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Fabulously Procedural: *Braid*, Historical Processing, and the Videogame Sensorium

What if you could learn from your mistakes . . . but undo the consequences? What if you could reverse death? What if you could see multiple realities? What if you could warp time? . . . Then what would you be? —*Braid* game trailer (2008)

Level 1: A Braided Sensorium

The independently developed videogame *Braid* became both a critical and commercial success when it was released through the Xbox Live Arcade in 2008, followed by Windows and Mac OS versions in 2009. Created by Jonathan Blow (2008a), *Braid* is a rare example of a hit American videogame that was designed not by a sizeable development team but in an auteur-style fashion.[1] As many game reviewers have suggested, it is an exceptional videogame that operates as "a risky experiment" and a "singular innovation" (Gapper 2008 and Forrestall 2009). Through its gameplay, *Braid* offers an ingenious twist on the classic 2D side-scrolling "platform" or "run 'n' jump" game genre that originated in arcades and was popularized by the Nintendo Entertainment System console in the 1980s. Traditionally, these games rely on hand-eye coordination and management of an avatar that jumps across platforms, traverses levels, collects items, and dispatches enemies. *Braid* explicitly alludes to classic platform games such as *Donkey Kong* (1981), *Pitfall!* (1982), and most of all *Super Mario Bros* (1985). However, instead of testing a player's digital dexterity with a controller, *Braid* privileges engaging spatiotemporal and procedural challenges.[2]

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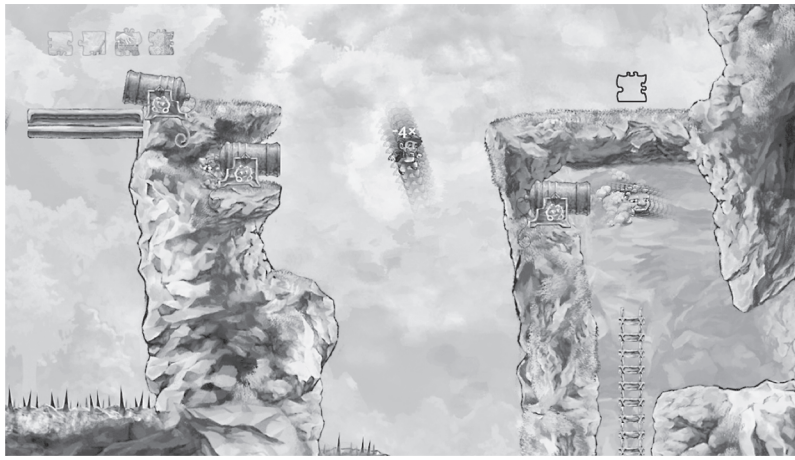

Figure 1 The central mechanic of the video game *Braid* (2008)*:* the dynamic manipulation of time. All images from *Braid* are reproduced with permission from the designer.

While most videogames rely on a punitive ethos—one in which players must replay a level until they have performed the correct sequence of actions or achieved a suitable score—*Braid* establishes, through its mechanics, an ethos of forgiveness. The central mechanic that it adds to the usual platform game repertoire is the dynamic manipulation of time (fig. 1). Each "world" in the game is subject to a different set of temporal rules that affect the player's ability to reach jigsaw puzzle pieces—fragments that must be collected in order to progress to other worlds.[3] These pieces can also be joined together to compose a series of paintings that promise to be pictures of the total life of the protagonist Tim, but which ultimately offer little more than discontinuous impressions (fig. 2). Given his core ability to reorganize time, Tim is functionally immortal and immune to linear chronology. Whenever players make an otherwise fatal mistake or any action they wish to undo, they can hold down a button or key and reverse events.[4] While in different worlds, Tim discovers still other abilities that are critical to completing his trials. He can slow down or speed up temporal flow, synchronize or suspend different time streams, call on a shadow self that exists at a slight delay, and drop a magical ring that slows objects based on their proximity to its center.

For all of the ways that *Braid* stands apart from contemporary videogames, it does so less to dismiss them than to contemplate, historicize,

Figure 2 Players collect puzzle pieces that make up a series of paintings representing the game's protagonist, Tim.

and produce a reading of the videogame form. The game demonstrates the ways in which videogames (including *Braid* itself) are entangled in complex late twentieth- and early twenty-first-century histories of media, computing, weapons technology, ethical responsibility, and subject formation that are both broadly geopolitical and uniquely American. As *Braid* reminds the player, videogames are historical outgrowths of a modernity specific to an informatic, postindustrial society.[5] These games emerged from World War II computing research, stabilized as a form during the late Cold War, and became a cultural dominant in the midst of the current proliferation of digital media. This history is far from smooth. Videogames have been shaped by forces as diverse as American counterculture and military R&D (Brand 1972). They are indebted as much to entrepreneurs, science-fiction writers, computer scientists, and creative visionaries as to military strategists and information analysts (see Kline, Dyer-Witheford, and De Peuter 2003). Such complex origins produce a host of often-paradoxical formal effects that present-day players may take for granted. Videogames integrate mathematical abstraction and sensory experience, total immersiveness and nontrivial difficulty, surreal graphics and algorithmic operations.

