into a depersonalized enchantment for public consumption. Raphaelle and Charles Willson Peale's complex relationship was at times dark, especially during the last years of the son's life, during which illness and alcoholism kept him financially dependent and often unable to paint.[148] The elder Peale's love for his son is apparent in his letters, but so is his frequent disdain, most of all for Raphaelle's genre of choice: still life painting. As Charles Willson Peale remarked in his autobiography, he saw still life painting as "the painting of objects that have no motion"—a static, limited world, existing in stark contrast to the animated spectacles he surrounded himself and his children with. Perhaps Peale lamented that a trial-and-error education had failed Raphaelle; had encouraged the wrong curiosities. But Raphaelle's Venus, a canvas of stacked prospects shrouded by a metamorphic covering, is a self-conscious claim for the opposite. *Venus Rising from the Sea* exists as a series of planes, layered and folded and poised to slide and shift at any moment. Raphaelle Peale, contrary to his father's claim, had made an image that was anything but still.

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[146] Baker, 20.

[147] Bellion, *Citizen Spectator*, 223.

Thinking about *Venus Rising from the Sea* in relation to the folded and layered surfaces of the *Metamorphosis* is a multidirectional process. Noticing that the creases and cracks of the paper phenomenon appear in unexpected places, including canonical fine art, speaks not only to the permeation of visual culture into the realm of sophisticated image-making, but also to the shared context of education and philosophy from which both genres emerged.

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[148] The father-son relationship between Charles Willson Peale and Raphaelle has long fascinated scholars, perhaps to the point of prioritizing a biographical narrative over an art historical one. Lillian B. Miller, "Father and Son: The Relationship of Charles Willson Peale and Raphaelle Peale," *American Art Journal* 25, no. 1/2 (1993): 5–61; Nemerov, *The Body of Raphaelle Peale*.

Conclusions

In tracing the journey of America's first widely produced tactile image, this chapter has traversed a wide swath of space, time, and medium. It has followed print and manuscript production as it crossed between England and America; pursued transformations in images and their reception between 1650 and 1822; and tracked the permeation of particular surface dynamics from paper into paint. Attending to the historical and trans-medial journey of *The Metamorphosis* reveals, primarily, the critical role that turn-ups played in an educational system that was attuned to memory training and learning through simultaneous visual and haptic interaction. As the first object of its type in the United States, *The Metamorphosis* sets the stage for the flourishing production of a variety of tactile images to come over the following century. It shows that from the start, images positioned upon or within paper constructions existed in an intermediary cultural space that conjoined play and seriousness, amusement and education, memory and magic.

CHAPTER 2: ANIMATING ANATOMY AT MIDCENTURY

And ever and anon the master turned to his book, as he laid bare the mysteries of the hidden organs; to his precious Vesalius, it might be, or his figures repeated in the multifarious volume of Ambroise Paré; to the Aldine octavo in which Fallopius recorded his fresh observations; or that giant folio of Spigelius just issued from the press of Amsterdam, in which lovely ladies display their viscera with a coquettish grace implying that it is rather a pleasure than otherwise to show the lace-like omentum, and hold up their appendices epiploicae as if they were saying 'these are our jewels.'
—Oliver Wendell Holmes, "Scholastic and Bedside Teaching," from an introductory lecture delivered to medical students at Harvard, 1867.[149]

Between 1833 and 1850, five editions and thousands of copies of *Obstetric Tables*, a curious book written and designed by English botanist, printmaker, and midwife George Spratt (ca. 1784-1840), circulated in and beyond London and Philadelphia (Fig. 2.1).[150] Though female anatomy and pregnancy were common topics in scientific books of the day, *Obstetric Tables'* visual approach to the subject matter was anything but standard. Between the covers of each abundantly illustrated anatomical atlas, layers of hand-cut lithographic pictures stack upon themselves to form moveable, superimposed images of the female body. In some plates, sculptural accretions of paper slips mimic swells and curves of a pregnant body, while in others, the razor-sharp edges of hand-trimmed paper evoke the scalpel slices of surgery.

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[149] Oliver Wendell Holmes, *Medical Essays, 1842-1882* (Boston: Houghton, Mifflin and Company, 1883), 279.

[150] The first edition, *Obstetric tables; comprising coloured delineations on a peculiar plan, intended to illustrate elementary and other works on the practice of midwifery, elucidating particularly the application of the forceps, and other important practical points in obstetric science,* was published by John Churchill in Soho in 1833. I have traced fifteen different title and publisher variants. For brevity's sake, I will refer to the book as *Obstetric Tables* throughout this chapter, unless a specific copy is otherwise noted.

To period readers, the publication's allure was in the book's elaborate, hand-activated movable pictures, rather than the descriptions of procedures and prognoses familiar from contemporary texts like those by William Smellie and William Hunter.[151] Anatomical illustrations with flap components were well-known by the nineteenth century, but Spratt's tactile images offered readers something fresh. They intervened in the genre's three-hundred-year history by pushing beyond the conventional spatial metaphor of peeling back the body's layers that had been in vogue since Vesalius's day.[152] Some illustrations utilized layering to denote change over time, like a slow-moving flip book, while others detailed the intricacies of physical maneuvers—application of pressure, grasping a tool—through the same stacked format. Disembodied hands of surgeons and attendants, scattered across these flaps in ghostly black and white outline, primed the way for the reader's own points of contact with the page, and by proxy, with the scientific body. The tactile images in *Obstetric Tables* did not just analogize and represent the three-dimensional body, but crucially, provided the reader with a nascent interactive technology of simulation keyed to an array of surgical scenarios.[153]

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[151] According to one period review of Spratt's book, "the descriptions and directions are brief, explicit, and generally sound—in fact, the doctrines are essentially those of Denman and Smellie." Dr. Thomas Denman (1733-1815) and William Smellie were physicians focused on midwifery and obstetrics whose publications defined medical literature in the generation preceding Spratt's. *The Medical Examiner: A Monthly Record of Medical Science* (Lindsay & Blakiston., 1848), 359; Lyle Massey, "'Pregnancy and Pathology: Picturing Childbirth in Eighteenth-Century Obstetric Atlases,' The Art Bulletin, Vol. 87, No. 1 (March 2005): 73-91.," *Art Bulletin* 87, no. 1 (2005): 73–91.

[152] Scholars attribute the first flap anatomies, or "fugitive sheets," to Heinrich Vogtherr the Elder's pair of male and female anatomical broadsides published in Strasbourg in 1538-9. As Suzanne Karr Schmidt, Sachiko Kusukawa, and others have pointed out, Andreas Vesalius capitalized on Vogtherr's success and included pages to be cut out and assembled as flap prints in an edition of *De humani corporis fabrica* in 1543. Renaissance and Early Modern flap anatomies have received far more attention than their eighteenth and nineteenth-century counterparts. For more on fugitive sheets, see: Suzanne Karr Schmidt and Kimberly Nichols, *Altered and Adorned: Using Renaissance Prints in Daily Life* (Chicago, Ill. : New Haven, Conn: Art Institute of Chicago, 2011); Suzanne Karr Schmidt, "Printed Bodies and the Materiality of Early Modern Prints," *Art in Print* 1, no. 1 (2011): 24–31; Suzanne Karr Schmidt, "Art, A User's Guide: Interactive and Sculptural Printmaking in the Renaissance" (Ph.D., Yale University, 2006); Sachiko Kusukawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany* (Chicago ; London: University Of Chicago Press, 2012); Andrea Carlino, *Paper Bodies: A Catalogue of Anatomical Fugitive Sheets, 1538-1687* (London: Wellcome Institute for the History of Medicine, 1999).

Far from the only example of its kind, Spratt's *Obstetric Tables* was the most visible, accessible, and widely circulated set of scientific tactile images in America during the first half of the nineteenth century. While much like *The Metamorphosis,* exact print run figures are impossible to come by owing to absent archives, subscription lists show approximately 800 names by the 1840s editions, listing British subscribers only. That figure accounts for what was likely only a portion of each edition's publication volume, as it does not include American subscribers, books sold outside of the subscription system, for instance at individual booksellers' or print shops. Despite the book's wide circulation, it has, until now, only been written about cursorily from the disciplinary perspectives of the history of science and medicine, and never as the central object of study.[154] I rely on scholarship in these fields as a starting point for my analysis of Spratt's work, as it is crucial to contextualize *Obstetric Tables* as part of a massive literary, artistic, and cultural interest in anatomy that flourished in Britain and later America from the early eighteenth century onwards. But my own treatment of the topic will diverge from Spratt's place in the canon of scientific literature, and will instead consider what this oddly structured British book can tell us about shifting modes of physical reception, fantasies of gender and power, and hands-on inclinations for art viewership in the mid-nineteenth century United States.

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[153] Simulation is a key term in this chapter, and is informed by Jessica Riskin's work on early attempts at producing artificial life. In particular, I take up her notion of the difference between an analogy (replications in appearance only) and a simulation (replications of process, experience, and appearance). Jessica Riskin, "Eighteenth-Century Wetware," *Representations* 83 (Summer 2003): 97–125.

[154] George Spratt's work is the central focus of one book chapter by James A. Secord, and is briefly mentioned in a handful of dissertations and one collection catalogue. See: James A. Secord, "Scrapbook Science: Composite Characters in Late Georgian England," in *Figuring It Out: Science, Gender & Visual Culture* (Hanover, N.H: Dartmouth College Press : University Press of New England, 2006), 164–91; Cindy Lee Stelmackowich, "Bodies of Knowledge: Nineteenth Century Anatomical Atlases, 1800–1860" (SUNY Binghamton, 2010); Marcia Nichols, "The Man-Midwife's Tale: Re-Reading Male-Authored Midwifery Guides in Britain and America, 1750–1820" (University of South Carolina, 2010); National Library of Medicine (U.S.), *Hidden Treasure: The National Library of Medicine*, 1st ed (New York, N.Y: Blast Books, 2012).

In this case study, I situate the book's tactile images in a context of midcentury American debates about the shifting role of bodily contact in accessing not only science, but a wider visual cultural landscape that included encounters with fine art such as neoclassical sculpture. Such debates raised questions that resonate with contemporary notions of simulation, virtual reality, and experiential modeling long before such terms would enter the common lexicon. In order to trace this intellectual and physical history, I first explore the *Obstetric Tables'* creation as an object that occupied a liminal position between science and visual culture in 1830s London, before drawing upon written reception of the book in the United States, and tracking its circulation among period collectors. Ultimately, analyzing the production and proliferation of and engagement with these incredibly widespread books reveals that in mid-nineteenth century America, tactile images emerged as facilitators of a growing desire to materially simulate intellectually and physically challenging situations—a natural and expected augmentation of their role as educational tools earlier in the century, as traced in the previous chapter with the case of *The Metamorphosis*. In the dynamic intellectual milieu of the 1840s and 50s, during which an emerging mass visual culture converged with a public health renaissance, tactile images became material surrogates for a mixture of specialist and non-medical audiences eager to understand the scientific and medical phenomena that they could not otherwise access hands-on. Largely still barred from operating on real bodies in practice if not by law, curious users (many, but not all of whom were medical professionals) instead turned eager hands and eyes to experiential facsimiles predicated on physically questioning and interrogating the multiple surfaces of images.

This chapter is divided into three parts, beginning at the molecular level of each illustration's constituent flaps, and expanding progressively outwards from the object into its initial context of creation, its reception and practices of use, and finally the broader visual cultural environment of simulation and modeling in midcentury American art. In part one, I devote significant space to a visual analysis of the first American edition of *Obstetric Tables* (Philadelphia, 1847). Layered ilustrated books, in their compression of vast amounts of inscribed surface area into a relatively small package, demand an almost ekphrastic visual description—if this is glossed over or abbreviated, important evidence like image-text relationships, patterns of image distribution, and page design risks becoming lost.[155] Because the nineteenth-century reader's experience of encountering various different types of movable illustration over the course of the text is key to my arguments about the emergence of a visual culture of simulation, I describe the mechanics of each category of image in detail. This section also provides, for the first time, a thorough overview of the book’s origins in early nineteenth century Britain, centered on a sketch of its little-known author’s life and adjacent artistic and scientific pursuits. Section two considers the tactile and physical reading practices occasioned by Spratt’s book by exploring the lives and epistemological priorities of a cross-section of users. In this section, I position this practice of illustrated simulation in a wider cultural phenomenon in Antebellum America: the popular anatomical performance. Finally, section three concludes the chapter with the proposition that the simulated, tactile, and physical culture of midcentury American medical sciences offer a new way of thinking about the forbidden, sensual physicality of a parallel art form: neoclassical sculpture such as Hiram Powers’ *Greek Slave*, exhibited for the first time in the United States in 1847, the very year the *Obstetric Tables* was first published in the United States.[156]

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[155] While this is especially true for books with layered illustrations, in which surface area is exponentially increased with each additional flap layer, illustrated books and even books in general require specific and elongated forms of description. Throughout this dissertation, I employ methods drawn from the fields of bibliography and book history specifically formulated to deal with the book as a material object. An overview of this discipline and its interpretive techniques can be found in Philip Gaskell, *A New Introduction to Bibliography* (New Castle, Del: Oak Knoll Press, 1995).

Part I: Scalpels and Scrapbooks: Inventing the Obstetric Tables

In the fall of 1847, a traveling book salesman made his way north to Boston.[157] He carried a new release from Philadelphia publishers Wagner & McGuigan: George Spratt’s *Obstetric Tables: Comprising Graphic Illustrations, with Descriptions and Practical Remarks; Exhibiting on Dissected Plates Many Important Subjects in*

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[156] The second version of *The Greek Slave* was exhibited at the National Academy of Design in New York between 1847-1848. In 1848, it was shown in venues across the United States, including the Odeon in Washington, D.C., Carroll Hall in Baltimore, and the Pennsylvania Academy of Fine Arts in Philadelphia. Martina Droth and Sarah Kraus, “‘Mapping The Greek Slave’ Digital Interactive,” *“The Greek Slave by Hiram Powers: A Transatlantic Object,” Eds. Martina Droth and Michael Hatt, Special Issue, Nineteenth-Century Art Worldwide* 15, no. 2 (Summer 2016), http://interactive.britishart.yale.edu/mapping-the-greek-slave/map.

[157] J.V.C. Smith, ed., “Medical Intelligence,” *The Boston Medical and Surgical Journal* 37, no. 15 (1848): 306.

Midwifery. The much sought-after anatomical book had seen major success in Britain between 1833 and 1846, and was now finally available as an affordable American imprint.[158] It was soon issued again by Thomas, Cowperthwaite & Co in 1848 and in 1850 by James A. Bill, both of Philadelphia, using Wagner & McGuigan's illustrations. Throughout this chapter, my analysis centers on a copy from this first American printing by Wagner & McGuigan in Philadelphia in 1847, held at the University of Pennsylvania's Kislak Center for Special Collections.[159]

Obstetric Tables is an eye-catching object, bursting with hand-applied color and expansive potential hardly signaled by its modest quarto format and plain cloth binding.[160] As the traveling salesman displayed his wares to potential clients, he would have undoubtedly plucked this special item from his pack, opening its covers onto one of more than a dozen vibrantly colored, multilayered lithographic illustrations of the pregnant female body in various stages, angles, and predicaments. Each of these three-dimensional printed images, or as they were referred to in the period, "dissected plates," comprised multiple layers of superimposed pictorial paper flaps.[161] Between two sandwiched sheets of paper (one base sheet and one surface sheet), print shop laborers inserted perfectly registered stacks of smaller tabbed illustrations, made visible through a slit in the surface sheet, a sturdy structural technique that had been used for flap anatomies since the early seventeenth century.[162] Between the first London edition of 1833 and the first American edition of 1847, the book eventually grew from thirteen layered illustrations to accommodate twenty-one of these complicated plates.[163] Called "tables" in the traditional terminology of the genre, they bear no resemblance to information grids. Fifteen of the illustrated tables are outfitted with movable parts constructed of four or five flaps tipped on to a pasted-in sheet.[164]

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[158] British editions of *Obstetric Tables* were sold for 21 shillings in 1833 and 28 shillings from 1848-1848. Americans interested in owning a copy could buy a British imprint through American booksellers like Boston's Ticknor and Fields, who listed copies available for import in their catalogue of 1842. In the 1850s, *Obstetric Tables* was frequently listed for sale for $8. This was a mid-range price for an illustrated scientific publication. On one end of the spectrum, Frederick Hollick's *Anatomy and Physiology* cost only $1.50, but it had only one dissected plate illustration. Illustrated books with colored illustrations, for instance Jones Quain's *Series of Anatomical Plates in* Lithography, cost $30. Ultimately, while book collecting was a specialized activity aimed at the middle and upper classes, *Obstetric Tables* was a relatively accessible purchase. William D. Ticknor & Co., *Ticknor's Catalogue of Christmas and New Year's Presents, for 1842* (Boston: Ticknor & Fields, 1842), 27.

[159] George Spratt, *Obstetric Tables : Comprising Graphic Illustrations, with Descriptions and Practical Remarks, Exhibiting on Dissected Plates Many Important Subjects in Midwifery*, 1st American edition, from the 4th and greatly improved London ed., carefully rev., and with additional notes and plates. (Philadelphia: Wagner & McGuigan, 1847). Kislak Center for Special Collections, Rare Books, and Manuscripts, University of Pennsylvania. RG652 .S767o 1847.

[160] The original 1847 American binding was black cloth over boards with the front cover lettered in gilt.

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[161] It seems that nineteenth-century readers were familiar with the terminology "dissected plates" well before Spratt's publication appeared. In 1834, a reviewer of Edward Tuson's *The Anatomy and Surgery of Inguinal and Femoral Hernia* (1834) wrote that "we do not know who was the inventor of dissected plates: the earliest specimen of these stratified engravings that has fallen in to our hands was published at Amsterdam, in 1645." "Mr. Tuson's Dissected Plates of Hernia," *The Medical Quarterly Review* 2 (1834): 145–46.

[162] Brown, "Flip, Flap, and Crack: The Conservation and Exhibition of 400+ Years of Flap Anatomies."

[163] By first English edition, I refer to both volume one of the 1833 issue and the supplement, which is bound separately but was likely published very shortly after the first volume was released. Volume 1 of the 1833 printing includes 9 layered illustrations and 3 regular illustrations; the supplement includes four layered illustrations and two regular illustrations.

[164] I do not aim to provide a descriptive bibliography of this publication, though such a task would be a productive area of future research. However, I think it is important to draw attention to the book's material growth, accumulation, and transformation over 17 years of constant re-publication. In the course of my research on *Obstetric Tables*, I have physically examined dozens of copies in a variety of libraries, archives, and special collections. There are so many extant copies worldwide that I have been unable to complete a full census.

But despite what the illustration-focused period reviews might otherwise suggest, *Obstetric Tables* was not solely a portfolio of "artistical" images—it was a weighty, bound, portable, and insistently physical book, an object that demanded a specific kind of interaction and engagement with its many materials and components.[165] By the 1847 printing, *Obstetric Tables* had grown to feature over one hundred pages of images, text, and supplementary material, composed of leather, paper, glue, ink, and tissue. Paratexts envelop the sheets of medical information, including a lengthy list of European subscribers, dedications, an introduction from the American editor, and advertisements for Wagner & McGuigan's lithography firm and for "Moorhead's Graduated Magnetic Machine," which promised to cure all ailments from deafness to curvature of the spine. Tissue guards are slipped between leaves of illustration and type, conjuring ghostly outlines of bodies and organs as the reader pages through the book. Image and text are constantly interwoven through numerical labels and descriptive keys, and the experience of reading is to ricochet from corner to corner, recto to verso. For the medically untrained eye, tracing the labyrinthine partnership of figure and text is indispensable for accessing the book's practical lessons. Without the flap-by-flap narrative as a guide, discerning whether an image shows forceps employed to deliver a healthy breech baby (table X), or to perform a craniotomy of a stillborn fetus during a partial-birth abortion (table VII B), would be impossible (Figs. 2.2-2.3). The text provides crucial diagnostics about bodies in crisis, and the images provide a pathway to a real-time response.

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[165] "It must be seen to be appreciated, for when the utmost effort has been made to describe the character of the plates, it will fall far short of the object. Besides being true to nature there is an artistical finish about them that really gives an idea of individual organs and the relation which one bears to another." "Obstetric Tables," *The Medico-Chiurgical Review, and Journal of Practical Medicine* 20 (December 1, 1847).

In 1847, a white male American of even modest social and financial means could choose from an array of experiences to learn about the workings of his body. Women could also decide where to obtain this information, albeit from a more limited set of choices, and African-Americans, Native Americans, and marginalized immigrant groups had far fewer options still.[166] Thus, middle-class men and some white women might attend a public lecture, visit an anatomical museum, or even view a wax-fleshed Venus sculpture undergo dissection—all experiences endowed with different benefits and drawbacks. Learning about the body through a book was a deliberate choice, as it was an experience that diverged from that of viewing a painting or studying a print. A slow and personal undertaking, book learning is scaled to the reader's body and offers up information in a destabilized and constantly shifting manner. The following analysis concentrates on the kinetic illustrations as part of a larger visual program impossible to divorce from the unique structure and interactive conventions of the book.

Movement, Three Ways

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[166] Women were welcome to participate in a range of popular anatomical performances, lectures, and courses from the 1830s onwards, though they did not gain access to the official instruction of medical schools until the 1850s. Occasionally, performances and lectures were segregated by gender. The situation of African-Americans interested in learning about anatomy was more complicated. Black bodies had long been associated with anatomical study in deeply problematic ways, as most of the dead bodies plundered for dissection in the years before the Anatomy Acts of the 1830s were those of African American, Native American, or from marginalized immigrant groups. Although the establishment of medical schools like Philadelphia's Woman's Medical College, which admitted a diverse student body from its founding in 1850, opened some doors to Black women interested in gaining medical knowledge, many non-white people continued to shy away from the world of anatomy because of its nefarious earlier connotations. See: Michael Sappol, *A Traffic of Dead Bodies: Anatomy and Embodied Social Identity in Nineteenth-Century America* (Princeton, N.J: Princeton University Press, 2002), 192–95; Susan Wells, *Out of the Dead House: Nineteenth-Century Women Physicians and the Writing of Medicine* (Madison: University of Wisconsin Press, 2001); Susan Shifrin, "'The Worst Are Women Doctors': Nineteenth-Century Attitudes Toward the Appearance and Professionalism of Women Physicians"," *Transactions & Studies of the College of Physicians of Philadelphia* 5, no. 16 (December 1994): 47–65.

The fifteen kinetic plates interspersed with the text of *Obstetric Tables* fall into three categories based on what iconographic purpose the flap format is meant to serve. At the most basic level, stacked flaps index spatial relationships, useful for visualizing dissection or internal examination. A second category deals with temporal problems, for instance tracking changes in the body over the nine months of pregnancy. The third category illustrates spatio-temporal scenarios, specifically, manual operations that require a specific set of bodily gestures and interventions with surgical instruments. As I will discuss later in the chapter, period reviewers also made note of these three distinct groups, and praised this functional diversity as one of the book's greatest strengths.

Category one, in which paper layers index actual bodily space, is neatly demonstrated by the first movable illustration in *Obstetric Tables* (Fig. 2.4). Table III is a daring view of female genitalia, posed as if to prefigure Courbet's *L'Origine du Monde* (Fig. 2.5). Like many other images in Spratt's text, this is copied directly from Jacques Pierre Maygrier's popular obstetrical atlas *Nouvelles démonstrations d'accouchemens* (first published as a luxurious multi-volume folio in Paris in 1822, and widely available in English translation in cheaper octavo editions before 1833), and enhanced by the novel mechanical format (Fig. 2.6).[167] In Spratt's image, flaps correspond directly to the natural contours of female anatomy. At the text's direction, the reader can "separate" the outermost flaps—here, the labia majora—and perform a simulated internal gynecological exam. Similarly, table XI allows the reader to dissect the uterus at full term, separating its numerous membranes into distinct paper layers to best compare differences in texture, color, and translucency (Fig. 2.7). In a time when accessing cadavers for authorized dissection was still only newly legal, practicing dissection on a pregnant woman at full term would have been a rare experience, and this illustration is a prime example of how paper technologies of modeling helpfully sidestepped obstacles of access and preservation, though the replacement would always be necessarily incomplete and inadequate in comparison.

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[167] Jacques Pierre Maygrier (1771-1835) was a key figure in the development of the field of obstetrics in France, although he has been the subject of little scholarship. For a brief overview of his biography and publications, see: John Leonard Thornton and Carole Reeves, *Medical Book Illustration: A Short History* (Oleander, 1983), 108.

Table IV, one of the most frequently reproduced images from this still widely collected and exhibited book, neatly exemplifies the second temporal category of dissected plates (Fig. 2.8). In this image, "On the signs of pregnancy and the development of the uterus," a woman is depicted in profile view from head to thigh against a blank background.[168] She is nude, save for a cloak loosely draped over her shoulders to signal her modesty, and a frilly bonnet secured to her head by a bright blue ribbon. Cheeks flushed and rosy, she demurely diverts her gaze away from the reader who is about to manually enter her body. Between the edge of the cloak and the top of her breast, a slight fluctuation in the paper's thickness alerts the user to an opening between the first layer and the base of the page. As each successive flap lifts, the woman's body propels through nine months of pregnancy, belly swelling from sheet to sheet, nipples elongating and darkening in color. Opening the innermost flap uncovers a small, curled fetus. Overall, four small paper flaps encapsulate the woman's transition from "virgin female" to "the female at full period of gestation."[169] We do not see her face again—as the reader pages onwards, the model's body becomes increasingly fragmented and depersonalized, the object of a Foucauldian medical gaze.[170]

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[168] Table IV only appears in editions of the book printed after 1835.

[169] These descriptions come from the plate's accompanying text, "Description of the plate IV."

The remaining tables fall into the third and most complex category: images that represent operations, in every sense of the word. These dissected plates allow readers to rehearse gestures and physical maneuvers in three dimensions, demonstrating surgical tools like obstetrical forceps in action. In each of these tactile images, users fumble through a simulated medical experience, for instance a physical examination of the patient, a partial-birth abortion, or a caesarian section surgery (Fig. 2.9). Paper flaps compress spatial and temporal concerns into a single material unit in these illustrations, highlighting both the promise and pitfalls of tactile interaction as a method of learning from visual surrogates. In particular, the depiction of the doctor's hands in several of the images simultaneously reinforces the period interest in hands-on interaction as a desirable mode of absorbing information, and calls its actual effectiveness as an epistemological tool into question.

Handy Images

Most of these operative images cluster in the final third of the book, following a section on "preliminary observations on the use of instruments." Obstetrical

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This edition is unpaginated. Spratt, *Obstetric Tables : Comprising Graphic Illustrations, with Descriptions and Practical Remarks, Exhibiting on Dissected Plates Many Important Subjects in Midwifery*.

[170] For more on the construction of the sexed and erotic anatomical female body, see: L. J Jordanova, "Medical Images of the Female Body," in *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries* (Madison, Wis.: University of Wisconsin Press, 1989), 134–59; Foucault's concept of the "medical gaze" is developed throughout: Michel Foucault, *The Birth of the Clinic* (London: Routledge, 2003), 15.

instruments—i.e. forceps and other specialized tools—became symbolic objects in a debate about the gendered professionalization of the field of women's health from the mid-eighteenth century onwards. According to scholars of the history of medicine,[171] British male midwives (who would not be called obstetricians until about 1820) pushed for recognition as a professional, bourgeois class among their fellow physicians during the late eighteenth to early nineteenth centuries.[172] Male midwives occupied an uneasy position in professional medical hierarchy: they competed with traditional female midwives for business, while public opinion variously figured them as fashionable dandies, quacks, and gender-bending freaks. See Isaac Cruikshank's *Caricature of a Man Midwife as a Split Figure*, one of countless popular prints skewering the profession, which suggested that men assisting with labor must harbor some dark hermaphroditic secret (Fig. 2.10). Physical mastery of tools became a powerful weapon of self-fashioning for the man-midwife—a visual means of conveying education in anatomical study, experience in all types of medical situations, and most of all, preserving conventional masculinity.[173]

Male midwives' professionalization strategy depended on demonstrating a need for their services dire enough to excuse breaking social taboos about touching married women's bodies.[174] By "expand[ing] the definition of emergency" and presenting themselves and their physical toolkits as the only thing between life and death, male midwives successfully re-defined their profession as an indispensable necessity.[175] Well-respected practitioners of the day publicly eschewed any visible signs of eccentricity that might call a male midwife's professionalism and ability to focus on the task at hand into question. "I think it unnecessary, and would wish that any thing which adds to the mystery or peculiarities of the profession should by all means be avoided," recommended one doctor in 1833.[176] The man-midwife persona was a cultivated performance of education, physical skill, and social grace, meant to appeal to clients of means faced with the choice between a traditional midwife and a self-fashioned "surgeon-accoucheur." Seen in this light, images like Table VIII become attempts to convey these via tactile interaction sensory qualities that would otherwise escape words—especially for those without proper hands-on training in the proper use of instruments—such as directionality, force, pressure, and texture (Fig. 2.11). Spratt's illustrations achieve this goal through creative appropriation of a trope in medical publishing, an emphatic inclusion of the doctor's hands in anatomical imagery.

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[171] The introduction to Lisa Forman Cody's article makes clear that the displacement of female practitioners by male-midwives and eventually obstetricians was even in 1999 particularly well-trodden ground, yet remains a magnetic subject for feminist historians. Lisa Forman Cody, "The Politics of Reproduction: From Midwives' Alternative Public Sphere to the Public Spectacle of Man-Midwifery," *Eighteenth-Century Studies* 32, no. 4 (1999): 477–95.

[172] Nichols, "The Man-Midwife's Tale: Re-Reading Male-Authored Midwifery Guides in Britain and America, 1750–1820"; Sappol, *A Traffic of Dead Bodies*; Adrian Wilson, *The Making of Man-Midwifery: Childbirth in England, 1660-1770* (Cambridge, Mass.: Harvard University Press, 1995).

[173] Wilson, *The Making of Man-Midwifery*, 91.

For instance, Table VIII, "On the application of the forceps in the most natural position of the foetal head," demonstrates the proper use of the forceps instrument by emphasizing angles of entry into the body—a process more easily understood experientially than didactically. In order to translate sensory cues like resistance, tractability and pressure into the paper simulation, Spratt used illustrated hands, which literally pop out from the page, to connect the user's body with that of the pictorial surgeon. Focus on the relationship between hand, tool, and patient's body is immediately established by the outermost layer of flaps, from which a disembodied black-and-white outlined hand juts out, grasping the black handle of a silver tool. To proceed with the scenario, the reader must join his own hand with the illustrated paper appendage (Fig. 2.12). Cantilevered by the weight of the opened pages, the limb floats above the paper's surface, casting shadows on the page below and inviting precisely this symbolically charged interaction. Cupping the forceps from beneath is the surgeon's second hand, again truncated just below the palm. Throughout the course of the illustration's five flaps, the outlined hands subtly change position. A thumb circles the forceps' handle to re-angle the tool, as the other hand's fingers slip protectively beneath the fetus's head.[177] Eventually, the flaps burrow too deep inside the body for hands to fit, and the fetus's head is alone with the metal blades of the tool.

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[174] Nichols, "The Man-Midwife's Tale: Re-Reading Male-Authored Midwifery Guides in Britain and America, 1750–1820," 4; Sappol, *A Traffic of Dead Bodies*, 88–95.

[175] Nichols, "The Man-Midwife's Tale: Re-Reading Male-Authored Midwifery Guides in Britain and America, 1750–1820," 4.

[176] F.H Ramsbotham, "Dr. F.H. Ramsbotham on the Practice of Midwifery," *London Medical Gazette, or, Journal of Practical Medicine* 13 (April 1833): 886.

Tactile, tool-mediated knowledge, therefore, is at the heart of the final group of images. Nowhere is this more evident than in Table VI B, which visualizes the process of manually rotating a breech fetus to achieve a safer presentation of the head (Fig. 2.13). Version, or the operation of turning, is a strictly manual process in which the midwife is deprived of any visual clues. Instead, he or she must know by sense of touch precisely where to grasp for the fetus's limbs, how much pressure to apply, and what direction to rotate. Spratt's tactile image gives sight to an otherwise blind process, with the final goal of teaching the operator how to see with his hands.

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[177] Thomas Jefferson University Archivists Kelsey Duinkerken and Michael Angelo produced a series of videos of their 1838 copy of *Obstetric Tables* in motion. These short videos, available online as a digital exhibition, are much more useful for understanding the mechanics of the book than a still image. For the video of this particular illustration being operated, see: Thomas Jefferson University Archives & Special Collections, *Table VIII. From Obstetric Tables: Comprising Graphic Illustrations, with Descriptions and Practical Remarks; Exhibiting on Dissected Plates Many Important Subjects in Midwifery. George Spratt. London, 1838.* (Philadelphia, PA, 2016), http://library.jefferson.edu/archives/exhibits/flapbooks/videos/videos/obstet_7.mp4.

Though the table comprises only three flaps, its design is visually complex and unique within the book as a lone experiment with illusory motion, the style of movement most commonly recognized as proto-cinematic.[178] Three slips of paper printed on both sides show four successive stages in the operation of turning (Fig. 2.14). When tasked with illustrating a time-based operation like version, double-sided images work to eliminate any gaps in the fluid sequence of stages. [179] For instance, in the top flap, the midwife carefully grasps the breech baby's upended feet. Opening the flap downwards reveals, on its verso, the midwife's firm hand beginning to pull the fetus by its feet towards the opening of the cervix. By rhyming the physical movement of the flap with the trajectory of the fetus, the reader appears to convincingly tug the baby downwards on the page as she operates the illustration.

Table VI B is Spratt's most successful re-organization of an illustration from Maygrier's earlier obstetrics manual. A comparison of the two books reveals how differences in format, physical structure, and relationship between image and material

support can radically change the meanings and uses of nearly identical iconography.[180] Jacques-Pierre Maygrier (1771-1835) was a French physician who whose publications all focused on the manual and physical techniques of obstetrics.[181] *Nouvelles demonstrations d'accouchemens* (retitled "Midwifery Illustrated" in translation) was his final and most ambitious publication. Featuring lavish illustrations designed by Antoine Chazal and engraved on copperplate by Forestier and François-Louis Couché, *Nouvelles demonstrations* led the charge in a new anatomical publishing trend that prioritized the visual. Publishers commissioned scaled-down lithographic copies of Chazal's illustrations when the book was reprinted in a smaller, cheaper octavo format across Europe, the United States, and Mexico.[182] The images would later circulate in other publications well into the late nineteenth century.[183]

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[178] Gunning, "The Play between Still and Moving Images: Nineteenth-Century 'Philosophical Toys' and Their Discourse."

[179] "Version" refers to external cephalic version, the medical terminology for turning a breech baby in the womb to facilitate a more safe delivery. Gunning, "The Play between Still and Moving Images: Nineteenth-Century 'Philosophical Toys' and Their Discourse."

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[180] I follow Hans Belting's notion of the image as a time-based mental construction that occurs between the body of the viewer and the material support—the canvas, wall, parchment, paper, or book. Different media transmit images in different ways, and a layered, mechanical material support would transmit an anatomical image differently than a flat, static piece of paper. Hans Belting, "Image, Medium, Body: A New Approach to Iconology," *Critical Inquiry* 31, no. 2 (January 1, 2005): 302–19.

[181] A selection of Maygrier's publications include: J. P. Maygrier, *Manuel de L'anatomiste, Ou Traité Méthodique et Raisonné Sur La Manière de Préparer Toutes Les Parties de L'anatomie, Suivie D'une Description Complète de Ces Mêmes Parties*, 4. d (Paris: L. Duprat-Duvurger, 1807); J. P. Maygrier, *Nouveaux Élémens de La Science et de L'art Des Accouchemens*, Seconde d (Paris: De Pelafol, 1817); Johann Caspar Lavater et al., *L'art de connatre les hommes par la physionomie*, Nouv. d (Paris: De Pelafol, 1820); J. P. Maygrier, *Nouvelles Démonstrations D'accouchemens. Avec Des Planches En Taille-Donee, Accompagnées D'un Texte Raisonné, Propre À En Faciliter L'explication* (Paris: Béchet, 1822).

[182] For more on how *Nouvelles Demonstrations* (or *Nuevo metodo para operar en los partos)* fit into nineteenth-century Mexican print culture, see: Nora E. Jaffary, *Reproduction and Its Discontents in Mexico: Childbirth and Contraception from 1750 to 1905* (UNC Press Books, 2016), 63–70.

[183] Even in 1883, medical reviewers recognized when plates from Maygrier's *Novelles Demonstrations* were inserted into later publications, as did one reviewer of Dr. A Martin's *Atlas of Gynecology and Obstetrics* published in the *Buffalo Medical Journal*, 1883.

Placed side by side, *Nouvelles demonstrations* and *Obstetric Tables* appear as two potential solutions to the same problem: how to depict the complicated time-space confluences of pregnancy within the limited physical structure of the book (Fig. 2.15). As we now know, Spratt chose to bend the book's basic architecture to the very boundaries of what it could support, coaxing three dimensions out of two. Yet before Spratt's efforts, Maygrier and Chazal found a time-tested alternative solution in the sequential image. In the Maygrier plates, it is as if Spratt's stacked layers have been peeled apart and pasted next to one another in a straight line across the page. The sources for Spratt's Table VI B are four figures split across two plates, XXXVII and XXXVIII, which illustrate the same rotating, pulling, and grasping motions (Fig. 2.16).

