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Game After

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Game After

A Cultural Study of Video Game Afterlife

Raiford Guins

The MIT Press
Cambridge, Massachusetts
London, England

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Game After is for Deckard Bergren Guins, my son, who generously dedicated the first two years of his life to the writing of this book.

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Foreword

America, the land of technology, has many traditions that nostalgically celebrate past technologies. The biggest and loudest is probably NASCAR, which celebrates stock cars outfitted with outdated technologies. For example, overhead valve systems are forbidden, so when Toyota, an outlander, wanted to race, it had to redesign its engines to fit the older technology. Less organized but widespread is the love for Harley Davidson motorcycles' noisy, bulky technologies probably better fitted to the often older and heavier riders who tout them.

In *Game After*, Raiford Guins, who has founded a game studies collection at Stony Brook University, takes a very up-to-date approach to the cultural afterlife of games. Guins has learned lessons from the last two decades of new social studies of science, technology, and culture. He has taken the "empirical turn," as Hans Achterhuis has claimed for this genre of concrete case studies. In Guins's case it is the material afterlives of video and computer games. He chases his games from California to the Smithsonian.

In his pursuit, he also learns to appreciate what many call the new materialism, and that I call a sensitivity to materiality, now prominent in the humanities and social sciences. This too pervades empirical turn studies and arises out of a shift from early modern distanced observation which spent much of its energy on classifying objects. The new studies have turned to practices—what does one do with (and experience) in an *interrelational way* with these material machines? Yes, humans make them, but interrelationally, they also make us. Indeed, the omnipresent screen today occupies an average of twelve hours per day for the typical collegian. And the shift to smaller and more mobile screens has also been heavily weighted towards entertainment and game activities. As with all recent technologies there is much and often rapid development. If the early days were dominated by coin-fed arcade games, the newer types are built into portable tablets and mobile phones.

The other emphasis that Guins draws upon in his pursuit is an appreciation for what I call *multistability*. Unlike the early, often essentialist, philosophy of technology—for example, Heidegger—Guins is appreciative of the multiple contexts and uses

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of games. If games have become an ever-widening practice and even obsession, there are often unintended side effects. Only gradually have we become aware that the special embodiment skills sharpened in game playing have become part of our contemporary lifeworld. In action, game playing entails learning bodily skills—as does any other physical sport. What was not foreseen was the way in which this leads to a reservoir of *pre-skills*. Friedrich Kittler cited one such outcome for the late nineteenth century: the invention of the typewriter with its keyboard, he argued, stimulated, within a very few years, the replacement of a dominantly male-gendered secretariat with a dominantly female one. A major factor included the pre-skilling that piano playing fostered among middle class young women, which easily translated into typing skills. Contemporarily, we now have a practice called "Nintendo surgery," the style of surgery utilized in laparoscopy and angioplasty. Seeing and manipulating at a distance calls for precisely the eye-hand coordination developed in video gaming. Or, if one switches to far more distant sensing-manipulating, then robotic warfare and Martian exploration also come to mind. Just this fall my audiologist told me that her husband, an eye and ear surgeon, had given up his practice because the newer "kids" skilled at more robotic techniques could perform better than his now outdated skill level.

Guins is well aware of the multistability of the many points of view available to players, of the multistabilty of through-the-screen worlds of games and of the wide varieties from abstract to three-dimensional beings of games. However, with an informal style that invites us to join him in his gaming road trip, he goes beyond the common player-game interaction to consider a lesser understood mode of interaction: the material lives of games within cultural institutions devoted to their preservation and historical documentation.

Game After is a romp. Its readers will revel over their own memories and uses of games familiar but not disappeared. They are given a sort of second life here, and like the visitors to "The Art of Video Games," the Smithsonian American Art Museum's exhibit that Guins walks through to conclude his book, one ends up as a cheering audience in the midst of games' afterlives.

Don Ihde
Distinguished Professor of Philosophy, Emeritus
Stony Brook University

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Acknowledgments

I must start here, with my parents, Al and Nora Guins. They played a cruel trick on me in December 1977. While Christmas shopping at our local Sears in Alexandria, Virginia, I was glued to the playable display for the Atari VCS/Tele-Games System Video Arcade. The display occupied what seemed like hours to my kid mind as my father shopped for more power tools. This thing I clutched and controlled little tanks on is what I wanted, scratch that, what I *needed*, for Christmas. I already spent a lot of mall time at Time Out arcade as well as at Dart Drug, Safeway, High's, and my local bowling alley to play coin-op games wherever I could find them (I'd even skip school lunch to save quarters). Now with the introduction of game cartridges for home play, nothing else would suffice. Not even Mego superheroes and Mattel Shogun Warriors. We exited the sporting goods/tools section of Sears with a big mystery box. I was ecstatic until my parents broke the news to me: "We can't get you that game system this year 'cause your dad needs new tools!" "Shit, he's already got a basement full!" is what my "dirty-mouth" seven-year-old anger may have breathed beneath fat tears. As it turned out that box wasn't new tools, it was "an Atari" even if the working-class brand said Sears. A cruel trick indeed. Well, Mom, I didn't "stop wasting quarters on those damn machines," and revenge is sweet. Here's payback for all of those quarters stolen over the years.

My acknowledgments could easily read like one of those Bob's Big Boy paper placemats with an idiomatic map of America illustrating numerous points of interest for drivers traveling Interstate highways. Instead of Cadillacs buried in the sand, or the "world's largest thermometer," my map would be plotted with museums, archives, and a barren plot of land in southern New Mexico. On this imaginary map I offer tremendous thanks to the many people I interviewed in the writing of this book. Without their time, willingness to take part in this project, and invaluable insights, I could *never* have written the book. I mean that sincerely. A huge debt of gratitude goes to Gene Lewin and Morris (Vintage Arcade Superstore, Glendale, California); former mayor of Alamogordo, New Mexico, Donald E. Carroll, and residents of Alamogordo, Ricky and Cathy Jones, Roy Austin, Jason Brockett of KZZX FM 105.3,

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I would like to thank the following people at the Smithsonian Museum of American History for assisting with my research while a Senior Research Fellow at the Lemelson Center in the fall of 2010: Alison Oswald, Art Molella, and Eric Hintz. I also wish to thank Katherine Ott, Curator of the Division of Medicine and Science, for our many stimulating lunchtime conversations devoted to material culture.

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I also received support from Stony Brook University's Faculty in the Arts, Humanities, and lettered Social Sciences (FAHSS) research fund. I am grateful to the review committee.

I gave a number of invited talks and conference papers based on my research for *Game After* and I want to thank the following people and organizations for making these events invaluable to the book's completion: Sherry Ridlon Dobbin (formerly of the Watermill Center), Marq Smith (University of Westminster), Fiona Candlin (Birkbeck University), Martin Lefebvre and Marc Steinberg (Concordia University), Elizabeth Guffey (SUNY Purchase), and the International Association for Visual Culture.

While finishing *Game After* I worked on a documentary film dedicated to the history and recreation of *Tennis For Two*, titled *When Games Went Click: The Story of Tennis For Two* (2013). That project helped further inform my research on Higinbotham's game for the book and I am indebted to the following people for their assistance with the documentary: Peter Takacs, Robert P. Crease, Robert Dvorak Jr., Laine Nooney, Jane Koropsak, and Kristen J. Nyitray.

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To Don Ihde, for writing this book's foreword, I am eternally grateful. Stony Brook University will never be able to fill the intellectual gap left by your retirement. I wish you the very best in all your future endeavors. May you catch many, many fish in Vermont.

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Relatedly, I deeply value the criticism and thorough engagement with *Game After* provided by the reviewers of the book. At both the proposal and manuscript stages, they provided invaluable feedback.

Game After exists in this final form thanks to the wonderful support, advice, and labor of Marq Smith, Fiona Candlin, Laine Nooney, and Jaleen Grove. They had the challenge of slogging through early drafts of the book. I admire their endurance and greatly appreciate their friendship and collegiality.

I wish to acknowledge Robert Harvey for being an incredibly supportive chair, colleague, and friend. In addition, I have him to thank for bringing the Monty Python "Dead Parrot" skit to my attention during a dinner conversation about video games in museums.

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And with every piece of work I produce, I must convey my profound respect, appreciation, and love for Omayra Zaragoza Cruz. As always, her tireless soldiering through draft after draft (even those horrendous early ones) and constant slapping of my often-convoluted prose helped extract the significance from my love of pataphysical details. Not to mention that any woman who would accompany me on a research trip only hours after tying the knot at the courthouse is straight out of a Sam Peckinpah script; with one exception, she's the Steve McQueen of our relationship, "Punch it, baby!"

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Introduction: Persistent Games

Mr. Praline:

This parrot is no more! He has ceased to be!

'E's expired and gone to meet 'is maker! 'E's a stiff!

Bereft of life, 'e rests in peace!

If you hadn't nailed 'im to the perch 'e'd be pushing up the daisies!

'Is metabolic processes are now 'istory! 'E's off the twig!

'E's kicked the bucket, 'e's shuffled off 'is mortal coil, run down the curtain and joined the bleedin' choir invisibile!!

THIS IS AN EX-PARROT!!
—Monty Python's "Dead Parrot Sketch" (1969)

Ex-Game

I gently swipe my index finger across my iPad's smooth "fingerprint-resistant oleophobic coated" screen surface to flick through a panoply of coin-op (coin-operated) arcade video games. Standing at full attention, embossed by a telltale blue shimmer to highlight the selectable arcade cabinet from its counterparts, the app, *Atari's Greatest Hits*, stores information on eighteen coin-op cabinets and game programs for the Atari VCS complete with playable FOCAL (Flow-Optimized Code Analysis) emulation technology developed by Code Mystics Inc. for its cross-platform Prometheus engine. It translates, as Apple's App Store announces, "the most popular retro games from the 70s and 80s" for your twenty-first-century Apple tablet computer.[1] Such an act of translation is coated heavily with digital anti-aging cream: none of these simulated coin-op cabinets appear old whatsoever, looking as fresh as when they first shipped from the Atari assembly line over thirty years ago. Like the Titan from which it takes its name, the Prometheus engine endlessly regenerates these games.