Maygrier was, like Spratt, primarily concerned with conveying tactile knowledge via the book. In the text, he recognizes that operating with instruments was something that must be learned through repeated practice; touch needed to be taught. Calipers, for instance, were prone to "errors into which we may consequently fall from a want of experience."[184] The pelvimeter, too, was "ingenious in its combinations [but] presents numerous inconveniences, which have caused it in a great measure to be abandoned: these are, the difficulty and the danger attending its introduction."[185] In the most dire of scenarios, Maygrier recommended assessing the situation "by touching: by introducing the index finger of one hand into the vagina, the practitioner can acquire all the knowledge relative to the examination he proposes to make."[186] In some shocking plates, Chazal's illustrations grotesquely reduce the female body to skinned pelts tacked to the page by their edges, as if to further invite physical interaction unobstructed by the movements and volumes of a complete body (Fig. 2.17). Yet recommending that the student relinquish book study in favor of hands-on instruction alone would be exceptionally poor business practice for an author, whose livelihood depended on a strong rationale for his work's purchase. Therefore Maygrier, and later Spratt, emphasized the illustration as a site of an equally important companion intellectual and physical practice. Even if it was possible to "acquire all the knowledge" with an index finger alone, the book served as a necessary handbook for what knowledge to seek and how to seek it.

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[184] J. P. (Jacques Pierre) Maygrier, *Midwifery Illustrated*, trans. A. Sidney (Augustus Sidney) Doane (New York : J.K. Moore ; Philadelphia : Carey & Hart, 1833), 42, http://archive.org/details/midwiferyillustr00mayg.

[185] Maygrier, 43.

In Maygrier's text, several plates of hands and fingers in precisely diagrammed poses slow down the blur of live study to an analyzable crawl. One illustration shows the reader how to turn the index finger into a mathematical instrument, capable of calculating the "true measure of the antero-posterior or sacro-pubic diameter" if inserted at precisely the right angle (Fig. 2.18).[187] Another image provided an important sensory footnote on social decency, depicting the doctor politely averting his gaze as he conducted his digital examination (Figs. 2.19-2.20). Not only was touch-based investigation superior to (and more practical than) visual examination in this case, it was also a mark of a good bedside manner.

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[186] Maygrier, 44.

[187] Maygrier, 45.

The success of *Nouvelles Demonstrations* shows that by the time *Obstetric Tables* was published, the role of touch in the medical investigation of women's bodies was so firmly established that it had acquired a codified visual shorthand. Pictorial hands with pointing, grasping, active fingers punctuate its illustrated leaves as a reminder of the equal importance of physical and intellectual access in the cultivation of medical knowledge. Spratt's design capitalized on this newly established visual style and enhanced it with a kinetic element, thereby destabilizing the mental-tactile balance that earlier texts had presupposed and placing physical investigation in the position of primacy. Much like the indices or manicules that have peppered pages of manuscript and print since at least the twelfth century, these pointing hands served as a reminder of the charged bond between the reader's body and the materiality of the book's surface.[188]

In sum, *Obstetric Tables* emerged from a scientific book culture that took touch quite seriously as an investigative methodology. Not the anomalous novelty that previous studies have suggested, Spratt's book instead used its trifold program of moving images as an attempt to outstrip its peers in support of touch-based instruction. Reading the book as the author and publishers intended pushed the reader to penetrate ever deeper into the secrets of the medical female body, each procedure or operation more complicated than the last. Most of all, the book's careful outlining of three distinct forms of movement positioned tactile investigation as something far from innate, but instead, specialized and practiced. Like learning to read or to speak a foreign language, accessing information with the hands was thought of as a skill acquired with the assistance of education and book study. Although this prizing of tactile knowledge was born from the medical community's attempts to underscore their professional indispensability in a moment of changing technologies in the field, it resonated with the priorities of a broader American visual culture grappling with a shifting role of touch in spectatorship.

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[188] William Sherman claims that the small pointing hand was the most commonly printed or handwritten symbol found in books between the twelfth and eighteenth centuries. William H. Sherman, "Toward a History of the Manicule," in *Used Books: Marking Readers in Renaissance England*, Material Texts (Philadelphia: University of Pennsylvania Press, 2009), 29.

George Spratt and the Transatlantic Book

What social and cultural forces tipped *Obstetric Tables* from run-of-the-mill anatomical textbook to material manifesto for hands-on discovery? Just like its kinetic sibling *The Metamorphosis*, the *Obstetric Tables* emerged from transatlantic circumstances and precedents. Though Wagner & McGuigan's lithographers painstakingly re-drew each of the book's hundreds of flap components for its 1847 Philadelphia re-issue, making subtle adjustments to details throughout, *Obstetric Tables*'s first American edition was very much a product of the author's life and work in Britain as well as the long European tradition of anatomical flap illustrations.[189] Considering this context of creation nearly a decade earlier and across the Atlantic sheds light on the motivations behind its collaged, fragmented aesthetic.

Written and illustrated by George Spratt near the end of his career, the *Obstetric Tables* represented the culmination of three areas of lifelong expertise—science, midwifery, and artistic practice. Spratt's sole anatomical study relied heavily on previously published texts, atlases, and prints for its foundational content. The author accessed these sources by way of his wide-ranging social and professional network, evidence of which is woven throughout the subscribers' list, dedication, and the text of *Obstetric Tables* itself. As was common practice in contemporary medical publishing, Spratt dedicated his treatise to an esteemed figure in the medical community, Sir Charles Mansfield Clarke, physician to Queen Adelaide. Other well-known surgeons and physicians throughout the United Kingdom are represented in the long list of subscribers, which continued to grow between the first British edition of 1833 and the final fourth edition of 1846. Scattered throughout the text are references to contemporary authors and lecturers whom Spratt encountered during his studies.

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[189] A method for lithographic transfer using a special kind of paper is outlined in: Charles Joseph Hullmandel, *The Art of Drawing on Stone, Giving a Full Explanation of the Various Styles, of the Different Methods to Be Employed to Ensure Success, and of the Modes of Correcting, as Well as of the Several Causes of Failure* (London : Longman & Co. [etc.], 1833), 78–79, http://archive.org/details/artofdrawingonst00hull.

Unlike the book's contemporary textual and professional influences, the many direct visual sources are not explicitly cited. Still, visual comparison shows that whether or not Spratt was familiar with the long history of anatomical illustrations with paper flaps—the tradition that dates back to works by Heinrich Vogtherr the Elder, Hans Guldenmundt, and Andreas Vesalius in the 1530s (Fig. 2.21)—he certainly knew of experiments in the genre by his contemporaries.[190] Beyond Maygrier's *Nouvelles demonstrations d'accouchmens*, which did not feature flap illustrations, a number of contemporary movable books served as models for Spratt's work. He based some of his illustrations for *Obstetric Tables* on James Hogben's 1813 *Obstetric Studies*, a massive anatomical atlas that featured a single, deeply layered illustration as its centerpiece, and which Spratt cites in his text (Fig. 2.22).[191] Hogben's atlas, which was sold in New York in addition to London, included a slip of detailed instructions for manual interaction with its many cumbersome flaps, urging users to pay attention to the paper's texture, pliability, and range of motion (Fig. 2.23).[192] He would also have been aware of Edward Tuson's *Myology,* as the intricately sculptural treatise on the muscular system was a frequently invoked comparison to *Obstetric Tables* in period reviews (Fig. 2.24).[193]

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[190] For a video of a sixteenth century flap anatomy in action, see: http://library.jefferson.edu/archives/exhibits/flapbooks/cat.cfm. The history of early modern flap anatomies is outlined in: Schmidt and Nichols, *Altered and Adorned*.

Little is definitively known about the author and designer, who was active in the London publishing world during the 1820s and 30s and worked throughout his life as a surgeon, midwife, botanist, and artist. Scholars have given his approximate life dates as ca. 1784-1840, but I have been unable to verify even these most basic details.[194] He is listed variously as a surgeon, surgeon-accoucheur (an alternate term for male midwife), gentleman, and esquire in period sources, and has been described in recent scholarship as a member of the Royal College of Physicians, the Linnean Society, and the Medico-

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[191] I consulted a copy of Hogben's atlas in the collection of the New York Academy of Medicine: James Hogben, *Obstetric Studies: Comprehending a Treatise on Parturition; Likewise the Various Accompanying Symptoms during Pregnancy, and Subsequently to Labour, with Descriptive References and Practical Observations* (London: F. Vigurs, 1813). Special Collections S.94. Spratt cites Hogben as an influence prior to Table X in the 1848 edition of *Obstetric Tables*.

[192] The New York Academy of Medicine's copy has a slip glued on to the cover that reads "Sold by H. Stevenson, No. 257 Broadway, New-York." Text is pasted onto a back board with "directions for placing the Tables, or Plates," as well as directions for handling and care. Hogben.

[193] Period commentators wrote of *Myology* in similar terms to *Obstetric Tables.* According to one 1829 reviewer, "In the study of these dissected plates, the sense of touch is exercised as well as that of sight; hence their vast superiority over every other description of graphic illustration." Edward William Tuson, *Myology, Illustrated by Plates: In Four Parts*, 2nd ed. (London: Callow and Wilson, 1828); "A Supplement to Myology," in *The Lancet*, vol. 11 (London, 1829). University of Pennsylvania Kislak Center for Special Collections, Rare Books, and Manuscripts, Portfolio QM34 .T9 1828.

[194] Marcia Nichols, "Midwifery Demistyfied," in *Hidden Treasure: The National Library of Medicine*, ed. Michael Sappol (Blast Books, 2012), 50–51.

Botanical Society.[195] These are largely misattributions caused by Spratt's participation in collaborative publications written by other society members.[196] Yet it appears that even in his day, Spratt embraced an identity as gentleman of all trades at the expense of specialized expertise or authority. My research confirms that he was elected a fellow of the Medico-Botanical Society of London in 1829, where he joined a social network of well-to-do botanists, physicians, and scientific social climbers.[197] However, his dilettantish participation in a broad range of scientific endeavors is evident in reviews of his *Medico-Botanical Pocket-Book,* which noted the "very slight and superficial character" of the scientific descriptions, as well as errors in the coloring. "The toxicology, in short wants much correction, and the artist who colours the copies ought to be carefully superintended," closed one annoyed review.[198] Similarly, while Spratt does not appear in the membership rolls of the College of Physicians, he did collaborate with these groups as an illustrator, colorist, and editor of various society-sponsored publications.[199] The author of *Obstetric Tables* was apparently a jack of many scientific trades but a master of none, a liminal position enforced and enabled by his social standing.

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[195] James Secord's essay "Scrapbook Science: Composite Characters in Late Georgian England" is the only scholarly essay devoted in large part to Spratt's work. Since its publication in 2006 year, it has been the main source of information for booksellers and archivists wishing to contextualize *Obstetric Tables* in catalogues and databases. Secord writes that "Spratt was a member of the Royal College of Surgeons and active in the Medico-Botanical Society of London," citing P.J. and R.V. Wallis's *Eighteenth Century Medics* as the source of this information. I have been unable to locate this information in the Wallis database and have confirmed that Spratt does not appear in the Royal College of Physician records. Secord, "Scrapbook Science: Composite Characters in Late Georgian England"; Peter John Wallis et al., *Eighteenth Century Medics: Subscriptions, Licenses, Apprenticeships* (Newcastle upon Tyne: Project for Historical Biobibliography, 1985).

[196] George Spratt has been associated with William Woodville, an English physician and naturalist, who was a confirmed fellow of the Linnean Society (elected 1791) and the Royal College of Medicine. Woodville published the wildly successful *Medical Botany* (Flora Medica), which described and illustrated all plants discussed in *Materia Medica*, between 1790 and 1794. It was reissued in second edition in 1832, for which Spratt contributed illustrations and coloring. Title pages for these later editions describe the author (an unnamed Woodville) as a member of these prestigious scientific societies: "edited by a member of the Royal college of physicians, and fellow of the Linnaean society ; with the assistance of several eminent botanists. "Later readers have understandably—but incorrectly—interpreted these confusing claims to refer to Spratt. Sir Leslie Stephen, *Dictionary of National Biography*, ed. Sidney Lee, vol. LXII (Smith, Elder, & Company, 1900), 417.

[197] *The Athenaeum and Literary Chronicle* (W. Lewer, 1829), 143.

[198] *London Medical Gazette: Or, Journal of Practical Medicine*, 1836, 567.

I want to destabilize a notion of George Spratt as an esteemed scientific expert in any one area because I believe his tendency to move nonchalantly across genre boundaries is key to understanding the reception of *Obstetric Tables* as first and foremost an artistic object, and only secondly a scientific one. Claiming Spratt as a member of the Royal Society of Physicians is a product of a modern desire to ascribe stature and legitimacy to his work in the contemporary British medical world. But correcting this historiographic mistake has equally important implications: if Spratt operated at the margins of the elite world of medicine, the popular and artistic aspects of his work carried greater weight, both to the author and the book's audience.

Another persistent and intriguing speculation is that Spratt's artistic work was a family affair, as Mrs. George Spratt and Julia Spratt, his wife and daughter, are listed in contemporary census records as art teachers.[200] Mrs. George Spratt illustrated a natural science publication of her own, *The Language of Birds*, which suggests her active participation in the landscape of book publishing.[201] Mrs. Spratt's artistic style does bear some resemblance to illustrations attributed to her husband. See, for instance, her illustration of the Skylark, which rests on an oval cross-section of space that emulates George Spratt's print of the Greengrocer, described later in this section (Fig. 2.25, see also Fig. 2.28). Each colorful bird perches on an individualized branch, for instance a chaffinch resting on the thorned twigs of a flowering blackberry bush that would look quite at home in Spratt's *Flora Medica* (Figs. 2.26-2.27).

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[199] Email correspondence with Felix Lancashire, Assistant Archivist of the Royal College of Physicians, 12/31/16

[200] Secord, "Scrapbook Science: Composite Characters in Late Georgian England," 174.

[201] G. Spratt, *The Language of Birds : Comprising Poetic and Prose Illustrations of the Most Favourite Cage Birds : With Twelve Highly-Coloured Plates* (London: Saunders and Otley, 1837).

George Spratt, perhaps along with his wife and daughter, provided illustrations for several scientific publications, including *Flora Medica,* the *Medico-Botanical Pocket-Book,* and *A Table on Vegetable Poisons*, all natural history works featuring hand-colored botanical pictures.[202] As James Secord has suggested, considering these publications as potential collaborations between George Spratt and the women in his family opens an intriguing avenue for gendered analysis of these works, especially *Obstetric Tables*, which takes the most intimate workings of the female body as its subject. However, such analyses would be purely speculative, as the evidence of their participation is scarce.

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[202] Each publication was issued in multiple editions over several years. The following citations refer to the specific copies that I consulted in my research. These are not the only copies available, nor necessarily first editions: *Flora Medica: Containing Coloured Delineations of the Various Medicinal Plants, Admitted into the London, Edinburgh, and Dublin Pharmacopœias : With Their Natural History, Botanical Descriptions, Medical and Chemical Properties, &c. &c. : Together with a Concise Introduction to Botany : A Copious Glossary of Botanical Terms and a List of Poisonous Plants, &c. &c.* (London: Callow and Wilson, Princes Street, Soho, 1829); George Spratt, *The Medico-Botanical Pocket-Book: Comprising a Compendium of Vegetable Toxicology, Illustrated with Coloured Figures with Their Botanical Descriptions, Poisonous Effects, Treatment, Etc. ; to Which Is Added an Appendix, Containing Practical Observations on Some of the Mineral and Other Poisons, Illustrated with Tests* (London: Published for the author by John Churchill, Princes Street, Soho, 1836); George Spratt, *A Table of Vegetable Poisons, Exhibiting the Principal Poisonous Plants : Comprising Their Common English Name, Botanic Name, the Class and Order to Which They Belong in the Linnaean System, Essential Character by Which They Are Particularly Distinguished, Native Country, Places of Growth, Time of Flowering, Poisonous Effects and Mode of Treatment, &c. ; Illustrated by Accurate Drawings of the Principal Indigenous Plants, Including the Poisonous Mushrooms, and Some of the Exotic Poisonous Plants Cultivated in Britain /* (London: John Wilson ... and C. Tilt ..., 1843). Library of Congress Prints & Photographs division, QK99 .S77.

While I do not want to overlook female labor in a narrative of scientific publishing that is overwhelmingly male-oriented, I have not yet found any evidence, visual or textual, to support a theory that anyone other than George Spratt contributed to the creation of *Obstetric Tables.* The book's significant implications for nineteenth-century gender studies should not be overlooked, but lie primary in the realm of reception rather than the intentions of its possible authors.

Reckoning with mischaracterizations of Spratt attests, first of all, to *Obstetric Tables*' intriguing objecthood. Scholars, book collectors, and archivists have sought a biographical entry point to its peculiarities, only to come up mostly empty-handed. More importantly, it reveals the author's position at the margins of medicine, science, and popular art. That is not to say that Spratt was an outsider to any of these fields. Rather, he was embedded in social networks within them all, and created products that moved between and among such interests. While this fluid situation might have deterred scholarship in past decades, new directions and alliances in fields of art history, history of medicine, and history of science have recently embraced an interest in popular and social and cultural practices, enabling further investigation of liminal works like Spratt's.

Bodies of Work

A final set of images cements Spratt's participation in the world of popular art and visual culture, and provides a fuller context for understanding his scientific works as part of that broader environment.[203] Between 1830 and 1831, he designed a series of approximately sixteen single-sheet prints in collaboration with London lithographer George Madeley, who would later print the flap illustrations for the first edition of *Obstetric Tables*. At least a dozen of these prints were copied by nascent American lithography firms and sold by publishers in the United States, including Senefelder Lithography Co. and publisher Thomas Kettell in Boston, and lithographers Ennicott & Swett and publishers J.N. Toy & W.R. Lucas in Baltimore.[204] Sold varyingly as portfolios and single sheets, black and white and hand-colored, these humorous prints would have been among the first mass-produced lithographs available to American consumers.[205]

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[203] Secord's essay is a crucial starting point for analyzing the connections between Spratt's scientific and medical publishing practice and his more popular endeavors. However, I disagree with many of this points and much of the evidence he cites. Most significantly, his suggestion that Spratt's

As they show occupational or social types such as greengrocers, physiognomists, antiquarians, and connoisseurs with bodies composed of the very objects of their preoccupation, these images have been referred to as composite or personification prints. The Greengrocer, for example, ambles around on sturdy russet potato feet, shifting the weight of his legs of lettuce, artichoke, and spring garlic (Fig. 2.28). His literal carrot-top is crowned with an ample green cabbage hat, and an even plumper red brassica makes up his rotund midsection. In another image, a female connoisseur peers through a magnifying glass into empty space (Fig. 2.29). What could she be looking at? The space she occupies is empty, as all of its pictures have attached, like magnets, to her body:

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caricatures were made possibly because of the artist's success with the *Obstetric Tables* is simply anachronistic – Spratt produced the caricatures several years before the first edition of *Obstetric Tables* was publishedSecord, "Scrapbook Science: Composite Characters in Late Georgian England."

[204] No complete set of the caricature prints exists. There are significant collections at the American Antiquarian Society, the Boston Athenaeum, and the John Johnson Collection of Ephemera at the Bodleian Library. A short catalogue entry about the AAS's imprints can be found in Sally Pierce et al., *Early American Lithography: Images to 1830* (Boston, Mass.: Boston Athenaeum, 1997).

[205] Pierce et al.

gilded frames large and small encircle her bodice and skirt; the cuffs at her wrists are silhouettes. Botanists, pharmacists, shell collectors, and fishmongers are all built with the same fragmented care, with vials for hands and mussel shells for arms.

To anyone who has gazed at one of sixteenth-century Italian painter Guisseppe Arcimboldo's visual feasts, the essence of a composite print will be familiar. As Thomas DaCosta Kaufmann has demonstrated of this image category's Renaissance origins, these seemingly surrealist oddities were carefully conceived "serious jokes," humorous and arresting veneers for complex social and political content.[206] Lesser known is that composite portraits like Arcimboldo's were among the earliest metamorphic pictures—Arcimboldo painted at least four "inversions," which transform from an innocent still life to a portrait when turned upside-down, much like the similarly conceived "topsy-turvy" prints that began to circulate during the Reformation and lived well into the nineteenth century (Figs. 2.30-2.31).[207] From their invention, composite images blurred the line between static spectatorship and physical, transformative interaction, a quality that deepened in Spratt's later experiments with the format.

When Spratt designed his composite prints in 1830, he was participating in a timely revival of the genre within British visual culture—and making a shrewd business decision. Composites were a subgenre of the flourishing category of comic and caricature prints, championed by artists like George Cruikshank and Henry Heath.[208]

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[206] Thomas DaCosta Kaufmann, *Arcimboldo: Visual Jokes, Natural History, and Still-Life Painting* (Chicago ; London: The University of Chicago Press, 2009), 91–114.

[207] Suzanne Kathleen Karr Schmidt, "Art--a User's Guide: Interactive and Sculptural Printmaking in the Renaissance" 2006, 158.

[208] Brian Maidment, "Henry Heath's 'The Caricaturist's Scrap Book,'" *Victorian Review* 38, no. 2 (Fall 2012): 13–18.

Unsurprisingly, the unstoppable Cruikshank pioneered the revival of the genre in Britain, publishing *Comic Composites for the Scrap Book* through S.W. Fores in 1821 and again via W.B. Cooke in 1829 (Fig. 2.32). Many imitators followed, often congregating with the same few publishers, including W.B. Cooke, Thomas Hood, and Charles Tilt, with whom Spratt would also partner. Composites were printed in a variety of formats, from single-sheet images to pages crammed with several figures, and even appeared on the first set of printed paper thaumatropes, an early optical toy issued by Dr. J.A. Paris in 1825 (Fig. 2.33).[209] In short, Spratt knew composites would sell. These images' popularity, success, and traditions of use provide a key to understanding the motivations behind the creation and later use of *Obstetric Tables*.

Contextualizing the themes of fragmentation and excision embedded in these images is crucial to understanding the role of the composite print in nineteenth century culture. Again, personification prints were part of a larger corpus of prints made for the scrapbook, a history which James Secord has traced in his essay on Spratt's contribution to the genre. They were intended to be cut out from the page and pasted into compositions of the user's own design, and many surviving specimens bear traces of adhesive and transfer on their back sides. In Secord's analysis, composites were not simply satires skewering the amateur scientist or others aspiring to intellectual professions, but rather images appropriated by mostly female audiences to express "their own, often ambiguous, attitudes toward learning."[210] While primarily an act of exercising creative agency and imaginative play with print culture, cutting out the figure of the botanist and placing her on a page with botanical specimens gathered in the field could also be seen as a way of “participating in scientific practice” and identifying one’s self—specifically, one’s physical body—with the active pursuit of knowledge.[211]

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[209] Stephen Herbert, "The Paris/Phillips Thaumatropes," The Wheel of Life, accessed February 12, 2017, http://www.stephenherbert.co.uk/ParisThauma.htm.

[210] Secord, "Scrapbook Science: Composite Characters in Late Georgian England."

But the logic of separation is also ingrained within the subject matter. In each image, the artist has taken pains to evoke a tension between flatness and three-dimensionality. Each object that defines a personified body is individually delineated, lifting away from the page as it casts subtle shadows. At the same time, the figures are barely situated in space—the greengrocer, for instance, rests on a clean-edged island of ground that begs to be cut from its blankness and inserted somewhere more exciting, as one creative owner acknowledged in an aviary-themed composition (Fig. 2.34). The connoisseur in the John Johnson collection is also cut out from her original setting. The composite portraits are, in their two-dimensional faux-collaged aesthetic, insistently tactile, so much so that many period users responded to the images’ silent demands for interaction by cutting them out of their sheets and pasting them in lively arrangements within larger scrapbook compositions even when that was not an explicit textual direction. In one rare survival held at the Bodleian’s John Johnson collection of ephemera, the Entymologist and the Mineralogist are sliced from their broadsides settings and arranged together on a horizontal sheet surrounded by butterflies, caterpillars, and birds that flit around the newly textured, dynamic space of the scrapbook page (Fig. 2.35). Popular comic prints made to be disassembled and reconstructed by the user, especially “scraps” formats by artists like David Claypoole Johnston, will appear again as the subject of my third dissertation chapter, as their sometimes surprising kinetic potential was highly important to a late 1830s material culture that transferred anxieties about political and economic change to an intense concentration on the use and re-use of paper surfaces (Fig. 2.36).

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[211] Secord.

Much like the composites, the illustrations in *Obstetric tables* emphasize the complex relationship between student and object of study. However, while the medical images take an epistemological approach, identifying the body as the key site of knowledge transfer, the composites hinge upon creative thought process and the imaginative activity of representing the self. The personification prints take this representational task literally, if not profoundly, conjecturing a physiognomist composed of faces or a librarian stacked of books (Fig. 2.37). Such images were intended as playful jokes, but there is a nightmarish potential in scenarios like an art historian so consumed in study that her body is cannibalized by silhouette cuttings and floral miniatures. Simultaneously lighthearted and disturbing, the images identify physical closeness between body and thing as a means of imagining occupation. The anatomy book’s approach is parallel in its desire to literalize the abstract qualities of professional expertise, although the connections it draws between viewer and material surface are matters of reception and readership rather than subject and style. The explanatory and exploratory potential of Spratt’s text can only be activated through a user’s tactile interaction with its images. To absorb the lessons of the *Obstetric Tables*, a reader must *perform* the delivery, *dissect* the gravid uterus, *witness* and examine every stage in bodily transformation—must grasp, push, and pull these lithographed bodies with their very hands.

As Secord notes, the aesthetic genre made famous by Arcimboldo has long been called on to illustrate theorizations of boundary breakdowns between self and other, object and subject.[212] And I agree that these images speak loudly about the physical, material configurations of student, object of study, and knowledge in the nineteenth century. They raise the question of how must one corporeally interact with a thing to unlock its secrets. Books and paper, through their very substance and architecture, demand the viewer's bodily closeness, a point that the composites make through their iconography and *Obstetric Tables* reinforces through its format. As the uses of Spratt's anatomy book in the United States reveal, this desire was frequently consummated through a performative, physical manipulation of the material surface of the page: simulations of knowledge through acts that include playing, folding and unfolding, demonstrating and lecturing.

Part II: In the Flesh: Simulating the Body

The previous section revises a long-held scholarly dismissal of *The Obstetric Tables* as a novelty scientific publication. Its significance for the history of art, as well as cinema and media studies, is rooted in how its interactive visual program at once pushed against trends in anatomical publishing and reinforced others in popular print culture. While obstetrical specialists used illustrated books to claim, but not fully elucidate, physical knowledge as a professionally proprietary skill set, Spratt engineered nascent mass-produced technologies of motion to bring touch-based expertise to the public domain. Not simply an epistemological egalitarianism, the author's embrace of accessible tactile knowledge emerged instead from economic factors, specifically, his successes as a popular printmaker, producing images meant to be sliced up and manually reconstituted by active agent-viewers. Far from an isolated print gimmick, the book emerged from mainstream debates about tactility's place in knowledge production that straddled science and art, Britain and America.

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[212] Secord, 168.

I aim, now, to sharpen these notions of tactility and knowledge. Why was Spratt's experiment so successful in midcentury America? Does its particular blending of specialized scientific subjects and popular modes of material cultural interaction fit within (or, perhaps, challenge) a larger media history? I argue that the concept of "simulation," though an anachronistic term to the nineteenth century, clarifies this physically motivated object's popularity and illuminates otherwise unseen practices in its adopted cultural milieu of the 1840s and 1850s United States. *Obstetric Tables* is best understood as itself a technology of simulation, and as part of a flourishing interest in technologies of material modeling as a mode of testing the dangers, pleasures, and power structures of the lived world.

Simulation and the Rehearsal of Touch

To people living in the nineteenth century, simulation was nothing to take pride in: the term meant to feign, dissemble, malinger, or otherwise deceive. Webster's 1828 dictionary defined simulation as "*n.,* [Fr. the L. *simulatio*.] The act of feigning to be that which is not; the assumption of a deceitful appearance or character. *Simulation* differs from *dissimulation.* The former denotes the assuming of a false character; the latter denotes the concealment of true character. Both are comprehended in the word *hypocrisy.*"[213] Medical journals spoke of the best ways to spot the "simulation of diseases," the military warned of the "simulations of impostors," and newspapers reported on a murderer's attempts to "simulate insanity" on the witness stand.[214] From the seventeenth century to the mid-twentieth century, the term signaled an attempt at physical resemblance of a person, thing, or behavior, usually with ill intentions."[215] To simulate was to pull the wool over someone's eyes, using one's own body as the material of the masquerade.

"Simulation" as it is most commonly employed today, and as I will define it for the remainder of this chapter, diverges from this earlier meaning. In present day usage (particularly common or scientific, rather than philosophical, usage), simulation most often refers to the replication of a system or process through bodily interaction with a surrogate model or technology, and has no pejorative connotation-- although it is important to note that in the work of Baudrillard, Deleuze, Debord, and Eco, the related concept of the simulacrum overtakes reality.[216] The amount of bodily interaction required varies depending on the purpose of a simulation. Some technologies work by encompassing the body's full sensory range, for instance in antigravity simulations used to train astronauts. Other simulation technologies allow the body to remain rooted in place but toy with the user's senses through optical effects, sound, and vibrations, such as the "serious games" employed in contemporary military training.[217] Importantly, mimesis and visual resemblance function differently in this scenario, much like Deleuze's definition of simulacrum as an "image without resemblance."[218] Simulation, in this sense, depends on a clear physical separation between the model and the system or process under investigation—they are distinct entities, meant to be continuously cross-referenced. Naturalism and other forms of aesthetic mimicry remain important, but the goal of simulation is not to fool the eye or even one's sense of touch with a one-to-one "copy." As this chapter demonstrates, the concept of a technology of modeling time, space, and various possibilities of decision-making was very much alive in and before the nineteenth century, even if not pinned down by precise vocabulary. My goal in employing an anachronistic and imperfect contemporary phrase to describe this desire is to illuminate the connections between historic and contemporary experiences of media that have been left out of prior scholarly narratives.

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[213] Noah Webster and Hezekiah Howe, *An American Dictionary of the English Language: Intended to Exhibit, I. The Origin, Affinities and Primary Signification of English Words, as Far as They Have Been Ascertained. II. The Genuine Orthography and Pronunciation of Words, According to General Usage, or to Just Principles of Analogy. III. Accurate and Discriminating Definitions, with Numerous Authorities and Illustrations. To Which Are Prefixed, an Introductory Dissertation on the Origin, History and Connection of the Languages of Western Asia and of Europe, and a Concise Grammar of the English Language* (New York : S. Converse, 1828), http://archive.org/details/americandictiona02websrich.

[214] "Trial of Abner Rogers," *Law Reporter* 10, no. 12 (1848): 449; Hector Gavin, "General Rules for the Discovery of the Simulation of Disease," in *On Feigned and Factitious Diseases, Chiefly of Soldiers and Seamen, on the Means Used to Simulate or Produce Them, and on the Best Modes of Discovering Impostors: Being the Prize Essay in the Class of Military Surgery in the University of Edinburgh, Session 1835-6, with Additions* (London: John Churchill, 1843), 36–46; "On Feigned and Fictitious Diseases," *The Monthly Review* 3, no. 2 (October 1843): 157–67.

[215] "Simulation, N.," *Oxford English Dictionary Online* (Oxford University Press, December 2016).

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[216] Michael Camille, "Simulacrum," in *Critical Terms for Art History*, ed. Robert S. Nelson and Richard Shiff, 2nd ed (Chicago: University of Chicago Press, 2003), 36.

[217] Harun Farocki, "Serious Games," *Intervalla: Platform for Intellectual Exchange* 2, no. Trauma, Abstraction, and Creativity (2014): 123–26.

[218] Gilles Deleuze, "The Simulacrum and Ancient Philosophy," in *The Logic of Sense*, ed. Constance V. Boundas (New York: Columbia University Press, 1990), 257.

As an ancestor of immersive virtual reality technologies that coax the senses into imaginatively occupying an alternate world, simulation depends upon bodily participation. This physicality is in fact what sets simulation apart from similar types of information rehearsal, such as scientific demonstration and performance. For instance, the magic lantern demonstrations that captured public attention from the seventeenth century onward used instruments and moving representations to convey information, but were primarily visual in their address.[219]

Thus, although its initial creators and users would never have described it as such, *The Obstetric Tables* was a technology of simulation to the letter: a physical, tangible model meant to *reproduce*, not merely depict, an array of scenarios in childbirth, activated by the user's touch. Period reviews got at this simulative quality by stressing the book's benefits as a go-between object or intellectual waystation meant to intercede between study and practice. For instance, an 1848 review touted the book's strengths when "used as an assistant to the more direct means of investigating."[220] Another publication praised the flap format as a means of modeling, or rather "conveying," the tactile maneuvers inherent to obstetrical practice:

> The obstetrical art is, to a very large extent, strictly mechanical; and the various stages of the parturient process can never be fully comprehended, nor justly appreciated, without some illustration to strike the eye, as well as descriptions

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[219] Thomas L Hankins and Robert J Silverman, *Instruments and the Imagination* (Princeton, N.J: Princeton University Press, 1995), 41.

[220] "Bibliographical Notices," in *The American Journal of Medical Sciences*, vol. XV (Philadelphia: Lea & Blanchard, 1848).

> addressed to the mind. […]The peculiar merits of Spratt's tables consist in what is termed *dissected plates*; that is, plates arranged in different sections, so as to represent the various lamina and tissue of an organ, and the successive stages of parturient process. It will be readily understood that these illustrations will be especially valuable in conveying a distinct and accurate view of the different positions of the fetus, and the manipulations necessary to correct preternatural conditions embracing the application of instruments together with the mere simple aid of the hand alone.[221]

Though the period reviews varied in their appraisal of Spratt's unique publication, they are united by an interest in exactly *how* it conveyed information, and to whom. As one 1834 reviewer wrote of the first British edition in 1834, "the desire of pointing out to the attention of the student whatever is calculated to facilitate his acquisition of knowledge has induced us to notice several works analogous to the present."[222] *The Obstetric Tables* was an object that raised complex questions about the processes and mechanics of knowledge transfer.

It will become increasingly apparent, as I explore how and to what ends the *Obstetric Tables* was employed as a simulation technology, that nineteenth-century simulations operated most frequently and compellingly at the margins of polite culture. In order for a simulation to be practical to design, the system it resembles must be subject to limits, whether they be biological, physical, or cultural. Medical simulations present an obvious case: stand-ins like *Obstetric Tables* emerged from a desire to teach, learn, and experiment without the risk of harm to a patient, or the obstacle of limited access to cadavers. But, as I will show, Spratt's book simulated more than just birth: it also allowed users and viewers to rehearse and imaginatively inhabit a range of other socially and culturally marginal or off-limits experiences, including sexuality, eroticism, and fantasies of female bodily agency and control.

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[221] *The Western Lancet and Hospital Reporter* (Cincinnati, Ohio: Robinson & Jones, 1848), 165. This is a review of the first American edition from Thomas, Cowperthwaite, & Co. of 1848, and notes that the book is for sale in Cincinnati by J.F. Desilver, Cincinnati, Ohio.

[222] *London Medical Gazette: Being a Weekly Journal of Medicine and the Collateral Sciences*, vol. 13 (London: Printed for Longman, Rees, Orme, Brown, Green, & Longman, 1833).

Dr. Jones's Library

Beyond medical journal editors, who used *Obstetric Tables*? And what lived experiences did it come to simulate for them? The book's intended audience was a point of disagreement for reviewers. Some believed that it was best suited for medical students and practicing physicians—that the unusual visual aid would help young doctors learn, and would jog the memories of the older set growing rusty in the sundown of their careers.[223] As Spratt himself wrote in the preface to the first English edition,

> It must be acknowledged that many gentlemen, immediately after having completed their medical course of studies, enter into general practice, and although well grounded in the theoretical points of Midwifery, (one of the most important branches of the profession to a country practitioner,) yet after the lapse of some years, on the more rare points of practice, the memory needs some little refreshing. We will take, for example, the use of the forceps: from the commencement of practice many years may elapse before it is necessary even to look at them; is it not then probable that some points, of much importance in their application, &c. &c. may have escaped the memory?[224]

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[223] Several period reviews echoed this idea, likely because the author himself positioned his publication for this purpose in the book's introduction. As the Philadelphia reviewers in the American Journal of Medical Sciences put it, the plates were useful for "recall[ing] to the mind of the young practitioner, subjects of which his recollections are liable to become obscured or confused, unless occasionally revived by plates, models, preparations, or some appropriate apparatus." "Bibliographical Notices."

[224] George Spratt, *Obstetric Tables : Comprising Coloured Delineations on a Peculiar Plan, Intended to Illustrate Elementary and Other Works on the Practice of Midwifery Elucidating Particularly the Application of the Forceps, and Other Important Practical Points in Obstetric Science* (London : Published for the author by J. Churchill, 1833), preface.

Building upon the author's announcement of the book's intended use, one publication went so far as to claim that anatomical inaccuracies and exaggerations of scale in the illustrations would be a boon to the student, highlighting important body parts that would be otherwise difficult to notice in the messy viscera of dissection.[225] Others disagreed, insisting that while the book held aesthetic appeal for the scientist or bibliophile, its miniaturized paper surgeries could never effectively reproduce the textures, sounds, and adrenaline of the anatomical theatre.

Whether practical to them or not, medical professionals and scientific institutions made up the bulk of initial purchasers. A list of subscribers to the English editions is helpfully included in each copy, but tracking down American owners is trickier business, and depends on provenance records and lucky instances of marginalia. Luckily, there are several extant copies that can be linked to American readers whether by inscription, insertions, alterations, or provenance records. Investigating what drove nineteenth-century Americans to purchase, read, or otherwise interacted with Spratt's *Obstetric Tables* gets us one step closer to understanding the complex position between education and entertainment that moving images held in a pre-cinematic American culture. What follows is a sketch of two types of book operators: the first, a young doctor fascinated with texts as tactile agents of knowledge, and second, an anonymous public witnessing artificial bodies operated before them in the lecture hall.

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[225] "Our Library Table," in *The Athenaeum: Journal of English and Foreign Literature, Science, and Fine Arts.*, vol. 271 (London, 1833), 794–95.

One inscribed edition, an 1850 reprint published by James A. Bill in Philadelphia, once belonged to Dr. Samuel Arthur Jones (1834-1912) of Englewood, New Jersey.[226] Jones, a white male doctor trained in a Philadelphia medical school, is representative of the typical audience for specialized books like Spratt's. Born in Manchester, England, in 1834—one year after *Obstetric Tables* was first issued in London—Jones received a medical degree from Philadelphia's Homeopathic Medical College of Pennsylvania in 1861.[227] Today, this institution is known as the Hahnemann Medical College at Drexel University. Jones was passionate about medicine, but had a wide range of interests beyond his day job, including book collecting and the study of transcendentalism. His papers, held at the University of Illinois Urbana-Champaign, document a life spent thinking critically about the role of books as active objects in the transfer of knowledge, medical and otherwise.

Obstetric Tables was one of more than four thousand books Jones collected in his lifetime.[228] His comments about book collecting do not specifically mention the dissected plate atlas, but rather make a persuasive case for why this interactive object would have held such appeal. In 1895, the 61-year old doctor wrote to Dr. Thomas Lindsey Bradford, who as curator of Hahnemann Medical College and the Hospital of Philadelphia was at work on "Bradford Scrapbook," a cut-and-pasted set of 35 volumes of biographical information about the homeopathic physicians who had trained at the school.[229] Upon seeing photographs of well-known physicians, Jones begins to reminisce about a special book he once had the opportunity to examine: a copy of *Chronic Diseases* by Samuel Hahnemann, once owned by the great Dr. Samuel Gross of Eakins portrait fame, among other things. Jones wrote:

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[226] At time of writing, this copy of Obstetric Tables was listed for sale on ABEBooks.com: "Obstetric Tables: Comprising Graphic Illustrations, with Descriptions and Practical Remarks; Exhibiting on Dissected Plates Many Important Subjects in Midwifery by Spratt, G.: James A, Bill, Philadelphia Half-Leather - Kerkhoff Books DIV KSI," accessed February 14, 2017, https://www.abebooks.com/Obstetric-Tables-Comprising-Graphic-Illustrations-Descriptions/1001615106/bd.

[227] Jones was 27 when he graduated, after serving in the Union Army during the Civil War. "Samuel Arthur Jones Papers, 1833-1974 | Rare Book & Manuscript Library, University of Illinois at Urbana-Champaign," accessed February 14, 2017, https://archives.library.illinois.edu/rbml/?p=collections/findingaid&id=1078&q.

[228] Samuel A. Jones, "Catalogue of Dr. Samuel A. Jones' Medical Library" (Samuel Arthur Jones papers, 1833-1974 | Rare Book & Manuscript Library, University of Illinois at Urbana-Champaign, 1879), Box 7, File 22.

> The photo of Gross reminded me that Dunham one day showed me the copy of Hahnemann's *Chronic Diseases* that had once belonged to that same Dr. Gross. It was most copiously underlined with verifications and showed that practice to those early disciples meant and was serious work. We latter-day drones have fallen far short of our duty, and for every symptom in our voluminous Mat[eria]. Med[ica]. Is like a smooth coin from the mint that is waiting for us to stamp upon it its absolute value […].[230]

Jones ascribes the material surface of the page with significant power in this recollection. From his perspective, the books of Dr. Gross's age, dog-eared, underlined, and peppered with annotations, might as well be smudged with the blood, sweat, and tears of determined study—he even counts smooth, untouched book pages as evidence of the new generation of doctors' lack of studiousness. Spratt's book, which insists that the reader dive deep—fingers first-- into the nitty-gritty detail of its subjects, seems a trophy object for a collector anxious about the loss of a physical style of learning from books. For Jones, touching paper was akin to absorbing knowledge.

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[229] Bradford collection of biographies of Homeopathic Physicians, 1868-1918. Drexel University College of Medicine, Legacy Center: Archives and Special Collections on Women in Medicine and Homeopathy.

[230] Letter to Bradford, Ann Arbor, 4th of April, 1896. Thomas Lindsley Bradford, *Biographies of Homeopathic Physicians, Volume 18: Ibershoff - Junkermann*, 1916, 439, http://archive.org/details/bradford018-jpg10-mediumsize-pdfx.

Publics and Privates

Dr. Jones' comments establish that physical interaction with the surface of the page was understood to be an effective way of translating learned experience into a memorable form, but stop short of telling us what specific sorts of information the *Obstetric Tables* mediated in midcentury America. A pattern of extracted, lost, or damaged illustrations offer one intriguing clue.[231] Missing plates are a widespread feature of extant editions that speak to a set of alternative, but common, modes of physical interaction with the *Obstetric Tables*: public anatomical performances and private study and interaction.

My survey of auction records and catalogue listings shows that a majority of surviving copies of the book are missing at least one illustrated plate.[232] Most interestingly, certain images are disproportionately absent from these incomplete books. The most frequent culprit is, perhaps unsurprisingly, one of the book's most overtly erotic plates: Table III, the full-frontal view of female genitalia (Fig. 4). Where did these plates go? What information about use, authorized or unauthorized, might be extrapolated from absences and losses? Considering the subject matter, and the fact that later in the century, flap anatomies were outfitted with lock-and-key fixtures to prevent adolescent boys from the obscene temptations held within, it is easy to draw certain conclusions.[233] It is likely that some plates were excised from the book for personal and perhaps intimate use.[234] But others lived decent, public lives as visual aids on the anatomical lecture circuit.

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[231] An edition held at Harvard's Countway Medicine Rare Books, inscribed by its former owner William Read, is missing table III – the frontal view of female genitalia. G. Spratt, *Obstetric Tables: Comprising Graphic Illustrations, with Descriptions and Practical Remarks; Exhibiting on Dissected Plates Many Important Subjects in Midwifery*, First American edition (Philadelphia: Published by Wagner & M'Guigan, 1847). Copies missing plates are frequently advertised for sale on online auction websites like ABEbooks and ViaLibri, for instance one recently sold 1850 edition that only had 13 plates present of the original 21.

[232] Bibliographic description and analysis, particularly an understanding of the differences in editions, is crucial here, as the number of plates intended in each version differs depending on when and where it was published.

As Michael Sappol has demonstrated, a popular anatomy craze swept the United States during the early decades of the nineteenth century, cresting in mass appeal in the mid 1840s. As surgeons and physicians sought to professionalize as a bourgeois, educated class in self-conscious contrast to healers and practitioners of folk medicine, a wide public began to clamor for access to medical knowledge that had long been offset by an aura of exclusivity and secrecy. Encouraging this hunger for access to information were various "anatomy acts" legislated beginning in the 1830s that called for anatomy to "form a part of the education of every well-informed man."[235] Pseudo-scientific movements such as phrenology gained unprecedented popularity during this time, and further blurred the boundaries of who was authorized to practice medicine. And most of all, the emergence of public anatomical lectures, often paired with low-cost illustrated handbooks aimed at the non-specialist public, brought the science of the body into the American home.[236]

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[233] Rachel Ingold et al., "Under Lock and Key," *Animated Anatomies*, accessed February 14, 2017, http://exhibits.library.duke.edu/exhibits/show/anatomy/anatomy/lock.

[234] April Haynes, *Riotous Flesh: Women, Physiology, and the Solitary Vice in Nineteenth Century America*, American Beginnings, 1500-1900 (Chicago: University Of Chicago Press, 2015).

[235] Sappol, *A Traffic of Dead Bodies*, 120.

Spratt's book was often used as a visual aid in anatomical lectures, an incredibly popular source of scientific education for a non-medical public in the United States from the late 1830s onward. These lectures fell into two categories: those led by authorized practitioners, usually held in spaces such as universities, hospitals, and medical schools, and lectures aimed at the lay public, often delivered by charismatic speakers with no credentials of which to speak. In cities across the eastern seaboard, crowds flocked to public spaces to listen to practitioners—trained or not- profess "physical education." More importantly, audiences hoped to witness the hidden interior workings of the body via a variety of illustrative techniques including paintings, wax casts, papier-mâché models, paper manikins, and especially dissected plate prints like Spratt's. Philadelphia newspapers are peppered with advertisements for these public performances: one typical advertisement ran in the *Pennsylvania Freeman* in 1852, pitching a course of anatomical lectures "to ladies," illustrated by both an "artificial female figure […] capable of separation, so as to answer all general purposes of actual dissection," as well as a set of life size anatomical plates.[237] A broadside that circulated in Philadelphia in 1848 advertises a similar array of visual spectacles, promising a space where "Science will be blended with Rational Amusement," populated by "Nothing offensive, except to the impure" (Fig. 38). We tend to think of reading as a private, individual act, much like Dr. Jones described in his reminiscences of the activating effects of the book's page. Yet in these lectures, texts like Spratt's were reduced to their illustrations alone, viewed and handled by many at once and embedded in a complex network of sensory experiences.

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[236] For an example of one of these low-cost handbooks that included a dissected plate illustration, see: Frederick Hollick, *Outlines of Anatomy & Physiology: Illustrated by a New Dissected Plate of the Human Organization, and by Separate Views Designed Either to Convey a General Knowledge of These Subjects in Itself, or as a Key for Explaining Larger and More Complete Works : With a Portrait of the Author* (Philadelphia: Peterson, 1846).

[237] The advertisement described a course "illustrated by a fine French Apparatus, the Modelle de Femme, or Artificial Female Figure, and a set of life-size Anatomical Plates. The Modelle is composed of artificial representations of all the important Organs and Tissues of the Human Body, and is capable of separation, so as to answer all the general purposes of actual dissection. The Muscles, Blood-vessels, and Nerves are accurately represented; the Organs of the Chest and all the Abdominal Biscera are exhibited in *situ*, removed at pleasure and their interior structure readily

The materials, performances, and spaces of public anatomical culture in the midcentury United States have been a subject of extensive scholarship, which I will not repeat here. But the mechanics of display and use of Spratt's book in these contexts, as just one of a variety of visual aids that accompanied these public lectures, has on the other hand never been considered. Evidence of *Obstetric Tables*' participation in public medical performances dates to 1833, when Dr. Francis H. Ramsbotham (1801-1868) delivered a lecture series that focused on the theory and practice of midwifery. In the *London Medical Gazette*'s transcription of the popular lectures, Dr. Ramsbotham uses a dissected plate from the newly released *Obstetric Tables* to simulate a possible set of choices made as the cervix dilates during the beginning of labor:

> With regard to the first of these requisites, it is not always very easy for a novice to distinguish the os uteri at the commencement of labour: I have known many students attend a number of cases before they have been able to satisfy themselves whereabouts the os uteri was, or detect it by the feel. But you will generally find it looking backwards toward the hollow of the sacrum, about two inches, or two inches and a half, from the vulva, and dilated to the size of a shilling, a half crown, or more, as the case may be. In these obstetrical tables [presenting them] by Spratt, contrived upon the ingenious plan of Hogben, you will observe the

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examined." It was taught by a female lecturer, Mrs. M.A.W. Johnson, in the lecture hall of a church. Admission to the entire course cost $1, and single lectures were 25 cents each. "Lectures to Ladies," *Pennsylvania Freeman*, March 18, 1852.

> mode in which it is recommended that an examination should be made, either with the first finger of the right hand or two fingers of the left. In the first representation, the os uteri is open to the diameter of about a sixpence; in the second, to the size of half a crown; in the third, it is almost entirely dilated—the membranes being protruded into the vagina; and in the fourth, you see the situation of the child after the membranes have ruptured.[238]

Putting aside the quite pregnant comparison between the diameter of the cervix's dilation and actual tokens of monetary value, let us reconstruct Ramsbotham's actions and movements from this summary. Dr. Ramsbotham is attempting to describe a process so profoundly tactile that it takes several rounds of childbirth to even begin to grasp. What was the best way to convey the combination of sensory clues necessary for understanding this particular medical event? Bringing a real patient in labor would be impossible, not to mention distracting. A corpse, only barely more practical, would be incapable of demonstrating the muscular contractions inherent to the process. A kinetic model, capable of not only demonstrating, but also repeating, slowing down, and speeding up an array of possibilities, was by far the ideal choice. To demonstrate the illustration's various possibilities to a closely watching audience, Dr. Ramsbotham would have likely excised the plate from its binding, operating it as a stand-alone image.

Separated from the material support of the book, the dissected plate is reborn as a newly mobile and public image. The experience of reading a book, with some exceptions, has usually been figured as a private experience.[239] Even if read aloud to an audience, the text must be filtered through the body of the individual holding the object. However, when an illustration is cut from a binding, it inhabits viewing space differently. Dr. Ramsbotham would have displayed the image vertically, rotated it in space, highlighting the angles and planes of the unfolding flaps. Perhaps the members of his audience handled the plate for themselves, rehearsing the doctor's lessons in real time, or mirrored his movements on the pages of their personal copies. Freeing the illustration from the material support of the book transformed it into a public image for broad consumption.

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[238] F.H Ramsbotham, "Natural Labour," *London Medical Gazette, or, Journal of Practical Medicine* 13 (April 1833): 887.

[239] For an example of recent work that considers books beyond private reading practice, see: Leah Price, *How to Do Things with Books in Victorian Britain* (Princeton, N.J: Princeton University Press, 2012).

Not all lecturers had the credentials of the eminent Dr. Ramsbotham, who studied at London Hospital and Edinburgh, where he received his MD in 1822, and was named a fellow of the Royal Colleges of Physicians in 1844.[240] The notorious "Doctor" Frederick Hollick, a master of self-reinvention, is a prime example. On a March evening in Philadelphia in 1846, a riveted public gathered to see Dr. Hollick peel apart a female body layer by layer. As they listened to a lecture titled "the Origin of Life," the audience watched as the doctor stripped away a sheet of skin to reveal a tangle of blue veins, then a film of pink muscle beneath, and finally solid white bone, all the while professing the relationship between anatomy, health, and sexual pleasure (Fig. 39).[241] It may seem that nothing is amiss in this scenario, except for the fact that Hollick had no medical training whatsoever. A British-born Owenite socialist, Hollick spent his early years training as a silversmith and lecturing as a "missionary" about the repression of organized religion and the plight of the working class, before immigrating to the United States in 1844 and reinventing himself as an expert in reproductive health.[242] Not one to be burdened by facts or the scientific research of the day, Hollick unleashed a spectacular combination of progressive sexual education and dynamic visual aids upon his American audiences, which quickly rose to the thousands per lecture.[243] These spectacles also just as quickly attracted a heated obscenity trial. His detractors attacked the "lewd illustrations" accompanying the easy-to-read text of his treatise, as well as the use of a lifelike female anatomical model in front of a nonmedical audience.[244]

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[240] Peter M. Dunn, "Perinatal Lessons from the Past," *Archives of Disease in Childhood* 73 (1995): F118–20.

[241] Hollick's obscenity trial has received significant scholarly attention in the field of History of Science. His illustrations and visual aids have not been analyzed whatsoever. For the most complete overview of the obscenity trial, see: April Haynes, "The Trials of Frederick Hollick: Obscenity, Sex Education, and Medical Democracy in the Antebellum United States," *Journal of the History of Sexuality* 12, no. 4 (2003): 543–74. Hollick titled these lectures after his most recent publication: Frederick Hollick, The Origin of Life: A Popular Treatise on the Philosophy and Physiology of Reproduction, in Plants and Animals, Including the Details of Human Generation (New York: Nafis & Cornish, 1845).

After Hollick was acquitted of all charges in early 1846, his lectures, open to the general public, attracted larger crowds than ever. In order to meet a growing desire for knowledge about not only spatial anatomy, but also time-based bodily processes such as growth, decay, and regeneration, he produced a dissected plate book of his own, *Outlines of Anatomy and Physiology*, which included a single layered illustration (Fig. 2.40). The plate first depicts a dark-haired man in profile, his body covered in classicizing drapery.

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[242] Haynes, 543.

[243] Haynes, 545–48.

[244] According to Haynes and various primary sources, Hollick was charged on three counts. The first focused on the colloquial language he used in describing sexual pleasure. A second charge, according to an April 21st 1846 edition of the Philadelphia Daily Chronicle, "charged him with having publicly exhibited certain indecent and immoral figures and models in the course of his lectures." A third and final charge attacked the colorful and diagrammatic illustrations of *The Origin of Life*. Hollick was also known, in the press, as a "very evil-disposed and designing individual, who was contriving to corrupt the morals of the community." Donna Dennis, *Licentious Gotham: Erotic Publishing and Its Prosecution in Nineteenth-Century New York* (Harvard University Press, 2009), 122; Haynes, "The Trials of Frederick Hollick," 550; "No Title," *Philadelphia Daily Chronicle*, April 21, 1846; "Acquittal of Dr. Hollick.," *Pennsylvania Freeman*, May 23, 1846, Vol. III, Issue 17 edition, sec. p. 3.

Two flaps, hinged at the left edge of the chest and face, open onto the inner abdomen and skull. Once opened onto the first layer, the lower verso immediately announces itself as an artificial means of visualizing dissection through an inscription on the reverse of the first flap. The visual metaphor of opening the chest cavity is disrupted by the appearance of writing where viscera should appear instead, particularly as the upper flap operates as expected, offering a cross-section of the skull on the verso and a blueprint of brain and nervous system on the right. This uneasy tension between expectation and revelation continues throughout the entire procession of flaps. Because of these formal and spatial inconsistencies, is difficult to believe that period viewers would have understood Hollick's design as conveying illusionistic or mimetic truth.

The *Outlines of Anatomy* dissected plate marks an early American attempt to grapple with anatomical epistemology via printed moving images, and its disjunctions and failures are a result of that transitional status. Hollick's dissected plate book sold much more cheaply than Spratt's (for about $1.25 - $1.50 per copy) and was intended to accompany his speeches.[245] This flap anatomy, though produced contemporaneously with *Obstetric Tables,* signaled a divergence in the intended audience for such publications. *Obstetric Tables* circulated impressively widely for a book of its expense, but *Outlines of Anatomy* was a truly mass-marketed bestseller, helped along by a shift toward cheaper paper and production techniques.[246] A flood of movable anatomical books hit the market in the late nineteenth century from authors following in the footsteps of antebellum pioneers Hollick and Spratt, pushed along by technological advances in color printing, mechanized die-cutting, and variation in paper stock.[247]

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[245] Hollick, *Outlines of Anatomy & Physiology*.

[246] Brown, "Flip, Flap, and Crack: The Conservation and Exhibition of 400+ Years of Flap Anatomies," 8.

Gendering movement

Medically inclined readers like Dr. Jones, performative lecturers like Dr. Ramsbotham and Frederick Hollick, and the diverse publics that came to hear and watch them speak had a primary goal of one-to-one simulation. In other words, simulation technologies were a means of better understanding the processes and bodies they were designed to replicate. Such audiences engaged in physical interactions with Spratt's anatomical models, either firsthand or by proxy, to learn as much as they could about how pregnancy and childbirth worked. But, unsurprisingly, physical interaction with representations of the nude female body was also charged with a secondary set of symbolic and metaphoric meanings.

What role did movement, and its specific mechanisms, rhythms, and directionalities, play in transforming simulations of science into simulations of sexualities? The answer may lie with robots—or more precisely, with a critical analysis of the Obstetric Tables' position within a broader media network. No viewer, modern or historic, could confuse the paper bodies illustrated in *The Obstetric* Tables for a robot—an attempt to mechanically replicate a living thing, including intelligence. The small-scale models, composed of flat stacked planes, have nothing of the heft or roundness of the human form. No matter how finely pressed, paper does not give off the sheen of supple skin. Flaps, when handled, are dry and cold to the touch, even as they depict the glistening warm viscera of the body's interior. But nineteenth-century audiences frequently encountered attempts to reproduce the look, feel, and movements of living things—most prominently, mechanical automata and sensuous wax anatomical models. Many of the objects displayed alongside Spratt's book at anatomical museums, or examined at public lectures, would resonate with these gear-powered machines. Still, it would have been obvious to viewers that Spratt's book did not belong in the club of the artificially living, but instead existed in an adjacent and connected space. In spite of this divergence, the history of experiments in artificial life offers a picture of how the book's users conceived of technology as a mediating force between human beings and the unknown.

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[247] For more on later flap anatomies, see: Sappol, Michael, *The Apotheosis of the Dissected Plate: Spectacles of Layering and Transparency in 20th Century Anatomy*, Lecture, Duke University, Animated Anatomies: The Human Body in Anatomical Texts from the 16th through the 21st Centuries (Duke University, 2011), http://www.youtube.com/watch?v=_HB4vI8h44s.

Although the history of simulation technologies has been largely overlooked, parallel efforts to investigate archaeologies of artificial life have flourished in the past decade. No doubt, this imbalance is a byproduct of our contemporary obsession with artificial intelligence, which has waxed just as a fascination with virtual reality waned. The motivations behind this shift—from a twentieth-century culture fascinated by the dystopic simulated worlds of *The Matrix* (1999) to today's fear of and desire for robots a la *Westworld* (2016)—are unfortunately beyond the scope of this dissertation. Nevertheless, simulated realities and artificial lives are cut from the same philosophical cloth. Scholarship on automata, self-moving mechanical models of people or animals that flourished in various forms as early as the middle ages, is an ideal starting point for questions of selfhood, technology, and knowledge.[248] As scholars including Jessica Riskin and Adehleid Voskul have shown, throughout the enlightenment and nineteenth century, automata and other lifelike machines became contested intellectual battlegrounds.[249] Piano-playing women, endlessly-praying priests and quill-wielding scribes challenged an increasingly tenuous horizon between life and death, self and object. Viewers' responses to these boundary-crossing models reveal some of the most potent attempts to negotiate the changing human relationship with machine technology.

Most of all, scholarship on automata has shown that the dynamics of movement—how human operators move upon automata, how automata self-move, and the channels and negative spaces that lie between—are areas especially inflected by cultural habits, concerns, and desires. *Automaton's* Greek root means to "act of itself," and this self-propelling quality is of critical importance to the genre's nineteenth-century reception. In particular, the self-propulsion of automata was viewed through the lens of gender. As M. Norton Wise has shown, in the nineteenth century, different modes of movement were interpreted as either male or female, particularly with regard to labor and mechanization.[250] Repetitive, lateral movement, such as the motions of factory machines propelled by female workers, were a feminine kinetics. Alternately, unpredictable, dynamic and ultimately generative motion, for instance that of the roaming factory overseer, had the power to make all other forms of movement take place—and was therefore marked as male. Immobile until lifted by the hands of the observer, the flap illustration is a perfect example of what the nineteenth century viewer would have considered a masculine mechanics. The very mechanics of *Obstetric Tables* welcomed a male-coded approach to accessing knowledge, a pursuit of forbidden fruit that was encouraged, rather than punished.

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[248] Elly Rachel Truitt, *Medieval Robots: Mechanism, Magic, Nature, and Art*, The Middle Ages Series (Philadelphia: University of Pennsylvania Press, 2015), 2.

[249] Jessica Riskin, *The Restless Clock a History of the Centuries-Long Argument over What Makes Living Things Tick* (Chicago: The University of Chicago Press, 2016); Riskin, "Eighteenth-Century Wetware"; Adelheid Voskuhl, *Androids in the Enlightenment: Mechanics, Artisans, and Cultures of the Self* (Chicago: Univ. of Chicago Press, 2013), 170.

[250] M. Norton Wise, "The Gender of Automata in Victorian Britain," in *Genesis Redux : Essays in the History and Philosophy of Artificial Life* (Chicago: University of Chicago Press, 2010), 172.

What, then, did simulators want? Nineteenth-century male viewers interacted with these technologies because they offered more than just scientific data: fluency with scaled-down models provided a socially acceptable a way to gain intellectual control (broadly defined) over women's bodies without actually touching the real thing. The flap models in Spratt's *Obstetric Tables* gave equal access to male and female users—the difference was the ends to which these audiences directed their newfound knowledge.

Thus far, this chapter has presented a largely male portrait of the audience for the *Obstetric Tables* and its immediate contexts of use. In fact, women would have interacted with the book as well, and were present in the spaces in which it was displayed and operated. Although women were not permitted to engage in dissections until about 1850, they were actively encouraged to attend public anatomical lectures from at least 1816 onwards, and to engage with anatomical science in a variety of sanctioned ways—chiefly through books and print.[251] In response to climbing female readership, journals like the

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[251] Michael Sapol cites Alexander Ramsay's dedication of lectures to the women of Boston between 1818-1820 as an early starting point for women's inclusion in lectures. However, these early lectures had an entrance fee of $10, which would have significantly limited access to the wealthiest classes. Sappol, *A Traffic of Dead Bodies*, 170; Londa Schiebinger, *The Mind Has No Sex? : Women in the Origins of Modern Science* (Cambridge: Harvard University Press, 1989).

Boston Thomsonian Manual and Lady's Companion included multiple weekly sections on anatomy and physiology.[252] As *Obstetric Tables* was a rich source of information about the most internal workings of the female body, it appealed to a growing audience of women who sought to gain intellectual control over their own anatomy—a key first step to gaining full physical agency, a still elusive goal even in the twenty-first century. Engaging in simulations was a way of claiming control for female audiences barred entrance to sanctioned scientific spaces.[253] As period critics were wont to point out, scaled-down paper sculptures could never truly mimic the viscera and adrenaline of the operating room; but the success of the *Obstetric Tables* in spite of its clear material and mimetic limits reveals that touch and simulation had real symbolic, cultural stakes. Ultimately, the book's tactile illustrations captured the attention of an American viewership that equated tactile knowledge and physical fluency with scholarly expertise and cultural sophistication. To see with one's fingers meant exhibiting a muscle memory that belied careful, practiced, and empirical study.

Part III: To Touch or Not to Touch: Sentimental Viewing and the Management of Desire

Sculpture and Simulation

In this concluding section, I ask how midcentury American audiences' reception of seemingly unrelated artistic genres, movable anatomical books and neoclassical sculpture, might in fact be complementary extensions of a shared and multidirectional visual culture in which touch, real or imagined, functioned as a means of displaying power and control. *The Obstetric Tables* is material evidence that midcentury American audiences were trained to investigate the scientific world through physical, immersive, and performative rehearsal with simulative proxy objects, a mode of interaction that stemmed from a gendered claim over the use of tools and physical knowledge. But life-size marble nudes functioned as proxies as well: if not for scientific knowledge, for sensual and emotional feeling equally implicated in dynamics of male control. Considering the much-studied genre of sculpture through the unexpected lens of animated anatomy—and more specifically, through the dynamics of gender and power that shaped the reception of both—provokes a reconsideration of long-held interpretive frameworks for canonical art, most of all, the culture of sentimental viewing.

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[252] Michael Sappol, "The Cultural Politics of Anatomy in 19th-Century America: Death, Dissection, and Embodied Social Identity" (Columbia University, 1997), 222.

[253] Wells, *Out of the Dead House*, 193–226.

In order to think about these two object categories as part of the same midcentury culture of projecting power through proprietary ways of touching, we must accept the fact that audiences brought physical, bodily modes of processing visual data to bear on far more than just anatomical books. Though I will cite several specific instances of how this mode of viewing was applied to sculpture, the simplest explanation for this interpretive cross-pollination is that antebellum Americans did not live in a visual vacuum. The same viewers that attended Frederick Hollick's popular anatomical lectures in Philadelphia in 1846, or purchased *Obstetric Tables* in 1847, undoubtedly went to go see touring statues on display in their home cities over the following years. For many viewers, medical settings were the dominant framework for understanding even "artistic" representations of nude bodies (a blurry and problematic designation). Non-medical Philadelphia audiences encountered paintings of nude women on display at the Pennsylvania Hospital decades before they could visit one in the gallery: beginning in 1762, for only a dollar's admission fee, visitors could see illustrator of William Hunter's *Gravid Uterus* Jan Van Rymsdyk's colorful pastel studies of pregnant female nudes (Fig. 2.41).[254] The high finish and unusual coloration of works like Rymsdyk's suggest that this was a dynamic that reached in both directions; that scientific makers learned just as much from their experience viewing and consuming fine art as artists gleaned from science. It is interesting to compare this culturally sanctioned viewing setting to outcry that was generated by the display of Adolph-Ulrich Wertmüller's *Danaë and the Shower of Gold* in a non-medical gallery in 1806—in short, viewing the nude from the medical perspective, which included a tactile sensibility, was the appropriate way to approach the controversial subject (Fig. 2.42).[255] Sculpture's very own critics expressed concern that the distance between sculpture's fine art status and the surging realm of popular amusement was in danger of collapsing.[256] In each accumulative act of looking, viewers drew parallels between their experiences with related art forms.

Certain aesthetic resonances helped audiences make these connections. Most notably, nude marble female figures, products of a burgeoning mid-century interest in neoclassical sculpture, bore an undeniable resemblance to the simulative anatomical models built to withstand repeated physical encounter. This resemblance was circular: as both the contrapposto skeletons of Vesalius and the famous wax figures of La Specolla demonstrate, anatomical modeling had long worked to emulate artistic convention in representing the body. Of course, the similarities between the two genres were not just visual. Rather, analysis of the reception of sculpted nudes in the United States during this same period reveals that audiences harbored strong urges to touch these marble bodies in ways that uncannily mirror culturally sanctioned ways of interacting with popular anatomical simulations. Considering sculpted marble nudes as objects embedded within the same intellectual frameworks as simulative anatomical images calls for a rethinking of long-held narratives of distanced and sexually repressed sentimentalist viewing of sculpture.

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[254] Marcia Nichols and Jolene Zigarovich, "Venus Dissected: The Visual Blazon of Mid-18th Century Medical Atlases," in *Sex and Death in Eighteenth-Century Literature* (Rutgers University Press, 2013), 117.

[255] Bellion, *Citizen Spectator*, 322.

[256] According to Christina Ferando, artist's strategies that heightened the surface quality of sculpture, such as waxing and the addition of color, was the source of this discomfort. Christina Ferando, "The Deceptive Surface: Perception and Sculpture's 'Skin,'" *Images Re-Vues. Histoire, Anthropologie et Théorie de l'art*, no. 13 (August 20, 2016), https://imagesrevues.revues.org/3931.

The literature on figural sculpture in midcentury America is vast, in part due to the sheer volume of primary data related to its production and reception. Still, scholars have long agreed that there was one sculpture to rule them all in the nineteenth century: Hiram Powers' *The Greek Slave*, created in six versions between 1843 and 1866, and by all accounts the most widely viewed artwork of any genre during the entire nineteenth century (Fig. 2.43). [257] When I viewed *the Obstetric Tables* for the first time in 2013, I opened its pages onto Table IV, or as movable book collector Ellen Rubin refers to her,

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[257] Tanya Pohrt, "The Greek Slave on Tour in America," *Nineteenth-Century Art Worldwide*, Special issue on The Greek Slave by Hiram Powers, 15, no. 2 (Summer 2016), http://www.19thc-artworldwide.org/index.php/summer16/pohrt-on-the-greek-slave-on-tour-in-america.

"Lady Modesty."[258] I immediately thought of Powers' iconic marble nude, who could be the twin sister of the lithographic flap illustration before me. Both women are posed to show their naked forms mostly unobstructed. While the Greek Slave's arm grazes her right hip, delicately blocking her nether regions from view, Lady Modesty's arm lifts upwards, pulling her loose-fitting cloak away from her breast. The most striking echo, though, are their twin downcast gazes, perched on mirrored sloping shoulders. Both heads are turned away from the viewer, looking demurely to the right, at once shameful of their bodies on display and non-confrontationally allowing for the viewer's lingering gaze.

As numerous scholars have pointed out, the Greek Slave's look askance was crucial to the Christianized narrative scaffolding that surrounded her—the "modest mien" that "repel[led] each vulgar gaze" and allowed her to at once be both "naked yet clothed with chastity."[259] As a sculpture in the round, The Greek Slave's pose does not reflect the static illustration so closely from every viewing position. However, photographers and printmakers reproducing the sculpture have repeatedly captured her this particular angle since the statue's first tour, as it provides an ideal view of the figure's key attributes: chains, breasts, pudendum.[260]

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[258] Personal conversation with Ellen Rubin at her home, 2016.

[259] R.S. Chilton, "The Greek Slave," *The Knickerbocker*, December 1846.

[260] The relationship between photography and sculpture, and its manifestation in art historical scholarship, has long preoccupied scholars. Geraldine Johnson's work in this area provides a primer on that historiography: Heinrich Wölfflin, "Heinrich Wölfflin, 'How One Should Photograph Sculpture''," trans. Geraldine Johnson, *Art History* 36, no. 1 (February 2013): 52–71; Geraldine Johnson, "Photographing Sculpture, Sculpting Photography," in *Photography and Sculpture: The Art Object in Reproduction*, ed. S. Hamill and M. Luke (Getty Research Institute, 2017), 271–99.

I think it unlikely that Powers looked to Spratt's book for the source of his creation, although like many sculptors before and after him, he was deeply interested in anatomy.[261] A translation of Sarlandière's *Systematized Anatomy* (1835) was a part of his personal library, for example, and he often made casts from living bodies.[262] I raise the question of resemblance between the illustration and the sculpture to make a broader point: fine art objects and scientific models often looked shockingly similar during this moment, a connection not lost on the period viewers who frequently moved between realms of science and art.[263] As I have shown, nineteenth-century viewers were conditioned to encounter anatomical simulations through touch and physical immersion. Furthermore, it was this very quality of unexpected three-dimensionality that triggered these perceptual habits. Sculpture's lush, life-sized volumes, when combined with its anatomically exacting nude subjects, would have triggered the same impulses in viewers practiced in this mode of visual-physical encounter. In other words, they would want to reach out and touch sculpture's marble skin. This desire stemmed in part from habits crystallized through experience with the layering present in anatomical culture of the moment, and at a more fundamental level, from the touch-based forms of controlling women's bodies that dictated those layered forms to begin with.

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[261] Like many of his peers, Powers was interested in casting from live bodies, for example *Loulie's Hand* (1839): http://americanart.si.edu/collections/search/artwork/?id=20100

[262] Theresa Leininger-Miller, "Theresa Leininger-Miller Reviews Hiram Powers: Genius in Marble," *Nineteenth-Century Art Worldwide* 7, no. 1 (Spril 2008), http://www.19thc-artworldwide.org/spring08/40-spring08/spring08review/99-hiram-powers-genius-in-marble.

[263] Most recently, Naomi Slipp has written about the relationship between academically trained artists and anatomical study in the United States. Her dissertation offers an overview on the subject, some of which is summarized in a 2013 exhibition catalogue. Naomi Hood Slipp, "'The Secret Figure': Artistic Anatomy and the Medical Body in Nineteenth-Century American Culture" (Ph.D., Boston University, 2015); Naomi Slipp, *Teaching the Body: Artistic Anatomy in the American Academy, from Copley, Rimmer, and Eakins to Contemporary Artists* (Boston: Boston University, Art Gallery, 2013); For two recent articles that focus on the relationship between sculpture and anatomy specifically, see: Ferando, "The Deceptive Surface"; Naomi Slipp, "Thomas Eakins and the Human Écorché: Understanding the Body in Three Dimensions.," *Sculpture Journal* 24, no. 3 (2015): 333–80.

Written evidence of nineteenth-century viewers' endowment of *The Greek Slave* with human bodily qualities that begged for physical interaction abounds.[264] One commentator, immortalized in Powers' scrapbook of reviews of the popular statue held at the Archives of American Art, enthusiastically imagined touching—and then ultimately resisting—the marble body come to life:

> The marvellous point then is that the statue is not marble-ous; that the flesh looks as plastic, and the skin as porous as if it could—pray do not shudder, madam—Greece is a warm climate—as if it could perspire. […] These Pygmalion touches of palpitating life must, however, be studied to be recognized, for their result is an aspect so perfectly natural, that you do not behold the statue with any surprise when you first look upon it; it speaks here most transparently; and the rest of the statue forms a unity with this expression of the nobler part. And now having dismissed the impression that those wrinkles in the elbows can be distinctly taken up in your fingers—stand aloof, and look at the whole composition (as the Poets in marble and paint call their exercises.)[265]

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[264] As one of the most iconic artworks of the nineteenth century, Hiram Powers's *Greek Slave* has been explored from nearly every imaginable angle—the emergence of sentimental culture (Joy Kasson), the racialized reception of neoclassical sculpture (Charmaine Nelson), unseen narratives of artistic process (Lemmey), to name just a few. But even taking into account the recent issue of Nineteenth-Century Art Worldwide devoted entirely to the sculpture, scholars have not devoted significant attention to the phenomenological or physical aspects of reception of the statue. This chapter offers only a starting point for a theme I hope to take up in future research. Joy S Kasson, *Marble Queens and Captives: Women in Nineteenth-Century American Sculpture* (New Haven: Yale University Press, 1990); Charmaine Nelson, *The Color of Stone: Sculpting the Black Female Subject in Nineteenth-Century America* (Minneapolis: University of Minnesota Press, 2007), https://www.upress.umn.edu/book-division/books/the-color-of-stone; Karen Lemmey, "From Skeleton to Skin: The Making of the Greek Slave(S)," *Nineteenth-Century Art Worldwide* 15, no. 2 (Summer 2016), http://www.19thc-artworldwide.org/index.php/summer16/lemmey-on-from-skeleton-to-skin-the-making-of-the-greek-slave.

[265] "Scrapbook of Hiram Powers Publicity, between 1847 and 1876," 13, Hiram Powers Papers, 1819-1953, bulk 1835-1883, Archives of American Art, Smithsonian Institution, accessed February 16, 2017, https://www.aaa.si.edu/collections/items/detail/scrapbook-hiram-powers-publicity-421.