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My flick through stops on the image of Atari's 1979 arcade cabinet, *Lunar Lander*, the company's first vector graphics game developed by Rick Moncrief, Rich Moore, and Howard Delman. *Lunar Lander* is surrounded by other arcade games grouped in close proximity like interchangeable choreographed dancers in a music video: *Atari Force Liberator* (1982), based on the short-lived Atari Force comic book, to its left and *Major Havoc* (1983) to its right. In lieu of walking through a once-crowded arcade, pockets sagging with quarters, my fingers now facilely swipe through its simulation, deciding which "stand out games of video game history" to embrace first.[2] Applying the correct pressure with my finger to the *Lunar Lander* arcade cabinet image, the scene flips to a new page upon which the arcade cabinet is less prominent (a smaller version appears in the upper-right corner of the page). Here I can select "play" to experience Code Mystics's emulation of *Lunar Lander's* source code accompanied by a simulation of the physical interface and plastic buttons (minus the large mimetic thrust controller) working overtime to reimplement the cabinet's original material design on my iPad.

Faithful emulation is not the only means to "relive" the arcade video games included in *Atari's Greatest Hits*. Code Mystics's stoking of remembrance for those who encountered these games in their original commercial forms, or for those newly introduced through its app, boasts a smattering of contextual materials with its emulation. Each coin-op game is accompanied by a "gallery" of images that depict actual arcade cabinets and marquees, detailed images of cabinet artwork, and digital scans of original promotional flyers for the machines. *Lunar Lander's* gallery consists of five images. It launches with a photograph of the arcade cabinet's original interface, clearly showing the "thruster controller" while suggesting the "realistic action" it was meant to afford players when maneuvering their lander module across the inhospitable vector graphic lunar terrain. The coin-op cabinet pictured in the photograph has visible signs of physical wear suggestive of a well-played history and looks far removed from the one I first encountered on the options screen. This gallery also provides its player with a scan of an original advertisement for the machine. *Lunar Lander's* marquee and a photograph of its side art round out the images relegated to "memorabilia" by Code Mystics's own description of its downloadable product.

Code Mystics is certainly no stranger to developing cross-platform engines.[3] With its latest migration to web browsers, Nintendo DS, Android, Kindle, and Apple devices, the full range of "retro" titles is staggering. Code Mystics regards its emulation of older games as a "way to bring classic games back to life" while Apple touts the app to its users as the opportunity to "relive the Golden Age of Gaming."[4] No mere emulation technology, *Atari's Greatest Hits* is hailed as a rebirth—the resuscitation and reanimation of irretrievably lost, obsolete, or, perhaps, long believed deceased video games. Code Mystics is in the eerie business of necromancy. Like Charles Dexter Ward from H. P. Lovecraft lore, its FOCAL technology is alchemy to resurrect the "essential saltes" of Atari's games.[5]

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In such occurrences of "reliving" or of a video game being brought "back to life," the questions of what is returned, recreated, restored, and especially by what means, summon the likes of Lovecraft, Mary Shelley, Stephen King—the Micmac burial ground "gone sour" in his novel, *Pet Sematary*—and in particular a short story by Philip K. Dick. Written in 1953, Dick's "The Preserving Machine" gifts us with a messy tale of cultural posterity: it reminds readers of the Garden of Eden origins myth to provide a lesson applicable to the imagined reanimation of video games. Dick's protagonist, Doctor Labyrinth, designs a "preserving machine" to guarantee the survival of Western classical music, deemed by its self-appointed cultural custodian as "the most perishable of things, fragile and delicate, easily destroyed."[6] Scores by Mozart, Schubert, Brahms, Wagner, Beethoven, and others are inserted into the machine and transformed into living creatures to help ensure their survival. In goes a score by Mozart and a Mozart-bird steps out. Some creatures were distinguishable: a Beethoven-beetle or a Brahms-centipede. Others were mysterious oddities: "The Schubert animal was silly, an adolescent sheep-creature that ran this way and that, foolish and wanting to play," while the Wagner-animal was "large and splashed with deep colors" and "seemed to have quite a temper."[7]

Such anomalies are the result of Labyrinth's original concept being flawed for not considering the life of these things *after* their creation: "Once a thing has been fashioned it begins to exist on its own, and thus ceases to be the property of its creator to mold and direct as he wishes."[8] Labyrinth's creatures quickly become screwed-up prodigies battling for survival in the woods behind his house. The Schubert-animal is the first casualty, discovered ripped to shreds from a vicious attack by the Wagner-animal. Upon seeing the Wagner-animal and identifying it as the responsible party, Doctor Labyrinth laments, "But it's changed. It's changed. I hardly recognize it."[9] The Wagner-animal mutated beyond recognition to meet the needs of its own survival. These music scores, in reanimated biological living form, live on but in ways neither anticipated by their creator nor immediately discernible. Dick's short story reminds us that things have lives regardless of how we wish them to be and that our understanding of these lives is shaped by and dependent upon the experiential context of the extant things. Being neither transgresses time nor successfully evades history; things lack infinite continuity, a guaranteed and intrinsic stability and equality. Their coming into being is contingent upon the multiple situations both formative and, in particular, transformative across their erratic life cycles.

If we heed Dick's lesson in regard to video game history, we lessen the primacy of nostalgia that weighs on the writing of game histories, resisting the urge to regard this past as hermetically sealed, time-capsuled for our rediscovery and reliving. This allows us to examine the enduring material life cycles of games that greatly exceed the retrofascination with ageless games from an ahistoric, idyllic, and more often than not, solipsistic and trivialized past. After all, objects acquire histories of their own as they

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move through time and space regardless of our affinity for them. Our memory of a particularly meaningful object is, no doubt, treasured by us, but alas, only a moment in its complex life cycle as it passes "from one possessor to another, perhaps from one kind of use to another, and from one place to another."[10] Objects are opportunistic. This book is about the historical life cycles of video games and the diverse ways we experience them today. It foregrounds the mutable taxonomic phases games pass through and the meanings, uses, and values they acquire and shed over time as technological, material, and cultural objects. In this sense, it is an awareness of past lives along with their remaining forms in the present.

We are already accustomed to the idea of technology life cycles (TLC—wonderfully enough): "battery life" for running our appliances and devices; "lifetime warranties" for our automobiles, washers and dryers, and refrigerators; and especially the shorter and shorter "life spans" of our computing technologies on account of planned obsolescence. *Lunar Lander*'s life, according to Code Mystics's marketing rhetoric, would be its "pixel-perfect rendition" exemplified by its faithful emulation. Life here equals the strong pulse of emulation of original source code. But what about the coin-op arcade video game from which the source code was emulated for the app? Is it like John Cleese's parrot from the memorable *Monty Python* sketch, bereft of life, declared an *ex-game*? Does it cease to matter once its organs have been donated? Is the arcade cabinet but an empty shell after its "true essence" has been siphoned? Do the photographs of the aged *Lunar Lander* coin-op serve as a "before-and-after" comparison: visible evidence of a remediated preservation process migrated from cabinet to tablet? Although attention is clearly directed at the "rebirth" of Atari's games by way of Code Mystics's emulation (over six million downloads at Apple's App Store in 2013), what of its "prebirth," and, most important for this book, what of the phases in the game's total life beyond its intended design and commercial circulation? What of its afterlife?

We can only speculate on the afterlife of *Lunar Lander* beyond its early design as a text-based computer simulation and eventual commercial product development by Atari to turn profit from quarters.[11] Perhaps the coin-op arcade machine in Code Mystics's photograph is now located in a private collection where its owner may share information on the Killer List of Video Games website, an online encyclopedia that catalogs surviving arcade games. Perhaps the machine gets unearthed once a year and is transported to California Extreme, the "Classic Arcade Games Show" held annually in Santa Clara, California. Perhaps it is on the floor and being played at the American Classic Arcade Museum located at Fun Spot, Laconia, New Hampshire. Maybe it is sitting in a garage somewhere. Or, perhaps, it continues to turn a meager profit in its ruinous state at a nondescript laundromat where other coin-ops like vending machines dispensing soap detergent are in far greater demand. Perhaps the machine was so worn and in such disrepair that it was "parted out," its parts helping to resuscitate another

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machine, or its cabinet converted into a MAME cabinet. It may even have been disposed of as trash in a local landfill. Further speculation could find the coin-op arcade video game at the Strong National Museum of Play's International Center for the History of Electronic Games in Rochester, New York, where it is conserved as a playable artifact at the recreated arcade the museum has fashioned to evidence the historical and social experience of public game play. One thing is certain, *Lunar Lander* marshals considerable significance for the history of computing at the Computer History Museum's permanent exhibition, "Revolution: The First 2000 Years of Computing." Atari's promotional flyer for *Lunar Lander* and the hardware for running the early graphical programs on the DEC GT- 40 are prominently displayed in Mountain View, California.

In the field of game studies and within the consumer market we rarely (or are only beginning to) attend to video games—a spongy phrase used here to account for electronic screen-based games played on a home console, arcade machine, and personal computer unless a particular medium is specified—in terms of their aging, deterioration, obsolescence, ruinous remains, or even history (more on this point later), let alone within the contexts of museums, university archives, exhibitions, or private collections, where they are collected as materials for historical study, posterity, cultural heritage, and preservation. The working program and fully functioning console, computer, or arcade cabinet are most often regarded as the definitive property of the game. We purchase games to play them, not to save them. Yet video games from the so-called "golden age" are now thirty-something-year-old technologies with one joystick in the trash heap. We will continue to encounter more timeworn, out-of-date, even broken and nonfunctional video games as the game industry's planned obsolescence rushes to discontinue the last "next gen" before the "next, next gen" debuts at this year's Electronic Entertainment Expo (E3). Whereas the development and actual play of video games has tended to dominate scholarly interests, *an understanding of a game's history far exceeds these two phases*. And in this book, such phases are but two moments in a game's overall life history. Video games inclusion at cultural institutions like those mentioned above and studied throughout this book signals the need to recognize an emergent moment when and where video games take on new roles and responsibilities within contexts far removed from the shelves of a local GameStop. It is the responsibility of the game historian to attend to this.

Afterlife and the Cultures of Materiality

A real buzz over the preservation of video games and their ingress into cultural institutions has risen in recent years. The Preserving Virtual Worlds I (PVW I) project, part of the Preserving Creative America initiative of the Library of Congress National Digital Information Infrastructure and Preservation Program, has demonstrated the

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many challenges confronting the preservation of gaming worlds. The project's activities are no stranger to the pages of the *New York Times,* the *Atlantic*, and *Wired*. Its successor, Preserving Virtual Worlds II (PVW II), received substantial funding from the Institute of Museum and Library Services in 2010 for a two-year follow-up project to study the significant properties, or perhaps more accurately, the "contingent significant properties" of video games.[12] Many graduate dissertations are sure to be defended in the coming years on the subject of "game preservation" and those already knee-deep in the subject are fortunate to have a book-length study to turn to, James Newman's *Best Before: Videogames, Supersession and Obsolescence*.[13]

Original prototypes like Ralph Baer's Brown Box and Al Alcorn's prototype to *Pong* find themselves safeguarded in institutions for cultural heritage such as the Smithsonian's National Museum of American History and the Computer History Museum respectively. Libraries, archives, and museums have built collections of variegated materials (including developer papers, periodicals, gaming peripherals) to help document the history of video games. Private collectors are also entering the museum world: John Hardie, Sean Kelly, and Joe Santulli of *Digipress* began a Kickstarter campaign in 2011 to help raise money for a Video Game History Museum; the American Classic Arcade Museum is registered as a 501c3 nonprofit corporation in the state of New Hampshire; and the International Arcade Museum, a long-running web project, aims to break ground on a permanent location in the near future.

"Preservation," "exhibition," "access," "longevity," along with "collection development," "climate control," "archival materials," "digital cultural heritage," or even "cultural institution," are terms thought more at home in departments of library and information science, in museum studies programs, or in the pages of the *American Archivist, E-Conservation,* the *International Journal of Digital Curation*, and the *Smithsonian Magazine* than as utterances circulating freely amidst current research and public interests in video games. This, it seems, is no longer the case when a room at the PAX EAST 2011 game convention overflows with gamers eager to attend a panel on establishing a "game canon," or in the following year at PAX EAST 2012 when a larger room is required at the Boston Convention Center for the panel "Selecting Save on the Games We Make." Game preservation is now a subject regularly featured in *Gamasutra.* Games further entered the arena of "cultural officialdom" with the Smithsonian American Art Museum's "The Art of Video Games" exhibition in 2012. And in November 2012 the Museum of Modern Art in New York announced that it would include video games in its collection. It is fair to say that Nintendo's GameCube has met the white cube.

For now let us not labor over why video games are being preserved, a question already answered well by those actively working to preserve them.[14] Instead, consider that much is to be gained for the scholarly study of video games if we focus on what I call their afterlife history. Video games have entered into subsequent phases and

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contexts that greatly exceed their initial use/exchange value as products and designed game programs. These include secondary and tertiary markets (antiques, collectibles, secondhand goods, thrift, yard and garage sale), the forgotten and nebulous void of storage ("finds," "treasures" found in abandoned storage lockers—fodder for recession-era television like A&E's *Storage Wars*) and neglect, obsolescence, and the general aging of a celebrated cultural technology. Demarcated as an epistemological "phase" or "situation" in an object's life history, the afterlife is a curious state after commodification and consumption, after intended utility and designed functionality, and possibly even after obsolescence; where a standard life span is met with extended or repurposed and recontextualized uses. It designates a formative situation affecting how we know, understand, and experience video games when their attributed values and meanings are neither limited to the actual play of a game nor mark an obvious terminus in a life history.

The conceptual framework of the afterlife, by no means unique to this project, commits this book to studying video games outside of their habitual parameters. It accounts for the life cycles of cultural technological objects in situations of disposal, ruins and remains, and within cultural institutions dedicated to preservation and conservation that manage their born digital (sans the ubiquitous scare quotes), material, and ephemeral forms, conditions, and functions. An urgent need for such a perspective exists because silent or invisible stages of waste and everyday ruin are becoming the reality of how we experience and study games. Initiatives, projects, and practices, such as those examined in this book, be they professional or amateur, national museums or itinerant exhibitions, university archives or independent databases, herald a watershed moment in both the history of video games and its scholarship.

Key to the argument in this book is that our increasing awareness of the importance of looking "off screen," "inside games," as well as "around them," an awareness resulting from the recent work of platform studies, media archeology, and a general ebullience for the study of objects, things, and materiality within the social sciences and humanities, resonates well with the preservation practices of cultural institutions managing collections of video game artifacts. Video game preservation is changing how we understand the popular medium: the onscreen immersive, interactive, and dynamic virtual world of the game, like all digital technology, is not immune to deterioration and requires dedicated techniques, strategies, and policies to help manage its longevity. Preservation questions the very ontology of the video game; the common question, "What is it?," somewhat explodes when we must discern the significant properties of a game to determine what ought to be preserved to still be "the game" when writing emulation, or when we must consider what materials for documentation ought to accompany game play to understand video games from this century and the last. We quickly learn that "the game" is never singular but a

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complex object: a cultural accretion of technologies, materials, manufacturing, design and development, government standards for electronic devices, patent protection, distribution, marketing, sales, usage, users (of various identities), functionality, non-functionality, and contexts of experience for economic and social relations. Simultaneously, cross-examining games as complex objects, attempting to occupy the judicious look and touch of a conservator, archivist, preservationist, or curator, greatly pressures how game history is conducted as our objects of analysis move beyond the actual screen of game play to offer invaluable lessons for constructing more rigorous histories.

While practices and processes of preservation endeavor to maintain and protect an object, preservation's direct engagement with different materials also provides intimate encounters with video games in ways that reading about them, or even playing them, cannot. To study video games critically is to be indebted to preservation because our objects of study are available to us by virtue of having been preserved. Tautology, possibly. True, absolutely. Preservation is not the exception for our sustained study of video games; it is a general rule before our ability to work with arcade, console, and computer games becomes irretrievably lost like works of film surrendered to celluloid decomposition, the stench of vinegar choking the writing of history.

Game After, as inelegant as the title may be, captures my intentions and subject matter more accurately than the exhausted phrases "game over," "extra life," or even "game saved" common to gaming parlance (and many academic paper titles). Games in this book may not be "over," or even "saved" for that matter. I find the book's clunky title fitting for a project that studies video games in their afterlife situations. These situations, I will argue, illustrate the preservationist strategies and curatorial models at work in diverse cultural institutions while conjointly recognizing games that persist outside of "official" institutions, lingering a little longer in disrepair, disuse, and damage. Museums, archives, exhibitions, enduring arcades, private collections, and landfills are the cultural terrains of the afterlife of video games.

I offer neither a comprehensive history of the cultural institutions holding video game materials nor a technical manual for preservation, but a cultural study at the nexus of places, people, and objects that inform critical historical studies of video games as refracted by the wide-angle lens of afterlife situations. Surviving materials corroborate multiple and specific lives, apprising us of the knowledge available by which to evidence the past and thus affording the opportunity for more expansive historical understandings of video games. In short, I study the stuff collected, be it in a museum or landfill, and what it enables for the writing of game histories.

To study this stuff, I turn to life-cycle or life-history models of objects that prove multitudinal, ducking and weaving across the intellectual contours of diverse fields of study and disciplines. The study of the "social life of things" or the conceptualization of an object's life history as a "biography" and "career" are theoretical models common

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in anthropology and archeology.[15] Although uncommon in the study of games they are, I contend, conceptually efficacious here. In place of viewing the identity, meaning, and uses of any object as fixed and static, documenting an object's history approaches what Nicholas Thomas would regard as the "mutability of things in recontextualization."[16] Things or objects (either appellation applies within this context) take on numerous lives as they undergo recontextualization across their careers and biographies. Their histories, or what Arjun Appadurai regards as a thing's "total trajectory," are a composite of phases or situations—shifts in context—that determine a thing's value, function, and possible meanings.[17] Appadurai's social life model is nonessentialist, designed to dissolve positivist conceptualizations of the commodity as "being a certain *kind* of thing" so that instead of resting an analysis on whether a commodity is "one kind of thing rather than another" we direct such questions to a specific phase or situation in the life history of a thing. In other words, no single situation exhausts the total trajectory or biography of a particular thing and questions of values—economic or otherwise—are context dependent.

A few points need to be fleshed out from my Tricorder reading[18] of social life theory. The first pertains to the need to expand its total trajectory so that video games can be viewed within such a framework, while the second articulates the study of specificity that close attention to afterlife situations engenders. For the study of the afterlife history of video games, anthropological models alone are not sufficient since they concentrate on the exchange, circulation, and diverse uses of a thing until its demise. For instance, "production, through exchange/distribution, to consumption" marks the "commodity situation" of a thing's total trajectory for Appadurai, while the processual biography of Igor Kopytoff's well-known Zairian Suku hut begins its life history as a shelter to house a family, experiences shifts in its status "variable from situation to situation" across its changing physical state, to conclude its biography when "the termites win and the structure collapses."[19]

It is not terribly challenging to pinpoint skeins of intellectual work that would allow social life history both to precede production and survive consumption. The commodity situation that Appadurai speaks of, to offer one direction for expansion, cannot exist outside of the processes of development and design. Work such as design historian Victor Margolin's concept of the "product cycle" would not dispute the importance of mapping the circulation of products. On the contrary, it enriches our understanding by demonstrating the need to also consider planning, conceptualization, and design that precede production. "Every product," Margolin informs us, "goes through a process of development and use that begins with its conception, planning, and manufacturing, moves to its acquisition and use, and ends with its disassembly or disposal."[20] Design studies introduces additional (formative) phases to bear upon the life history or biographical theories of things. (And I should also acknowledge the elusive cultural studies[21] of Dick Hebdige's "Object as Image: The Italian Scooter

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Cycle," whose analysis of Vespa and Lambretta scooters examines their progression from "design/production through mediation into use"[22] as interlocking frames or moments in their histories.)