Similar thoughts echoed across a range of publications during the statue's first American tour in 1847. "As we gaze we unconsciously ask, can this be marble? We look for it to move, its veins to swell with the warm current of life, its muscles to expand, and its breast to heave," wrote a critic in the New York Saturday Emporium, concluding by calling Powers' work a "sculpture so touching."[266] "That is not marble but flesh and blood; that cheek must yield to the touch, and you instinctively watch for the heaving of the bosom," wrote another New York critic a few months earlier.[267] And in the fantasies of a critic in *The Age,* "You can scarcely doubt that if you pressed your hand, however gently, on that fair shoulder, the flesh would yield beneath the touch and (the pressure removed) spring up again glowing with life. […] the man or woman who could entertain an impure thought while looking at this statue, must be grossly sensual indeed."[268] While the trope of sculpture come to life winds a long thread from ancient ekphrastic description to Renaissance *Paragone* (the competition between painting and sculpture) to Medieval devotional figures and onwards, nineteenth-century viewers endowed the art form with new agency.[269] It is worth noting that based on written reception, the sculpture's range of response to the nineteenth-century viewer's imagined touch seems quite limited: a shudder, an indentation of flesh beneath one's finger, a heaving bosom, a glisten of perspiration. Each of these movements is a bodily *response* to external stimuli, which is always the action of the male viewer. She is never imagined as a fully mobile or conscious person, never endowed with the ability to speak out or walk away. In this way, the nineteenth-century imagined the *Greek Slave* as a partially living woman who is animated only through relation to the empowered male viewer; a prefiguration of the twenty-first century sex robot who is powered off when its services are longer needed.[270]

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[266] "The Greek Slave," *New York Saturday Emporium*, August 31, 1847; "Scrapbook of Hiram Powers Publicity, between 1847 and 1876," 9.

[267] "City Items," *New York Tribune*, n.d.; "Scrapbook of Hiram Powers Publicity, between 1847 and 1876," 5.

[268] "Powers' Statue of 'The Greek Slave,'" *The Age*, August 29, 1847; "Scrapbook of Hiram Powers Publicity, between 1847 and 1876," 6.

[269] For an account of medieval animation of sculptures, see Assaf Pinkus. Lynda Nead's *Haunted Gallery*, on the other hand, takes up the question of how viewers imagined sculptures come to life in the age of cinema. Lynda Nead, *The Haunted Gallery: Painting, Photography, Film c. 1900* (New Haven and London: Yale University Press, 2007); Assaf Pinkus, *Sculpting Simulacra in Medieval Germany, 1250-1380* (Burlington, VT: Ashgate Publishing Company, 2014).

Such reviews recall the language American audiences applied to anatomical models such as the Anatomical Venus, a genre that further elides the gap between medical and fine art objects. In the United States, this term referred to wax models made in the eighteenth-century Florence workshop of Clemente Susini, and toured on American soil beginning in 1820 (Fig. 2.44).[271] Unlike the cheaper didactic papier-mâché Auzoux models favored by lecturers like Hollick, Anatomical Venuses used the fleshy texture of hardened wax to mime the form of the nude female body.[272] The supine, ecstatic women are adorned with pearl jewelry, braids of human hair, and detachable abdomens that give way to glistening wax lungs and intestines.[273] Each organ, down to the last layer of the fetus (and there is always a fetus) could be plucked out of its cavity and experienced as a sculpture in the round. Perhaps because of the extreme mimesis of texture and accessories, viewers were all the more disturbed by the visual disconnect between surface beauty and repulsive interior. For example, the exhibition of a Venus in Philadelphia in 1840 inspired a flurry of reviews, in which one observer wrote of his shock that such a beautiful and pristine veneer could be tied to such a gruesome subsurface:

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[270] For more about sexualized dolls, see: Liliane Weissberg, "Playing Doll," in *On Writing with Photography* (University of Minnesota Press, 2014), 145–72.

[271] The earliest reference I have found to the Anatomical Venus in American periodicals is: "Transylvania University, Medical Department," *Edwardsville Spectator*, June 7, 1823, Volume IV, Issue 206 edition, sec. p. 3, 3; Martin Kemp, Marina Wallace, and Hayward Gallery, *Spectacular Bodies: The Art and Science of the Human Body from Leonardo to Now* (London; Los Angeles: Hayward Gallery ; University of California Press, 2000); Clemente Susini et al., *Flesh & Wax: The Clemente Susini's Anatomical Models in the University of Cagliari* ([Nuoro, Italy]: Ilisso, 2007).

[272] Anna Maerker, "Anatomizing the Trade: Designing and Marketing Anatomical Models as Medical Technologies, ca. 1700-1900," *Technology and Culture* 54, no. 3 (2013): 534.

> The color of the "skin" and brilliancy of the eye give the whole an appearance of a living subject. But the garments being removed, the exhibitor soon dispels this allusion [sic], by lifting that portion of the face which represents the flesh. The muscles, bones, nerves, &c. are then exposed, and the eye-balls being left prominent and ghastly, farewell to the beauty that before riveted attention![274]

Much like the Greek Slave's audiences seven years later, this observer's fantasies did not end with the flutter of an eyelid or the blush of a cheek, but climaxed with physical interaction between their own body and that of the sculpture. However, as this review confirms, the Anatomical Venuses were actively handled, a physical interaction that gave way to disappointing reality: engaging with their movable parts would have at once dispelled the notion that the beautiful form could ever come to life. In the moment the perfect ivory abdomen was lifted to reveal the grotesquely glistening tangle of intestines and interior organs, the body's surface was confirmed as the ultimate deception. Whereas the marble solidity of the *Greek Slave* allowed the viewer to maintain their fantasy indefinitely, so long as he or she resisted the urge to actually touch, the Anatomical Venus severed desire by jarringly demonstrating that beauty was only skin deep.

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[273] In future work on this topic, I hope to discuss the journey of the Anatomical Venus into the early twentieth century. As other scholars have noted, the Anatomical Venus takes on new forms and associations in the era of cinema, most of all for the Surrealists. Scholars have also offered numerous rich readings of the Anatomical Venus from feminist and gender and sexuality studies perspectives. The foundational work of approaches like these, most of all Elisabeth Bronfen's analysis of the politics of deanimating the female body, have allowed me to temporarily bypass these pressing questions of gender and investigate how Anatomical Venuses contributed to a broader visuality. Elisabeth Bronfen, *Over Her Dead Body: Death, Femininity, and the Aesthetic* (New York: Routledge, 1992), 71; Joanna Ebenstein, "Ode to an Anatomical Venus," *WSQ: Women's Studies Quarterly* 40, no. 3 (2013): 346–52; Elizabeth Stephens, "Venus in the Archive," *Australian Feminist Studies* 25, no. 64 (June 2010): 133–45; Kathryn A. Hoffmann, "Sleeping Beauties in the Fairground," *Early Popular Visual Culture* 4, no. 2 (2006): 139–59; Wendy Moore, "Behind the Fairground Curtain," *BMJ: British Medical Journal* 339, no. 7716 (August 8, 2009): 350.

[274] "The Anatomical Venus," *The Public Ledger*, May 16, 1840, 2nd edition.

Resisting Touch and Temptation

Significantly, nineteenth-century viewers *resisted* the urge to put their hands on the cold marble of sculptures designated as fine art, despite its alluring enticements. As the accounts relayed above make clear, resisting the urge to touch was as much about maintaining proper public behavior as it was about propagating a fantasy of desire. Touching cold marble would puncture the balloon of fantasy in which viewers couched their acts of spectatorship. Even today, sculpture magnetizes its audiences, and many viewers have no qualms about giving in to its lure, at least when museum guards are looking away. While a fellow in the American Wing of the Metropolitan Museum of Art, I witnessed visitors in the sculpture courtyard surreptitiously reach out to graze the cold marble forms almost daily. Once I even watched as a particularly brave visitor gingerly tap twice on a bronze with his knuckles—whether checking for signs of life or authenticity, I will never know. By all accounts, however, nineteenth-century viewers respectfully kept their distance. The flesh of the Greek Slave's shoulder yielded softly to the viewer's touch only in his or her imagination. What, then, stopped them from reaching out to test its solidity and stillness? What cultural limitations caused them to pause in front of the sculpture but push forward in front of the dissected plate or the wax model? As several of the period reviewers suggested, it was the social code of sentiment—a system of provoking, and valuing, extreme emotional response specifically from art and literature—that encouraged viewers to imagine, but not act. By acknowledging the physical allure of the artistic nude and documenting their resistance of base bodily urges, sentimental period viewers ultimately claimed a triumph of moral willpower that co-existed with their continued erotic fantasies.

Sentimentality has long been recognized as a driving force in nineteenth-century American culture, powerfully shaping the ways that literature, art, and entertainment were produced and received. According to Shirley Samuels, nineteenth-century sentimental culture consisted of a performative and codified "set of cultural practices designed to evoke a certain form of emotional response, usually empathy, in the reader or viewer"—in short, a "set of rules for how to feel right."[275] Deeply entwined with class politics, viewers and readers who correctly performed sympathetic feeling simultaneously showed off their education, taste, and knowledge of culture.[276] But although "feeling" is central to these narratives, scholarship has tended to concentrate on intellectual and emotional "feeling," rather than its sensory definition—that is, the abundant physical and somatic byproducts of sentimentalist culture. Even in studies of the body's role in sentimental culture, for instance Karen Sánchez-Eppler's study of resonances between the bodies of white abolitionist women and black female slaves in antebellum America, it is interpreted as a metaphorical relationship.[277] Yet just as novels like Stowe's *Uncle Tom's Cabin* provoked readers' compassion for Little Eva's suffering, statues like Powers' drove viewers to imagine tears, caresses, warm embraces with the helpless young woman before them. Despite much evidence for sentimentality's sensory, phenomenological address to viewers and readers, these qualities have been largely absent from its ample historiography.

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[275] Shirley Samuels, ed., *The Culture of Sentiment: Race, Gender, and Sentimentality in Nineteenth-Century America* (New York: Oxford University Press, 1992), 4.

[276] Amy Schrager Lang, "Class and the Strategies of Sympathy," in *The Culture of Sentiment: Race, Gender, and Sentimentality in Nineteenth-Century America*, ed. Shirley Samuels (New York: Oxford University Press, 1992).

When considered within the culture of tactile viewing that surrounded *The Obstetric Tables*, the sentimental responses surrounding *The Greek Slave* take on new complexity and physicality. Undoubtedly, the Greek Slave sent nineteenth-century viewers into a frenzy of emotional and somatic performance. She was recognized as a textbook example of a sentimental object almost immediately: as Reverend Orville Dewey wrote in the pamphlet that accompanied her tour across the United States, "The Greek Slave is clothed all over with sentiment; sheltered, protected by it from every profane eye." Reverend Dewey's statement captures the tension that viewers would have felt upon encountering the statue: a push-pull between giving in to the socially conditioned impulse to physically examine her form, and maintaining the cultural decorum of keeping one's distance. This productive tension resulted in somatic responses that were only imagined and crystallized in written form, blocked by this very "veil of sentiment." The same poem that climaxes "unconscious marble throbs with life!" warns that "her inborn purity of the soul demands / Freedom from the touch of sacrilegious hands."

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[277] Karen Sánchez-Eppler, "Bodily Bonds: The Intersecting Rhetorics of Feminism and Abolition," in *The Culture of Sentiment: Race, Gender, and Sentimentality in Nineteenth-Century America*, ed. Shirley Samuels (New York: Oxford University Press, 1992).

Ultimately, reading period viewers' imaginatively charged encounters with *The Greek Slave* as inflected by a somatic, simulative, and fundamentally erotic visuality introduces a new complexity into our previous understandings of sentimental viewing. Period audiences who were invested in how to "feel right," who reacted to sentimentalist triggers, were not merely unconsciously responding to cultural stimuli, as they have long been figured. Instead, they engaged in complicated and tension-ridden internal dialogues between physical desire and cultured resistance that found its source in a broader culture of touching women's bodies as a means of displaying power and agency. Denying sculpture's persuasive tactile call was an act of self-reflective denial that required an acute awareness of the constructed and artificial nature of engaging with art—an intellectual agency that contemporary scholars have repeatedly denied of the pre-twentieth century viewer.

Conclusions

Juxtaposing the marble form of *The Greek Slave* with the paper anatomy of *The Obstetric Tables* highlights the shared cultural priorities that drove the reception of each. In the United States at midcentury, tactile engagement with the female body—illustrated, sculpted, simulated, and real--was tightly bound up with the construction of a masculine identity. As the illustrations in Spratt and Maygrier's obstetrical atlases show, in the realm of medicine and anatomical study, penetrating the female body with tools and hands allowed medical workers to claim both professional expertise and conventional masculinity.

Breaking the female body apart into discrete layers, as did the *Obstetric Tables*, emphatically literalized this desire to gain (and convey) knowledge of female anatomy through physical engagement. Arranging each layer of the body separately, superimposed and separated, exponentially increased the amount of surface area available for the viewer to conquer. But scalpels and dissections were not requirements for exercising fantasies of gendered control. As the visions of contact that fill the reception of Hiram Powers' *Greek Slave* show, the tactile images of the *Obstetric Tables* simply made explicit and tangible a broader formulation of desire.

CHAPTER THREE: DAVID CLAYPOOLE JOHNSTON AND THE ECONOMY OF SURFACE

Of all opiates, there is none so powerful—when administered by so skillful a hand as myself—as a certain quantity of ink and paper.[278]
– David Claypoole Johnston, Autobiography, 1835

Lecherous, sneering, and haughty faces stare out from a group of metamorphic portraits designed and printed by Boston artist David Claypoole Johnston (1799-1865) (Fig. 3.1). None larger than a trade card, the paper envelopes conceal internal mechanical features—creased, tucked, and pasted folds of paper—that allow for the image to visually and materially transform. Tug on the paper tab, and a red-faced carouser's eyes roll into the back of his head, a dandy's smile turns to a grimace, and a politician's confident smirk becomes bug-eyed amazement. Push the tab back in to place, and each sitter's expression returns to its original position (Fig. 3.2). Alternating between "before" and "after" states with a simple pull and push of engineered paper, users receive two pictures for the price—and space—of one.

Between 1837 and 1863, Johnston tweaked and repurposed three basic portrait templates to generate more than a dozen variations on the pull-tab portrait card. Each example was sketched, engraved on copper, and then printed and constructed at Johnston's studio, before finally circulating in large volume to meet wide demand for the artist's politically and socially incisive work. While some of these alterations were made at the base level of the plate or stone, Johnston also frequently scratched and scraped at leftover specimens from past print runs, pasting fresh information atop outdated surfaces to be re-sold as new objects. This chapter considers how Johnston's practices of revision, recycling, and compression were not merely techniques employed towards the end of ephemeral novelties, but rather were strategies closely linked to social concerns about the material value of paper in a time of financial panic, and were central to the production and success of the mainstream printed works for which he is best known.

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[278] William Dunlap, Frank William Bayley, and Charles E. (Charles Eliot) Goodspeed, *A History of the Rise and Progress of the Arts of Design in the United States* (Boston : C.E. Goodspeed & Co., 1918), 111, http://archive.org/details/historyofrisepro03dunliala.

In this chapter, I argue that David Claypoole Johnston's economical artistic surfaces offer a gateway onto two critical issues. First is a question of physical modes of reception: that is, how did American artists and audiences respond to the economically and politically tumultuous "hard times" of the late antebellum period in the ways they handled and corporeally engaged with print culture? For the innovative and ever boundary-pushing Johnston, paper-engineered images became a platform to experiment with the political and social valences of material and format. The series emerged from the economic depression and financial panics of the period beginning in 1837 and lasting until the onset of the Civil War, during which time paper—its abundance, scarcity, material makeup, and surface iconography—took on especially charged political and cultural meanings. Johnston's first cards skewered the radical Democratic Locofocos and 1840 presidential candidate Martin Van Buren, stalwarts of specie and enemies of printed money, and in so doing, engaged contemporary debates about hard money, speculation, and the abstract value of paper bills head-on. The pull-tabs' visual and physical compression of multiple surfaces into a single material support made such anxieties about scarcity, excess, and value literal and tangible.

But Johnston's oeuvre, including the mechanical and still alike, provokes a second and broader line of questioning about how to grapple with moving images before cinema—particularly those that fit uncomfortably in the history of screen projections. David Claypoole Johnston's pull-tab pictures are, by definition, movable images, capable of and defined by their propensity towards visual and material metamorphosis. However, the jerky lateral transformations of these flat paper slips bear little resemblance to the fluid, spinning zoetropes and hypnotic phenakistascopes that are widely regarded as the ancestors of modern cinematic technology.[279] Looking closely at Johnston's pull-tabs—at their mechanisms of movement, their relationship to other forms of visual and material culture, and their period reception and circulation—forces a reconsideration of long-held assumptions about nineteenth-century viewers' physical and intellectual relationships with technologies of motion.

Art history, cinema studies, and media studies have long avoided reckoning with moving images that do not conform to teleological frameworks of illusion, screen culture, and the persistence of vision. But, as this dissertation shows, this limited scope edges out the vast majority of moving images that were created and used before 1895. Three-dimensional paper constructions such as flap books, metamorphic prints, and mechanical ephemera were unavoidable and celebrated during the nineteenth century especially, and far outpaced their slick illusory cousins in production and circulation. This elision has left a cache of borderland objects like Johnston's pull-tabs largely unexamined and undertheorized, and as a result, key modernist narratives of the apprehension of motion, surface, and flatness at the turn of the century do not tell the whole story—and indeed do the pre-cinematic viewer a disservice. My analysis of Johnston's novelties will show that nineteenth-century audiences frequently encountered moving images that demanded a high level of intellectual and conceptual engagement from their viewers. Physical, kinetic movement was understood as a symbolic and often metaphorical feature of an artwork, ripe for the same level of interpretation as graphic iconography, and viewers were expected to rise to the challenge of connecting idiosyncrasies of format with cultural meaning.

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[279] For two prominent examples of scholarship that concentrates on illusionistic or screen-projected devices as predecessors of cinema, see: Mannoni and Crangle, *The great art of light and shadow*; André Gaudreault, "The Culture Broth and Froth of Cultures of So-Called Early Cinema," in *A Companion to Early Cinema*, ed. Santiago Hidalgo (Malden: Wiley-Blackwell, 2012), 15–32.

This chapter is divided into two parts, a structure that echoes how I propose we might best learn from objects resistant to standard notions of format or genre. I first engage in a close analysis of the objects themselves in order to discover what questions its formal and material features provoke, and continue by expanding into problems of social and historical context in the service of answering those queries. Part one, "Techniques of the Preserver," begins by hewing closely to the mechanical prints, describing them both as singular things and part of a group. Moving steadily outward from the pull-tabs, the chapter then buttresses questions of format, motion, and material with direct contextualization in the artist's biography and larger body of work. Part two, "Paper and Panic," pieces the objects together with their historical context of the Panic of 1837, treating the artist's own involvement in the creation of financial ephemera as a conceptual link connecting moving images with period modes of physically encountering a broader array of material.

Part I: Techniques of the Preserver

The Cruikshank of the New World

David Claypoole Johnston loved a good joke.[280] Born in Philadelphia (or as he put it, the "drab-colored city of brotherly love") in 1799, the young artist was surrounded by the performance, spectacle, and drama of the theatrical world from an early age.[281] He grew up singing, dancing, acting in stage productions, engaging in "petty schoolboy mischief," and dreaming of life as a "rude and boisterous captain of the sea."[282] Johnston spent a few seasons acting in the Philadelphia theatre like others in his family, but ultimately gave up the stage in favor of a full-time printmaking apprenticeship with Philadelphia engraver Francis Kearney.[283] In 1825, he moved to Boston and fashioned himself "The Cruikshank of the New World," throwing his incisive humor and abundant energy into life as an artistic polymath (Fig. 3.3).[284] Over the course of a prolific career that lasted until his death in 1865, Johnston produced countless book illustrations, single-sheet prints, advertisements, comic "scraps" pamphlets, oil and watercolor paintings, and genre-defying combinations of all of the above. He gave drawing lessons to young Bostonians, collaborated with emerging artists in newly organized hybrid display spaces like the Boston Athenaeum, and along with his wife Sarah Elizabeth Murphy Johnston, a still life painter, raised a family of artists.

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[280] For more on the social operations of Johnston's humor, see: Jennifer A. Greenhill, "Playing the Fool: 'David Claypoole Johnston and the Menial Labor of Caricature,'" *American Art* 17, no. 3 (2003): 33–51; David Tatham, "D.C. Johnston's Pictorialization of Vernacular Humor in Jacksonian America," in *American Speech, 1600 to the Present*, ed. Peter Benes (Boston: Boston University, 1985), 107–19.

[281] Malcolm Johnson quotes Johnston's autobiography in a catalogue of the only monographic exhibition of his work, organized by the American Antiquarian Society in 1970: Malcolm Johnson, *David Claypool Johnston, American Graphic Humorist, 1798-1865* (Lunenburg, Vt.: Stinehour Press, 1970), 5.

[282] In 1834, Johnston provided a short autobiography to William Dunlap (1766-1839), an artist and playwright who took it upon himself to write the first history of American art. That history was published in 1834 and included an autobiography of Johnston alongside other American artists, including Benjamin West, who had been Dunlap's painting instructor in London. Selections from Dunlap's history were also published in period newspapers. William Dunlap, *History of the Rise and Progress of the Arts of Design in the United States* (George P. Scott and Co., Printers, 1834), 328, http://archive.org/details/historyriseandp00dunlgoog; Maura Lyons, *William Dunlap and the Construction of an American Art History* (Amherst: University of Massachusetts Press, 2005).

[283] David Tatham, *A Note about David Claypoole Johnston with a Check List of His Book Illustrations* (Syracuse: Syracuse University Press, 1970).

[284] A 1971 Ph.D. dissertation in history by Georgianne McVay delves into the history of this moniker, particularly the interchange between Johnston and Cruikshank's work: McVay Georgianne, "David Claypoole Johnston: America's Cruikshank" (University of Pennsylvania, 1971).

A recent study of Johnston describes the illustrator as "the best known and most popular American graphic artist of the first half of the nineteenth century."[285] Readers encountered his engravings in at least seventy illustrated books—some of the best-known titles included *The Dramatic Works of William Shakespeare* (New York: Durell, 1817-1818), Milton's *Paradise Lost* (Boston: Bedlington, 1825), and *The Thousand and One Nights, or the Arabian Nights' Entertainments* (Boston: Phillips, Sampson, 1852) (Fig. 3.4).[286] He regularly illustrated for some of the most popular periodicals of the day, including *Boston Monthly Magazine, Ballou's Pictorial, The Liberator, The New York Mirror, The Boston Notion, Brother Jonathan*, and many more (Fig. 3.5).[287] Thousands subscribed to his self-published periodical *Scraps*, an image-packed annual publication issued between 1828 and 1840, and for a final time in 1849. In *Scraps,* as well as a handful of other publications, Johnston wrote clever satirical texts to accompany his illustrations. He is best known today for his broadside political cartoons, which lambasted pillars of Jacksonian Democracy, issues of abolition and women's rights, temperance, religion, and more, and included some of the of the earliest mass-circulated lithographs in the United States.

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[285] Jack Larkin, Chief Historian Emeritus at Old Sturbridge Village, was at work on the first comprehensive biography of David Claypoole Johnston when he passed away unexpectedly in 2013. The following Common-Place article was published posthumously from that research. Jack Larkin, "What He Did For Love," *Common-Place* 13, no. 03 (2013), http://www.common-place-archives.org/vol-13/no-03/larkin/.

[286] David Tatham, "David Claypoole Johnston," in *American Book and Magazine Illustrators to 1920*, ed. Steven Escar Smith, Catherine A. Hastedt, and Donald H. Dyal, Dictionary of Literary Biography, v. 188 (Detroit: Gale Research, 1998).

[287] Tatham.

There has been a resurgence of scholarly interest in Johnston's work, particularly his painted compositions such as *Sound Asleep and Wide Awake or Marker & Sleeper* (1855, Fig. 3.6) and satirical single-sheet broadsides like *A Militia Muster* (1819, Fig. 3.7), *A Foot Race* (1824, Fig. 3.8), and *Richard III* (1828, Fig. 3.9).[288] Yet considering his mass appeal among nineteenth-century audiences, the extent of his professional and personal network, and the substantial archival material that exists to document both, it is surprising that there has still been no full-length study of his contributions to the landscape of antebellum American art.[289] As a result of this lacuna, his forays into moving pictures, which were part of an enduring interest in technical and mechanical printing innovations, have gone entirely unremarked upon in scholarship.[290]

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[288] More frequently, Johnston's work is discussed in passing, or supplied uncritically as an illustration of a particular historical event, usually by historians. A few examples that engage in sustained analysis of Johnston's work include: Greenhill, "Playing the Fool"; David Tatham, "David Claypoole Johnston's 'Militia Muster,'" *American Art Journal* 19, no. 2 (1987): 4; Amy Torbert, "Dissolving the Bonds: Robert Sayer and John Bennett, Print Publishers in an Age of Revolution" (University of Delaware, 2017).

[289] The closest thing to a monographic study of Johnston's work is a 1970 dissertation, Georgianne, "David Claypoole Johnston: America's Cruikshank."

[290] A glaring example of this is Malcolm Johnson's catalogue of Johnson's work, which features the movable Van Buren card on its cover, but does not remark upon the object or series whatsoever in its descriptive catalogue essay. Johnson, *David Claypool Johnston, American Graphic Humorist, 1798-1865*.

Johnston wrote and published his own autobiography, painstakingly saved every letter he received and each scrappy sketch and transfer rubbing that he ever produced, and passed his piles of paper on to his descendants. Houghton's Johnston archive is filled with hundreds of orange-chalked transfer rubbings, some as small as a postage stamp, evidence of a minor stage in artistic process preserved for more than a century. He left recipe books that preserve his ratios of pigment to medium, his printing techniques and shortcuts, and even step-by-step directions for virtuosic distractions such as engraving upon an eggshell.[291] He kept many of his print matrices—copper, wood, isinglass—as well, which can now be studied in public collections. The majority of those materials are at the American Antiquarian Society and Harvard's Houghton Library, within miles of where the artist lived, worked, and died.[292]

As a result of these preservationist strategies, David Claypoole Johnston's biography has far surpassed discussion of his work in scholarship and popular memory. Although those in search of details about the artist's life would be better off consulting one of these previous biographical publications, I have included a bare-bones outline of that story here for one key reason: it is rare that we know so much about the background, training, and professional priorities of a creator of metamorphic pictures.[293] As we have seen, biographical details are scant about Benjamin Sands (the creator of *The Metamorphosis* discussed in chapter one) and George Spratt (the author of *Obstetric Tables* discussed in chapter two). Furthermore, we know little about how these creators saw their movable pictures as participating in broader artistic contexts or individual artistic trajectories because they often did not identify as professional artists. Later in the century, creators of movable pictures who did indeed view themselves as artistic professionals found their identities subsumed within the larger publishing firms by whom they were employed. In this category are the illustrators who produced the United States' first pop-up books under the auspices of the McLoughlin Bros. Publishing Firm, discussed in this dissertation's conclusion.

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[291] Johnston's recipe for engraving upon an eggshell can be found in: David Claypoole Johnston, "Receipt Book" n.d., David Claypoole Johnston Drawings and Papers, Houghton Library, Harvard University. MS Am 1608, Folder 59.

[292] The extensive archival collections documenting Johnston's life and work offer rich opportunity for scholarship on a number of issues in antebellum American art, including social and professional artistic networks; the early illustrated book trade in America; the evolution of illustrated newspapers; printing techniques and issues of process; and many more. In addition to a microfilm of a private collection of papers in the Archives of American Art, these collections can be found in the following locations: David Claypoole Johnston Family Papers, 1824-1940, Mss miscellaneous boxes J, American Antiquarian Society, Worcester MA; David Claypoole Johnston Family Collection, 1815-1934, Graphic Arts, American Antiquarian Society, Worcester MA; David Claypoole Johnston Drawings and Papers (MS Am 1608). Houghton Library, Harvard University.

David Claypoole Johnston's metamorphic pictures provide a rare opportunity to examine how moving images functioned in the broader practice of professional artists in antebellum America. Johnston was active from roughly 1818 until 1863, dates which encompass an era of unprecedented transition in the landscape of visual culture, print circulation, and artistic technologies in the United States. Thus, situating these usually anonymous objects within one artist's own well-documented life and body of work opens up avenues for questions about how ephemeral and experimental pictures—a term I will use for printed matter that does not conform to popular categories including broadside, book or newspaper illustration, advertisement, and crucially attempts to push the boundaries of these genres through format or mechanical features—operated within a broader mass visual culture. For instance, when and why would an artist issue an experimental print? Were such objects created simultaneously alongside other projects, or one-offs created with scraps and leftovers during the interval between more important print runs? How did an artist envision the object's audiences, and what strategies did they use to market it alongside other works? How did experimental projects relate to past and future endeavors that dealt with different subjects or were created in alternative media? And finally, how might we imagine the professions and motivations of the creators behind the countless other examples of experimental ephemera that are not attached to a known identity?

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[293] A more extensive biography can be found here: Johnson, *David Claypool Johnston, American Graphic Humorist, 1798-1865*; Clarence S. Brigham, "David Claypoole Johnston: The American Cruikshank," *Proceedings of the American Antiquarian Society*, April 1940, 98–110.

Innovations in print format like Johnston's movable cards are usually dismissed as ephemeral novelties. The methodology I develop in this chapter calls, instead, for a closer analysis of such experimental products, which provide a rare glimpse into artistic decision-making processes. Johnston, for instance, did not intend to make a living on his playful novelties alone. Instead, he created his pull-tabs in the spaces between other more demanding and large- scaled projects. Johnston's movable ephemera functioned like connective tissue between old and new ideas—conceived at the end of one project, containing the grain or seed of projects to come.

David Claypoole Johnston's Pull-Tab Pictures

At first glance, the torn slip of thin, faintly lined paper is a jarring sight (Fig. 3.10). On its surface is a pencil sketch of a man in a suit jacket. His glossy dark hair curls around his jawline, crowned by a shiny top hat. He grasps a piece of paper in his hands, poised in front of his chest as if actively reading. There is no headline or layout to clue the viewer into the document's contents—perhaps he is reading a newspaper, or a freshly opened letter. But all of these details fall away upon studying the man's face. In the place of his eyes and mouth are three sharply excised holes. Rendered expressionless without these key signifiers of interiority, our dapper reader becomes a menacing, empty-eyed figure.

Three of these haunting sketches remain preserved in the Johnston Family Collection at the American Antiquarian Society. The top-hatted man has a mustachioed twin, likely another attempt at envisioning the same end product (Fig. 3.11). Red chalk was rubbed on the back of this sketch, indicating that it was used as a transfer drawing to incise the image upon a plate or stone. The third example provides a clue to what exactly that final work might be. Distinguished by the same empty eyes and mouth, figure three is dressed in Napoleonic garb: a feathered tricorn hat, high collar and cravat. Unlike the other two sketches, he is centered within a square pencil outline, about the size and shape of a rectangular trade card (Fig. 3.12). As this pencil outline suggests, the curious hole-punched drawings are preparatory sketches for a series of small-scale metamorphic cards. Each sketch represents the surface layer of a planned multi-layered device. A second slip of paper would be inserted beneath the punctured top sheet, marked with the missing puzzle pieces of the figure's mouth and eyes. Because the interior sheet was designed to move up and down with the pull of an attached paper tab, two versions of the figure's mouth and eyes are included-one a smile, and below it, a frown. A printed proof of a finished card clarifies the odd visual calculus involved in bringing these negative spaces together to form one image (Fig. 3.13).

Between 1837 and 1863, David Claypoole Johnston created at least eight versions of the pull-tab portrait format, each likely issued in large number, though there is not sufficient evidence to estimate exact print runs. He may have been inspired by German Biedermeier-era mechanical greeting cards or *ziehkarte*, popular in Europe in the 1820s and likely available in urban centers in the United States, which employed a similar pull-tab mechanism to animate subjects ranging from illicit lovers to orientalist caricature—see, for instance, two examples listed for sale in a recent London auction (Fig. 3.14.). Biedermeier mechanical cards were a much more popular format in Europe than they ever were in the United States—Johnston's are the only examples I have come across that were made by an American printer or publisher before the Civil War. His cards were sold at periodical shops, bookseller's shops, offices of engravers and lithographers, and anywhere else people could get their hands on print.[294] I have yet to locate the hat-wearing gentlemen among his printed cards, but it is possible that they were made into prints as well—as ephemeral objects, it is almost certain that the full run does not survive. A motley crew of politicians, drunkards, and dandies is instead featured in the corpus of extant examples.

Johnston's first card of the series is a hand-colored engraving titled "Before and After: A Locofoco Christmas Present" and subtitled "A Locofoco before the N.York election/after the N.York election" (Fig. 3.15). Shown in "before" and "after" states is a disreputable looking fellow, with rumpled dark hair and mutton chops creeping across his cheeks, ruddy from alcohol. His suit lapels flare outwards to reveal his sloppily tied ascot and upturned shirt collar. In the “before” state, his open, braying mouth displays several missing teeth, and his eyes are barely visible in a drunken squint. Pull the tab (in this first version, it is unmarked; later renditions instruct the user to “pull”) and he becomes chagrined and downcast, dismayed and embarrassed that his radical political party, the Locofoco Democrats, have lost. This card was issued in December 1837, after the Whigs walloped their competitors, the Locofoco and Tammany Hall factions of the Democratic Party, in the New York election, an event represented across a broad array of media including a lithographed broadside published by H.R. Robinson (Fig. 3.16). In “The Death of Old Tammany and His Wife Loco Foco,” the Locofoco party is caricatured as an Irish woman who sobs as she and her husband (Old Tammany, shown here as a stereotypical Native American figure) are crushed by the weight of a ballot box filled with votes against their cause. Surrounding the couple, Whigs, many of whom are recognizable figures in the newspaper and print trade, celebrate their victory triumphantly. Robinson’s cartoon captures the chaos of the electoral defeat, which stirred up significant interest in the period as the first time the city of New York had elected a Whig mayor and Common Council.[295]

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[294] Several of the cards list the place where they were sold, for instance, "Redding & Co., 8 State Street—Publisher," a periodical depot.

A string of tiny text at the bottom of the “Before and After” card reads: “Entered according to the act of Congress in the year 1837 by David C Johnston in the clerks office of the district court of Massachusetts.” Johnston used language pulled directly from federal copyright statues initially issued in 1802 and updated in 1831 to indicate his intent to protect his work from piracy.[296] This decision to preemptively protect his work from being stolen and copied suggests that Johnston anticipated a large print run, mass appeal, and wide circulation. Copyright and intellectual property was a longstanding concern of his, and was often explicitly addressed in his correspondences with publishers.[297]

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[295] David Tatham, *Prints and Printmakers of New York State, 1825-1940* (Syracuse University Press, 1986), 101.

Massachusetts newspapers frequently made mention of new works by their local caricaturist, including book illustrations, single-sheet prints, paintings, and the pull-tab cards. On December 28th, 1837, the *Boston Weekly Messenger* published the following announcement:

> *Before and After.—*Mr. D.C Johnston has published a very amusing caricature representing a Loco Foco, *before and after* the New York election. The metamorphosis in the features, exhibited in the engraving, is quite magical, and it aptly illustrates the effects which may be supposed to have been produced by the event which it is the design of the ingenious artist to commemorate."[298]

The nearby *Salem Gazette* issued a similar review the following day:

> If any one wishes to develop the wrinkles round his mouth, to broaden his nose below the bridge, to contract his eyes, and distend his mouth, let him look at Johnston's Loco Foco before and after the New York election. That Samuel [*sic*]

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[296] *Copyright Law Revision Studies Prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary. United States Senate Eighty-Sixth Congress, Second Session, Pursuant to S. Res. 240. Studies 7--7. Notice of Copyright* (United States Government Printing Office, Washington: Printed for the use of the Committee on the Judiciary, 1960), https://copyright.gov/history/studies/study7.pdf?loclr=blogpic.

[297] For example, see the following letter, in which Johnston offers to sell a publisher drawings "include[ing] the copy right." David Claypoole Johnston, "Letter from David Claypoole Johnston to Unnamed Publishers," July 7, 1855, David Claypoole Johnston Family Papers 1824-1940 Folder 4, American Antiquarian Society.

[298] "Before and After," *Boston Weekly Messenger*, December 28, 1837; "Before and After," *The Evening Star*, December 28, 1837.

> D.C. Johnston is accountable for many stitches in the sides of the good people of the Bay State.[299]

While the content of these reviews is unsurprising—audiences found the subject matter funny, entertaining, and enjoyed the "magic" of the pull-tab metamorphosis—the fact that they were reviewed at all is significant. Ephemera and novelties were rarely, if ever, given the same kind of attention that single-sheet prints or illustrated books garnered in the press as reviews or advertisements. Judging by the frequency of announcements regarding his work in area newspapers, denizens of Massachusetts were eager to know about any new experiment by their local artist.

Press interest in Johnston's print was likely intensified by the year of publication. 1837 is often identified as the locus of major political, economic, and social turbulence in the United States. The events of this pivotal year and the decade beyond (for recent scholarship has shown that the timeline is far from contained) did indeed have an outsized impact on Johnston and his professional identity as an artist. The following section, "Paper and Panic," will more thoroughly address these external forces. But in short, the 1837 "Locofoco Christmas Present" cards were introduced into a visual culture preoccupied with current political events, particularly elections and changeovers of political power. Johnston's cards did not exist in a vacuum – rather, they were distributed and viewed alongside an array of politically-engaged material texts produced by Johnston and his peers. These included broadsides like "Specie Claws" by New York engraver H.R. [Henry] Robinson, which comments on the ubiquity of political broadsides—i.e., its own format—by including tacked-up print portraits of Andrew Jackson and Martin Van

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[299] *The Salem Gazette*, December 29, 1837.