Equally, inventive works like Michael Thompson's classic *Rubbish Theory: The Creation and Destruction of Value,* William Rathje and Cullen Murphy's *Rubbish! The Archaeology of Garbage,* Tim Edensor's *Industrial Ruins: Space, Aesthetics and Materiality* along with other writers on trash, and in particular, ewaste, urge us to consider the opposite spectrum of design and development, to account for a thing's destruction, liquidation, dereliction, and possible recycling.[23] Lastly, museum studies and conservation methodology demonstrate that the transformation of an object (including waste and ruins) into a "museum object" bestows yet another phase, identity, meaning, and series of values in the lifetime of the object via the processes of institutional acquisition, documentation, curation, storage, display, and preservation and conservation treatment. From such a brief account of research conducive to life-cycle and afterlife perspectives it becomes necessary to pull in both directions, stretch the enervated cliché of "cradle to grave" so that we consider our objects of examination "before the cradle and beyond the grave."

Given the wide view necessary to capture a total trajectory, the afterlife can only be a mixed disciplinary formulation: anthropology, industrial archeology, cultural studies, design studies, garbage studies, media studies (that emphasize materiality), material culture studies, and museum studies, are a few relevant fields that inform this cultural study. The afterlife of video games shares intellectual camaraderie with research interests in media studies and recent projects such as Charles R. Acland's collection *Residual Media*, within which its authors consider the depths of "reconfigured, renewed, recycled, neglected, abandoned, and trashed media technologies and practices."[24] It is not just the diverse range of objects conforming to such categories examined in the collection that motions a shared interest but the important renegotiation of a dubious category such as "dead media." Throughout Acland's introduction to the chunky collection he offers other phases, moments, and conditions that complicate the idea of security in a defined and definite final resting place. We read instances of things that "won't stay lost, dead, and buried,"[25] how they "hang around long past their supposed use-by date"[26] and "fade away or persist."[27] With such indeterminacy it is no surprise that Acland contrasts "residual media" with "dead media" to assert that the work contained in the volume "might be better represented as studies of 'living dead' culture."[28] This cycle of reanimated life, or the slow fade of wear, cultural aging, and the resurrection into new uses has not been lost on the emergence of Garnet Hertz and Jussi Parikka's "zombie media"[29].

In its camaraderie, my project attempts to locate, through empirical research elaborated upon later in this introduction, the persistent, if not prolonged, *specific situations of* lingering, fading, decaying, and aging of video games within the contexts

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of cultural institutions, private collections, and residual public spaces. "Residual media," "undead," and "zombie media" mean little unless a context is established to help attend to these conditions and apprehend the situations formative of such a label. Becoming "zombie media," at the end of the day, is something that *happens to* media, not an inherent condition. Therefore, the afterlife phase is not exact, indicating a precise moment when a video game slips from its prime to find itself in another state where it is not distinguished as waste or disposed of, but, in the case of a museum or archive, recast in a composite of aesthetic, educational, research, museological, heritage, and historical values.[30] It accounts for an oblique moment when the product phase recedes and, in the case of video games, they find themselves not only disassembled or destroyed but revalued for new uses and assigned new functions as historic materials. In this phase, obsolescence is but an opportunity to attend to a video game in a different situation of understanding and meaning making.

My second point concerning the specificity afforded by an afterlife framework also requires further explanation. Video games are historically specific things in time and place. This is in contrast to the study of games as an abstracted totality, or as an ahistorical consensus. For example, I do not speak of "*Space Invaders*"—as a non-medium-specific thing—instead I discuss the *Space Invaders* coin-op arcade cabinet at the Strong National Museum of Play, where it is housed in a glass display case working not to collect quarters but working to evidence and represent game history. Journalist J. C. Herz wrestles briefly with the ontology of a video game when she poses the following question in her popular history of games: "What is *Space Invaders*? Is it the code? Is it the arcade cabinet? Was it the idea in a Namco engineer's mind when he made it? Where is the actual game?"[31]

Don Ihde's *Technology and the Lifeworld* provides a perceptive means of responding to such questions, one that also maintains the emphasis on context pertinent to afterlife history. Ihde tells of a party game where his guests each attempt to identify a peculiar stone artifact. "What is it?" he asks of each of them. For his artist friend the stone is, of course, an *objet trouvé*. The writer sees in it a paperweight, given its practical task of holding down magazines from an invading summer breeze. The anthropologist, noting its form, declares it to be an Acheulean hand ax. Ihde offers this game to demonstrate the ambiguity of objects. "The object is or could be," he writes, "any of the things named, or it could become how it is used."[32] The anthropologist disagrees and holds to the object's intentional design as an ax. Another guest offers a correction to this notion of intended design to point out a recent reinterpretation of its actual usage (purportedly, it was thrown like a discus). Analogous to Dick's lesson from the "The Preserving Machine," Ihde accentuates the position that "the designer's intentions play only a small part of the subsequent history of the artifact."[33] This ought to be read less as a swipe at design than as a refusal to regard the context of design as the lone determinant of his stone artifact.

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Ihde's game demonstrates the need to think less in terms of the "thing-in-itself," something with fixed hermeneutic, intrinsic properties, confident ontological value, and predetermined uses over time, than of "things in contexts, and contexts are multiple."[34] Objects are not stable but "multistable," Ihde maintains. In *Heidegger's Technologies: Postphenomenological Perspectives*, Ihde clarifies his concept in a way consistent with my emphasis on situational specificity: "I claim that technologies are multistable, that is, they have structured ambiguities that allow what first appears as a 'same' technology to be differently situated and have different trajectories."[35] Peter-Paul Verbeek summarizes Ihde's concept of multistability very well when working through the example of the multidimensionality of the Necker cube figure to clarify that "what it 'really' is remains undetermined. It is many things at once; it is 'stable' in multiple ways."[36]

Ihde and Verbeek's anti-essentialism maps onto technologies as well in that technologies are "only technologies in their concrete uses, and this means that one and the same artifact can have different identities in different use contexts."[37] The situation of the afterlife homes in on a series of different identities video games assume that are markedly different from their intentional design and execution as functional hardware and software lived out in a present or past life. For Ihde, the once-intentional hand ax becomes an "ex–hand ax" in its multistability: "I could have used it as a keystone in one of my Vermont fireplaces; my Viking could have placed it into the hold of his vessel as ballast; or one could have cemented it, point up, along the top of a stone fence, as the Europeans do."[38] The determining context for Ihde is the multiplicity of uses (use contexts) assigned to an object; a technological object in particular "*becomes* what it 'is' through its uses."[39] Properties of any object are not deemed irrelevant when examining a specific "use context." Context provides access or helps to generate an understanding of those very properties. Ihde's game of "name that stone" does not divorce the materiality of the thing from its multistable potentiality. Alternatively, and this is the business of the afterlife framework, it aims to understand any prominent use as always contingent upon temporal and contextual biases. Of interest are situations that may suppress previous lives of an object (a onetime hand ax rendered an ex–hand ax) while magnifying those currently at work in variable contextual worlds (this point is elaborated upon in chapter 1 via Philip Fisher's work on the resocialization of objects within the museum context).

Returning to J. C. Herz's question, rather than ask "What is *Space Invaders*?" (the coin-op arcade cabinet) when working through the conceptual framework of the afterlife we would ask, "What is *Space Invaders* in the situation of a museum where it is tasked as a historic artifact, document, and evidence?" The answer becomes the basis upon which video game history is written. Delineating a thing's situation is a prerequisite to writing its history. When the itch to ask "What is [insert object]?" arises, we would do well to also ask "When" and "Where" is that object before we scratch

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too hard. "What is *Space Invaders*?" can be replaced with "When is *Space Invaders*?" and "Where is *Space Invaders*?" in an entirely different sense from Herz. Drawing from the scenarios assigned to the aforementioned *Lunar Lander*, the meanings of a game are dependent upon "when and where" it is located—is a *Space Invaders* coin-op arcade cabinet positioned behind glass in a museum the "same thing" as one that accepts quarters at the Casino Arcade on the Santa Cruz Beach Boardwalk? No, it is not.

I find Ihde's concept of multistability incredibly illuminating when I peer through museum glass at a static coin-op arcade *Space Invaders* at the Strong Museum. In fact, I have taken to calling such a thing an "ex-game" like Ihde's "ex–hand ax" (and not to be confused with the Mountain Dew–infused extreme sports phenomenon). The multiplicity of contexts and uses that Ihde suggests would help address such questions. "When is *Space Invaders*?" demonstrates the importance of the passage of time for an understanding of *Space Invaders*. "What is *Space Invaders*" when it functioned as a mass-produced serial coin-op arcade game by Taito/Midway compared to "What is *Space Invaders*" when a nonfunctioning lone machine rots in a nondescript warehouse thirty years later? Junk? Trash? Relic? Antique? Emblem? Fossil? Treasure? Museum prop? Ex-game? Such questions emphasize the importance of recognizing shifting situations, along with the multiple shifts in meaning that occur as a result, when faced with ontological questions to help specify the circumstances and contexts that inscribe meanings and ways of knowing a video game at particular moments in its life history. Games may occupy or perform various palimpsestic roles across their life history depending upon status, values, age, function, and usage, and our study of them requires recognition and awareness of their general life succession together with specific phases.