Buren on the background wall (Fig. 3.17). Single-sheet engraved prints like Robinson's and Johnston's, which were usually issued in small runs of approximately two hundred, were advertised in newspapers and sold at engravers, lithographers, printmakers', and booksellers' shops.[300] Although the elections of 1837 have melted away from historical memory for most, for period commentators, they functioned as a metonymic event that crystallized a string of sometimes intangible cultural and social transitions, including rampant poverty and wild land speculation, the passage of laws controlling the materials of currency such as the Specie Circular (passed in 1836, which outlawed payment for Western land in any currency other than gold or silver), and other events that upset the existing social order.

Capitalizing on the success of the 1837 Locofoco cards, Johnston revisited the mechanical format for the presidential election of 1840—an event still very much connected to the forces that inspired the 1837 cards. As Michael Leja has recently argued, the campaign of 1840, which pitted much-derided incumbent Martin Van Buren against Whig candidate and war hero William Henry Harrison, was the first to truly employ images on a mass scale.[301] Johnston joined the fray with a card featuring Martin Van Buren in all of his red-mutton-chopped glory (Fig. 3.18). Van Buren's political identity was, for Whigs like Johnston, inextricably tied to the financial crisis deeply felt across the United States. As the sitting president who brought predecessor Andrew Jackson's much-reviled Specie Circular into law, Whigs viewed Van Buren as responsible for the ensuing bank failures and rippling depressions.

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[300] This circulation figure comes from Georgia Brady Barnhill, *Political Cartoons at the American Antiquarian Society* ([Columbus, Ohio: Ohio State University Press, 1995), 35.

[301] Michael Leja, "Almanacs and the Image Campaign of 1840." Colloquium presentation at the University of Pennsylvania Department of the History of Art, Friday, September 4, 3015.

The incumbent president's reputation as an out-of-touch dandy is enforced by a luxurious suit, a brooch featuring the cameo portrait of his democratic predecessor Andrew Jackson, multiple rings on his fingers and an upturned pinky delicately grasping a golden goblet labeled with his initials, "MVB." In the card's "before" state, Van Buren grins at the viewer, captioned with the words "A Beautiful Goblet of White-House Champagne" in the box below him. Pulling the tab wipes the grin off his face—his expression turns to a gloomy pout, eyes shamefully averted. The caption below the figure has been replaced by "An Ugly *Mug* of Log-Cabin Hard Cider," which the artist has helpfully italicized to drive home the play on words: Van Buren lost to William Henry Harrison, touted by his supporters as a down-to-earth "log cabin and hard cider candidate,"—indeed, the goblet in his hand has transformed into a wooden tumbler labeled WHH—but it also slyly referenced Van Buren's own ugly mug. A question for future research is whether these cards were created after the election, or whether they were hopeful propaganda.

Moving Images and Mechanical Pictures

Johnston's pull-tab cards are a flat and static bunch, unconcerned with illusion or cinematic motion. Smug candidate Van Buren's transformation into embarrassed defeat could hardly be called a metamorphosis, although that was indeed the language used by period reviewers: it is as much a flip from before to after as it is a catalogue of the awkward the in-betweens. The tab, highlighted in many editions with an engraved instruction to "pull," makes the mechanism of its movement (and the artifice of its illusion) especially visible. Whether due to the object's age or its design, is impossible to move the tab in a clean, fluid motion. The hand-constructed paper mechanism moves jerkily, catching and tugging as paper meets paper and generates friction. As a result, each intermediate stage in the image's shift is visible before the user's eyes. Mid-way through the conversion from before to after, the paper pauses itself to reveal a garish Van Buren with negative space for eyes and teeth where his chin should be; his goblet is half-gold, half-wood (Fig. 3.19). These jerky movements trouble our understanding of what a moving image should look like and *how* it should operate, and in turn raise questions about what audiences expect and desire of formats with the capacity for expansion and transformation. Spliced and jerky moving images like the pull-tabs suggest that audiences engaged in processes of mental stitching, committing the previous stage to mind as the next image "buffered." If the cards' central trick—the visual humor of a quick-turn from "before" to "after"—was unsatisfyingly rough and disjointed, what then was the source of their appeal?

Johnston was familiar with other popular technologies of motion, especially those that are more readily categorized as proto-cinematic: panoramas, cycloramas, and other mass entertainments.[302] In the 1849 issue of *Scraps*, he parodied moving panoramas, hybrid spectacles of painting and performance that had entertained American audiences since the end of the eighteenth century. While most moving panoramas do not survive (often owing to the fiery special effects involved), period advertisements attest to their presence and popularity in cities including Boston, New York, and Philadelphia. In Boston alone, Johnston might have visited a moving panorama of the city of Athens in 1837,[303] or rotating scenes including "a storm," "Battle of bunker hill," "fairy land," "a rural landscape," and "a night scene" at Boston's Amory Hall in 1839.[304] Moving picture shows on topics ranging from the Holy Land to the Mississippi river to natural wonders like the Mammoth Caves passed through the city throughout the 1840s.[305] It was no wonder that Johnston parodied the format—and its outsized impact on the press—In *Scraps* in 1849. The vignette shows “Raphaelle Vildaub” painting an endless spool of canvas with a vat of lamp black pigment. A caption reads: “this selection, says the *Daily Snob*, which for strength, & force of color, is unequaled by the most powerful of the old masters, embraces that portion of time when DARKNESS WAS THE FACE OF THE DEEP, & truly may it be said the artist has left nothing to be desired, save a mile or two more of canvas…” (Fig. 3.20). With this vignette, the artist parodies the spectator so anxious to experience the much talked-about spectacle of the panorama that he fails to see that the emperor has no clothes, so to speak.

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[302] Jeffrey Ruggles has suggested that David Claypoole Johnston was one of three Boston painters who created a moving panorama of Henry "Box" Brown's legendary escape from slavery via the mail, "Henry Box Brown's Mirror of Slavery." Whether or not Johnston was indeed one of these artists, he would have been familiar with spectacles of movement like the panorama that concentrate on more illusionistic and performative forms of movement. DCJ also included a panorama scene in 1849 scraps. Jeffrey Ruggles, *The Unboxing of Henry Brown* (Richmond: Library of Virginia, 2003), 75.

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[303] Henry Aston Barker et al., eds., *Description of the View of Athens, and Surrounding Country;: With an Improved Explanation, Giving a Complete Outline of the Whole Picture. With Numbers and References.: This Panorama Was Painted by Messrs. Barker and Burford from Drawings Taken from the Most Elevated Part of the Museum Hill, by Signor Pomardi, a Roman Artist, Whom Mr. Dodwell Employed in Aiding Him to Form a Collection of Views in Greece: Which with Mr. Dodwell's Travels in That Country, Have Been Published in London. The Point Was Chosen by Mr. Dodwell, as Being the Only One from Whence All the Interesting Objects in the Vicinity of Athens Could Be Seen. The Perfect Accuracy of the View Has Been Admitted by All Who Have Visited Athens, and Seen the Panorama in Progress. To Mr. Robert Cockrell, Who Has Lately Returned from Greece, Messrs. Barker and Burford Were Indebted for Much Useful Information, and Drawings of Several of the Principal Figures, in Their Correct Costume. In the Following Description, It Is Only Intended to Give Such an Account of the Most Important Objects as May Render Them Interesting to the Visitors of the Panorama When in the Room: To Those Who Wish for More Detailed Information, the Excellent Works of Stuart, and the Travels of Chandler Are Recommended* (Boston: Press of W.W. Clapp, 1837).

[304] Lewis, Bartholomew & Co and Clapp & Son's Press, eds., *A Storm! Another New Scene!! At Amory Hall.: Positively the Last Week. The Public Are Respectfully Informed That in Consequence of the Inclemency of the Weather for Several Evenings the Past Two Weeks, That the Battle of Bunker Hill! Fairy Land, &c. Will Remain in This City One Week Longer, and Then Close. Rural Landscape with Figures, Cattle, Sheep, &c. in Motion Will Be Added, on Monday Evening, April 22, 1839* (Boston: From the press of W.W. Clapp & Son, 1839).

[305] Lower Music Hall (Boston, Mass.) and Boston Mammoth Steam Job Printing Establishments, eds., *Banvard's Great Panorama of the Holy Land, and Magnificent Mechanical Picture of the Destruction of Jersusalem, Now on Exhibition, at the Lower Music Hall, Winter Street, Boston* (Boston: Boston Mammoth Steam Job Printing Establishments, 2 Spring Lane, and 32 Congress Street, 1846); Lower Music Hall (Boston, Mass.) and Boston Mammoth Steam Job Printing Establishments; Walter McPherson Bayne, ed., *Amory Hall. Washington Street: Open Every Evening. Great Success of Bayne's Gigantic Panoramic Picture of a Voyage to Europe! Comprises Views of Boston, Its Harbor, the Atlantic, the River Mersey, Liverpool, London from the Thames, and Both Sides of the Rhine, Painted from Original Sketches Taken by the Artist Himself, Constituting by Far the Largest Panorama Ever Presented to the Public, and Which Has Been in Preparation Upwards of Three Years*

Peep-shows, magic lanterns, and dissolving views also appeared in Johnston’s oeuvre. An undated woodblock held by the American Antiquarian Society shows a spectator hunched over, peering through the lens of a peep-box (Fig. 3.21). While the block has clearly been inked and cleaned, suggesting that it has been used to pull prints, I have not located an extant impression. Carved into the dark wooden surface, a showman hovers behind the box, operating the spectacle from a lever at the back. On the back of the block, in Johnston’s hand, is the following description:

> Showman- Taking a peep in a Magical Showbox….you are now looking down Pennsylvania Avenue, in the distance you perceive a white house; keep your eye on it and you will see it dissolve and disappear.

Dissolving views were glass slides, usually hand-painted, that “transformed” with manipulation of a light source enclosed in the viewing box. Though the transformations were usually simple—day to night, summer to winter, and so on—their goal was to mask

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(Boston: s.n, 1847); *Strong’s Alphabetical Panorama* (New-York: T.W. Strong, 98 Nassau Street. Boston: -- G.W. Cottrell & Co, 1845).

the mechanism of the illusion from the viewer. Johnston's joke hinges on an understanding of how this form of movement operates—that the white house, or the seat of political power, could slip away before the viewer's very eyes.

I raise these examples of Johnston's fluency with immersive and illusionistic forms of moving images to emphasize that the mechanical movements of the pull-tabs were a conscious and alternative choice. Johnston knew how panoramas and peep-shows operated and that they were popular formats with Boston audiences. As a former actor and talented artist, he could have easily engaged in the business of theatrical moving picture shows. But he saw these mass entertainments as sources of satire rather than of potential income. Historical perspective allows us to see the pull-tabs as part of a broader spectrum of moving images, but for Johnston and for his audiences, these objects existed adjacent to the mainstream landscape of moving images. Instead, the compressed two-in-one format offered a space to think through issues of surface, space, and physical interaction with paper material itself.

Considering Johnston's mechanical experiments through the eyes of a midcentury viewer requires that we reexamine longstanding notions of "moving images" as a monolithic and ultimately cinematic category. Visual cultural formats that were defined by movement but not by their illusionistic or immersive qualities demand new contextualization beyond frameworks of theatrical and entertainment culture. Johnston's pull-tab cards offer an experimental case study for understanding how and why mechanical formats resonated with American audiences. In the case of the pull-tabs, quick changes of facial expression echoed the rollercoaster of the moment's political fortunes, in which one’s candidate could fall out of favor in the blink of an eye, smartly packaging an experience commonly felt in an age of unprecedented political polarization.

Recycling, Repurposing, and Reuse

Van Buren cards survive in large quantities, which suggests that they found a welcoming audience in the climate of the image campaign of the 1840s. But despite the success of these early forays into mechanical formats, Johnston did not return to moving images for another eight years, until 1848. The cards he issued between that date and 1863, when he published a final specimen caricaturing Confederate leader Jefferson Davis, depart from these earlier examples in their negotiation of the material surface. In the election of 1848, Johnston repurposed the Locofoco plate to skewer a Democratic Lewis Cass supporter after learning his candidate had lost to the Whig Zachary Taylor. The American Antiquarian Society holds five variants of this particular run, which are titled “A Locofoco Before and After the Late Election,” and proclaim “Hurra for Cass!”/ “What! Old Zack Elected!” in the caption box (Fig. 3.22). Four years later, the same gap-toothed drunkard reappears as a character dubbed “Jonathan Soaker,” a booze-loving fellow who is outraged to learn about the 1852 Massachusetts liquor law, which placed significant limits on the sale of spirits. Although the character is recognizable from the earlier cards, Johnston either re-engraved the image on a new plate or made significant changes to the existing matrix, perhaps due to wear from multiple print runs. In his makeover, his nose is more bulbous, lips more prominent, and the hand-coloring consistently exaggerates pimples and pockmarks across his cheeks with saturated swaths of red (Fig. 3.23).[306] He appears again as a "Fremonter" in 1852, a "Buchan-eer" in 1856, and finally, as a figure without any description at all (Fig. 3.24).

The red-faced man's final appearance departs from the other cards in both its subject matter and material qualities. Most overtly, its subject matter is apolitical. Unlike every other example in the series, which explicitly referenced an election, political party, or political event, this card makes no mention of current news. In lieu of an identifying header or changeable caption box, Johnston has pasted a slip of printed text below the portrait, which reads:

HURRAH! For the Fair,
We'll banish all care,
But the paper below don't you pull;
Because if you do,
I shall feel rather blue,
And look like a roaring mad bull.

Johnston wrote this verse specifically for this edition of the pull-tab card. I have found no other trace of it in the period literature. But the poem's lack of clear or immediate relationship to the illustration raises questions about why he would alter the preexisting image in this way. Why add this particular text to an already completed portrait? What did he want to cover up? There are two of these pasted-over examples at AAS, and I have seen at least three more at auction. The pasted-over cards were as much of a new "edition" as any other instance, not simply a one-off constructed to cover a mistake. The poem functions as an additive erasure – an inconsequential text that exists only to block what lies beneath. Looking closely at this material curiosity reveals that this moment of surface alteration is just the tip of the iceberg in the artist's oeuvre.

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[306] In light of Jennifer Greenhill's work on Johnston's racial caricature, it is worth investigating whether these figures are meant to convey pejorative racial stereotypes of the Irish. Greenhill, "Playing the Fool."

The American Antiquarian Society holds twenty-four of the pull-tab cards, which is the largest single public collection of which I am aware. While a fellow at the Society in October 2016 and June 2017, I spent several days under the dome with all two dozen cards spread out across the table before me. In the reading room's shifting light, details emerged that set the clusters of red-faced men and sneering politicians subtly apart from one another. Viewed in direct and raking light and through the lens of a magnifying glass, I noticed details in the paper surfaces that disclose the artist's practices of alteration and revision—in particular, scratch marks, pasted-over text, and palimpsests of burnished and sloppily canceled etching. Johnston was actively reusing previous copperplates and burnishing (erasing) old text to make new cards. Some Buchaneers have the scraped-out headline "Jonathan Soaker" clearly visible below the surface; Jonathan Soaker harbors the ghostly imprints of the earlier Locofoco cards, and so on (Fig. 3.25). These palimpsests are the residue of Johnston's attempts to "erase" through the process of burnishing, in which the artist uses a curved tool to rub away engraved lines, pushing the metal down and inwards, and tapping from the back of the plate to ensure that a depression does not form and to maintain flatness. Burnishing was a run-of-the-mill technique for metal engravers since the earliest days of printmaking, and would have been a component of any practical engraver's method.[307]

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[307] Ad Stijnman, *Engraving and Etching 1400-2000: A History of the Development of Manual Intaglio Printmaking Processes* (London : Houten, Netherlands: Archetype Publications ; in association with HES & De Graaf Publishers BV, 2012), 152–53.

But, importantly, Johnston's methods of alteration did not stop with burnishing, which he clearly did quickly and not very carefully, considering how visible past imprints are on the surfaces of much of his stock. This standard workshop technique was just one part of a broader set of experimental and slapdash techniques of alteration. He also etched on top of old designs, pasted hand-cut paper slips over outdated information, and essentially did as much as he could to retain the use value of old stock in metal and paper. Recycling and reuse of surfaces and materials was a key artistic concern.

Because Johnston worked and re-worked this material over a twenty-five-year period on what may have been only three copperplates, the level of material revision is extraordinarily high. It speaks to two key and related concerns: the importance of an economy of materials, as well as the function of the movable print as an experimental surface, a waystation for testing out ideas not yet ready for the expense of new metal and paper, or the labor of a full print run. As I have already suggested, the pull-tabs were never quite an end in themselves—they were a space to work out ideas about movement, weight, and the use of space and surface in a broader artistic vision.

Johnston's impulse to refresh old products with new, event-specific information is linked to period notions of the temporality of novelty. "Novelty"-- by the Oxford English Dictionary's definition, "something new, not previously experienced, unusual, or unfamiliar; a novel thing"—is a term often associated with paper ephemera of the eighteenth and nineteenth centuries.[308] Despite the frequency with which experimental prints are designated (and usually dismissed) as novelties, the term has never been adequately unpacked as either a material or historic category. Did period viewers have a concept of "novelty," and if so, what were its associations with notions of value, creativity, and use? Furthermore, how might we push back on the idea that novelties were standalone or one-off productions, and consider the role that they played in an artist's broader practice?

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[308] A clear example of this designation can be found in the title of Peter Haining's catalogue of movable books, one of the only published studies on the topic: Haining, *Movable Books*; "Novelty, n. and Adj.," *Oxford English Dictionary Online* (Oxford University Press, June 2017), http://www.oed.com/view/Entry/128781; Noah Webster and Hezekiah Howe, "Novelty," *An American Dictionary of the English Language: Intended to Exhibit, I. The Origin, Affinities and*

Johnston was certainly invested in providing his customers and audiences with something not previously experienced. This took on several forms in his work, from sheer piracy of European concepts for American audiences, to technical innovations previously untested among American artists. Sometimes, Johnston falsely claimed trailblazer status, for instance proclaiming he had made the first lithograph in the United States in 1825 (Bass Otis had actually beat him to the punch by six years). How, then, should we understand the pull-tab cards in relation to this inchoate notion of "novelty," especially considering the artist's own interest in technological and imaginative innovation?

A historicization of "novelty" is a helpful first step. These cards participated in an established tradition of printed souvenirs and novelties that were often issued around holidays. As writer and art critic (and Johnston patron) John Neal remarked:

> One word to the publishers of our country who are embarked in these and other costly enterprises of a similar nature. Their new-year's gifts and Christmas-

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Primary Signification of English Words, as Far as They Have Been Ascertained. II. The Genuine Orthography and Pronunciation of Words, According to General Usage, or to Just Principles of Analogy. III. Accurate and Discriminating Definitions, with Numerous Authorities and Illustrations. To Which Are Prefixed, an Introductory Dissertation on the Origin, History and Connection of the Languages of Western Asia and of Europe, and a Concise Grammar of the English Language (New York : S. Converse, 1828), http://archive.org/details/americandictiona02websrich.

> presents—are entirely out of season. The original object is lost sight of. All these keep-sakes are old stories, familiar to everybody, on every body's table, and in every body's way, long and long before the hour of rightful presentation arrives. What would be said of a dealer in prepared, spider-net valentines, if he were to bring them out in mid-winter, on the fourth of July, or on the first of April? But a word to the wise may be, and we hope will be – enough. Depend upon it that he who keeps back his Christmas-gifts till the very day when Christmas-gifts are *wanted*, will gain more by his self-denial, than others do by their eagerness and precipitation. As well may you wash your face a month beforehand, as finish an article of this necessity before the appointed day. It is *novelty* men want for Christmas-boxes—and we have yet to know that women and children are wiser than men in this particular. Next Christmas-morning, and the next new-year's day, if there should be any publisher prepared with a keepsake which nobody out of school has had a sight of, depend upon it that he will sweep away the whole cream of the trade for this year. By that time all the British and American annuals will have passed through every neighborhood, if not through every circulating library of our country.[309]

Neal's commentary reveals, first and foremost, that nineteenth-century audiences did indeed use the term novelty in relation to printed ephemera—and secondly, that these objects' value was primarily linked to temporality. He stresses Americans' appetite for the excitement of something fresh and new, particularly heightened by quick-moving fashions and tastes. Ultimately, Johnston's practices of recycling and reuse emerge, in part, from this emphasis on the short temporal window of the novelty.

Material Concerns

In 1837, the same year that Johnston began the pull-tabs series, the seventh edition of his comic annual *Scraps* was published. The comic periodical series, which was published in eight editions between 1828 and 1849, is the work for which Johnston is best known. Inspired by George Cruikshank's *Scraps and Sketches*, which was published in London between 1828 and 1832, the pamphlet's sheets were filled with etched and engraved vignettes that cleverly parodied everything from the Temperance movement to phrenology to overconfident art patrons. On the final page of the 1837 issue, he included a small self-portrait titled "Number or Calculation (Fig. 3.26)." In the vignette, the artist sits at a table piled with books (Gall, Spurzheim, Combe--sources for the phrenological text at the issue's start), and holds in his hands issue seven of *Scraps*.[310] "Let me calculate," he muses as he looks over his new publication. "Here are four plates, each containing about twelve illustrations; four times twelve are forty eight—forty eight for one dollar & a quarter, bless my soul! A fraction over two cents per sketch! & no charge for letter-press matter!!! VERY cheap is't not?"[311] This tongue-in-cheek parody of the artist's own frugality found many real-life parallels in his collaborations with printers, publishers, and authors, as well as in the material qualities of the work itself.

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[309] John Neal and Harold E. Dickson, *Observations on American Art: Selections from the Writings of John Neal (1793-1876)*, [Pennsylvania State College] The Pennsylvania State College Studies, no. 12 (State College, Pa: Pennsylvania State College, 1943), 63.

Like many of his peers in the increasingly competitive world of graphic print, Johnston was an entrepreneur who worked to balance relevance of subject matter with production costs. Comparison of the pull-tab cards, especially the many re-issued versions of the dark-haired man between 1837 and 1856, makes clear that before making major changes to iconography and subject matter, which would require purchasing more copper—the most expensive material in his arsenal—he turned to material strategies of reuse. Interventions into plates, ink, paper, and format were key to maintaining the balance between economy and marketability. His keen interest in creative approaches to material and process was not limited to the pull-tab cards, but rather was a theme across most of his career. In this way, examining the mechanisms of Johnston's moving images opens up questions about the motivations and meanings of formal qualities in his broader body of work that would otherwise go unnoticed. Two bodies of evidence provide more insight into Johnston's concern with materially-inspired strategies of compression and preservation: a receipt (recipe) book made during his time as a young apprentice, and his correspondence with publishers, postal workers, authors, and patrons.

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[310] Johnston references Franz Joseph Gall, Johann Spurzheim, and George Combe, authors of phrenological texts well-known in the early nineteenth century.

[311] "Phrenology Exemplified and Illustrated or Scraps No. 7 by D.C. Johnston, Boston, 1837," Becker Medical Library, accessed June 19, 2017, https://becker.wustl.edu/about/news/phrenology-exemplified-and-illustrated-or-scraps-no-7-dc-johnston-boston-1837.

Sometime during Johnston's apprenticeship with Philadelphia engraver Francis Kearney, he purchased a blank blue-covered book from local booksellers S.W. Conrad at 87 Market Street (Fig. 3.27).[312] In neat cursive script, he jotted down "receipts" for each step in the practice of engraving. There are formulas for mixing any conceivable type of ground (a waxy, acid-resistant substance that coats the copperplate and a key stage in the process of etching and engraving): hard, soft, serpentine varnished, even formulas that would react more reliably in the cold of winter or the heat of summer. He recorded instructions for stopping out—a method for controlling acid's bite into an engraved line and therefore the width and darkness of the resulting print—and for making "lovely colors" and various inks. Outlines for non-copperplate engraving methods, for instance "the process of engraving in aquatint," a "method of etching upon glass," "etching on steel," "method of engraving upon an eggshell," and even "a new method of drawing upon stone"—i.e. lithography—are copied with particular care.

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[312] Johnston was apprenticed to Kearney from 1815-1819, when he turned twenty one. S.W. Fores was only at the address on the cover of the blank book until 1818, so it is likely that he purchased this during his apprenticeship.

Johnston copied these recipes wholesale from John Hippisley Green's *The Complete Aquatinter*, first printed in London for the author in 1801.[313] It was reprinted until at least 1810 (though never by an American publisher) and was thus sold as a more expensive British import in United States booksellers' shops.[314] As a young apprentice who had not yet had the opportunity to travel to Europe to train with academic artists, Johnston valued these recipes greatly. Not in a financial position to purchase the expensive London imprint for his own library, he copied the formulas out in their entirety to keep on hand for reference, a task that would have taken hours (and may have helped him commit formulas to memory). On a blank label on the book's cover, he wrote "D.C.

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[313] John Hippisley Green, *The Complete Aquatinter: Being the Whole Process of Etching and Engraving in Aquatinta: The Method of Using the Aquafortis, with All the Necessary Tools: To Which Are Added Upwards of Fifty of the Best Receipts for Grounds, Varnishes, &c.: Collected from near a Hundred That Are Most in Use: The Difficulties Which May Possibly Occur, Are Point out, and the Method of Obviating Them: The Whole Rendered Clear and Practical*, First edition (London: Printed for J.H. Green, book and printseller, 1801).

[314] American-published recipe books that Johnston could have consulted include: Joseph Bumstead and John G. Holland, eds., *Valuable Secrets, Concerning Arts and Trades. Or, Approved Directions from the Best Artists,: For the Various Methods of Engraving on Brass, Copper, or Steel. Of the Composition of Metals and Varnishes. Of Mastichs and Cements, Sealing-Wax, &c. Of Colours and Painting, for Carriage-Painters. Of Painting on Paper. Of Compositions from Limners. Of Transparent Colours. How to Dye Skins or Gloves. To Colour or Varnish Copper-Plate Prints. Of Painting on Glass. Of Colours of All Sorts for Oil, Water, and Crayons. Of the Art of Gilding. Of the Art of Dying Woods, Bones, &c. Of the Art of Moulding. Of the Art of Making Wines. Of the Various Compostions of Vinegars. Of Liquors and Essential Oils. Of the Confectionary Art. Of Taking out All Sorts of Spots and Stains.: With an Appendix, Containing Valuable Selections, in Addition to, and Never before Published in This Work.: [One Line in Latin from Virgil]*, Third American edition (Boston: From J. Bumstead's printing-office, Union-Street, 1798); Friend to American manufactures et al., eds., *The Artist's Companion, and Manufacturer's Guide.: Consisting of the Most Valuable Secrets in Arts and Trades.: Calico Printing--Bleaching of Cotton and Paper--Dyeing of Wood, Bones, &c. Engraving and Etching on Copper--Engraving in Aquatinta--Engraving on Wood. Dyeing of Various Colours--Manufacture of Glass, Pottery, Beer, &c.: With above Five Hundred Valuable Modern Receipts; Forming a Great Variety of Useful Articles, Collected from the Latest European Publications* (Boston: Published by J. Norman, chart-seller, no. 1, North-Row. E.G. House, printer, 1814).

Johnston Receipts," indicating his ownership over these hard-won outlines of process and ingredients. The receipt book is rare evidence of the artist's attention to precision of weights, measures, protocol, and the elimination of excess material and time.

Also in Houghton's uncatalogued Johnston archive are an especially intriguing set of matrices that speak to the artist's commitment to experimental and creative methods of economizing his practice. Described by a short type-written caption on the archival folder's exterior as "engravings on isinglass," the translucent surfaces are fragile and brittle, marked by spindly, shallowly incised lines (Fig. 3.28). Isinglass is a collagen substance made from fish bladders, and is a material still used in current conservation practice as an adhesive. When spread in a thin layer and allowed to harden, it has the appearance of a cloudy plastic. In Johnston's day, printmakers were experimenting with using the substance to make the process of transferring image to block more efficient and easily replicated.[315] In April 1834, London printmaker Charles Hullmandell (incidentally, one of the first printers of Spratt's *Obstetric Tables*) applied for a patent for the use of "isinglass paper" in the process of "putting on," in which he outlined a method of transferring images from an engraving to isinglass with the aid of a piece of oiled silk, avoiding the need for a copperplate altogether. Indeed, it appears that Johnston used isinglass to facilitate transfer, as the thinly etched images on the transparent isinglass surfaces are copied directly from George Cruikshank's illustrations for Charles Dickens' *Sketches by Boz* (Fig. 3.29). Several of the plates have traces of ink remaining in their shallow incisions, suggesting that they were used to pull prints. As Cruikshank's copperplate engravings for *Sketches by Boz* were included in editions published from 1836 onwards, Johnston likely engaged in these experimental forms of copying in the late 1830s or early 1840s, a timeframe that corresponds with his growing interest in creative modes of economizing his artistic practice.

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[315] William Newton, *The London Journal of Arts and Sciences, and Repertory of Patent Inventions* (Sherwood, Gilbert, and Piper, 1836), 94.

Quality of materials was also a fundamental concern. Johnston's correspondences regarding commissions reflect a constant negotiation of the size, heft, cost, and provenance of metal, ink, and paper. For instance, between 1830 and 1833, he exchanged many letters with the New York publishing firm Ilman & Pilbrow regarding the purchase of materials and the sale of his products in the New York market. Many of these letters focus on the weight, dimensions, and overall quality of the copper plates Johnston used to create *Scraps* and other prints. In early November 1833, after years of exchanging metal through the mail, Ilman & Pilbrow wrote to Johnston with excitement. They had located an unusually cheap source of copper, coming in at just 2 ½ cents per centimeter.[316] A parcel containing two 28 by 36 centimeter sheets were on the way to him in Boston. Just two weeks later, the firm wrote back to their Boston client expressing their regrets.[317] Johnston had refused the "lowest that can be afforded" copper and sent it back to its source, unhappy with its poor, cheap quality.

By the early 1830s, shifts in the public appetite for images went hand-in-hand with pressure for cheaper and faster picture-making technologies. In the early years of

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[316] Ilman & Pilbrow, "Letter from Ilman & Pilbrow to David Claypoole Johnston," November 2, 1833, David Claypoole Johnston Family Papers 1824-1940 Folder 4, American Antiquarian Society.

[317] Ilman & Pilbrow, "Letter from Ilman & Pilbrow to David Claypoole Johnston," November 19, 1833, David Claypoole Johnston Family Papers 1824-1940 Folder 4, American Antiquarian Society.

Johnston's career, single-sheet engravings like "Militia Muster," (c. 1828, Fig. 3.7) which centered on a single event, could sustain interest and sales months and even years after their issue.[318] This was no longer the case in an era of an emerging mass visual culture, in which audience's attention spans were re-fitted to a fast-moving news cycle. Johnston, who was a holdout for the expensive medium of copper in a moment when it was quickly being replaced by cheaper and faster technologies—wood engraving and lithography, especially—was forced to recalibrate both his materials costs and the content and format of the images he produced. Yet, as his letters show, he wanted his copper to be *good* copper. The availability of less expensive matrices may have reinforced this attitude –if one is already going to splurge for metal, why skimp? Johnston was no luddite: he was proficient in new printmaking technologies, and as evidenced by examples like his Pendleton-commissioned lithographic copies of British mezzotints retitled "A New Method of Macaroni Making as Practised at Boston," he could draw on stone with the best of them. But he gravitated to copper because of its ability to support the finest lines and spindliest sketches, crucial qualities for an artist prone to working tight and small.

I am interested in the strategies Johnston developed to simultaneously support his penchant for good quality materials and still stay in the black financially. Of course, investment in the quality of materials in light of one’s financial bottom line was not at all a concern unique to Johnston. On the contrary, the manifestation of these materialist concerns in the formal qualities of his artwork makes visible how common and socially-rooted this issue was in the antebellum era. In addition to high quality metal, Johnston chose his inks and paper with great care. As a result of these material expenses, he was especially conscious of how the cost/benefit ratios worked out for every slip of printed paper that left his studio. Balancing materials cost with income from sales required multiple types of mediation. Johnston counterbalanced these up-front expenses with strategic negotiation of the weight and size of paper – as reflected by both the formal qualities of his work and his dealings with the post office and the system of sending objects through the mail.

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[318] Johnston referenced on the popularity of his own work across media, for instance, in "An Accidental but candid confession," a pen and wash scene made around 1819. The image shows the interior of a print shop, where an angry customer is in an altercation with a printseller behind the counter. In prominent view on the counter is an account book labeled "Subscription names for Militia Muster Vol 8," one of Johnston's well-known titles, and on the shelves in the rear are behind him are engravings and litho stones, one of which reads "10,000 impressions militia muster sold for cash." Nearby, two men engage in conversation about a print that one of them holds: "How can you sell them our Militia Muster?" "25 cents each" "Well I'll take on but I tell you what any man that would buy such a thing is a d-n rascal. I none but a d-n rascal would sell em" "The very man himself by heavens!." The drawing is located in Box 5 Folder 1.2 , David Claypoole Johnston et al., *David Claypoole Johnston Family Collection*, n.d., n.d. American Antiquarian Society.

Print and the Post

Johnston’s repurposing tactics introduce productive friction into narratives of the transmission of print that figure circulation as a clean circuit—flowing, flooding, and saturating markets with no attention to the stuttering and obstacles posed by antebellum systems of transport. As investigations of the mobility of objects across geographic distances increase, scholars have begun to productively complicate idealized and too-clean notions of “circulation.” Studies of the transmission of material texts such as Sonia Hazard’s dissertation “The Touch of the Word: Evangelical Cultures of Print in Antebellum America,” (Duke, 2017) which attends to the messy work involved in “circulating” mass-produced religious tract pamphlets in the antebellum era—exhausting and non-linear labor that involved colporteurs climbing mountains and tricking their way into homes to deliver their wares to readers' hands—make clear that the transmission of print was never as easy as traveling from point A to point B.[319] In art history, Jennifer Roberts' *Transporting Visions* (2014) reoriented the field's attention to the ways in which American artists of the same period embedded concerns about similarly difficult processes for the physical transit of images across space in their very form and material. The book's case studies oscillate between movement and stillness, from paintings shipped in cargo holds across the Atlantic to elephant folios so heavy that they resisted the portability that is characteristically expected of material texts.[320] The developing antebellum American postal system, yet to be addressed in art historical accounts of transmission and mobility, was exactly the type of cultural force that caused artists to reconsider form and iconography in terms of transit—in ways both practical and conceptual.[321]

The period between 1820 and 1870 ushered in a total revolution in the American postal system, in terms of both volume and perception of access.[322] By the Civil War, a system that had once carried fewer than 27 million letters annually became easier and faster to use, eventually transporting about 161 million letters in 1860.[323] Laws passed in 1845 and 1851 dramatically lowered the cost of sending things through the mail and expanded the possibilities for what kinds of objects could be transported through the post, including newspapers, letters, daguerreotypes, and more. Before 1845, anything other than a printed pamphlet or a newspaper would have been prohibitively expensive to send via the USPS, and individuals wishing to send larger or more complicated matter through the mail would have been forced to turn to one of many private parcel shippers to meet their need.[324]

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[319] I am grateful to Sonia Hazard for sharing her unpublished research on this topic with me, which we have discussed in seminars at Rare Book School and the McNeil Center for Early American Studies' Early American Literature and Material Texts Workshops. Hazard, Sonia. "How to Do Things with Tracts: The American Tract Society and the Burdens of Circulation." Chapter one in "The Touch of the Word: Evangelical Cultures of Print in Antebellum America." Ph.D. Dissertation, Duke University, 2017. See particularly "The idea of Circulation," p. 98-109.

[320] Jennifer L Roberts, *Transporting visions: the movement of images in early America* (Berkeley: University of California Press, 2014).

[321] While art historians have yet to take up the antebellum American postal service as a force shaping creative and aesthetic decisions, a recent dissertation addresses its impact on the transmission of literature. I am grateful to Christy for sharing her unpublished research with me. Christy Pottroff, "Citizen Technologies: The U.S. Post Office and the Transformation of Early American Literature" (Fordham University, 2017).

[322] David M. Henkin, *The Postal Age: The Emergence of Modern Communications in Nineteenth-Century America* (Chicago: University Of Chicago Press, 2006); Richard R. John, *Spreading the*

Johnston's career maps tightly on to these dates of postal transformation. He began his career as an independent artist in 1819, when transporting paper media through the mail system was possible yet tricky, inconsistent, and unreliable. By the end of his life in 1865, rates for various printed formats had been codified and standardized by the U.S. Postal service, which carried printed pamphlets, illustrated newspapers and periodicals, comic annuals, and various ephemera through the mail alongside handwritten correspondence in high volumes. In 1845, when people began to use envelopes to send matter through the mail, rates began to be calculated by weight rather than by sheets, which in most cases offered a drastic price reduction. Johnston's most active period,

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News: The American Postal System from Franklin to Morse (Cambridge, Mass: Harvard University Press, 1995).

[323] Henkin, *The Postal Age*, 3.

[324] Hollis Robbins, "Fugitive Mail: The Deliverance of Henry 'Box' Brown and Antebellum Postal Politics," *American Studies* 50, no. 1 (March 3, 2011): 5–25.

roughly 1825-1845, offers rich evidence about an unstudied topic: how graphic artists negotiated this major transformation in the circulation of print across the United States.

During these decades, Johnston was frequently in direct communication with the postal service about how much his printed matter would cost to send through the mail. The assigned prices had major impact on his ability to sell his work beyond a local market. As an artist whose works were for the most part sold quite cheaply, Johnston could not live on sales from the local Massachusetts market alone. It was important to be able to ship his work to New York, Philadelphia, Baltimore and beyond, both in large quantities to be sold by bookseller-agents in each city, and also to individual patrons and subscribers. An exchange with the Boston post office regarding Johnston's *Scraps* shows that weight and format, particularly the number of sheets in a printed item, were the deciding factors. In April 1830, Johnston sent Boston postmaster general Nathaniel Greene a proof of the third edition of his comic annual to assign its postage fees. An agent of the office replied on Greene's behalf:

> Sir, the post master general thanks you for two numbers of the Scrap book which accompanied your letter of the 29th and has decided that it is subject to be charged with postage by the sheet, the same as periodical pamphlets.[325]

Significantly, the post office agents declared that they would treat Johnston's publication by the number of sheets it included, rather than by a more holistic measure like weight or scale. By this logic, two publications could contain equal amounts of paper, but cost radically different amounts. A single-sheet print folded in half once to form a folio pamphlet would cost double the postage, but would contain exactly the same amount of paper. Flatness was a desirable quality charged with meaning.