"What is *Space Invaders*" in the mediating context of a museum does not foreclose on its previous careers as Kopytoff would say, or its previous product cycle per Margolin's work. But the question allows us to examine closely the meanings and values of the thing at a particular moment in its life history, a moment that reveals new and different uses, taxonomies, and how our wonted inveterate understandings of a video game are pressured when placed in diverse contexts. What does it mean to look at, but not play, a *Space Invaders* coin-op arcade cabinet at a museum? What, for that matter, does it mean to actually play *Space Invaders* in a museum? To help manage, or peer through and at, the ambiguity of objects for historical examination, a specific context or situation in the life history of a video game must be "sprung" loose while not losing sight (and site) of previous and unpredictable future lives.[40] By homing in on afterlife situations from a total trajectory we not only identify a phase increasingly pertinent to our general understanding of video games, but, perhaps more importantly, we can begin to study them when recontextualization defamiliarizes their everyday usage (or intensifies it?) and different conditions of knowledge enrich our historical understandings.

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The conceptual framework of the afterlife is a means to specificity, and as Lisa Gitelman asserts in the introduction to *Always Already New: Media, History, and the Data of Culture*, "Specificity is key."[41] She turns to Walter Benjamin to reach her neat claim concerning specificity. According to Benjamin in a passage from "On the Theory of Knowledge, Theory of Progress," "The present determines where, in the object from the past, that object's fore-history and after-history diverge so as to circumscribe its nucleus."[42] When considering technological nuclei, it is "a mistake," Gitelman cautions, "to write broadly of 'the telephone,' 'the camera,' or 'the computer' as it is 'the media,' and of—now, somehow, 'the Internet' and 'the Web'—naturalizing or essentializing technologies as if they were unchanging."[43] The specificity that Gitelman urges insists upon a focused subject like "telephones in 1890 in the rural United States" or "cordless landlines in North America at the beginning of the twenty-first century,"[44] rather than generalist and broad historical subjects premised on smooth stability and linearity. Such an emphasis in media history allows for mutability, difference, and change, the contingency of "fore- and after-histories" and the need to account for and explain the many divergences.[45]

It is less a matter of an identity crisis that Herz speaks of than multistable, uncertain, shifting, variable identities not in crisis but in change and complexity, enduring different circumstances and adaptations, and accumulating shifting situated meanings, significance, and values. To intentionally echo Gitelman's plea for specificity, it is not "the video game" that I write of but the afterlives of video games and their cultures of materiality in institutional, noninstitutional, and residual milieus in the United States at the beginning of the second decade of the twenty-first century. In a clamshell, I study concrete cases of "game stuff" or "evidential materials," "things representative of games," "digital objects," or "remains" in specific conditions and generative contexts. Less a series of "case studies," one might say, than a cultural study of cases, containers, cabinets, consoles, and cartridges.

With such preliminaries established, let us turn to the actual objects of this study. I have opted for the phrase "cultures of materiality" to help designate the mutable object taxonomies emergent in afterlife situations while also acknowledging the general life history of an object's total trajectory. "Cultures" hints at the plurality of multistable social lives of things and suggest that engagements and understandings of materiality *are cultivated* differently across institutions; curatorial, archival, restorative, preservationist practices; and academic fields and disciplines. In the humanities and social sciences, many speak of a "turn toward things" and a "material turn," following the "linguistic turn," the "visual turn," and the "digital turn" of the digital humanities.[46] "Ephemeral," "immaterial," or "dematerialized" approaches to the study of "new media" in the late twentieth and early twenty-first centuries[47] are now hotly contested by research interests in "residual media" and "zombie media" discussed above as well as German media theory, media archeology, new materialism, continued

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interest in actor network theory, forensic materiality, the writing of evocative objects, object-oriented ontology, object studies, and the malleability of Bill Brown's "thing theory" across many fields. Today the pairing of "media and materiality," referring to software as a thing,[48] refusing to regard information as exempt from leaving a trace,[49] or the inclusion of "materiality" as an entry in the University of Chicago Press's *Critical Terms for Media Studies* raises few eyebrows.

No general theory of materiality, objects, things, and stuff, will win consensus among this diverse research or across the many fields and disciplines that study materiality and material culture within established disciplinary boundaries. A realization that my coeditor, Fiona Candlin, and I agreed upon while writing the introduction to *The Object Reader* was that academia's sustained interests in objects is not necessarily interdisciplinary and the study of objects (as well as what objects are studied) is executed across many different disciplines in accordance with their own archives, debates, texts, methodologies, discourses, and intellectual histories.[50] Those lines were drafted in the summer of 2008. An amendment that I would make, one pertinent to this book, is that the "material turn" ought not to be taken at the sacrifice of long-standing contributions from fields that have engaged with material culture and materiality. For example, museum studies, American history and American studies, archeology, anthropology, history of technology, design history, and material culture studies (be they U.K.- or U.S.-based) ought not to be deemed irrelevant for this latest "turn to" materiality. In the spirit of respect and friendship, let us act less like sea captains on a voyage of discovery, one ending in intellectual conquest, and more like horizontal reading collaborators mindful of lands already populated.

"Cultures of materiality" is expedient on account of the diverse objects and materials on which I work. On my trips through the afterlife of video game history I found myself, on numerous occasions, rummaging through plastic controller parts, touching different types of wood used in coin-op arcade cabinets, examining various weights of paper stock used for product packaging and publications, moving (heavy) vintage analog computer hardware, carefully lifting an aged cellophane hinge (i.e., the piece of tape holding together Ralph Baer's original Brown Box prototype at the National Museum of American History), pressed against glass, and searching for waste. I was not just confronted with ROM cartridges, integrated circuits, EPROMS, printed circuit boards, program code, alpha and beta versions, emulators, design schematics, silicon, screens, networks, or even the activity of play. In my trips to museums, I would often stand in the presence of powered-down or nonfunctioning coin-op arcade video games, game consoles, storage media of cartridges and optical discs, controllers, packaging of PC games and cartridges, prototypes, and a vast assortment of game-related peripherals. Such experiences lead me to fully endorse the conclusion of the California Digital Library's Digital Materiality Research Group, which insists that for "archivists and others working to preserve born-digital materials, there is a strong argument for

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preserving the integrity of the original hardware and storage media accessioned with a collection, however generic or unremarkable these might appear."[51] Evidentiary value can be had in original hardware, storage media, as well as from a game's source code and emulation.

While game preservation is often couched in terms of the technical issues and challenges wrought by variable media like digital and older analog games along with the work to develop best-practice standards for digital preservation strategies and long-term stability,[52] this ought not to preclude the more conventional, object-centered, models and methods that custodians of cultural heritage have employed on nondigital materials and occasionally carried over to digital materials. I say this not to create a rupture between analog and digital objects in the care of cultural institutions but to make sure that we are thinking across code and context, software and hardware, static and nonstatic objects. The emulation of *Lunar Lander* and the arcade cabinet from which it was emulated *both* have roles to play in game preservation and in the writing of game history. This is less a polemical position than a voicing of what is *already well underway* at the cultural institutions examined in *Game After*. Therefore, I do not intentionally privilege a certain class of games, or even attempt to stretch (think: distortion of a comic strip migrated to Silly Putty's rubbery form) an analysis to envelop every single phylum of video games. My study is bound to what is placed behind panes of glass, slotted into drawers, and folders at specific locations.

Many diverse materials (materials that are nondigital, born digital, and digitized, informational objects, as well as those molded from plastics, or cut into wood) are collected, archived in acid-free boxes and/or digital repositories, exhibited, conserved, and preserved. No unified agreement on best practice or transinstitutional access exists at present. I often encountered divergences when the Smithsonian referred to its collections as *materials*, while the Strong Museum opted for *artifacts*. Or when the Computer History Museum used the word *games* to account for its computer game holdings—why not *artifacts*? Is *artifact* one of those words that signals hierarchical value compared to the lowly pronouncement of a *thing*? *Museum object* and *museum piece* certainly bespeak a cultural value that the more unassuming *object* fails to capture. Is *specimen* reserved for ethnographic, archeological, or natural history items, so that "specimen of game history" may appear unnatural or perverse in its disregard for the organic (especially those specimens whose life trace is frozen in time via taxidermy)? I also found myself increasingly warming to the wonderful word *stuff* to describe the unspecified material from which something is made, after a lengthy conversation with Van Burnham, author of *Supercade*, on the correct properties of lacquer for the restoration of Nintendo's *Punch-Out!* arcade coin-op cabinet (Burnham and her partner, Seamus Blackley, have stunningly transformed the arcade game content of *Supercade* into an actual arcade and I examine their restoration process in chapter 6). Besides

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viewing all of this stuff, I occupied my book-writing time by grabbing JPEGs of Atari game boxes from online repositories to discuss the role of packaging for game history in chapter 4. What should be underscored when navigating through the various groupings of objects glossed above is that on account of an epistemological life-history framework we do not have to wrestle with ontological questions that would grind us into making a case for *artifact* over *materials*, or *thing* over *game*, or even *artifact* over *activity* (a tension discussed in chapter 1). Such questions are situational and will not be answered out of context but directed at specific institutions and their curatorial practices for possible answers. Multistability permits objects to don many identities limited only by their situations.

The point here is that materiality, materials, and material culture, culminating in the convenient "cultures of materiality," are all necessary and require continued reaching out across fields *and at* things in order to best explain the specificity of video games within the situations of their afterlife. This is most evident given the conclusion that PVW I reached in its final white paper report. To wit, the preservation of a "game itself is insufficient; we need to also preserve the information that contextualizes the game and helps researchers achieve a more complete understanding of the game's significance and use."[53] What does *World of Warcraft* emulation, for example, do for a future historian besides reveal what a lonely world it is without some documentation of the social and cultural experience of online play? When turning our attention to preservation, documentation, and the inclusion of games within cultural institutions, we come to see games as complex artifacts. Diverse "component parts"—source code, platform, game schematics, console design, storage media, controllers, circuits, chips, boards, wires, buttons—possess significance and value for the documentation of social experience and cultural history in the life of games. The same is true of other materials like box art, arcade cabinet art, video game periodicals, marketing materials, and original hardware, to cite a few examples. I want to stress that these things themselves are not just documentation but must also be documented, not orbiting as paratextual (an ugly word), secondary, peripheral, meta, or restricted to the status of contextual materials. As Zach Vowell alerts in his contribution to PVW I's first white paper report, "The stuff of game history encompasses far more than the published games themselves."[54] Such "stuff," as we will witness, is broad in range: "calling from all directions for my undivided attention," as Paul Valéry once bemoaned of the museum,[55] requiring terabytes of storage space in digital repositories, while "parts" push for off-site storage at museums, or litter warehouses and pits in landfills alike.