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[325] Nathaniel Greene, "Letter to David Claypoole Johnston from Boston Post Office Department," May 6, 1830, David Claypoole Johnston Family Papers 1824-1940, American Antiquarian Society.

How did format and surface-based postal regulations impact or affect artists working primarily in the medium of print, which was frequently intended to be sent through the mail? Did it influence composition or format to veer towards flatness or visual compression? This is a question worthy of a much fuller investigation tracking how these practices varied among book publishers and graphic artists, but Johnston's case study provides one intriguing, if not necessarily standard, response. For Johnston, postal regulations were one factor in concert with several other social and economic stimuli—most significantly, shifting attitudes to paper and surface that emerged from the roller-coaster financial crises of the 1830s through the 1850s--that encouraged him to toy with visual compression and altered surfaces. This system gave Johnston financial incentive to visually pack the page with detail.

Is it possible to extrapolate from the strategies embedded in the pull-tab cards, which represent attempts to figure out compression, recycling, and reuse in ways that are at once materially savvy and visually compelling to an audience thinking about surface in complex ways, to the artist's broader oeuvre? For instance, how might the early forms of serialization in *Scraps* be linked to forms of movement that emerge from these same material concerns? The oblong pages of *Scraps,* which measure in the neighborhood of 26 x 33cm, are packed tightly with engraved vignettes that nestle closely to the plate mark, leaving only a thin blank margin surrounding the edge of the paper. Each page features somewhere between nine and twelve tiny comics jammed into a rough grid (Fig. 3.30). Examining the surviving copper plates for *Scraps* impresses how Johnston worked to the very boundaries of the copper, and how closely fitted paper was to the dimensions of metal, resulting in very little waste of either material (Fig. 3.31). Although Johnston often lifted ideas directly from his British idol George Cruikshank (and *Scraps* itself was Cruikshank's invention) he deviated from the London caricaturist's page design in significant ways. Cruikshank's *Scraps and Sketches* include a range of pictorial layouts, including single-sheet images (Fig. 3.32) and groupings of five images, which leave sufficient amount of negative space for the eye to comfortably wander. Johnston often copied Cruikshank's subject matter, but made layout his own.

Extreme compression of space and economy of materials (most of all, paper) was a theme throughout Johnston's career. He was used to working perilously close to the margins, as can be seen in exchanges with Micah Hawkins regarding a commission for Dr. Ebenezer Mack's "mock-heroic poem" *The Cat Fight*, for which Johnston provided engravings.[326] In February 1824, Hawkins responded to a proposal of the artist's with hesitation:

> You recommend doing the five plates on one sheet of paper. I like the economy; still, I think proper attention should be paid to the width of margin, seeing that the printing will be considerably spread on a Duodecimo sheet, and should the paper of the plates fall short of the rest, the book would not look well when bound, therefore, a little blank copper might not to be stuck at. Think of this, if you please.[327]

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[326] Ebenezer Mack et al., *The Cat-Fight;: A Mock-Heroic Poem.: Supported with Copious Extracts from Ancient and Modern Classic Authors.: Meant as Illustrative, Though Some (Not so Immediately Relative) Pressed in by Medium of Their Intrinsic Merit; Making Something like What Has Been Termed a Narrow Rivulet of Text, and Wide Extended Meadow of Notes* (New-York: --Sold at 350 Water-Street, 1824).

[327] Micah Hawkins, "Letter from Micah Hawkins to David Claypoole Johnston," February 14, 1824, David Claypoole Johnston Family Papers 1824-1940 Folder 4, American Antiquarian Society.

Hawkins gently reminds Johnston that his illustrations will not stand alone—rather, they will be bound into the structure of a book, and must account for features like a gutter where visual details could easily be lost. The final product shows that they struck a compromise, with illustrations bordered by sufficient paper margins.

Ultimately, compression began, for Johnston, as a necessary component of his artistic process. It was a decision inspired by a number of external factors, including but not limited to the expense of copper and paper, and the cost to send multiple-sheet pamphlets through the United States Postal Service. But eventually, these tactics began to emerge in a self-conscious way as prominent features of his artwork—not just a means to an end, but a feature of the final work itself.

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The first part of this chapter, "Techniques of the Preserver," looked closely at a largely unknown series of engravings made by the artist David Claypoole Johnston: a group of movable political portraits issued between 1837 and 1863. These non-illusory moving images, which I call mechanical prints for their self-conscious emphasis on revealing the mechanics of their own movement, do not seek to fool the eye or evoke a fluid or constant stream of pictures, and therefore provoke a total reconsideration of the genre of movable and metamorphic images. Close examination of this unusually large and well-documented body of surviving mechanical prints is a first step towards diversifying notions about movement before cinema. In order to expand the understanding of how non-illusory movable images operated for period artists and audiences, I have analyzed how the physical, technical, and formal properties of these small, ephemeral, and historically neglected objects reveal how questions of material compression, recycling, and reuse became central to the artist's broader practice. By situating the pull-tab cards in the context of the material costs of printing from copper, uncertainties about formatting print to be sent through the mail, and expectations about the temporality of printed "novelties," I have attempted to open these objects onto Johnston's immediate concerns as a graphic artist working in antebellum Boston.

Part two, "Paper and Panic," will push beyond Johnston's immediate orbit to explore how his work's concentration on the formal and material properties of paper surfaces—including weight, spatial play, and visual and physical compression—both emerged from and participated in a more widespread social and cultural context: the economic turbulence that defined the period between 1837 and the beginning of the Civil War. During this era, paper, which had gained a reputation in American material culture as a particularly symbolically-charged medium, became an avatar for anxieties about tangible value, invisible credit, and speculation that bled outwards from economic conversations into the world of graphic print. Ultimately, concerns about the material qualities of print and the meanings of paper merged in Johnston's compositional and mechanical economy of surface.

Part II: Paper and Panic

Hard Times

On June 11, 1837, David Claypoole Johnston watched from his Summer Street studio as an angry crowd tumbled through downtown Boston. What began as an insult-tossing clash between an Irish funeral procession and a group of volunteer firefighters exploded into hours of brawling, injury, and property damage, ending only with the intervention of the state militia. Near the intersection of Broad and Purchase streets, rogue teenagers entered residences, tore mattresses to shreds, and poured feathers onto the streets below like falling snow.[328] Looters pushed their way into the shops of Johnston's neighbors, such as Michael Desmond's shoemaking shop, where they robbed the artisan of freshly cobbled boots, leather, and calfskin.[329] "The air, for three hours, was literally alive with stones and brickballs," reported *The Friend of Man.*[330]

Racist attitudes toward Boston's growing Irish immigrant community were, in large part, to blame for this violent spectacle. Indeed, Johnston himself often chimed in to caricature the Irish according to predominant negative stereotypes, despite his marriage into an Irish Catholic family.[331] But the same underlying social tensions that fomented this racial unrest were further roused by the looming specter of the financial crisis emanating from the nation's commercial centers of New Orleans and New York. The Boston riot was a symptom of economic panic.

1837 was a notoriously financially and economically unstable year in the United States. However, historians have recently called for a rethinking of the term that is usually used to describe the result of widespread bank failure and crisis surrounding the circulation of paper money instead of gold and silver specie, the "Panic of 1837," for inaccurately centralizing a constellation of events that spanned a much longer time period.[332] Unemployment, poverty, and economic depression abounded from 1836, when Andrew Jackson issued the specie circular, until well into the 1840s, and recurring in the 1850s in the years leading up to the Civil War. This recent reconsideration of financial and economic panic as a structural underpinning to everyday life throughout these decades, rather than a series of fleeting and isolated events, raises questions about how such concerns were embedded in art, visual and material culture created and consumed during this moment.

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[328] "The Boston Riots," *Salem Gazette*, June 16, 1837.

[329] Desmond, Michael, "Request for compensation for damages incurred during riots of June 11," City of Boston Archives, accessed May 20, 2017, https://cityofbostonarchives.omeka.net/items/show/61.

[330] "Riot in Boston," *The Friend of Man*, June 21, 1837.

[331] Johnston's caricatures of Irish immigrants are the focus of Jennifer Greenhill's article: Greenhill, "Playing the Fool"; Larkin, "What He Did For Love."

Mapping the panic-fueled Boston riots onto the locations of Johnston's own life and work make clear that he would have personally experienced the physicality, violence, and desperation of the economic climate in going about his daily life. Political turbulence and controversy was the artist's bread and butter, and he captured the subjects and tensions of late 1830s financial panic through a number of projects, in ways both explicit and subtle. This section explores how Johnston's mechanical cards emerged from this very context of an extreme politicization of the medium of paper, a subject that diffuses throughout his larger body of work.

In the 1830s, Americans were asked to put an inordinate amount of trust in slips of paper. During this time, the material was made to stand for a vast array of symbolic and actual values: gold and silver money, shares in stock, proof of the ownership of objects and people, and so on. The collapse of that system of trust and confidence sparked not only a trans-Atlantic economic crisis, but also a cultural reevaluation of paper's cultural capacities. Yet despite compelling links to printmaking practice and the field's material turn, the resulting crisis of paper bills that fueled mid-century financial panics has been overlooked in Americanist art historical scholarship.[333]

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[332] Jessica M. Lepler, *The Many Panics of 1837: People, Politics, and the Creation of a Transatlantic Financial Crisis* (New York, NY: Cambridge University Press, 2013).

For a granular account of the complex political and economic dynamics that led to the string of panics between 1830 and the Civil War, it is best to refer to historical scholarship such as Jessica Lepler's *The Many Panics of 1837* (2013), which synthesizes the many competing economic, political, and social perspectives on this event.[334] But in short, the explosion of the paper money bubble occurred when a tenuous balance of power between national and local banks was disrupted in the years before 1836. During the preceding period, the only form of currency legally backed by the United States government was specie, or gold and silver coins. Even so, long before the Revolution, colonists (and later citizens of the United States) created paper bills as a means of credit and eliminating a need to transport valuable precious metals.[335] In the early nineteenth century, paper bills were issued by local banks as promises that they could redeem the amount of specie promised on the paper's surface—a constant gamble, as they always issued more bills than they could redeem at any one time.[336] The Bank of the United States helped facilitate this patchwork of localized currency. At its official branches in

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[333] For a recent example of how these issues have been successfully taken up in scholarship about British art, see: Amanda Lahikainen, "Currency from Opinion: Imitation Banknotes and the Materiality of Paper Currency in Britain, 1782-1847," *Art History* 40, no. 1 (February 2017): 104–31.

[334] Lepler, *The Many Panics of 1837*; Jessica Lepler, "Pictures of Panic," *Common-Place* 10, no. 03 (April 2010), http://www.common-place-archives.org/vol-10/no-03/lepler/.

[335] Dror Goldberg, "The Massachusetts Paper Money of 1690," *The Journal of Economic History* 69, no. 4 (2009): 1092–1106, https://doi.org/10.2307/25654034; Katherine Smoak, "The Weight of Necessity: Counterfeit Coins in the British Atlantic World, circa 1760–1800," *The William and Mary Quarterly* 74, no. 3 (2017): 467–502.

[336] Lepler, *The Many Panics of 1837*, 15–17.

New Orleans and New York, consumers who needed to purchase outside of their immediate communities could exchange banknotes from one part of the country with another at this federally-supported institution. In so doing, the Bank of the United States prevented inflation by ensuring that banknotes could make it back to their place of origin.[337] It also relied upon visual strategies to impress that confidence upon audiences. As Lepler points out, iconographies of strength and safety, such as the emblems of neoclassical architecture visible in both the banks themselves and in depictions on printed money, were successful in spreading this trust. [338]

Though it inspired confidence in paper money, the Bank of the United States was reviled by many for its increasing corporate power and what many viewed as encouragement of irresponsible speculation practices, in which western lands were snapped up and paid for with paper money which could not be redeemed in specie. "Hard-money men," including many supporters of President Andrew Jackson, endeavored to do away with all banks and paper money for good, leaving only gold and silver to deal with, which could speak to their own value rather than working through a material proxy. Political tensions came to a head and the Bank of the United States lost its charter in 1836, hundreds of new decentralized and unregulated banks springing up in its place. To add even more chaos to the mix, the Specie Circular of July 1836 declared that only specie would be accepted for the purchase of public lands, curtailing the Western land grab. This shift created the conditions for panic: lack of federal regulation of exchange rates, inflation, and the overproduction of bills. When the New York banks declared that they would no longer accept paper bank notes in return for hard money on May 10, 1837, the immaterial and abstract value of paper slips, now thrown into crisis, became a spotlight issue in American culture. What followed were years of financial turbulence that placed the paper banknote at the center of all uncertainty.

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[337] Lepler, 16.

[338] Lepler, 15–17.

Shinplasters with a Vengeance

In the months surrounding the panic-fueled riots in Boston, Johnston became personally entangled with the politics of paper money. He accepted several commissions to design and engrave banknotes—both real and satirical—as well as a variety of other items intended to make the abstract value of credit tangible, such as stock certificates.[339] To cite just one example, on January 29th, 1837, months before the crisis of the New York Bank's refusal of paper money, Maine businessman, author, and art critic John Neal wrote Johnston to request engravings for a certificate, a seal, and a plate. He specifically asked for a stock certificate that looked "as much like a banknote as possible—well covered--& the writing distributed, as it is in a banknote," instructions which he accompanied with his own sketch that emphasizes the bill-like composition (Fig. 3.33).[340] Neal recognized that the iconography of paper money was becoming useful in previously unexpected ways, most of all, as a tool of social critique. He commented to his friend that he “was much gratified to receive your shin-plaster. We have shin-plastered the administration with a vengeance in this city”—that is, added to the already gigantic piles of paper flooding urban centers and causing values to wildly vacillate.[341] Paper money’s value as both capital and a surface for projecting desires and associations was, as Neal’s letter shows, rapidly shifting.

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[339] Malcolm Johnson identifies "$100 and $500 denomination notes on the Ohio Exporting and Importing Company, Cincinnati, bearing the imprint Tanner Kearney & Tiebout" and "$1, $2, $3, and $5 denominations for the Oriental Bank of Boston circa 1835" bearing the imprint of the New England Banknote Co. as among the printed money commissions that Johnston took on. I have located a handful of other examples, mostly stock certificates. Malcolm Johnson, *Great Locofoco Juggernaut, a New Console-a-Tory Sub-Treasury Rag-Monster* (Barre, Mass: Imprint Society, 1971), 14.

[340] John Neal, "Letter to David Claypoole Johnston," Letter, January 29, 1837, David Claypoole Johnston Family Papers 1824-1940, American Antiquarian Society.

Inspired by these commissions and the economic climate, as well as earlier examples made by none other than George Cruikshank, Johnston issued a well-received satirical banknote of his own in 1837, known today by its partial title “the Great Locofoco Juggernaut.”[342] Examining multiple surviving copies of the banknote, printed on various weights of paper (both thicker rag paper and thinner, tissue-like “onion-skin” stock, which would have more closely resembled the true bills of the day)[343], makes clear the importance of the tactile experience of the material surface in assessing value (Fig. 3.34).

The Great Locofoco Juggernaut labels itself a shinplaster, or a paper banknote with a comically low value – ten cents, twelve and a half cents, and so forth. In a sense, shinplasters were much like metal specie in that their only worth was in the value of their material substrate.[344] With the abstracted idea of credit wiped away, a shinplaster's true worth was in the paper on which it was printed – hence the mythology surrounding the origin of the term, which refers to the bills being used to plaster one's shins for extra warmth or to soothe rough skin. Shinplasters were evidence of ad-hoc economies, printed by private entrepreneurs rather than official state banks. Several examples of real shinplasters survive, for instance a bill for 12 ½ cents issued by the Mayor, Recorder, and Alderman of the City of Detroit in 1838 (Fig. 3.35). However, they are more frequently spotted as period caricatures, for instance in a less sophisticated copy of Johnston's cartoon banknote pirated by rival printmaker H.R. Robinson and published in New York (Fig. 3.36). But Johnston's counterfeit shinplaster was evidently the most visible satirical attack made in this format, and the only to emulate not just the look, but the weight and feel, of real money through the use of onionskin surfaces.

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[341] Neal.

[342] George Cruikshank’s *Bank Restriction Note* parallels Johnston’s efforts in many ways, and has been the subject of recent scholarship including: Ian Haywood, *Romanticism and Caricature*, Cambridge Studies in Romanticism 103 (Cambridge ; New York: Cambridge University Press, 2013), 36–56; Lahikainen, “Currency from Opinion,” 106–7.

[343] Stack’s, *The August 2012 Philadelphia ANA Auction: United States Paper Money* (Stack’s, 2012), 59, http://archive.org/details/2012_07SBG_Aug2012_ANAMain_Curr_Catalog_LR.

Johnston's banknote, which measures 8.5 by 19.5 cm, proclaims its full title at the top center: "GREAT LOCOFOCO JUGGERNAUT, A NEW CONSOLE-A-TORY SUB-TREASURY RAG-MONSTER."[345] Below this heading, the composition is split into four distinct registers that evoke a visual format common to banknotes of the period. Two vertical sections cap the left and right ends of the note, and its central mass is divided into two horizontal rectangles. A surreal scene plays out in the upper central frame: in front of a backdrop of burning houses, a wheeled chariot carries a monstrous figure, a spotted and sharp-clawed cat with the unmistakable mutton-chopped head of Martin van Buren, who protects a bag marked "deposits" beneath his haunches. This vehicle is the titular juggernaut, an unstoppable force in motion. A figure whips the group of radical Locofoco democrats who are struggling to pull the chariot forward, several of whom end up crushed beneath its churning wheels. Below this scene, sixteen lines of verse punningly identify the culprits of the crash:

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[344] Katherine Smoak's work has recently complicated the idea that the value of metal coin came from the inherent value of material—she argues that in the eighteenth century, users insisted that value was instead in "ease of use and widespread access." Smoak, "The Weight of Necessity."

[345] The copperplate that produced this engraving is in the collection of the American Antiquarian Society, though it is difficult to discern wear as an indicator of the scale of print runs, as it is covered in wax for protection.

> To the father of shinplasters and better currency chieftain:
> Thou monster slayer, BENTON gold,
> Who every bank WOULD-BURY,
> Who KENN'D ALL things in the womb of Time.
> And wiser grew than sage Dog-berry:
> Endow'd with WIT-KNEE deep in lore,
> Mong'st learned pundits in the VAN
> Thou stands't a learned financier
> And a learned seer without finan.

The verse to the right reads:

> For thou did'st see Mississippi bank.
> (The only bank devoid of rags:)
> O 'erflow with shining yellow gold
> Instead of HICKORY leaves and snags.
> Then in thy yellow current, see
> Thou pay the bearer, TWELVE & A HALF CENTS
> At sight! and charge the same to me.
> Yours with respect, and in the expense,
> *Locofoco.*

A central legend divides these two stanzas. In winding, looping decorative text, it reads "Good for a Shave: Shinplaster 12 1/2 cents.[346] Solitary and alone amidst the jeers & taunts of my opponents/this ball in motion." Below, we see Martin Van Buren once again, being strangled by the "Laocoon" of a snaking banner reading "Treasury Circular," the aforementioned policy that was seen by many as singlehandedly puncturing the paper money bubble.

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[346] As Jessica Lepler points out, 12 ½ cents was probably the price of the cartoon. Lepler, "Pictures of Panic."

Johnston's banknote is stuffed to the gills with period-specific detail, but there is no need to unpack each miniscule caption and faux signature to understand its baseline message. As a Whig with no love lost for Jackson, Johnston's note expresses what were likely his own personal beliefs about the Democratic political corruption and greed that had led directly to the collapse of the financial system and the worthlessness of its capitalist materials. Johnston and his fellow political cartoonists addressed these ideas in a range of formats, but the choice of a satirical banknote is particularly significant given the intended or imagined use of the bill. The choice to print the note on multiple weights of paper, especially the almost-translucent onionskin stock, suggests that Johnston intended this piece of political ephemera to circulate alongside "real" money in hopes of taking a viewer by surprise—much like one might be offered a joke $3 bill today. This is a self-referential image concerned with the very economic climate in which it spuriously circulated, and its joke depends on an understanding of the shifting material value of the slip of paper itself.

Scholars across disciplines have recently turned their attention to the subject of the "materiality" of money.[347] I place this term in quotes because materiality currently lacks a sufficiently precise definition in scholarship across disciplines, and has come to describe a puzzlingly broad array of object-oriented methods ranging from the technical to the psychoanalytic.[348] However, recent scholarship has productively begun to untangle and specify what exactly materiality might mean with regard to particular sets of objects, acknowledging that it is a historically, culturally, and often medium-dependent notion—in other words, a term that must always be accompanied by an explicit definition and set of methodological parameters. Paper banknotes, a genre of objects that share, more or less, a common history of process of production and physical makeup, provide an intriguing opportunity to add a case study to the growing glossary of self-conscious studies of the multiple forms materiality studies might take.

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[347] Lahikainen, "Currency from Opinion"; Jonathan Senchyne, "Rags Make Paper, Paper Makes Money: Material Texts and Metaphors of Capital," *Technology and Culture* 58, no. 2 (June 20, 2017): 545–55; Seth Rockman, "Introduction," *Technology and Culture* 58, no. 2 (June 20, 2017): 487–505; Marc Shell, *Money, Language, and Thought: Literary and Philosophical Economies from the Medieval to the Modern Era* (Berkeley: University of California Press, 1982).

In handling paper currency, period users were prompted to attend to its physical qualities and the circumstances of its production as a physical thing. By numerous accounts, the paper substrate of currency, in its constant juxtaposition with the cold metal of gold and silver specie, exerted a powerful agency upon its users. Amanda Lahikainen has explored how this phenomenon played out with regard to imitation of low-denomination paper bills made and circulated in Britain during a parallel economic crisis across the Atlantic.[349] Lahikainen argues that each specimen shaped its handler's behavior in unique ways, but a common approach was to satirize material itself in order to "create doubt in paper's ability to carry value."[350] When considered in the broader context of his negotiation of the paper surface across print media, beginning with the pull-tabs and extending into the format and layout of productions like *Scraps,* Johnston's aims with the *Great Locofoco Juggernaut* come into a similar, yet slightly altered focus. Johnston's satire was not intended to create doubt or even simply draw attention to the contested place of paper money in the economy. Rather, its goal was to demonstrate that the value of paper bills was not an abstract or imagined number, but rather a real (albeit nearly insignificant) form of material value, palpable in the user's very hands—resident in the weight and surface of the substrate itself. Johnston's ability to make this materiality-dependent pun was indebted to a preexisting willingness to associate the material of paper with a broad range of metaphorical and imaginative connotations.

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[348] Two recent attempts to define materiality reflect this disjuncture: Martha Rosler et al., "Notes from the Field: Materiality," *The Art Bulletin* 95, no. 1 (March 1, 2013): 10–37; Jennifer Roberts, "Things: Material Turn, Transnational Turn," *American Art* 31, no. 2 (Summer 2017): 64–69.

[349] Lahikainen, "Currency from Opinion."

[350] Lahikainen, 121.

Projecting on Paper

As Johnston's money jokes make clear, during the mid-century financial crises in the United States and London, paper money became a tangible symbol of widespread anxieties about invisible economic processes: systems of credit, circulation, and value. But what recent work on the materiality of money has neglected to mention is paper's particular ability to invite imaginative association and speculation among its audiences. Americans thought about paper in capacious and metaphorical terms even outside of economic frameworks, and well before panic set in in 1837. As I argued in the first chapter of this dissertation, in the era before the Civil War, people had greater familiarity with the raw materials and manufacturing processes of paper than we have historically credited to them. The presence of rag-pickers on street corners and at doorways made the material's origins in the cast-out fabric materials of the home difficult to ignore, and the newspapers they read reported on the status of the very material readers held in their hands.[351] The poet Oliver Wendell Holmes wrote a poem to this effect, titled "To a Blank Sheet of Paper," in which he rhapsodized about the possible forms that the "virgin leaf" might take in future lives.[352] He imagines possible "stains" ranging from poetry to satire to the binding and gathering of the print shop, but touching the paper surface brings him most joy: "But if in merry mood I touch/Thy leaves, then shall the sight of thee/Sow smiles as thick on rosy lips,/As ripples on the sea." Paper was a material that provoked conscious thought about exchange, transformation of states, and matter itself through its enticement to touch its variable surfaces.

A short story that appeared in American newspapers in the mid-1830s animatedly demonstrates this fascination. In 1836, "The History of a Sheet of Paper," an it-narrative told from the perspective of the titular object, was published in several American newspapers and periodicals.[353] The story begins with the planting of a cotton seed—an opening detail which foregrounds the labor of slaves that made rag-paper production possible in this moment before the rise of wood pulp technologies, a thread woven throughout the piece, although the sheet of paper's views are far from abolitionist.[354] "Whether it was a white man or a negro that prepared the ground and planted the seed from which I sprang, it is impossible for me to discover, nor do I conceive it of any material importance," begins the sentient sheet of paper, who goes on to trace a transformative journey across continents and material states. Born as a cotton bloom in a southern plantation field, the sheet of paper is picked by a "heavy black hand" and transported from New Orleans to Liverpool before being woven into a fashionable dress. Growing progressively rattier, the dress becomes a nightcap, is torn up into pillowcase stuffing, and finally, sold to a young rag-picker. The sheet of paper recounts the violence of its transformation from rag to sheet:

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[351] Jonathan Senchyne addresses this material consciousness in a recent essay on the paper technologies of capitalism: Senchyne, "Rags Make Paper, Paper Makes Money." One such newspaper account reads as follows: "When we purchased the establishment of the Magazine and Advocate, we wrote to the paper makers in this vicinity, and also to several in Massachusetts, besides making inquiry in the city of New-York, in order to secure a supply of the best paper our means would allow. But paper was a scarce article. The several fires in New-York and Boston increased the scarcity very much. The eastern paper makers generally, refused to contract for the delivery of any paper until this Spring. We therefore made a contract near home, for a partial supply. Messrs. Savage and Moore were about fitting up a new manufacturing establishment, with improved and very extensive machinery, and we hoped soon to get an additional supply from that. But the severe Winter prevented them from getting their mill into operation until this Spring. Hence we have been obliged to get paper, as best we could, from three different paper makers. This will account for the difference which may have been observed by our patrons in the paper we have sent them. It was unavoidable. Nothing short of a ruinous expenditure could have prevented it on our part. We perceive that nearly all of our brethren at the East, and the publishers of several literary papers, have been apologizing frequently during the Winter, for the bad paper on which they have been obliged to print. We have delayed apology and explanation, until we were certain the evil was remedied." (G & H, Paper.)

[352] O. W. Holmes, "To a Blank Sheet of Paper.," *The New - York Mirror: A Weekly Gazette of Literature and the Fine Arts (1823-1842); New York*, October 20, 1838.

[353] "The History of a Sheet of Paper.," *The Southern Literary Journal and Magazine of Arts (1835-1838); Charleston*, October 1836.

> The wagon next carried me, along with others, to the Paper Manufactory, and there we were thrown into the mashtub, beaten, masticated, aye and washed whiter than I had been for some time past, for the running water carried with it every particle of dirt that had heretofore defaced me. After being pressed, dried, and packed, ready for sale, I was purchased by a young cadet, just fitting out for the East Indies, and was sent back again, a letter to his friends.

The object's journey from the hands of slaves to the bodies of white women, across the Atlantic and back again, and between realms of wealth and poverty, reveals the capacious imaginative associations that paper held in the mind of period audiences. Much as ultramarine blue was associated with lapis lazuli pigment in quattrocento Florence,

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[354] Interestingly, this sheet of paper has strong views about slavery and abolition. It notes that sailors had it way worse than slaves on the plantation – and that any empathy towards slaves came from ignorance about the realities of the world.

American viewers living under Hard Times saw paper in terms of raw materials, process, and labor.[355]

It-narratives (sometimes called "novels of circulation") were a fictional genre popular in the eighteenth and nineteenth centuries in which objects narrated their own biographies of production, transportation, and use.[356] Much has been made of the it-narrative's apparent affirmation of the core tenets of material culture and actor-network theories: that everyday materials and objects were things with a "social life," that they became imbued with meaning through their handling and use by humans, and in turn, exerted an agency upon their users—and most importantly of all, that their period interlocutors were aware of this power.[357] Although the genre has been mostly studied in literary contexts, considering it-narratives through the lens of commodity and economic history sheds light on the type of object that most often attracted this kind of imaginative narrative treatment: coffee, cotton, mahogany; namely, objects with particularly entangled histories of production, labor, and global transport. Paper's presence in this pantheon of objects with fascinating biographies highlights how the affective presence of objects became, for period audiences, charged through various interactions with human hands – planting, wearing, milling, mashing, sweating, writing.

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[355] Michael Baxandall, *Painting and Experience in Fifteenth Century Italy: A Primer in the Social History of Pictorial Style* (Oxford [Oxfordshire]; New York: Oxford University Press, 1988).

[356] Mark Blackwell, *The Secret Life of Things: Animals, Objects, and It-Narratives in Eighteenth-Century England* (Bucknell University Press, 2007).

[357] As Seth Rockman points out in a short essay on the relationship between object narratives and commodity histories, scholarly thinking about it-narratives almost always begins with Appadurai's germinal "Social Life of Things." Arjun Appadurai, *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 2016); Julia Dauer, "Introduction to The History of a French Louse," *Common-Place* 17, no. 3 (2017), http://common-place.org/book/vol-17-no-3-dauer/; Seth Rockman, "From Social History to Political Economy: The Changing Registers of Class and Capitalism in American History: Part I" ("Economic History's Many Muses" Fourteenth Annual Conference of the Program in Early American Economy and Society, Library Company of Philadelphia, 2014).

Frugal Surfaces

A central contention of this dissertation is that tactile images enable new methods of material investigation that can enrich art historical inquiry about the cross-pollination of visual media and period reception. If we view unusual, eccentric objects like Johnston's pull-tab prints as not just novelties or art historical limit cases, but rather as things unusually charged with material meaning, and attend closely to how and why such objects came to be the way they are, we will discover unexpected ways that they are interwoven with a broader cross-section of media and cultural events. Activated features like tabs, flaps, and layers provoke productive curiosity that, when harnessed, enriches the story of American art.

This chapter has argued that that Johnston's manipulation of the paper surface in his pull-tab cards is one such activated detail that, when explored in depth, makes visible an impulse that diffused across his broader oeuvre: a concentration on visual and material economy that, whether consciously or unconsciously, worked to draw attention to the shifting conceptual and material value of the paper surface. When viewed through the lens of the social context of economic panic, the widespread mistrust in the material and conceptual value of printed paper that it produced, and the artist's explicit engagement with that very subject through the creation of satirical banknotes, the pull-tab cards come into focus as not merely novelties or outliers, but participant in a culturally-specific aesthetic of frugality. Ultimately, while factors including the cost of materials and the structures of the postal service caused Johnston to integrate strategies of compression, recycling, and repurposing into his practice at a preparatory level, social stimuli—most of all the politicization of paper during two decades of panic—pushed him to integrate those material features as a visible and self-consciously symbolic aspect of his work. Only by overturning the stone of his mechanical experiments do these decisions, which resonated across the artist's oeuvre, come into clear relief.

CONCLUSION: WHEN TACTILE IMAGES WENT UNDERGROUND

Rationing Experimental Print

On July 4, 1863, a defiant announcement appeared in the *Vicksburg Daily Citizen,* the main news organ of its namesake Mississippi town:

> Two days bring about great changes, The banner of the Union floats over Vicksburg. Gen. Grant has "caught the rabbit:" he has dined in Vicksburg, and he did bring his dinner with him. The "Citizen" lives to see it. For the last time it appears on "Wall-paper." No more will it eulogize the luxury of mule-meat and fricassed kitten -- urge Southern warriors to such diet never-more. This is the last wall-paper edition, and is, excepting this note, from the types as we found them. It will be valuable hereafter as a curiosity.[358]

Sure enough, the newsprint surface is not what one might expect from a mid-nineteenth century periodical. Look closely, and floral shapes begin to appear looming behind the faded text (Fig. 4.1). Turning the page over reveals a color-printed field of blushing roses, stamped on smooth and once-glossy backing.[359] Made from the pulp of rags and straw processed through a rolling machine, the surface was meant to decorate the walls of a genteel Southern home, not deliver news of the ongoing siege of Civil War.[360]

The "wallpaper newspapers" of the Civil War have fulfilled the notice's original call: they are now much sought-after (and frequently counterfeited) collectors' items. More than just curiosities, their printed surfaces and garishly colored backsides palpably and dramatically visualize the resourcefulness that wartime scarcity made necessary. This was the type of "experimental print" that survived during a time of shortage and strife: far from the intellectually complex and physically engaging tactile images that flourished just years before, wartime innovation was keyed to survival.

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[358] J.M. Swords, "NOTE," *The Daily Citizen*, July 4, 1863, https://www.loc.gov/rr/news/circulars/dailycitizen.html.

[359] This visual analysis refers to just one example – as they were printed on sample stock, there are a variety of patterns to be found.

[360] Susan Campion, "Wallpaper Newspapers of the American Civil War," *Journal of the American Institute for Conservation* 34, no. 2 (1995): 129–40.

As the example of the wallpaper newspapers dramatically shows, with the onset of Civil War and throughout Reconstruction, the production of tactile images in print withered. In 1863, the same year that *Vicksburg Daily Citizen* publisher J.M. Swords resorted to printing his newspaper on wallpaper samples, David Claypoole Johnston issued his last pull-tab card (he died two years later from illness in his Dorchester home, just as the conflict came to a close). Boston publishers Degen, Estes and Priest released a final *Metamorphosis* shortly after. Listings for copies of *The Obstetric Tables* for sale had gone silent by 1859. Rumblings of war did not bode well for experimental print practice: as the case of the wallpaper newspapers shows, any formal deviation during this time was driven by scarcity, necessity, and fundamental changes in the business models of print. This was the case in both the North and the South: while the Confederacy suffered from a blocked supply of materials and exorbitant prices for paper produced in Northern mills, even Northern print shops were affected by restrictions on labor.[361] Printers and artists who had not gone to fight concentrated their efforts on using new wood engraving technologies to quickly and cheaply disseminate images of conflict, as Winslow Homer did as a correspondent illustrator for Harper's Weekly.[362]

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[361] For more on the impact of supply shortages on visual artists, see: Eleanor Jones Harvey and Smithsonian American Art Museum, *The Civil War and American Art* (Yale University Press, 2012), 130; Amy M. Thomas, "Literacies, Readers, and Cultures of Print in the South," in *The Industrial Book, 1840-1880*, ed. Scott E Casper et al., vol. 3, The History of the Book in America (Univ of North Carolina Press, 2007), 384.

[362] David Tatham, *Winslow Homer and the Pictorial Press*, 1st ed. (Syracuse, N.Y. : Syracuse University Press, 2003), 88–110.

While a handful of metamorphic images were produced between 1860 and 1876, none gained the cultural traction—in terms of circulation, copying, and varied editions—that had defined earlier antebellum specimens. A burst of folded prints depicting Jefferson Davis "before and after the war" make up the majority of Civil War-era examples (Fig. 4.2). While many of these took the form of creatively folded and cut booklets, a format echoing the structure of the *Metamorphosis,* the most popular instance is a broadside that features no unusual paper engineering whatsoever (Fig. 4.3). Printed by Samuel Upham and engraved by E. Rogers in Philadelphia, and based on an image that had already circulated in card format, the single-sheet print features an oddly composed image capped by text above and below.[363] Held right-side up, the headline reads "Jeff. Davis going to War." The image below it appears to show the Confederate leader himself sporting a comically large mustache and wearing a tightly-fitted helmet that gives his head a strange conical shape. The text below the portrait is upside-down, which prompts the viewer to flip the sheet in orientation. Turn the sheet one hundred and eighty degrees, and the joke is revealed: the headline now reads "Jeff. returning from War AN" – an abrupt stop to the phrase that is filled in by the image, which now appears to be a donkey, or as the headline requires, an ass.

Called a "topsy-turvy" print by period viewers, the flatness and simplicity of the format reinforces the notion that print experimentation could only stretch as far as the available materials and labor during wartime.[364] Upham would later market the image on envelopes priced for wholesale purchase: $1 for 100, $8 for 1000.[365] Beyond these Civil War productions, I have viewed moving images from this period of relative silence including (but not limited to) souvenir paper "roses" and miniature panoramic "historiscopes" that visualize history as a scrolling vista (Figs. 4.4-5).[366] While these objects are worthy of study in their own right, their scarcity and the lack of copies across formats signal that they were considered novelties rather than enduring elements of material culture.

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[363] Julie Mellby, "Jefferson Davis Turned on His Head," Graphic Arts, July 4, 2015, https://graphicarts.princeton.edu/2015/07/04/jefferson-davis-turned-on-his-head/.

Civil War-era material blockades and labor shortages were not the only force disrupting the production of tactile print. During this same period, the United States experienced a revolution in both papermaking and printmaking technologies.[367] Ground wood pulp paper came on to the scene in the 1860s,[368] drastically lowering the cost of paper production, and also eliminating the need to import materials from Europe for all but fine-press purposes, as westward expansion made clear that the United States had a (seemingly) inexhaustible supply of timber to support increased production at home.[369] Simultaneously, advances in technologies for quickly and cheaply printing increasingly higher-quality images, including lithography, wood engraving, and later chromolithography, completely changed the landscape of the visual culture of print.

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[364] "Topsy-turvy" is the language used in: Henry Angelo, *Reminiscences of Henry Angelo: With Memoirs of His Late Father and Friends, Including Numerous Original Anecdotes and Curious Traits of the Most Celebrated Characters That Have Flourished During the Past Eighty Years* (H. Colburn and R. Bentley, 1830), 418.

[365] Arlie R. Slabaugh and George S. Cuhaj, *Confederate States Paper Money: Civil War Currency from the South* (Krause Publications, 2012), 108.

[366] Jennifer Lynn Peterson, "The Historiscope and the Milton Bradley Company: Art and Commerce in Nineteenth-Century Aesthetic Education," *Getty Research Journal* 6 (January 1, 2014): 175–84.

[367] The transition to quicker, cheaper printing methods in the nineteenth century United States, such as lithography and wood engraving, has been well-covered in scholarship. For example, see: Peter C. Marzio, *The Democratic Art- Pictures for a 19th-Century America: Chromolithography, 1840-1900* (Boston : Fort Worth: Amon Carter Museum of Western Art, 1979); *Philadelphia on Stone: Commercial Lithography in Philadelphia, 1828-1878* (University Park, PA : [Philadelphia, Pa.]: Pennsylvania State University Press ; In association with the Library Company of Philadelphia, 2012); Boston Athenaeum, Sally Pierce, and Catharina Slautterback, *Boston Lithography, 1825-1880: The Boston Athenæum Collection* (Boston Athenæum, 1991).

[368] Dard Hunter's foundational history of papermaking provides an overview of the transition to wood pulp materials in the United States and Europe: Dard Hunter, *Papermaking: The History and Technique of an Ancient Craft* (Courier Corporation, 1978), 374–400.

Experimental print formats reemerged in full force by the 1880s, flashier and more widely seen than ever before, thanks to innovations in chromolithography and mechanization of die-cutting technologies that allowed for quicker and cheaper construction of three-dimensional formats. But while these unusually structured paper constructions resembled tactile images, the new pop-up books and metamorphic trade cards had more in common with the better-known category of optical toys. As I will demonstrate, these new objects shifted in emphasis away from the haptic: instead, they concentrated on features linked to sight and perception.

As discussed in the introduction to this dissertation, Jonathan Crary's 1990 *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* posited the transition from tactile to optical modes of reception as rooted in the 1830s, with the emergence of optical toys including the thaumatrope. In Crary's argument, this transition—which bleeds into the reception of artwork with viewership of Manet's work only in the late nineteenth century—amounts to a new form of "embodied vision." In Crary's definition, embodiment is situated in the viewing subject's eyes, connected to a thinking brain, which suture him or her to the visible world. It is a construction of embodiment that winnows away the viewer's remaining corporeality, especially the hand, which is a relic of enlightenment forms of manual exploration. The preceding chapters of this dissertation, in following the continued emphasis on tactility in American visual and material culture well past the enlightenment, have posited an alternative definition of "embodiment" that contests Crary's dismissal of touch. As this conclusion shows, only in the 1880s did experimental print in the United States begin to address a viewer that was "embodied" in Crary's physically constrained sense. Tactile images tell a story of a transformation in visuality that depends upon the physical malleability of images through combined haptic and optic interaction, rather than one focused on the mechanics of perception. And in turn, recognizing that nineteenth-century Americans valued the malleability of images, particularly the potential to break down barriers of surface and depth, opens up new avenues for thinking about reception of the artistic surface at the end of the century.

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[369] Cathleen Baker, *From the Hand to the Machine: Nineteenth-Century American Paper and Mediums: Technologies, Materials, and Conservation* (Ann Arbor, Mich: Legacy Press, 2010), 18–19.

With the McLoughlin Bros. pop-up dioramas considered in this chapter, I switch my terminology from "tactile images" to "experimental print," but tactility as a crucial component of American perceptual experience did not die off or disappear at the end of the nineteenth century. Rather, to adopt Tom Gunning's framework for thinking about the non-linear dispersal of visual cinematic styles in subtle and modified ways throughout the twentieth century, tactile images did not vanish: they went underground.[370] Gunning's germinal essay considers the first films popularized in the United States and Europe, produced by filmmakers including Lumiere Brothers, Thomas Edison, and Georges Melies, which he terms the "cinema of attractions." These early films are united by a rejection of narrative in favor of a self-conscious emphasis on the visual pleasure of motion, illusionism, and exoticism. When narrative films overtook the earlier "cinema of attractions" in popularity around 1906, he argues that "the cinema of attractions does not disappear with the dominance of narrative, but rather goes underground, both into certain avant-garde practices and as a component of narrative films, more evident in some genres (e.g., the musical) than others."[371] The notion of a visual style going underground rather than being replaced entirely troubles dominant frameworks for thinking about the progression of visualities throughout history. It considers historical modes of viewing as an expanded field rather than a teleological progression, leaves room for several ways of looking to coexist in a single period or place, and suggests that it was common or likely for visual habits to remerge throughout time.

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[370] Tom Gunning, "The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde," in *Early Cinema: Space Frame Narrative*, ed. Thomas Elsaesser (London: British Film Institute, 1990), 57.

In this moment, tactile images began to recede underground, helped along in its burial by a formally related set of objects that moved in familiar ways, but treated the relationship between hand and eye quite differently. The following coda centers on instances of these new movable prints produced by an overlooked yet significant American publishing firm of the nineteenth through early twentieth centuries as a lens on to the dissolution of tactile print at the end of the century, and its reemergence as a technology concerned—like so many others at the time—with the mechanics and idiosyncracies of perception.

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[371] Gunning, 57.

"Make this more American": Engineering Paper for the United States

The New York-based McLoughlin Bros. Publishing Firm, the primary producers of moving paper constructions in the postbellum era, had by the end of the nineteenth century built the largest color printing operation America had ever seen. Officially listed as the McLoughlin Bros. in 1858, the firm's roots stretch back to the 1820s and reach well into the twentieth century, ending upon sale to Milton Bradley in 1920.[372] In terms of scale of production, technical prowess, and artistic quality, McLoughlin should be recognized alongside chromolithography firms like Prang and Currier & Ives as a key player in the emerging canon of nineteenth-century mass visual culture. However, a frustratingly incomplete historical record has dissuaded scholars, save for McLoughlin historian Laura Wasowicz, from in-depth research on the publishing house.[373] In 1920, the company was sold to the toy and game producer Milton Bradley, and relocated from Brooklyn to Springfield, Mass. At this point, the company's archives were divided: a majority of the graphic material, including proofs, sketches, and file copies, were given to one Milton Bradley employee, while textual material—business records, letters, and so on—remained in a Springfield warehouse. When a catastrophic flood destroyed the Springfield location in 1938, these crucial documents were lost. George M. Fox, the son of the Milton Bradley employee who took over stewardship of the undestroyed parts of the McLoughlin collection, recalls the firm's woodblocks "floating out of the basement like little toy boats" into the surging floodwaters of the Connecticut river.[374]

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[372] Very little has been published about the McLoughlin Bros. Basic information about the firm's existence, such as active dates and changes in business locations over the years, comes primarily from research carried out by curators and cataloguers. The finding aids at the American Antiquarian Society and the de Grummond Collection at the University of Southern Mississippi are two good sources for this information: Laura Wasowicz, "McLoughlin Bros," Text, *American Antiquarian Society* (blog), November 5, 2014, http://www.americanantiquarian.org/mcloughlin-bros; Dee Jones, "McLoughlin Brothers Papers at the de Grummond Collection," *De Grummond Children's Literature Collection The University of Southern Mississippi* (blog), March 2002, http://www.lib.usm.edu/legacy/degrum/public_html/html/research/findaids/DG0649f.html.

[373] Laura Wasowicz' thirty years of research on the firm recently culminated in a monographic exhibition at the Grolier Club and the following catalogue: Laura E Wasowicz, *Radiant with Color & Art: McLoughlin Brothers and the Business of Picture Books, 1858-1920 : December 6, 2017 - February 3, 2017 the Grolier Club, New York*, ed. Lauren B Hewes, 2017.

In addition to the problems posed by this incomplete archive, an emphasis on material for young folks rather than the loftier single-sheet art prints produced by competitors has further damned the firm to historical obscurity.[375] While I do not aim to dismiss childhood studies interpretations of McLoughlin's output, such as important work on how the firm's frequently racist cartoon imagery reinforced pejorative stereotypes and racist attitudes in children from a formative age, it is often forgotten that books and prints aimed at children were used, encountered, purchased, and created by adults.[376] As demonstrated in chapter one with the case of the *Metamorphosis*, the subjects and designs of children's books reflect the ways adults chose to train young people to look at the world, and thus regardless of intended audience, these objects had a diffuse reach across ages. McLoughlin's mass-produced paper constructions suggest a refiguring of the relationship between tactility and opticality in the ways that young Americans were trained to experience their visual landscape. Of course, the haptic and optic can never be completely unbound, particularly when it comes to books. Turning pages require bodily contact; in the act of viewing, readers may unconsciously register the smooth surface of a chromolithographic illustration beneath their fingers in contrast to the nubbed texture of rag paper, or imagine physical engagement with the stories unfolding upon its pages. However, I want to draw attention to a basic difference in the way that experimental prints addressed audiences at the end of the century: a limitation of the formal features (i.e. flaps, tabs, or layers) that gave the user expanded agency over mechanical manipulation.

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[374] George King Fox, *The History of The George M. Fox Collection of Early Children's Books at the San Francisco Public Library* (Brochure accompanying the exhibition Educate! Amuse! And in Colors!, San Francisco Public Library, 2012); Justin G Schiller, "McLoughlin Brothers Archives--A Brief Account," in *Radiant with Color et Art: McLoughlin Brothers and the Business of Picture Books, 1858-1920 : December 6, 2017 - February 3, 2017 the Grolier Club, New York*, ed. Lauren B Hewes and Laura Wasowicz, 2017, 33–39.

[375] Chromolithography's relationship with painting has received far more attention than its uses for children's illustration. See, for example, Michael Clapper, "'I Was Once a Barefoot Boy!': Cultural Tensions in a Popular Chromo," *American Art* 16, no. 2 (July 1, 2002): 17–39.Justin G Schiller, "McLoughlin Brothers Archives--A Brief Account," in *Radiant with Color et Art: McLoughlin Brothers and the Business of Picture Books, 1858-1920 : December 6, 2017 - February 3, 2017 the Grolier Club, New York*, ed. Lauren B Hewes and Laura Wasowicz, 2017, 33–39; George King Fox, *The History of The George M. Fox Collection of Early Children's Books at the San Francisco Public Library* (Brochure accompanying the exhibition Educate! Amuse! And in Colors!, San Francisco Public Library, 2012).

In the early 1880s, John McLoughlin, Jr., proprietor of the publishing firm, noticed a craze in the European book market that he wished to adopt in his United States business. Since the 1870s, he had sent representatives from McLoughlin Bros. abroad to investigate trends in European books, prints, and games. He had even taken scouting trips to London himself, reported the publishing-world gossip columns of *American Bookseller.*[377] It was on one of these trips across the Atlantic, where he encountered the success of movable books by the British publisher Dean & Sons, that he decided to revive American markets for paper-engineering.[378] As discussed previously, those publishing activities had slowed in the United States in the decades following the Civil War. But McLoughlin's color printing prowess and technical ability was like none the United States had seen before—if any firm was to bring experimental print back to American visual culture, it was this one.

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[376] McLoughlin's racist imagery is mentioned in: Robin Bernstein, *Racial Innocence: Performing American Childhood from Slavery to Civil Rights* (NYU Press, 2011), 224.

[377] For more about the firm's distribution and marketing networks, see: Laura Wasowicz, "McLoughlin Brothers' Conquest of the American Picture Book Market," in *Radiant with Color et*

Soon after the proprietor's visit to London, where he purchased many European examples to be kept as "file copies" in New York, the firm issued their first animated contribution to the transatlantic pop-up boom: a theatrical paper diorama called the *Little Showman's Series* (Fig. 4.6).[379] The series was, as was common practice for McLoughlin and their American peers, directly inspired by a similar product issued by German publisher J.F. Schrieber titled *The Showman's Series,* which was published in both German and English language editions.[380] Beyond this immediate model, both McLoughlin and Schreiber took the longer nineteenth century tradition of paper theatres as a stylistic reference, a format that had enjoyed far more popularity in Europe than in

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Art: McLoughlin Brothers and the Business of Picture Books, 1858-1920 : December 6, 2017 - February 3, 2017 the Grolier Club, New York, ed. Lauren B Hewes, 2017, 24–25.

[378] The British publishing firm Dean & Sons (previously Dean & Munday and Thomas Dean & Son) were the first to produce movable books on a mass scale, alongside competitors including Darton and Ward & Lock. Dean's successful movable titles included the *Dame Wonder Transformation Series*, among others. Under the proprietorship of George Alfred Henry Dean (1822-1891), the firm issued numerous formats that the McLoughlin Bros. would later copy. For more about Dean & Sons, see: Peter Haining, *Movable Books: An Illustrated History : Pages & Pictures of Folding, Revolving, Dissolving, Mechanical, Scenic, Panoramic, Dimensional, Changing, Pop-up and Other Novelty Books from the Collection of David and Briar Philips* (London: New English Library, 1979), 20.

[379] Ruth McGurk, "Early Children's Books: The Fox Collection at San Francisco Public Library," *Ampersand* 19 (Summer 2000): 12–29.

[380] J.F. Schreiber was a German publishing company based in Esslingen that specialized in the production of children's books, especially paper theatres.

the United States up to this point. While McLoughlin lifted the German series' title and many of its compositions wholesale, they made certain changes to their copies in both format and iconography that speak to the priorities and desires of a specifically American market. Most visibly, Schreiber's paper theaters tended to rattle with animated movement, each stage set sprinkled with mechanical features like pull-tabs and rotating wheels. See, for example, Schreiber's *Die Menagerie,* a multi-plane view of a zoo cage in which a paper parrot dangles from a hook, swaying left and right in juxtaposition with the recession of perspectival depth (Fig. 4.7). The backsides of these frenetic paper constructions reveal volvelles and tabs that enabled their multidirectional movement (Fig. 4.8.) McLoughlin's specimens are, by comparison, mostly still and regimented in their organization of space (Fig. 4.9). Although they are technically movable books, they offer no illusions of motion, but rather a cycle of expansion and compression upon opening and closing that emphasizes scopic fields and the recession of perspectival depth. In this way, the pop-ups resemble stereographs, which produced three-dimensionality from seemingly flat surfaces.

McLoughlin's productive piracy of European designs offer an entryway into questions of how transatlantic print and book publishers branched out from core subjects to fit geographically specific markets, and more specifically, their specific visual tastes. American publishers lifted concepts from their competitors with abandon, irking artists like Walter Crane to no end, who in 1877 wrote a letter to *Scribner's* protesting McLoughlin's intellectual theft of his illustrations for *The Baby's Opera* (Fig. 4.10).[381]

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[381] Laura Wasowicz, "The Tempest Over "The Baby's Opera"," *Past Is Present* (blog), January 4, 2013, http://pastispresent.org/2013/good-sources/the-tempest-over-the-baby%e2%80%99s-opera/.

The firm's methods for copying were complex and targeted. Illustrated books, games, and other printed material were carefully and subtly revised for fresh reception in the United States, whether that meant appealing to local audiences' desires or—more likely—innovating in ways that would distinguish the firm from its competitors at home and overseas. In an era before the codification of visual copyright law, these tweaks were intended for commercial appeal rather than legal protection.

As inscriptions and visual edits in McLoughlin archival materials suggest, making a book "more American," to use the firm's own words, was a strategic business decision. However, only a portion of these adjustments were intentionally nationalistic in subject matter, while other edits were casual or even instinctive, distinct forms of revision each carrying a separate signaling power. The deceptively simple question of what, for McLoughlin, made an object "more American" at first seems to echo the "what's American about American Art" debates posed by the field's earliest critics in a moment of somewhat defensive self-definition.[382] Playing along with McLoughlin's own claims, not to isolate a different and better American tradition but rather to consider how period artists conceived of their own difference, complicates this query.

After the Civil War, McLoughlin hired a talented group of illustrators. Some of these artists, including Thomas Nast and Ida Waugh, went on to successful careers later.[383]

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[382] For an overview of scholarly attempts to isolate an "inherently national" look to American art, see: Wanda Corn, "Coming of Age: Historical Scholarship in American Art," *The Art Bulletin* 70, no. 2 (June 1988): 192.

[383] Bonnie Keyser, "The McLoughlin Brothers and 19th Century 'Toy Books,'" *AB Bookman's Weekly*, November 17, 1986, 1993–98. For an example of Thomas Nast's work for McLoughlin, see: George P. Webster and Thomas Nast, *Santa Claus and His Works* (New York: McLoughlin Bros., 1870). Ida Waugh, who exhibited alongside Mary Cassatt at the Women's building at the 1893 Columbian Exposition, produced illustrations for McLoughlin in publications including *Over the Hills, a Collection of Pictures in* Colors by Miss Ida Waugh. New York: McLoughlin Brothers, 1882.

Others remain unknown to this day, perhaps because they were chosen for their skill at imitating the hands of others, eventually forming a standardized house style. McLoughlin's in-house artists were responsible for outfitting pirated books with fresh illustrations and visual details—a process diagrammed in surviving file copies of British and German editions, held at the San Francisco Library George M. Fox Collection of Early Children's Books.

A file copy titled *Lost on the Sea Shore* is a story of shipwreck published by British firm Routledge in the early 1860s, and appropriated by McLoughlin around 1866. Routledge was a favorite source for the American firm (Fig. 4.11).[384] It is evident from the book's pencil annotations that the savvy publishers understood the process of reprinting as a fresh creative endeavor. For instance, scrawled in pencil above the cover image is the directive to "Make this American," and later, to "make this more American" (Fig. 4.12). Justin H. Howard, a prolific McLoughlin illustrator, was tasked with Americanizing the British pictures, and quickly responded with a decently altered version of *Lost on the Sea Shore* (Fig. 4.13). In Howard's reimagining of the cover plate, little American children are dressed in stripes and jaunty ascots, where their British counterparts look comparably rumpled (the American children have also caught quite a few more fish). But the major differences are formal: Howard's lines are clean and sinuous, and even in 1866, McLoughlin's advanced chromolithographic technique is evident in the crisp coloration and sharp registration.

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[384] Michael Hearn, *Catalogue 35: Original Woodblocks from the Archives of McLoughlin Brothers, Publishers, New York* (36 E 61 Street, New York: Justin G. Schiller, LTD, 1978).

McLoughlin's imprint is front and center, surrounded by ornamental latticework and the creative typography characteristic of the firm. This small detail – the envelopment of the cover image within a decorative frame—injects a coy three-dimensionality into the cover design, inviting the viewer to sort out its play of surface and depth. Embedded within this object is a rehearsal of the viewer's perceptual relationship to an imagined world: as we grasp the edges of the cover to open the book's pages, our gaze travels inwards, ricocheting off the cropped corners of the album-like frame. Designating an object as "more American" entailed, crucially, an active management of vision's path.

The adjustments made in *Lost on the Sea Shore* present a basic framework for understanding how and why the McLoughlin team made changes to European books for their American markets, including the *Little Showman's Series*. Of course, in the nearly two decades lapsed between these publications, the whims and concerns of the market shifted; but looking first at this well-documented case of alteration helps us notice similar instances of transformation in *The Aquarium*, for which we have no surviving McLoughlin-owned file copies. However*,* we can look to extant (but non-annotated) copies of both editions, such as those I consulted in the Brenda Forman Collection of Movable and Mechanical Books at the University of Virginia, to discern visual and material differences.

McLoughlin's Pop-Up Pictures

A pop-up book in McLoughlin's *Little Showman's Series* titled *The Aquarium* offers a detailed case study in how the firm altered spatial and kinetic features as well as subject matter to appeal to the United States market. Closed and flat, McLoughlin's *The Aquarium* is less than half an inch thick. Plump walruses and a mangy polar bear prowl around the arctic landscape on its cover. Sunlit glaciers give way, upon opening, to a distant time and place: an autumnal waterfall crowns a gilded case, which projects outwards from the back panel (Fig. 4.14). The book's theatrical frame, which would have recalled popular tableaux vivant performances and natural history diorama displays for viewers, was a common strategy for the publisher, and the designs were often recycled from one publication to the next. It's no accident that the 1880s also saw the height of aquarium-mania in America, and visiting public aquaria was a popular pastime mirrored by the presence of miniature oceanic cross-sections in the home.

Aquaria had existed in the United States since before the Civil War, but surged in popularity and availability for domestic purposes in the 1880s.[385] In one writer's words, "An Aquarium-mania seized upon the public mind. The aquarium was on everybody's lips. Morning, noon, and night, it was nothing but the Aquarium…."[386] Some daring models, like a combination birdcage-aquarium-plant stand, were clearly intended as decorative focal points or conversation pieces—objects to be gazed upon (Fig. 4.15). For those not fortunate enough to own their own parlor ponds, public aquariums in nearly every major city drew large crowds (Fig. 4.16). The contained, microcosmic aesthetic of aquaria was reproduced in political cartoons, such as an 1895 caricature of Uncle Sam removing a "greenback frog" from an aquarium labeled "U.S. Treasury" before he

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[385] Judith Hamera, *Parlor Ponds : the Cultural Work of the American Home Aquarium, 1850-1970* (Ann Arbor: University of Michigan Press, 2011), 84–85; Eldredge, "Wet Paint," 116.

[386] Hamera, *Parlor Ponds*, 96.

"swallows up all my Gold Fish!" (Fig. 4.17). The glass siding of the aquarium tank can be seen as a surface retooled to vision's desires—one that allows sight itself to easily penetrate, while still participating in the culture of containment and miniaturization that so fascinated Victorian Americans.[387]

Inside McLoughlin's proscenium-like aquarium, plants and creatures float, suspended, in regimented spatial slices (Fig. 4.18). Hovering only centimeters in front of the backdrop, blades of seaweed bend and curve as if undulating in gentle currents. A mid-layer features a stream of fish swimming through the undersea coral garden, their flat paper bodies juxtaposed against bursts of magenta and green. Three children watch the oceanic diorama through an outermost pane of cellophane-like transparent material. At the far right, an older girl points inwards towards the watery world, mouth slightly open, as she teaches her companion about its wonders. This self-conscious gesture references the book's potential as an instructional tool, which is reinforced by the advertisement for an "object teaching book" on the pop-up's reverse (Fig. 4.19). The firm viewed their products as not just toys and entertainment, but as visual teaching devices in line with the dominant classroom culture of "object lessons," which centered sensory engagement with the material world as a mode of education. Louis Prang's lithographic series *Prang's Aids for Object Teaching* provides just one example of this widespread pedagogical craze.[388]

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[387] Isobel Armstrong, *Victorian Glassworlds: Glass Culture and the Imagination 1830-1880* (Oxford ; New York: Oxford University Press, 2008), 95–132; Susan Stewart, *On Longing : Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* (Baltimore: Johns Hopkins University Press, 1984), 37–69.

[388] Sarah Anne Carter, "Object Lessons in American Culture" (Harvard University, 2010).

The Aquarium's multi-tiered structure presents a winding journey from icy arctic to golden forest to submarine world. The relationship between these spaces is puzzling, but in the McLoughlin edition, it is potentially clarified through comparison with John Frederick Kensett's *Bash Bish Falls*, one of many versions of the Taconic Mountains landmark painted before the artist's death in 1872 (Fig. 4.20).[389] The Massachusetts site was a popular one in visual cultural representation, but it's unlikely that the McLoughlin rendition comes from firsthand observation. Rather, the house artists likely drew inspiration from images circulating in printed guidebooks. The vantage point and composition of the McLoughlin version recall a Kensett *Bash Bish* canvas now in a private collection—most likely not the exact source for McLoughlin's design, but an example of the general type of painted or printed scenes the artist might have consulted. The swooping curve of the spindly wooden bridge, the nearly anthropomorphic profiles of the cliff faces, and the common palette of ochre and umber are just a few of many similarities. The illustrator of *The Aquarium* has, by referencing America's first established artistic "school," attempted to mark the *Little Showman's Series* as "more American" in the most nostalgic and idealized sense.

In the German-designed version of the book, published by J.F. Schrieber around 1880 in Esslingen and in English editions in London and New York, the space that Bash Bish falls occupies is left entirely blank (Fig. 4.21). McLoughlin's addition of the autumn landscape served a suturing function, tying together polar terrain and underwater world at the hinge of a recognizable landscape. In contrast, the blankness in the Schreiber edition is jarring and underscores the disconnect between exterior and interior. Its structure deviates from the American edition in other important ways: most obviously, the pop-up is bound in a book alongside several other scenes, while the McLoughlin edition was sold as a separate object. Encountering the diorama within a bound codex fundamentally alters the experience of physical engagement.

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[389] Metropolitan Museum of Art (New York N.Y.), *American Paradise: The World of the Hudson River School* (Metropolitan Museum of Art, 1987), 151–53.

Topping *The Aquarium* with a Hudson River School-inspired scene was a charged decision, and represents the firm's most calculated attempt at Americanization. By the early 1880s, paintings like Kensett's had fallen out of style, although illustrated tourist guides were more popular than ever before—marking landscape's transition between sophisticated fine art and popular culture.[390] Hudson River School painting was lambasted as retrograde and saccharine. Just a few years prior to *The Aquarium's* publication, critic Earl Shinn coined the term "Hudson River School," only to draw a distinction between "the fogy pictures" of American landscape created by homegrown artists and "the innovating pictures of impressionists who had trained abroad.[391] The unsubtle patriotism of Hudson River School aesthetics, deemed gauche in the art world and attractive in popular culture, was exactly the straightforward visual language that McLoughlin's designers needed to pass their copy off as conceivably native. Its geologic subject, too, took on national character. Art historians from Barbara Novak to Rebecca Bedell have noted the nineteenth century obsession with the geologic history of the

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[390] Maggie Cao's work traces the dissolution of landscape painting as a major nationalist endeavor during this period: Maggie M. Cao, "Heade's Hummingbirds and the Ungrounding of Landscape," *American Art* 25, no. 3 (September 1, 2011): 48–75.

[391] Edward (Earl Shinn) Strahan, "'The National Academy of Design,' Art Amateur 1 (June 1879)," in *American Art to 1900: A Documentary History*, ed. Sarah Burns and John Davis (Berkeley: University of California Press, 2009), 854.

United States as a New World alternative to an antique past. Lithographers have largely been left out of the litany of artists making symbolic use of the geologic, yet the act of using lithography's traditional stone canvas to imagine a famous geologic vista would not have been lost on the self-conscious McLoughlin team. The Hudson River School, circa 1880, was American down to its very bedrock, and appropriating both its scenery and its style allowed international copyright pirates at McLoughlin to assure audiences that their products were equally homegrown.

The firm's commercially-motivated idea of what it meant to make their book "more American"—topping the borrowed composition with an icon of national geology, a metonym for patriotic identity—tells only part of the story. Format reveals the rest. Structural decisions made by the McLoughlin publishers, namely the choice to publish the series as a group of standalone single-panel dioramas, rather than as the bound codex structure that Schreiber had favored, allowed an emphasis on layered recessive depth and repetitive lateral motion to shine through. Beneath the clamoring patriotism of *Bash Bish Falls* lies a subtler set of instinctive adjustments, indicative of—if not intentionally targeted toward—a growing turn of the century American interest with the dynamics of surface and depth.

Perhaps because of their ubiquity in contemporary children's literature, the pop-up genre has become archetypal, serving for many as a synonym for "movable books." Yet out of all possible movable formats, especially the turn-ups, dissected plates, and pull-tab cards discussed in previous chapters, pop-up books actually do not move very dramatically, and require very little tactile engagement from the viewer to "animate." The user must touch their surfaces on just two occasions: in the dual acts of opening and closing the covers. In these mirrored acts, a peculiar type of movement takes place, not unlike that of a breathing body. Indeed, pop-up structure is undeniably corporeal: as a closed book's covers are pulled apart, a series of delicately engineered die-cut folds activate and begin to emerge from their nests, bending and stretching with muscular elasticity. Supported by the twin axes of front and back covers, tension and motion transform paper ligaments into a self-sustaining architecture. Whereas the inclusion of a Hudson River School scene demonstrates how the visual forms of American national identity were consciously staked at the turn of the century, I propose that that the pop-up's expansive yet regimented unfurling was a different sort of unconscious adjustment.

As I have explored in the example of Schreiber's paper theatres, European competitors frequently outfitted their books with levers, tabs, and strings to produce a scatter of diverse movements in all directions—in particular, the German pop-up producer Lothar Meggendorfer was internationally known for this kind of surprising mechanical play. McLoughlin would later adopt some of these strategies, but the first run of *The Little Showman's Series* was free of such cacophonous animation, although the firm was certainly technically capable of adding in such details. By paring down the pop-up's potential for multidirectional dynamism in favor of an emphasis on recession into space, the book's designers allow for its clearly delineated layering to take center stage. Spatial details, particularly the arrangement of negative spaces throughout its layered surfaces, emphasize that the object is meant for ocular rather than haptic engagement. Cutouts, holes, and transparencies slice across the vertical planes, gaping increasingly wide as the book expands and settles into its popped-up form. The gaps shrink just as quickly away as the book shuts, surface again meeting surface. Vision seeps in through these punctures where fingers (even those of a small child) cannot, the path of the eye continually changing course as if following the twists and turns of an invisible maze.

In addition to symbolic and iconographic attempts to "Americanize" its subject matter, *The Aquarium*'s spatial layout reacts to a late nineteenth century artistic interest in the relationship between two- and three-dimensional representation most popularly seen in the period's stereograph craze. In particular, the book illustrates compromised depth, a volumetric space that offers gradients of visibility and obfuscation, such as an ocean that transformed from transparent surface to murky fathoms. In the realm of fine art, Winslow Homer's Adirondack watercolor *Mink Pond* offers another example of translating intriguing spatial situations into two-dimensional forms. *Mink Pond* is a watercolor painted a quarter-mile from the North Woods Club in Minerva, the Adirondacks town where Homer spent much time painting hunting and fishing subjects (Fig. 4.22).[392] The murky-hued image gives a split-view representation of the titular pond, eliminating surface refraction in favor of a view onto a submerged floor of waterlogged leaves and mossy twigs.[393] Cutting the surface are lilypads and flowers, a sunfish, and a wide-eyed frog, whose webbed foot dips below the water.[394] This perspectival arrangement provokes viewers' self-conscious examination of their own bodies position in the act of viewing. In order to see Mink Pond as Homer portrays it, the viewer must be positioned at frog's eye level, perhaps even submerged him/herself.[395] In *The Aquarium*, compromised depth is similarly inherent in the subject matter, a waterscape in which a clear view from water's surface to ocean floor is occluded by paper layers of seaweed and sea life; their flat solidity contrasts with the transparent cellophane stretched over the outermost proscenium. Closing the book's covers collapses the space from three- to two-dimensions before the viewer's eyes, emphasizing the equation between spatial expansion and visual information. Much like many of its predecessors earlier in the century, the paper-engineered book functioned as a kind of perceptual teaching tool, offering an algorithm for untangling depth and three-dimensionality that relied on a self-conscious interest in the operations of sight.

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[392] Annie Ronan, "Capturing Cruelty: Camera Hunting, Water Killing, and Winslow Homer's Adirondack Deer," *American Art* 31, no. 3 (November 1, 2017): 52–79; David Tatham, *Winslow Homer in the Adirondacks* (New York: Syracuse University Press, 1996).

[393] Helen A Cooper et al., *Winslow Homer Watercolors* (Washington; New Haven: National Gallery of Art ; Yale University Press, 1986), 174.

[394] Kathy Foster draws connections between the sunfish, whose body is caught mid-break of the water's surface, to contemporary works in the medium by Ruskinian flower painters and John La Farge. Kathleen A. Foster, *American Watercolor in the Age of Homer and Sargent* (Yale University Press, 2017), 307.

Unsurprisingly, McLoughlin's artists were no strangers to experimentation with perspective and the transition between two- and three-dimensionality, as products like *The Magic Mirror* demonstrate (Fig. 4.23). The 1880 toy came complete with a mercury glass tube viewer, a lens that unraveled anamorphosis's dizzying swirl into a coherent image when placed upon a marked target. But crucially, unlike its two-dimensional counterpart, a reader of *The Aquarium* could straighten out a 3D pop-up's temporary anamorphic distortions with just hand and eye, no reliance on optical prosthetics necessary. In this way, *The Aquarium*'s built-in mechanisms for visual confirmation offer an alternative way of thinking about questions of embodied vision—particularly Crary's now classic analysis of optical tools as instruments of a nineteenth-century separation of the senses.

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[395] Elliot Bostwick Davis, "Training the Eye and the Hand: Drawing Books in Nineteenth-Century America" (Columbia University, 1992).

No study of nineteenth-century moving images would be complete without considering pop-up books, the most iconic and well-known format that the genre has to offer. But as this coda has shown, the first pop-up books produced in the United States are worthy of examination not simply for their particularly visible position in a litany of experimental print. *The Little Showman's Series* offers a reminder that modes of reception are constantly in flux, and that format alone does not dictate patterns of viewing.

Conclusions

As the nineteenth century turned to the twentieth, new moving image technologies emerged that engaged viewers' bodies in very different ways: namely, cinema and related types of screen performance. Scholars including Miriam Hansen, Tom Gunning, and Anne Friedberg have long probed the new configurations of active and passive spectatorship that emerged during this time, particularly in relationship to cinema and screen culture.[396] This dissertation expands upon those conversations by presenting a media archaeology of active spectatorship beyond the screen or the projection. In particular, this closing coda has pushed the notion of "active spectatorship" toward greater sensory particularity, untangling active touching from active looking to better understand when and why certain senses were employed.

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[396] Miriam Hansen, *Babel and Babylon: Spectatorship in American Silent Film*, 3. print, n.d.; Anne Friedberg, *Window Shopping : Cinema and the Postmodern* (Berkeley: University of California Press, 1993); Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator," *Art and Text* 34 (Fall 1989).

As the preceding chapters of this dissertation have shown, from the early national period through the Civil War, tactility—or more specifically, an entanglement of tactility and vision—featured heavily in the construction of knowledge and practices of viewing for many American viewers. Movable paper constructions, such as the turn-up books, layered illustrations, and pull-tab cards discussed throughout these pages, were critical sites for the physical mediation of ideas about philosophy, science, and art. However, they were by no means the only places where tactile processes of seeing occurred. Rather, these unusual objects make those broader practices visible through their material and formal strangeness. Their unusual folds and tabs, or unexpected thickness and expansion, force the contemporary viewer to pause and ask how and why they came to be the way they are. Tactile images were constructed to fill a cultural desire to filter vision through touch, and simultaneously, their use reinforced and legitimized the tactility's continued importance. This self-reinforcing system continued for decades, evolving to suit social concerns ranging from education to the control of women's bodies to the abstract value of financial credit, until the cataclysmic effects of war forced its total reevaluation. Ultimately, the manipulative and imaginative play central to tactile images encouraged an imaginative play that extended across media.

When explored in tandem, the pull-tab portraits and paper currency, layered anatomical lithographs and marble sculpture, flap books and trompe l'oeil painting juxtaposed throughout the dissertation reveal the broader diffusion of the sensory relationships enabled by tactile images. While the paper constructions at the center of each chapter clearly and concretely invited the user's touch, they did so in the pursuit of particular ideological goals that were shaped by larger cultural forces that worked equally upon the creation and reception of other media. Historians of art (particularly in the subfield of American art, which has historically welcomed visual culture approaches) tend to relate fine art and visual culture in prescribed and formulaic ways. Art objects including painting or sculpture are frequently brought into conversation with artifacts including (but not limited to) pictorial newspapers, broadside prints, advertising ephemera, or snapshot photography. In most of these studies, the work of a known artist is at the center of the argument, buttressed by the surrounding supports of visual and material culture, which are called upon as evidence of widespread social or cultural forces that shaped either artistic intention or audience reception. The common purpose is to achieve a fuller understanding of the creation of the paintings themselves. This is a valuable methodology that has significantly enriched our understanding of the social history of art, and I am not suggesting that the field leave this approach behind. Rather, we would be well served to diversify and complicate the field's approach to this way of relating "high" and "low" through new configurations of genres and media. In this dissertation, I have attempted to unsettle this usually unidirectional relationship by placing books, prints, and ephemera in multidirectional conversation. Centering works on paper, which are then considered in parallel with a broader media landscape that includes the work of trained artists, is a strategy intended to do more than simply flip the script.

Considering these strange bedfellows together, as related approaches to a shared visual culture defined by multidirectional influence and exchange, has major implications for how we understand lineages of media and technology. Demonstrating that most pre-twentieth century moving images were neither illusory nor screen-dependent dismantles the clean and teleological narrative of proto-cinema under which tactile paper is usually grouped and ultimately dismissed. Similarly, complicating cinema's prehistory—or rather, the notion that any "prehistory" of media can or should even be told—forces reevaluation of origin stories foundational to disciplines of art history and cinema and media studies. Moving images were sites of diverse kinds of active, physical engagement long before the emergence of cinematic technologies c. 1895—a finding which supports recent research pushing against the myth of the shocked and unprepared early cinematic viewer.[397]

Finally, this dissertation poses an alternative means of understanding flatness, a key term in modern art history, in the particular context of American art.[398] By invoking flatness, I refer to a tradition of criticism that locates the origins of modernist painting with self-conscious strategies that render the artifice of painting visible, often through challenges to the systems of illusionism and naturalism that had defined earlier visual expression. There has been a large body of scholarship on flatness in late nineteenth-century European painting, in American abstraction, and on the critics who initially engaged with these ideas, which I will not attempt to rehearse in these final sentences.[399] Undisputed in these writings is a tendency to locate the revolutionary flattened and flattening surface with trained artists, mostly Europeans, from the last decades of the nineteenth century onwards. I do not want to contradict this timeline, but rather, to suggest that a timeline in and of itself is an imperfect structure for understanding period acknowledgement of visual surfaces as sites of intellectual complexity beyond perspectival illusion. For as this dissertation has shown, between the late eighteenth century and the turn of the twentieth, Americans frequently encountered an animated flatness, a keen acknowledgement of the dynamic and meta-representational potential of the surface that was dispersed across time and space. Animated flatness, like the tactile image, went underground throughout the century, only to continually reemerge.