The history of video games, as these afterlife histories and preservationist efforts attest, is a cluttered affair with many component parts scattered across its past and present topography. Something as random and seemingly unremarkable as a game cartridge box, or displayed nonplayable game consoles, affirm Steven Lubar and

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W. David Kingery's opening remarks in their *History from Things: Essays on Material Culture* that "artifacts are remnants of the environment of earlier periods, a portion of the historical experience available for direct observation [and] widen our view of history as they increase the evidence for historical interpretations."[56] The cultures of materiality constitutive of the afterlife of video games enable historical knowledge that cannot be achieved by presiding paradigms within game studies that have largely concentrated on play, rules, narrative, representation, games as cultural texts, and generalist descriptive histories that have characterized game history.

Where Is History in Game Studies?

I want to begin this section on the place of history in game studies by sharing an unexpected discovery that proved, early on, momentous for this book. While still contemplating the form and shape of the current project, still (joyfully) pursuing whims, hunches, and flights of fancy and nourishing my curiosity, I found myself at the Vintage Arcade Superstore in Glendale, California. The shop restores and repairs coin-op arcade video games and pinball machines. Its owner, Gene Lewin, agreed to an interview in July 2008 and I would return to conduct a follow-up interview in April 2011 (my interview with Lewin is discussed in chapter 6). He granted me free reign in his warehouse workshop on a hot July afternoon. My camera and I were able to get "up close and personal" with the shop's various games in all states of wear and repair. I observed Morris (as seen in figure 0.1), one of the specialists who rebuilds and repairs arcade video games, meticulously touching up the cabinet art for an Atari Inc.'s *Tempest*.

Digging through drawers (even suitcases crammed full) of paint markers, spray-paint canisters, and other assortments of paints, he searched for the correct hue of white to match the intergalactic imagery depicted in the cabinet's side art. "Customers want a machine fresh out of the box," Morris told me while plying his craft. For avid collectors, or for operators who still turn a meager profit from these antiquated machines, "the game" is more than its program and CRT monitor. It consists of a "working machine," one whose original cabinet art and material interface "work" in conjunction with its printed circuitboard, sound boards, wires, power supply, coin box, and CRT monitor. People, Morris insisted, want the "whole thing."

Supporting the "whole thing" is not simply matching paint; Vintage Arcade Superstore is jammed (to the ceiling in places) with salvaged, purchased, traded, and stockpiled parts to help sustain the life of these games. Very little is wasted in this process and it is the sort of place that a person prone to clumsiness should avoid. One corner attracted my attention a little longer than anticipated. Masking tape provided handwritten labels marked "Nintendo Cables," "Cinematronics Control Panel Cables," "Turtles Control Panel Harness," and one had the lone word, "Red" (see figure 0.2).

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Figure 0.1
Tempest in dry dock at Vintage Arcade Superstore, Glendale, California

Figure 0.2
“Fired buttons” at Vintage Arcade Superstore, Glendale, California

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Curiosity got the best of me so I opted to open this mystery drawer. Inside were heaps of grimy and well-worn red "fire buttons," "actions buttons," or "pushbuttons," as they are also known.

After making this find, a historical consciousness began to perspire (it was the summer and I was rummaging through a warehouse over twenty miles from the marine layer I used to call home in Santa Monica). To the untrained eye this would have been a drawer brimming with junk, remains, if not relics, of the last century. To Gene and his crew, however, such "leftovers" are the patchwork means to successful restoration when original parts are desired (and feasible). Accumulated parts like these red fire buttons enable Vintage Arcade Superstore to restore the life of machines produced in the late twentieth century. These innocuous fire buttons are like the "iron filings" of Siegfried Giedion's anonymous history from *Mechanization Takes Command.* "These small insignificant particles," Giedion instructs, "by the interference of a magnet become form and design, revealing existing lines of force. So, too, the details of anonymous history can be made to reveal the guiding trends of a period."[57] What can a bunch of worn red fire buttons reveal to one interested in game history? An examination of video game pattern wear is certainly tempting and would prove utterly fascinating to this writer. But I seriously doubt that we could lift any fingerprint to piece together the organic residue of an actual gamer history. So, I query the games they once allowed us to play; I speculate on their designer and when they were first installed in a coin-op arcade video game cabinet; and I ruminate over their place within game histories, asking myself what the history of the "fire button" is. More importantly, at least for the project at hand, they become a pressing question for the game historian's trained eye for making such incidental details matter. Do these parts of game history remain locked away in some metal drawer within the rapid rise of game studies? Are writers of game history even pulling open such drawers?

Works dedicated to the history of video games take diverse forms, both in terms of their specific historical emphases and in their approaches to the construction of that history. Such works include popular TV and DVD documentaries praising the "pioneers" of game invention (e.g., *The Video Game Revolution*, *Video Games: Behind the Fun*, and *Game On! The Unauthorized History of Video Games*); periodicals with an emphasis on histories of game designers, companies, and hardware and software, like *Retro Gamer*; informative industry histories;[58] and, perhaps most common of all, generalist histories—journalist and scholarly—that survey the past largely through descriptive and chronological accounts of factual events. We can mark the beginning of such an approach with the 1983 publication of George Sullivan's *Screen Play: The Story of Video Games*. Successors include Leonard Herman's *Phoenix: The Fall and Rise of Video Games*; Steven L. Kent's *The Ultimate History of Video Games*; J. C. Herz's *Joystick Nation;* Van Burnham's *Supercade: A Visual History of the Videogame Age, 1971–1984*; Rusel DeMaria and Johnny L. Wilson's *High Score!: The Illustrated History of Electronic Games;*

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Heather Chaplin and Aaron Ruby's *Smartbomb*: *The Quest for Art, Entertainment, and Big Bucks in the Videogame Revolution*; Mark J. P . Wolf's *The Video Game Explosion: A History from Pong to Playstation and Beyond*; Tristan Donovan's *Replay: The History of Video Games*; and Roberto Dillon's *The Golden Age of Video Games*.[59] This brief on game history cannot even begin to account for hobbyist, collector, and fan websites–cum–information repositories devoted to "retro," "classic," "golden age," or "old-school" hardware and software.

Within a more critical context, the history of games helps to build analytic frameworks for in-depth examinations of, for example, interactive fiction (Nick Montfort's *Twisty Little Passages*), game space (Michael Nitsche's *Video Game Spaces*), story and narrative (Jesper Juul's *Half-Real*), play (Mary Flanagan's *Critical Play: Radical Game Design* and Jesper Juul's *A Casual Revolution)*, rhetoric (Ian Bogost's *Unit Operations* and *Persuasive Games*),[60] as well as computing platforms (MIT's Platform Studies series). While these and other texts have introduced rigor, interdisciplinary methods, and welcomed theoretical positions to the academic study of games, their projects are not entirely proffered as historically centered, or necessarily intended as historiography. Game history, it is fair to say, is not their ultimate goal (saying this in no way denies their huge importance for doing game history, I want that to be crystal clear here). My point is that equally rigorous scholarship contributing to something that we could confidently call "historical analysis" "game historiography," or, better yet, "critical historical studies of video games" is long overdue.

It is disquieting for the field of game studies that Scott Cohen's *Zap* (1984) has long reigned as the only book-length history of Atari.[61] Other companies (with the exception of Nintendo), consoles, designers, and games have received even less scholarly attention to date. We may ask: Where are the histories of Sony's Playstations? Microsoft's Xboxes? Short-lived systems like Colecovision, Vectrex, Odyssey II, or TurboGrafix? What about the people behind the machines like Jerry Lawson, an African-American engineer who developed the Fairchild Channel F, the first console to use interchangeable cartridges? What of histories of female game designers working in the early 1980s like Carol Shaw, Dona Bailey, or Carla Meninsky? Or scholarly histories of Roberta and Ken Williams, the wife and husband entrepreneurial team responsible for Sierra On-Line? Where are game studies' *Analog Days; Of Bicycles, Bakelites, and Bulbs*; *Between Human and Machine; More Work for Mother; Make Room for Television; Window Shopping; The Atlas of Emotions;* and *Aramis, or the Love of Technology*?

I do not intend to continue to bewail what has yet to be written or, hopefully, is already being recommended to me the next time I visit Amazon.com.[62] Questions such as these are not prescriptive. At best they flag only a few blind spots in need of attention should game studies hope to welcome history into its growing curriculum and research purview. These questions also beg a much larger one: What constitutes

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game history? Is it stories of celebrated hardware and software? Platforms? Or is it stories of developers and designers? Are "gamers" and "game play" included in game history? Does game history reside as a "subsection" within the histories of television, film, computing, games, or, further afield, science, technology, and design? (This seems unlikely inasmuch as television studies has, by and large, ignored video games, opting instead to delve in other devices like RCDs, VCRs, DVDs, DVRs, and cable that have redefined the television set into an interactive screen.) Or is game history dependent upon a much longer history of human-machine interaction? If so, should it be linked to a much broader history of play, as many have argued? Additionally, how do game historians manage temporality within electronic game history? What are the criteria for delimiting epochs in game history? Do we only have "precrash" as a temporal marker of significance? Also, are epochs really reducible to technological "breakthroughs," as Wikipedia's entry "History of Video Games" would lead us to believe—a history told from mainframes to clouds while bit jumping in between? Lastly, and of particular interest, what are the research materials (and methods) that game historians consult to construct their histories, and where do game historians do their historical research? Surely game history requires more than game play and Google search?