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[397] Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator," *Art and Text* 34 (Fall 1989).Gunning, "An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator."

[398] An overview of the historiography of flatness can be found in: David Joselit, "Notes on Surface: Toward a Genealogy of Flatness," *Art History* 23, no. 1 (March 1, 2000): 19–34.

[399] Joselit.

FIGURES

All images have been withheld for copyright reasons.

Introduction

Introduction

Figure 0.1. Guts in the gutter. Walter Hamady, *Gabberjabb #6,* 1988. Kislak Center for Special Collections, Rare Books and Manuscripts, University of Pennsylvania. N7433.4.H34 N4 1988.

Figure 0.2. Unopenable overlays across three editions of Walter Hamady, *Gabberjabb #6,* 1988 (Kislak and Rare Book School).

Figure 0.3. Colophon closed by adhesive marked “tamper resistant.” Walter Hamady, *Gabberjabb #6,* 1988. Kislak Center for Special Collections, Rare Books and Manuscripts, University of Pennsylvania. N7433.4.H34 N4 1988.

Figure 0.4. Leslie Smith. Details from *Inner Rooms,* 2017. Written, designed, printed, and bound by Leslie Smith in Caslon and Caslon italic, printed from photo-polymer plates on Zerkall Book paper. Images courtesy of the artist.

Figure 0.5. Shawn Sheehy, *A Pop-up Culinary Herbal*, 2013. Paperboy press, edition of 30. Letterpress printing in Italian electric from photopolymer plates by Sarah Vogel.

Figure 0.6. Casey Gardner, *Body of Inquiry,* 2011. Set in Motion Press/Still Wild Books, edition of 57. Letterpress printed triptych with interior sewn codex & pop-up structures. Written, drawn, printed and hand-bound by the artist. Body parts are hand-cut. Materials are Lettra, Folio, Elephant Hide, Faux Leather, ink & pastels. Dimensions closed9.75x15.25”; dimensions open: 28.50x15.25.”

Chapter One

Figure 1.1. Manuscript *Metamorphosis* made by Benjamin Sands (b. 1748/49 – d. after 1823), Loudoun County, Virginia, December 24, 1782. Height 8’, width 6 ¼’. Ink and watercolor on paper. Colonial Williamsburg Foundation.

Figure 1.2 Verso, Manuscript *Metamorphosis* made by Benjamin Sands (b. 1748/49 – d. after 1823), Loudoun County, Virginia, December 24, 1782. Height 8’, width 6 ¼’. Ink and watercolor on paper. Colonial Williamsburg Foundation.

Figure 1.3. Detail of verso, Manuscript *Metamorphosis* made by Benjamin Sands (b. 1748/49 – d. after 1823), Loudoun County, Virginia, December 24, 1782. Height 8', width 6 ¼'. Ink and watercolor on paper. Colonial Williamsburg Foundation.

Figure 1.4. *The Beginning, Progress, and End of Man.* London: B. Alsop for T. Dunster, 1650. Print with woodcut illustrations. The British Library, 669.f.15.(34). Fully closed.

Figure 1.5. *The Beginning, Progress, and End of Man.* London: B. Alsop for T. Dunster, 1650. Print with woodcut illustrations. The British Library, 669.f.15.(34). Top flap open.

Figure 1.6. *The Beginning, Progress, and End of Man.* London: B. Alsop for T. Dunster, 1650. Print with woodcut illustrations. The British Library, 669.f.15.(34). Fully open.

Figure 1.7. *Dr. Last, or the Devil upon Two Sticks.* Hand-colored harlequinade engraving published by Robert Sayer, London, 1776. Collection of Richard Balzer.

Figure 1.8. Benjamin Sands, *A Key to the Impenetrable Secret.* Printed by Joseph Gales, Northampton Township, Bucks County, PA. Before 1799. American Antiquarian Society 353597.

Figure 1.9 Details from printed *Metamorphoses* showing a consistent loss on the illustration block. Left, 1814 Joseph Rakestraw edition, Penn State Library, PZ6.S26Me 1814b. Right, 1793 edition, Library Company of Philadelphia, AM 1793 San Log 5049.0 (G. Allen).

Figure 1.10. Benjamin Sands, *Metamorphosis, Or, A Transformation of Pictures : With Poetical Explanations* (Cheshire, CT: Shelton & Kensett, printed by Hale & Hosmer in Hartford, CT). Digital images from Brown University, Harris Broadsides collection, HB15963. Illustrations not drawn by James Poupard.

Figure 1.11. Benjamin Sands, *Metamorphosis, oder, Eine Verwandlung von Bildern mit poetischen Erklärungen zur Unterhaltung der Jugend*. Published in Harrisburg, PA by G.S. Peters, 1833. Library Company of Philadelphia, Am 1833 San Log.4564.D (G. Allen).

Figure 1.12. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.13. Folded into booklet format. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.14. Detail, Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.15. Detail, panel one. Shown fully closed, with top flap open, and with both flaps open. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.16. Detail, interior registers with sampler embroidery pattern. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.17. Detail, panel two. Shown fully closed, with top flap open, and with both flaps open. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.18. Detail, panel three. Shown fully closed, with bottom flap open, and with both flaps open. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.19. Detail, panel four. Shown fully closed, with bottom flap open, and with both flaps open. Benjamin Sands, *Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.* Printed and sold by J. Rakestraw, no. 256, North Third street, 1814. Penn State University Library, PZ6.S26Me 1814b.

Figure 1.20. Gravestone of John Foster, Slate, 1681. Carved by "The Old Stone Cutter." Dorchester, Mass. Image via Farber Gravestone Collection, American Antiquarian Society, photo number 1170.

Figure 1.21. Metamorphosis handmade by Sally White, Albemarle County, Virginia, c. 1805. Colonial Williamsburg Foundation. Watercolor on paper. Above, fully closed; below, interior.

Figure 1.22. Manuscript Metamorphosis c. 1800, Beinecke Library, Yale University (GEN MSS 566 Box 1 folder 10-13).

Figure 1.23. Detail, panel one. Flaps fully closed; top flap open; fully open. Manuscript Metamorphosis c. 1800, Beinecke Library, Yale University (GEN MSS 566 Box 1 folder 10-13).

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Figure 1.25. Detached panels of manuscript metamorphosis by Mr. Thomas Whitfield, 1745. Cotsen Children's Library, Princeton.

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Figure 1.27 Henry Perkins, panels from a manuscript metamorphosis, c. 1790-1820. Beinecke Rare Book and Manuscript Library, Yale University, GEN MSS 566. Box 1, Folders 6-9.

Figure 1.28. Esther Carpenter, panels from a manuscript metamorphosis, c. 1790-1820. Beinecke Rare Book and Manuscript Library, Yale University, GEN MSS 566. Box 1, Folders 1-4.

Figure 1.29. Manuscript Metamorphosis c. 1800. Penn State University Library, PS-V-MS-122 Vault F.

Figure 1.30. Alphabet page, woodcut, in *The New-England Primer Improved* (Boston: W. M'Alpine, 1767). American Antiquarian Society. From David Hall, *Protestants and Pictures*, 204.

Figure 1.31. Pages from *A new hieroglyphical Bible for the amusement & instruction of children; being a selection of the most useful lessons, and most interesting narratives (scripturally arranged) from Genesis to the Revelations. Embellished with familiar figures & striking emblems elegantly engraved. To the whole is added a sketch of the life of our Blessed Saviour, the holy apostles, &c* (London, G. Thompson, 1794). Archive.org digitization of University of Toronto original, https://archive.org/details/hieroglyphbible00unknuoft.

Figure 1.32. Maria Lalor, embroidered sampler, 1793. Silk embroidery on linen. Made in New York. Metropolitan Museum of Art, 1993.100.

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Figure 1.35. A suspicious fold in Charles Willson Peales' memorandum book, uncreased (above) and creased (below). Charles Willson Peale, "Memorandum Book (B P31 #8a)" Peale-Sellers Papers, American Philosophical Society, c.1820 1794. Images courtesy Jessica Linker.

Figure 1.36. Raphaelle Peale, *Venus Rising from the Sea – a Deception*, c. 1822. Oil on canvas. Nelson-Atkins Museum of Art, 34-147.

Figure 1.37. Charles Willson Peale, *Staircase Group (Portrait of Raphaelle Peale and Titian Ramsay Peale I*), 1795. Philadelphia Museum of Art, E1945-1-1.

Figure 1.38. Raphaelle Peale, *Catalogue Deception*, after 1813. Oil on panel. Philadelphia Museum of Art, lent by the Peale family.

Figure 1.39. Diagram of Raphaelle's first composition of *Venus Rising from the Sea*. From Mary Schafer and Lauren Lessing, 2009.

Figure 1.40. Charles Willson Peale, Portrait of Raphaelle Peale, 1817. Private collection.

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Figure 1.43. Charles Willson Peale, *Artist in his Museum*, 1822. Pennsylvania Academy of Fine Arts, 1878.1.2.

Figure 1.44. Neckerchief, c. 1868. Woven cotton. Shaker, made in New Lebanon, NY. Metropolitan Museum of Art, 1985.40.5.

Chapter Two

Figure 2.1. Cover of George Spratt, *Obstetric tables : comprising graphic illustrations, with descriptions and practical remarks, exhibiting on dissected plates many important subjects in midwifery*. First American edition, Philadelphia: Wagner & Mcguigan, 1847. Kislak Center for Special Collections RG652 .S767o 1847.

Figure 2.2 Surface layer, Table X. "Preternatural Presentations of the Foetus." Image via Archive.org digitization of 1848 edition in the National Library of Medicine.

Figure 2.3. Surface layer, Table VII B. "On the Application of the Forceps in the Most Natural Position of the Foetal Head." Archive.org.

Figure 2.4. Table III, "Female Organs of Generation." Kislak copy.

Figure 2.5. Gustave Courbet. *L'Origine du monde,* 1866. Musée d'Orsay.

Figure 2.6. Maygrier, *Nouvelles Demonstrations*, 1825. Pl. IX. Archive.org.

Figure 2.6. Table XI. "Contents of the Gravid Uterus, Membranes, Twin Conception. &c." Kislak copy.

Figure 2.8. Table IV. "On the Signs of Pregnancy and Development of the Uterus." Left, from 1848 American edition (Archive.org), right, from 2nd London edition (National Library of Medicine)

Figure 2.9. Table I. C. "Hysterotomy, or the Cesarean Operation."

Figure 2.10. Isaac Cruikshank, Caricature of a man-midwife as a split figure, June 15, 1793. Hand-colored etching. Wellcome Collection no. L0018481. Commission for Samuel William Fores (John Blunt), "Man-midwifery dissected; or, the obstetric family-instructor…In fourteen letters. Addressed to A. Hamilton…Occasioned by certain doctrines contained in his letters to Dr. W. Osborn." 1793 pamphlet.

Figure 11. Table VIII. Surface layer, "On the Application of the Forceps in the Most Natural Position of the Foetal Head." Kislak copy.

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Figure 2.13. Table VI B. "On Turning." Kislak copy.

Figure 2.14. Table VI B, four successive stages in turning, clockwise from top left.

Figure 2.15. Left, title plate from Maygrier, *Nouvelles Demonstrations*, 1825. Right, title plate from Spratt, *Obstetric Tables*, 1848. Images via Archive.org.

Figure 2.16. "De la manoueuvre simple." Maygrier, 1825. Archive.org.

Figure 2.17. Pl. X. "Des parties extérieures de la génération de la femme." Maygrier, 1825. Archive.org.

Figure 2.18. "Measurement of the sacropubic diameter by the index finger." Maygrier, 1834 American translation. Archive.org.

Figure 2.19. "Toucher la femme debout." Maygrier, 1825. Archive.org.

Figure 2.20. "Ballottement." Maygrier, 1825. Archive.org.

Figure 2.21. Heinrich Vogtherr, Anothomia, oder abconterfettung eines Weybs leyb / wie er innwendig gestaltet ist, 1539. Image via Duke Libraries.

Figure 2.22. James Hogben, Atlas, from Obstetric studies […]. London: F. Vigurs, 1813. New York Academy of Medicine Special Collections.

Figure 2.23. Directions for assembly and proper handling of flap anatomies. End boards of James Hogben, Atlas, from Obstetric studies […]. London: F. Vigurs, 1813. New York Academy of Medicine Special Collections.

Figure 2.24. Illustration from Edward Tuson, Myology, illustrated by plates, 1828. Image via Duke Libraries.

Figures 2.25-2.26. Mrs. George Spratt. "Skylark" and "Chaffinch" from *The Language of Birds.* Archive.org.

Figure 2.27. George Spratt. Digitalis purpurea (fox-glove). Fold-out illustrated plate from *Flora Medica.* Archive.org.

Figure 2.28. "The Greengrocer," illustrated by George Spratt, Lithographed by George E. Madeley, Published by C. Tilt. London, 1830. John Johnson Collection, Puzzle Pictures folder 3 (65b). Bodleian Library, Oxford.

Figure 2.29. The Connoisseur. Illustrated by George Spratt, c. 1830. Left: Cut-out hand-colored lithograph, likely published in London, John Johnson Collection, Trade in Prints and Scraps 2 (1). Right: un-colored lithograph, published in Boston by Senefelder Lithography Co. American Antiquarian Society.

Figure 2.30. Guiseppe Arcimboldo, The Vegetable Gardner / The Greengrocer (?), c. 1590 or earlier. Invertible. Museo Civico a la Ponzone, Cremona.

Figure 2.31. E. Rogers, Jeff. Davis Going to War. Jeff. Returning from War a [Jackass] … ([Philadelphia]: S.C. Upham, 1861). Princeton University Graphic Arts Collection GA2015.

Figure 2.32. George Cruikshank, illustration from *Comic Composites*, 1829.

Figure 2.33. A thaumatrope from Dr. Paris's original set featuring a composite figure made from tobacco pipes and wine glasses. Images from Richard Balzer collection.

Figure 2.34. Collaged version of *The Greengrocer*, John Johnston collection.

Figure 2.35. Scrapbook page with the entomologist and the mineralogist. Illustrated by George Spratt and lithographed by George Madeley, London, c. 1830. John Johnson collection, Puzzle pictures folder 3 (67).

Figure 2.36. David Claypoole Johnston. *Outlines illustrative of a F.A.K.* Boston: DC Johnston, 1835. American Antiquarian Society.

Figure 2.37. After George Spratt. “The Circulating Library.” Lithographed by Endicott & Swett, published by J.N. Toy & W.N. Lucas, Baltimore, c. 1831. American Antiquarian Society.

Figure 2.38. Anatomical Museum of New York. New Anatomical Museum. [New York]: Jonh [sic] C. Hall, ca. 1848. (Gift of William H. Helfand). Library Company of Philadelphia.

Figure 2.39. Frederick Hollick lecturing with his “Large Figure.” Lithograph by Lewis & Brown (NY) after a daguerreotype by John Plumbe. Frontispiece to *The Origin of Life,* 1845.

Figure 2.40. Frederick Hollick, dissected plate from *Outlines of Anatomy and Physiology*, 1846.

Figure 2.41. Jan van Rymsdyk, oil pastel drawing of a fetus. C. 1755-7. Exhibited at Pennsylvania Hospital in 1762.

Figure 2.42. Danaë and the Shower of Gold,
Adolf Ulrik Wertmüller, 1787. Collection of the Nationalmuseum Sweden.

Figure 2.43. Hugh Owen, The Greek Slave, salted paper print from paper negative, 1851.

Figure 2.43. An eighteenth-century Anatomical Venus in the collection of the Museo di Palazzo Poggi, Universita’ di Bologna. Photo by Joanna Ebenstein, Morbid Anatomy Museum.

Chapter Three

Figure 3.1. David Claypoole Johnston (1799-1865). A selection of variously titled pull-tab portrait envelopes in the collection of the American Antiquarian Society, shown after the tab is pulled. Hand-colored engravings, 1837-1863. David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.2. David Claypoole Johnston (1799-1865). A selection of variously titled pull-tab portrait envelopes in the collection of the American Antiquarian Society, shown with the tab in “before” position. Hand-colored engravings, 1837-1863. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.3. David Claypoole Johnston, hand-colored engraving for *The Boston Notion* featuring the nickname "The Cruikshank of the New World." (14 x 10.5 cm). May 1841. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 6, folder 1.1.

Figure 3.4. David Claypoole Johnston, *The Fleshy One*, 1835. Engraved illustration from Joseph C. Neal, *Charcoal Sketches, or, Scenes in a Metropolis* (Philadelphia, 1835). AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 6 Folder 1.31.

Figure 3.5. An example of one of Johnston's many designs for period newspapers. Masthead for the *Boston Notion,* 1840. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 7 Folder 17.

Figure 3.6. David Claypoole Johnston, *Sound Asleep & Wide Awake* or *Marker & Sleeper,* 1855. Watercolor. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 3 Folder 18.

Figure 3.7. David Claypoole Johnston ("Drawn by Busybody Engd by Nobody. Published by Somebody for Anybody & Everybody"), *A Milita Muster* (Second edition revised and improved), 1819. Hand-colored engraving. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 4 Folder 3.1.

Figure 3.8. David Claypoole Johnston ("Crackfardi"), *A foot-race*, 1824. Etching. American Antiquarian Society BibID 152802.

Figure 3.9. David Claypoole Johnston, *Richard III*, c. 1828. Etching and engraving. AAS BibID 153080.

Figure 3.10. David Claypoole Johnston, pencil sketch for a metamorphosis, 13.5 x 8.5 cm. No date. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 8 Folder 3.

Figure 3.11. David Claypoole Johnston, pencil sketch for a metamorphosis, 15 x 8.5 cm. No date. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 8 Folder 4.

Figure 3.12. Box 8 Folder 5 David Claypoole Johnston, pencil sketch for a metamorphosis, 10.5 x 13 cm. No date. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 8 Folder 5.

Figure 3.13. David Claypoole Johnston, proof for Martin Van Buren pull-tab card, c. 1840. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 9 folder 10. Author's photograph.

Figure 3.14. Two Biedemeier-era German pull-tab cards listed for sale in an auction catalogue issued by London-based dealer Bogislav Winner. E-List No. XVII, "Pamphlets

& Slim Books, Ephemera, Broadsides, & Games." Both cards are hand-colored engravings c. 1820s. The card at left was printed in Stuttgart and is labeled no. 56, and the card at right was issued in Vienna and is labeled no. 125.

Figure 3.15. David Claypoole Johnston, *Before and After: A Locofoco Christmas Present (A Locofoco Before/After the N. York election*), 1837. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.16. *The Death of Old Tammany and His Wife Loco Foco.* Drawn by Edward Williams Clay and printed and published by H.R. Robinson, New York, 1837. Lithograph on wove paper (image from digitized scan). Library of Congress 1837.C619.

Figure 3.17. H.R. Robinson, "Specie Claws," 1838. Hand-colored lithograph, signed by H. Dacre. AAS BibID 153134.

Figure 3.18. David Claypoole Johnston, *A Beautiful Goblet of White House Champagne/An Ugly Mug of Log Cabin Hard Cider,* 1840. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.19. Detail of Fig. 3.18 shown mid-pull.

Figure 3.20. David Claypoole Johnston, detail from plate 3 of *Scraps for 1849: New Series No. 1*, issued 1848. Bound engravings, 35 28 cm. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 9 Folder 9.

Figure 3.21. David Claypoole Johnston, *Dissolving Views*, no date. Woodblock, 9 x 7 cm, text on verso. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 2.

Figure 3.22. David Claypoole Johnston, Five variants of pull-tab cards titled *A Locofoco Before and After the Late Election (Hurra for Cass/What! Old Zack Elected!).* c. 1848. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.23. David Claypoole Johnston, *Jonathan Soaker after the Governor's Veto To the Liquor Bill.* c. 1852. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.24. David Claypoole Johnston, "Before and After" variations: a "Buchan-eer," a "Fremonter," and an untitled card. c. 1852-6. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.25. David Claypoole Johnston. Cards showing processes of revision and erasure, c. 1848-63. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Folder 8.

Figure 3.26. David Claypoole Johnston, *Number or Calculation.* Detail from plate 1 of *Scraps for 1837: No. 7,* published in 1836. Bound engravings, 33.5 x 26.5 cm. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 9 Folder 7.

Figure 3.27. David Claypoole Johnston, "Receipt Book" showing a page titled "Receipt for mixing colours," c. 1818, David Claypoole Johnston Drawings and Papers, Houghton Library, Harvard University. MS Am 1608, Folder 59.

Figure 3.28. Fragment of an isinglass printing matrix made by David Claypoole Johnston, date unknown. David Claypoole Johnston Drawings and Papers, Houghton Library, Harvard University. MS Am 1608.

Figure 3.29. Left: George Cruikshank, "Seven Dials," illustration for Charles Dickens' *Sketches by Boz*, c. 1835-6. Right: fragment of an isinglass printing matrix made by David Claypoole Johnston copying Cruikshank's image, date unknown. David Claypoole Johnston Drawings and Papers, Houghton Library, Harvard University. MS Am 1608.

Figure 3.30. David Claypoole Johnston, Plate 3 of *Scraps for 1849: New Series no. 1* (published 1848). Bound engravings, 35 x 28 cm. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 9 Folder 9.

Figure 3.31. A copperplate engraved with the design for Scraps no. 7 Plate 4, 1836. The American Antiquarian Society holds several copperplates for *Scraps*, however they have all been covered in protective wax and as a result are difficult to examine or photograph. AAS David Claypoole Johnston Family Collection, Graphic Arts, Box 10 Copperplate 4.

Figure 3.32. George Cruikshank, "The Gin Shop" from *Scraps and Sketches*. Published 1828. British Library L.R.410.pp.24. https://www.bl.uk/collection-items/the-gin-shop-from-george-cruikshanks-scraps-and-sketches#

Figure 3.33. John Neal, Sketch for a certificate commission from David Claypoole Johnston. John Neal, "Letter to David Claypoole Johnston," Letter, (January 29, 1837), David Claypoole Johnston Family Papers 1824-1940, American Antiquarian Society.

Figure 3.34. Two versions of David Claypoole Johnston's cartoon banknote, *The Great Locofoco Juggernaut*, 1837. Above: an impression on thin onionskin paper sold at Stacks Bowers auction. Below: an impression on thick paper in the AAS collection (Box 6 Folder 1.36).

Figure 3.35 Facsimile of a 1838 shinplaster banknote issued in Detroit, published in Silas Farmer, *The History of Detroit and Michigan or, the metropolis illustrated, etc.* (Detroit, 1884). Full text digitized by the British Library, https://www.flickr.com/photos/britishlibrary/11168518963.

Fig. 3.36 Treasury note. Published by H.R. Robinson, New York, 1837. Lithograph on wove paper. Library of Congress Prints & Photographs, 1837.R661, no. 47 (B size).

Conclusion

Figure 4.1. Wallpaper newspaper, front and back. *The Daily Citizen*, J. M. Swords, proprietor. Vicksburg, Miss. Thursday, July 2, 1863. Rare Book & Special Collections Division, Library of Congress. Printed Ephemera Collection; Portfolio 85, Folder 10a.

Figure 4.2. A metamorphosis print on the hanging of Jefferson Davis. Wood engraving on wove paper, 1865. Library of Congress 2008661692.

Figure 4.3. Jeff Davis Going to War/Jeff Davis Returning From War An [Ass]. S.C. Upham, 310 Chestnut St., Philadelphia. 1861. Copyrighted by E Rogers.

Figure 4.4. Schaefer & Korudi, Rose of Philadelphia. New York: Published by G. Heerbrandt, 1859. Black and white and color die-cut print. 9 x 9 in. Library Company of Philadelphia Civil War Envelope Collection.

Figure 4.5. The Historiscope: a panorama & history of America. Published by Milton Bradley & Co, 1868. Lithograph. Above, front view, below, back view. Beinecke Rare Book & Manuscript Library, Yale University, Shirley 3915.

Figure 4.6. A group of pop-up dioramas from the *Little Showman's Series, v. 2,* fully closed. Published by McLoughlin Bros., 1884.

Figure 4.7. *Die Menagerie.* From The Showman Series, published by J.F. Schreiber, Esslingen, Germany, c. 1880. The Brenda Forman Collection of Pop-Up and Movable Books, University of Virginia Special Collections, PZ92.F6. M26 1880.

Figure 4.8. Reverse of a Schreiber pop up, showing mechanisms for multiple types of movement.

Figure 4.9. Winter. From the Little Showman's Series no. 2., McLoughlin Bros., 1884.

Figure 4.10. Above, "I Saw Three Ships" illustrated by Walter Crane. Original version, published by George Routledge, London, 1877. Color printed wood engravings. Below, chromolithographed version by McLoughlin, 1877. Images via American Antiquarian Society.

Figure 4.11. Cover, *Lost on the Sea Shore*, published by Routledge, Warne & Routledge, engraved by Dalziel Brothers, London. 186-?. The George M. Fox Collection of Early Children's Books, Marjorie G. & Carl W. Stern Book Arts & Special Collections Center, San Francisco Public Library. Box no. P.11.2.6.

Figure 4.12. "The Boatman's Cottage," *Lost on the Sea Shore*, published by Routledge, Warne & Routledge, engraved by Dalziel Brothers, London. 186-?. The George M. Fox Collection of Early Children's Books, Marjorie G. & Carl W. Stern Book Arts & Special Collections Center, San Francisco Public Library. Box no. P.11.2.6.

Figure 4.13. Lost on the Sea Shore. Illustrated by Justin H. Howard. McLoughlin Bros: New York, 1866. Images via Ebay sales listing.

Figure 4.14. The Aquarium, from The Little Showman's Series no. 1, Published by McLoughlin Bros., New York, c. 1882. Images of edition in a private collection.

Figure 4.15. George B. Selden (American), Bird Cage, Aquarium, and Plant Stand, c. 1880. Albumen print, George Eastman House.

Figure 4.16. Interior of Aquarium, Belle Isle, Detroit, c. 1890. Detroit Publishing Co., Library of Congress, silver gelatin glass transparency.

Figure 4.17. J.S. Pughe, *A Critical Situation*, 1895. Chromolithograph print. Puck v. 36, no. 934 (1835 January 30), cover illustration. Caption: Uncle Sam I'll have to kill this here Greenback Frog; or, by Jingo! he'll swallow up all my Gold Fish! Image via Library of Congress, AP101.P7 1895 (Case X) [P&P].

Figure 4.18. The Aquarium, from The Little Showman's Series no. 1, Published by McLoughlin Bros., New York, c. 1882. Brenda Forman Collection of Pop-Up and Movable Books, University of Virginia Special Collections. PZ92. F6. A69 1880. Author's photograph.

Figure 4.19. Verso of *The Aquarium*, from The Little Showman's Series no. 1, Published by McLoughlin Bros., New York, c. 1882. Brenda Forman Collection of Pop-Up and Movable Books, University of Virginia Special Collections. PZ92. F6. A69 1880. Author's photograph.

Figure 4.20. Above: John Frederick Kensett, *Bash Bish Falls*, n.d. (before 1872). Collection of Thomas G. Davies, New Canaan, CT. Below: detail, *The Aquarium* (McLoughlin)

Figure 4.21. *The Aquarium* from The Showman Series, published by J.F. Schreiber, Esslingen, Germany, c. 1880. The Brenda Forman Collection of Pop-Up and Movable Books, University of Virginia Special Collections, PZ92.F6. M26 1880. Author's photograph.

Figure 4.22. Winslow Homer, *Mink Pond*, 1891. Watercolor over graphite on heavy white wove paper. Harvard Art Museums/Fogg Museum, 1943.304.

Figure 4.23. *The Magic Mirror, or, Wonderful Transformations*. McLoughlin Bros., c. 1880. Library of Congress, Rare Book & Special Collections, N7433.6 .M35 1880. Original glass tube viewer is lost; the Library of Congress's is a modern replacement made out of silver mylar.

APPENDIX A

Transcription of The beginning, progress and end of man.
London, Alsop for T. Dunster, 1650.
The British Library, 669.f.15.(34).

Transcription via Penn State University, *Learning as Play: An Animated, Interactive Archive of 17th to 19th-century Narrative Media for and by Children*, http://sites.psu.edu/play/image-gallery/1650-british/1650-british-metamorphosis/.

Panel 1, Upper Flap (Exterior):	**Panel 2, Upper Flap (Exterior):**	**Panel 3, Upper Flap (Exterior):**	**Panel 4, Upper Flap (Exterior):**
Here Adam comes first on the Stage, And Eve out of his side, Was given him in marriage, Lift up and see the Bride; [Vertically along the left	The Lion roaming from his den, In prupose for to range, Is turn'd into	But he hath scap'd [sic] the Eagles claws, And is from danger free : He gives his heart to gather Gold.	Now I have Gold and Silver store, Pounds of the rich, and Bribes oth' [sic] poor : What worldlycare [sic] can trouble me

edge: The Beginning Progress and End of MAN]	another shape, Lift up and see it strange.	Turn down the leaf and see.	? Turn down the leaf and you shall see.

[*Image redacted for copyright reasons*]

◆

Panel 1, Upper Flap (Interior):	**Panel 2, Upper Flap (Interior):**	**Panel 3, Upper Flap (Interior):**	**Panel 4, Upper Flap (Interior):**
Here Eve in shape you may behold, One body serveth twain Once more you may the leaf unfold, And see it strange again.	A Monster here you may behold, Half fowl, half beast to be. A stranger sight, if you delight, Turn down the leaf and see.	A purse of Gold and Silver store Doth cure his heart he’s sick no more: But is from care and grief set free Turn further and you may him see	Vain was my hope in Gold, Vain was my foolish bragging. For I must to the mold, And thou com’st [sic] after wagging. [Vertically along the right edge: London, Printed by B. Alsop, for T.Dunster, 1650]

[*Image redacted for copyright reasons*]

Panel 1, Lower Flap (Interior):	**Panel 2, Lower Flap (Interior):**	**Panel 3, Lower Flap (Interior):**	**Panel 4, Lower Flap (Interior):**
The Mermaids voice is sharp and shril [sic] As womens [sic] voices be ; For if you crosse [sic] them in their will, You anger two or three.	In Eagles claws behold and see, An Infant there doth lie : Which as a prey away doth bear, With wings prepar'd to flie [sic].	Behold a Heart with care opprest [sic] What salve can cure the same ? A Salve there is within this Heart. Turn up and see it plain.	Sicknesse [sic] is come, and Death is nigh : Help Gold and Silver else I die. It will not help, it is but drosse [sic]: Lift up and see a fearful Crosse [sic].

APPENDIX B

Transcription of Metamorphosis, or, A transformation of pictures: with poetical explanations for the amusement of young persons.
Philadelphia, PA, Benjamin Sands, 1814.
Penn State University Libraries, PZ6.S26Me 1814b, Vault, Section D.

Transcription via Penn State University, *Learning as Play: An Animated, Interactive Archive of 17th to 19th-century Narrative Media for and by Children,* http://sites.psu.edu/play/image-gallery/1814-metamorphosis/1814-metamorphosis-transcription/.

Panel 1, Upper Flap (Exterior):	**Panel 2, Upper Flap (Exterior):**	**Panel 3, Upper Flap (Exterior):**	**Panel 4, Upper Flap (Exterior):**
1. Adam comes first upon the stage, And Eve from out his side, Who was given him in marriage; Turn up and see his bride.	4. A Lion rousing from his den On purpose for to range, Is soon turn'd into another shape; Lift up and see how strange.	7. Now I've escap'd the eagle's claws And am from danger free, I'll set my heart to gather gold; Turn down the leaf and see.	10. Now I've got gold and silver store, Bribes from the rich, pawns from the poor, What earthly cares can trouble me? Turn down the leaf and then you'll see.

[*Image redacted for copyright reasons*]

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Panel 1, Upper Flap (Interior):	**Panel 2, Upper Flap (Interior):**	**Panel 3, Upper Flap (Interior):**	**Panel 4, Upper Flap (Interior):**
13. Adam and Eve in innocence, God was their glory and defence : Had they continued in that state, Their happiness had been complete. Angels, behold the happy pair, Who did your Maker’s image wear, While in obedience they remain’d And their innocence maintained. ~~~~~~~~~~~~~~~	14. In happy Eden see them plac’d, Who stood or fell for all our race; In a sweet bower, composed of love, This happy pair might safely rove. There was no curse upon that ground, Nor changing grief there to be found: There nothing could their joys controul [sic], Nor mar the pleasures of the soul.	15. This land they freely might possess, And live in joy and happiness: Adam was lord of all the land, Made by the great all-forming hand. Eat, said the Lord, of all you see, Except one interdicted tree; And on this truth you may rely, You may not eat that lest you die. ~~~~~~~~~~~~~~~	Had they obey’d their Maker’s voice, And made eternal bliss their choice, Then everlasting life had been The lot of all the sons of men. But Satan came now in disguise, To blind this happy couple’s eyes: Saying, this fruit now eat, and you Like God, shall good and evil know. ~~~~~~~~~~~~~~~ ~~~~~~~~~~~~

~~ 2. Here Eve in shape you may behold, One body showeth two; Once more do but the leaf downfold, And it’s as strange to view.	~~~~~~~~~~~~~~~ ~~~~~~~~~~~~ 5. A Griffin here you may behold, As fabled said to be; Once more do but the leaf downfold, A stranger sight you’ll see.	~~~~~~~~~~~~ 9. A purse with gold and silver store Has cur’d my heart, I’m sick no more; And am from cares and dangers free; What is there now can trouble me?	12. O Man! Now see thou art but dust; They gold and silver is but rust; Thy time is come, thy glass is spent; What is there that can Death prevent.

[*Image redacted for copyright reasons*]

[*Image redacted for copyright reasons*]

Panel 1, Lower Flap (Interior):	**Panel 2, Lower Flap (Interior):**	**Panel 3, Lower Flap (Interior):**	**Panel 4, Lower Flap (Interior):**
3. Eyes look not on the mermaid’s face, And ears hear not her song : Her features have an alluring grace, More charming than	6. Behold within the Eagle’s claws, An infant there doth lie! Which he has taken as a prey And is prepar’d to	8. A Heart here is oppress’d with care, What salve can cure the same? Under the leaf you’ll find a cure: Lift up and see how	11. Sickness is come and Death draws nigh, Help gold and silver, ere I die; It will not do, for it’s but dross,

her tongue. ~~~~~~~~~~~~~~~ ~~~~~~~~~~~~ 17. Eve then the fatal fruit did take, And gave her husband who did eat : Thus Adam fell to his disgrace, From his native righteousness. Now every thought that roves abroad, Is known to a sin-hating God : His perfect law he will maintain, Ah! he'll reward the fall of man.	fly. ~~~~~~~~~~~~~~~ ~~~~~~~~~~~~ 18. The Tree of Life, now in that land, And knowledge, do well guarded stand, Lest Adam should the same espy, And eat thereof and never die, There Cherubs with a flaming sword, Are set the Tree of Life to guard : Now who among our fallen race, Can hope to see his Maker's face?	plain. ~~~~~~~~~~~~~~~ ~~~~~~~~~~~~ 19. Or who before his awful bar In his own righteousness appear? The sons of Adam, since the fall, To death are subject one and all. But to the serpent it is said, The Woman's seed shall bruise thy head; Though Adam hearken'd to his bride, Who pluck'd the	Turn up and see man's end at last. ~~~~~~~~~~~~~~~ ~~~~~~~~~~~~ 20. Now Christ is come to set us free From everlasting misery: All the angelic host above, will shout the greatness of his love. There is a brighter world in view, Than Adam in old Salem knew; Proposed by the eternal God, And purchas'd by our Savior's blood.

	fruit which was deny'd.

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[*Image redacted for copyright reasons*]

Panel 4, Verso:	**Panel 3, Verso:**	**Panel 2, Verso:**	**Panel 1, Verso:**
21. Death! why so fast? pray stop thy hand, And let my glass run out its sand: As neither Time nor Death will stay, Let us improve the present day. Short is the space allow'd to man, Its length is fitly measur'd by a span; When life begins, we	The we may not mislead our little readers, it is desired they would understand the Mermaid and Griffin to be only creatures of fable, that never did exist. And although Death is represented in the form of a human skeleton, yet	[Image of a Ship]	METAMORPHOSIS ; OR, A Transformation of Pictures, with POETICAL EXPLANATIONS, for the AMUSEMENT OF YOUNG PERSONS. [fountain image] Philadelphia: Printed and Sold by Joseph Rakestraw

then begin to die; A few years labour’d, in the grave we lie: Yet on this space how short soe’er depends A long eternity, that never ends. How little of our little time is spent In pleasing God, for which that time was lent.	this is only an [?] but a state.	No. 256, North Third Street 1814

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Views in Greece: Which with Mr. Dodwell's Travels in That Country, Have Been Published in London. The Point Was Chosen by Mr. Dodwell, as Being the Only One from Whence All the Interesting Objects in the Vicinity of Athens Could Be Seen. The Perfect Accuracy of the View Has Been Admitted by All Who Have Visited Athens, and Seen the Panorama in Progress. To Mr. Robert Cockrell, Who Has Lately Returned from Greece, Messrs. Barker and Burford Were Indebted for Much Useful Information, and Drawings of Several of the Principal Figures, in Their Correct Costume. In the Following Description, It Is Only Intended to Give Such an Account of the Most Important Objects as May Render Them Interesting to the Visitors of the Panorama When in the Room: To Those Who Wish for More Detailed Information, the Excellent Works of Stuart, and the Travels of Chandler Are Recommended. Boston: Press of W.W. Clapp, 1837.

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