Specific historical subjects are the prerogative of the game historian's research interests, methodological approaches, and conceptual framework. Be that as it may, the question of "why" a "critical historical studies of video games" has been slow to emerge is one that can be addressed. A recent shift from what has been designated as the "chronicle era" of game history to what might be characterized as the "collection era" has occurred: an era with clear investment in making historical research possible via the collection, documentation, conservation, and preservation of games and related materials across various cultural institutions, including the labor of private collectors and committed game enthusiasts.

A propitious place to begin to consider the problems confronting critical historical studies of video games and to explain the notion of the "chronicle era" in game history is with Erkki Huhtamo's "Slots of Fun, Slots of Trouble: An Archaeology of Arcade Gaming," the opening chapter in Joost Raessens and Jeffrey Goldstein's *Handbook of Computer Game Studies*.[63] Huhtamo's polemical chapter, the first to seriously question the state of game history, outlines a set of decisive problems for writing game history at the midpoint of the field's purported first decade. These problems are identified as uniformity, experiential-generational knowledge, and the limitations of the chronicle as a prevalent form of history writing.

Game history, Huhtamo asserts, is conveyed in a "remarkably uniform fashion, built around the same landmarks, breakthroughs, and founding fathers (not a word about mothers!)."[64] Invention and innovation-centric accounts lead readers on a linear path across landmarks of origins: from a brief mention of William A. Higinbotham

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and Robert V. Dvorak's novel demonstration of "tennis" on a Systron-Donner analog computer and oscilloscope at Brookhaven National Laboratory in 1958; to the hacker development of *Space War!* on a DEC PDP-I at MIT in the 1960s; to Ralph Baer's TV-Game Unit prototypes leading to the production of the Magnavox Odyssey in 1972; and then a settling into the exploits of Nolan Bushnell and cohort before a Japanese-designed plumber "saves" the industry. Such "uniformity" amounts to leaping from hardware invention to hardware invention, software innovation to software innovation, while the game historian's task is seemingly confined to neat descriptive snapshots—Rankean historicism reporting on "who," "what," and "when" (seldom "how" within broader social, cultural, and economic frameworks) along the way.

This is not to suggest that invention is no longer valuable to game history, but that richer, carefully researched, and deeper studies are in need that are not relegated to a chapter in a larger study and positioned as milestones in a predetermined narrative of progress. Likewise, and very troubling indeed, is that such uniformity allows for misunderstandings to collect and perpetuate. It was not until 2009—nearly forty years after *Pong's* development—that Henry Lowood, in his contribution to the *IEEE Annals* "History of Computer Games" special issue, introduced an important correction: *Pong* was television technology, not computer technology. As Lowood cautions, "These mischaracterizations of *Pong* reflect a natural, if perhaps careless, assumption about the dawn of the video game. If much of its past—and, as we now know, its future—was bound to the computer, we are tempted to read these connections into every video game artifact."[65] This special issue of the *IEEE Annals* marks a substantial step toward critical historical studies of video games: it was the first journal issue exclusively devoted to the subject of history.

Huhtamo also criticizes the generational proximity that Herman, Kent, DeMaria and Wilson, and Burnham exhibit in their writings on game history. Noting that "all these writers belong to the first generation that grew up with electronic games," he describes this as both a strength, for intimate knowledge and firsthand experience of the subject, and a weakness: "They often lack critical distance to their topic and are unable to relate it to wider cultural framework(s), including contemporary media culture."[66] On the one hand, it is equally reasonable to say that "first-generation knowledge" is valuable precisely for its subjective and experiential voice. In place of faulting such writers for not possessing the desired "critical distance" (whatever that may in fact look like), their work ought to be valued for what it does provide rather than for what it does not.[67] On the other hand, Huhtamo's criticism will remain valid if such histories continue to be definitive to the exclusion of any critical historical studies of video games.

The uniformity of the reigning historical works on games and their writers' reliance on generational privilege prompted Huhtamo to identify such works as formative of the "chronicle era" of game history, where "amassing and organizing data" takes pre-

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cedence over interpretative assessment. Herman's *Phoenix* is cited as a representative of this era on account of its descriptive year-by-year account of new hardware and software. Even the expansive interviews with game industry insiders in Kent's *The Ultimate History of Video Games* fails to produce, according to Huhtamo, "a critical and analytical attitude towards its subject."[68] Again we should not fault such studies for lacking a more scholarly critique. This was never the intention of either writer. Such works demonstrate that game history is constructed by a diverse range of sources that are well outside of "official" academic resources and closer to the massive information repositories of Atari Age and Moby Games—enthusiasts, antiquarians, collectors, hobbyists . . . "amateur" historians who have been laboring over the histories of games much longer than academics have. Yet, as before, Huhtamo's critique remains relevant should such approaches—or any approach for that matter—dominate how game history is practiced and understood.

A fourth problem looms in Huhtamo's chapter. This particular problem, although unaddressed, is detectable in his very first line, which begins: "In *Pilgrim in the Microworld* (1983), an early, unjustly neglected analysis of electronic gaming . . ."[69] With this reference to David Sudnow's long-out-of-print book, we may return to the question raised previously: What research materials and subjects are constitutive of game history, and equally vital, consulted for constructing game history? This question of historical research sources and materials has broad implications for how the field of game studies has been imagined while confounding the transition beyond the "chronicle era" that Huhtamo laments to the era of collection. When Espen Aarseth declared 2001 "year one of computer game studies," he intended to mark a moment within which games were becoming "more sophisticated" and, as a result, "it might be the first time that scholars and academics take games seriously, as a cultural field whose value is hard to overestimate."[70] Aarseth is not, in any way, devaluing the scholarly research on games that preceded the launch of *Game Studies*, and it is fair to regard the online journal's launch as a catalyst, along with the collection in which Huhtamo's chapter appears and the journal *Games and Culture*, to the ascent of game studies in its first decade and at the beginning of its second. But such a declaration identifies a moment of transformation, a line drawn in academic sands, whereby previous works on video games—in all their diversity—are possibly regarded as less than relevant, or not applicable to the production of serious scholarship. Such a position, like the set of problems Huhtamo identifies, has also stymied work toward critical historical studies of video games, namely by ignoring early publications as evidentiary and documentation materials for writing game history.

Mark J. P. Wolf and Bernard Perron offer an inspective survey of the study of video games leading to Aarseth's "year one" in the introduction to their collection, *The Video Game Theory Reader*. They acknowledge contributions from computer enthusiasts, hobbyists, designers, and psychologists as well as coverage of games in trade periodicals

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and in the numerous strategy guides on the market from 1980–1983. Sullivan's *Screen Play* is given the distinction of being the "first history of the medium" but is quietly shelved for its length ("a short ninety-three-page book") and presumed audience—juvenile readers—while Herman's chronicle is assigned the status of being the "first history of video games written for adults."[71] This division between "juvenile" and "adult" is detrimental to critical game historiography. It discredits what can be defended as invaluable (primary) sources for historical research. Sullivan's book, regardless of its intended audience, offered one of the first, if not *the* first, histories of Ralph Baer's involvement in video game development and dedicated two chapters to the design of video and arcade games. Not to mention that the book's many images can now be considered important pieces of visual evidence in their own right, visual evidence of an eroding era in game history.

I return to early paperbacks devoted to video game culture and game play at length in chapter 2. For now I want to caution that should we maintain a dismissive attitude toward sources such as these, or ignore them for their lack of seriousness, not only will they be relegated to the category of the superfluous but the cultural commentary, detailed examinations of games, and evidential value they offer for historical work will sadly be forfeited. Those invested in game history do not have the luxury of ignoring such works just because these works seem nonacademic or lacking in seriousness.

This brings us to the current era. Huhtamo's description of mid-2000s writing on game history as an era restricted to "amassing and organizing data" is, nearly a decade on, met with a different practice and understanding, one not just of gathering data but also of protecting and providing access to it. According to Huhtamo at least, the "chronicle era" shied away from a "critical and analytic attitude." However, the "collection era"—exemplified by assorted documentation, archival, display, preservation, conservation, and restoration practices at cultural institutions such as libraries, museums, and universities, as well as itinerant exhibitions, private collections, and information repositories produced by the gaming community—helps enable this very perspective by building (and most importantly, sustaining) historical collections for purposes of study, posterity, education, access, and cultural heritage.

This is precisely why I have titled this section "Where Is history in Game Studies?" My intention is to highlight the diverse efforts already underway at the "official" and "unofficial" cultural institutions explored in *Game After*— but only if those who profess to write game history are willing to open drawers like the one I stumbled upon, marked as it was by a piece of brittle masking tape bearing the lone label "Red." In this action of opening a drawer, we also experience a shift from Giedion's "anonymous history" to the labor of "anonymous historians" who have been diligently, meticulously, and creatively making the historical study of video games possible chiefly by devising ways for historians to have materials to research. The era of collection recog-

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nizes an important period for game history where video games themselves take on new roles and responsibilities. In the context of cultural institutions games are now tasked with evidencing and documenting history. Game studies' aversion to history is no longer tenable: it is within these cultural institutions that game history finds its most dedicated allies as the era of collection endeavors to provide materials that have not been available to researchers. The necessity of access to historical collections cannot be underestimated, especially when the chief subject of game history proves so vulnerable. The rapid deterioration and obsolescence of original game hardware and software is upon us. Without dedicated preservation and documentation game historians will lose access to materials vital to their historical research. They will have little recourse but to base future histories on the back of chronicle era works rather than apply their interpretative methods to materials that allow for critical histories that run deeper than fact checking.

Now Boarding

In addition to opening drawers, I also happened upon Jeff Ferrell's *Empire of Scrounge: Inside the Urban Underground of Dumpster Diving, Trash Picking, and Street Scavenging* while dawdling away an afternoon in one of the last remaining bookstores in Santa Monica, Hennessey + Ingalls, just off the tourist pit known as the 3rd Street Promenade. Ferrell's book left me with feelings of envy: a researcher who is not straining his eyes behind a computer with stacks of dog-eared books annotated with messy notes scribbled in their margins and hardcopy journal articles avalanching alongside the corners of a crowded desk, but a person actually getting their hands dirty, exciting all senses, by rummaging through the hidden world of urban trash heaps.[72] Best of all, his proclaimed "ethnography of objects" was conducted on a scrounged BMX bicycle, something I can easily relate to as I used to pedal my "tricked-out" Raleigh beach cruiser around Los Angeles taking pictures of mosaic tiles depicting video game characters placed on urban surfaces by the French artist, Invader. Ferrell details his "trash-pile drive-bys": "a quick rolling stop, a quick look through the pile, an item or two plucked, and then off again."[73] From a bicycle seat sociocultural research was conducted: for Ferrell pedaling becomes a method for peddling discarded objects to compose an ethnography across the sociopolitical urban sprawl of Fort Worth curbside trash piles and alleyway dumpsters.

Ferrell's drive-bys were the means by which he collected, recorded, and described the objects of his typology of urban scrounging. My means consisted of numerous vehicles for wayfaring across the United States:[74] rental cars, taxis, personal vehicle, planes, trains, my bicycle, and my Adidas. The sites that I visited are not zoned within a single cityscape, museum, archive, or exhibition. In 2008 I found myself driving across the arid Southwest in July to visit a defunct landfill in Alamogordo,

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New Mexico, to interview local residents about Atari Inc.'s disposal of its game products in September 1983. That same summer, as mentioned previously, found me sifting through a sweaty warehouse of arcade parts in Glendale, California. In December 2010, I drove through a blizzard (10 mph top speed at times) in upstate New York to visit the Strong National Museum of Play. In 2010 and 2011, I collected a wallet full of Caltrain tickets between the Computer History Museum in Mountain View, California, Stanford University's Green Library, and San Francisco International Airport (not to mention frequent flyer miles). From my short-term lease in DuPont Circle I would saunter daily along Pennsylvania Ave in October 2010 passing the White House to reach the Lemelson Center for the Study of Invention and Innovation, Smithsonian National Museum of American History. I dined on wonderful fish tacos in Austin while visiting the Dolph Briscoe Center for American History's Videogame Archive at the University of Texas and caught a cold in a dingy Motel 6 while at the University of Illinois, Urbana-Champaign (the morning was worse as I reluctantly found myself at a Cracker Barrel). After visiting the Justice of the Peace in East Los Angeles in April 2011, my "wedding day" was happily spent at Van Burnham's private arcade collection. (In all fairness to my prego partner, the interview had been scheduled far in advance of our shotgun nuptials.) Simply put: I never, in my wildest dreams, imagined that a book on video games would take me to a desert, or to Lake Winnipesaukee in New Hampshire, or to the Smithsonian, or to a cold-war-era fallout shelter at Brookhaven National Laboratory (more on that later).

Experiences such as these demonstrate not a luxury of travel, but the *necessity of making the journey in order to do historical research on video games*. Historians of many flavors, whether they are concerned with art, literature, film, archeology, architecture, design, or other fields, already know that valuable source data is not measured in Google hits alone. Being *on-site as well as online* speaks to the need to visit institutional archives and museums and, given the unofficial and unorthodox conventions of game collections, you may easily find yourself not only glued to Moby Games, Atari Age, VG Museum, Old-Computers, or countless other databases, but also digging through warehouses, private collections, eroding arcades, itinerant or annual exhibitions, specialist collector shops (the cramped conditions of Video Games New York, for instance) and conventions, or even a defunct landfill, where the inhalation of dust and the need to wipe away the grime from your brow go hand in hand with researching game history. Walking, flying, training, searching, stumbling upon, opening drawers, lifting lids off boxes, pressing my nose against glass, looking at, in, along the sides of, and behind games, playing and not playing, listening, looking, and touching things, writing, recording, photographing, jotting down notes on my hand and in my Moleskin notebook, conversing with people, the past, and the present: these are the experiences of this journey.

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Between 2008 and 2012, I conducted over twenty on-site interviews—the full details of each research trip appear in the book's appendix—with collection managers, museum officials, archivists, librarians, curators, members of the Preserving Virtual Worlds Project, conservators, restorers, private collectors, and commercial collectors. Other interviewees included the former mayor of Alamogordo, New Mexico, the security guard who worked at the infamous landfill where Atari Inc. disposed of its "waste," as well as a local resident who scavenged the materials from the pit; Cliff Spohn, the American illustrator responsible for the box art adorning Atari's iconic game cartridge packaging; former Atari employees Al Alcorn and Steve Bristow; and Peter Takacs, the physicist at Brookhaven National Laboratory responsible for the recreation of the William A. Higinbotham's 1958 analog computer game. Site visits consisted of conversational interviews, tours of facilities (in both public areas and areas deemed off-limits to the general public), exhibition observations and/or observations of archival materials, consultation of accession records, participant observations, and, when possible, detailed walkthroughs of actual restoration and recreation projects and explanations of the *Pong* prototype by its inventor, as well as descriptions of the conceptualization and technique for designing Atari's game cartridge packaging. Impressions, observations, and interviews feed directly into the narrative style of the book,[75] while many of the photographs—captured by my high degree myopia unless noted otherwise—in the book provide further documentation of experiences not always available to the general public at several of the cultural institutions visited. The photographs are included to showcase individual artifacts, collections, museums, and archival practices and protocols. These images also help attest to the concrete afterlife situations discussed in *Game After*.

The book is organized materially, not thematically. I begin with video game materials in cases and boxes, and then address the importance of cabinets and containers as material evidence for historical documentation and exhibition practices. Chapters 1 and 2 concentrate on the evidential materials collected in museums and archives. Chapter 1 works through the tension between ascertaining video games as "artifacts or activities" within the schema of curatorial practices at the Computer Game Gallery in the Computer History Museum of Mountain View, California; at the International Center for the History of Electronic Games, Strong National Museum of Play, Rochester, New York; and at the Smithsonian National Museum of American History. My central focus is on the physical incorporation of game consoles into displays and their resocialization within the situation of the museum as opposed to the inclusion of emulation that has received much more attention when discussing video games in museums. In chapter 1, case studies on the *Pong* prototype and the Brown Box prototype help illustrate the resocialization of video games as museum objects. I then switch from the exhibition floor and display cases to the materials housed in archival boxes at the Archives Center at the Smithsonian National Museum of American

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History; the Stephen M. Cabrinety Collection in the History of Microcomputing, Green Library, Stanford University; the Dolph Briscoe Center for American History Videogame Archive at the University of Texas at Austin; and Stony Brook University's William A. Higinbotham Game Studies Collection, Stony Brook, New York. Chapter 2 adopts a "storytelling" mode to push histories and practices of specific collections and archives outside the walls of their respective institutions.

Chapters 3 and 4 further solidify this book's investment in the cultures of materiality employed in the documentation of video game histories. Through a number of impressionistic episodic "arcade projects," chapter 3 explores an often-neglected medium of game history: the cabinet of the coin-op arcade video game. Many cultural institutions regard the coin-op cabinet as more than a mere vessel for the game it contains and try to provide access to original arcade games. Such practices, this chapter argues, treat the coin-op arcade video game as a "paradoxical monument" for evidencing game history. While I return to many of the museums examined in chapter 1 to exclusively focus on their coin-op collections, chapter 3 also explores itinerant and annual arcade game exhibitions (e.g., Videotopia and California Extreme), as well as single-subject emergent museums like the American Classic Arcade Museum and the online venture, the International Arcade Museum. In addition, I examine the continued functionality of coin-op arcade video games as "ruinous remains" outside of these cultural institutions. On account of the cabinet serving as a physical context for the coin-op arcade game, such an investment is equally pertinent to the documentation role assigned to packaging materials that used to sell, protect, and transport game cartridges to their prospective owners. Whether positioned behind glass in a museum—a common occurrence in the museum's construction of context for its video game collection on view—or on-screen in the form of JPEGs, video game cartridge boxes are lending their design and images to the practice of historical documentation. Chapter 4 offers a rare glimpse behind the artwork of game boxes for the Atari VCS to provide a much-needed explanation of the design process for conceptualizing artwork for the new medium of an interchangeable ROM cartridge via the work of illustrator Cliff Spohn, whose realistic style quickly became a template for Atari's game programs. Chapter 4 maintains that the documents used to document game history also require their own documentation.

Cases, boxes, cabinets, and containers move us into the final afterlife situations explored by *Game After*: disposal and restoration/recreation. Chapter 5 documents the life history of Atari's flawed game, *E.T. The Extra-Terrestrial*, to traverse the various circumstances that this game inhabited over its life cycle—its conception and compromised design as an Atari game program, its shift from failed product to trash—and, of great interest, its afterlife status as decay and memorialized relic of cultural remembrance. *E.T.* affords an opportunity that few games do, the chance to literally track a

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total trajectory. If chapter 5 tracks a burial, chapter 6 could be regarded as regeneration: the commercial and collector restoration of coin-op arcade video games and the recreation process of Higinbotham's analog computer game. Experts like Van Burnham, Gene Lewin, and Peter Takacs share their unique conservation, restoration, and recreation stories. Chapter 6 returns to the "storytelling" motif of chapter 2 so that these select voices can articulate their personal relations to regeneration.

A Final Walkthrough concludes this project. It shares observations and impressions of the Smithsonian American Art Museum's "The Art of Video Games" exhibition while drawing the curtain on the pages of the book.

The goal of understanding the afterlife of video games animates *Game After*, a book dedicated not to the historicism of the past, but to how and where video games remain in the present and the new roles such situations enable for writing their history. How the past remains in its multifarious and multistable material forms is this book's focus, and in it I explore the diverse component parts of game history, as they are revalued, resocialized, rebuilt, recontextualized, and assigned new life.

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