In recent years, the growing field of game studies has contributed to the ongoing cultural debate about what it means for videogames to

be an art form that both selectively draws and dramatically departs from earlier forms such as the novel, theater, and cinema.[6] Game studies has already produced important work on topics such as the history of videogame platforms and software, the ethics of computer games, and the development of digital gaming culture. Despite a number of careful and exemplary analyses, however, scholars have more often tended toward a cultural studies approach that treats particular games in a superficial and instrumental fashion. To achieve a sense of videogames as a unique art form requires a more intimate understanding of the new sensorium that they open up—that is, the specific experience of spatiality, temporality, speed, graphics, audio, and procedural activity that they make available.[7] This sensorium is not simply a dimension of the history *of* videogames; it is also productive of a broader experience of history as such that is nonetheless grounded in digital game technologies and their formal expressions dating back to the mid-twentieth century. In many senses, the historical experience I have in mind has been distinctively American, though increasingly, digital games have grown popular throughout the Americas, Europe, Russia, and East Asia. In contrast to written historical texts, which generally privilege narrative exposition, videogames open the possibility of a historical contemplation that proceeds through activity and interactive play.

This essay approaches the game *Braid* as a multilayered field—a system of "levels," to employ the standard videogame idiom. The game uses media-specific techniques to make accessible the material effects of the American military-industrial-media-entertainment network on historical consciousness.[8] In what follows, I analyze three levels of *Braid*'s operation—its narrative and aesthetic experience, its historical context, and its procedural and process-oriented form. Although I differentiate these strata for heuristic purposes, they are too entwined to separate out entirely in the gameplay. Beneath the first manifest "braid" of the fictional princess's hair, each of these layers betrays another type of entanglement, which I seek to unlock (as one might a videogame achievement), one strand at a time. Through these levels, *Braid* interrogates the impulses that drive videogames and the historical subjects that they produce. It demands that a player encounter the accumulated past within which he or she, a contemporary gamer, is firmly embedded in the present. *Braid* uses the affordances of game form to develop a formally experimental analytic of processing—one

that is aesthetic, affective, and interactively experiential as opposed to purely cognitive or cerebral. The game uses its formal blends and its play mechanics to complicate how history is typically thought and to imagine how it might be engaged or processed differently.

Level 2: Formal Tangles

Braid is not the first videogame to thematize time or to use a time-oriented mechanic. Games such as Artoon's *Blinx: The Time Sweeper* (Oshima 2002) and Ubisoft's *Prince of Persia: The Sands of Time* (Mechner 2003), for instance, deploy their time mechanics in the skeuomorphic idiom of home video, allowing actions such as playing, pausing, and rewinding. Unlike these games, however, *Braid* explores time in a dynamic and detailed fashion. *Braid*'s temporal shifts do not merely enhance the game's difficulty, but produce what Blow (2008b) has described as "a meditation" or a "study" of potential temporal realities. Indeed, players must engage in mindful observation to achieve an intellectual and sensory understanding of the interactive environments they inhabit. The gradual internalization of temporal rules is not an end in itself. Controlling time, as I demonstrate in the next section, opens up novel historical perspectives later in the game. From the very beginning, however, *Braid*'s design, which juxtaposes incongruous temporal realities, promotes an unsettling feeling rather than the sense of empowerment generated by other games that allow such manipulation. For instance, whenever players rewind their actions, they witness a discoloration of the game's graphical palette as well as an uncanny reversal of its soundtrack.

Alongside such distortions, the game conveys a feeling of unease through vertiginous effects achieved through the intertextuality, genre hybridity, and intermedia relations that are central to its aesthetic. A second major referent and conceptual resonance of the title *Braid*, then, is the formal tangle that makes up the videogame experience.[9] As Blow (2008b) has observed, the game's narrative composition was indirectly inspired by two literary texts: Italo Calvino's *Invisible Cities* ([1972] 1974) and Alan Lightman's *Einstein's Dreams* (1993).[10] In both of these postmodern fictions, minimal-frame narratives open up onto a series of labyrinthine and finally irresolvable thought experiments. *Einstein's Dreams* makes for an especially rich comparison. Set in 1905, this novel introduces Albert Einstein just prior to his

groundbreaking publication on special relativity, as he wanders through Bern and dreams of other universes with fanciful temporal rules. Lightman imagines the shape that life and culture would take under those other time schemes. The novel foregrounds its temporal disruptions at the level of literary form, breaking up its plotting into fragmented, chapter-length vignettes that evoke different worlds. At the scale of the sentence, Lightman conducts his experiments through a prose that conveys a sensuousness of thought. Many of his sentences have a staccato rhythm, sounding suddenly and then trailing off.

Like Lightman, Blow explores the way that varied experiences of time can shape human subjects. Although it is *Braid*'s mechanics that prove central to the game's experience, the player's introduction to the narrative comes through a novelistic experience not unlike that of its fictional intertexts. Games, of course, do not tell stories in the same linear way as novels or films. In most cases, they promote what Henry Jenkins (2004, 123) calls "spatial storytelling." Classic platform games use their scrolling sequences to "evoke" narrative associations, invite players to enact events, and occasionally provide resources for "emergent narratives." *Braid* relies on a spatial storytelling that nonetheless includes a significant quantity of text. At the entryway to each world, the player passes across lecterns that hold thick tomes and trigger blocks of text. Despite the initial left-to-right placement of the lecterns, the player has the option of reading these texts in a right-to-left order that produces a different kind of narrative—another liberty that the game takes with temporal sequencing.[11]

Braid's narrative begins in medias res, sans standard option menu, with Tim standing before a burning city and the game's title floating in the middle of the screen. When the player is ready, he or she moves Tim from a burning darkness into an empty middle-class house (ostensibly Tim's home) where the player sees a series of empty rooms and picture frames to be filled with puzzle pieces. Only the first room is lit, and it reveals a door leading to what the game describes as "World 2." In World 2, the first game space that the player encounters, the story initially resembles that of the classic *Super Mario Bros.* Tim, we read, travels from castle to castle, seeking a "Princess" who has been "snatched by a horrible and evil monster." Quickly enough, this chivalric fairytale frame breaks down, suggesting a layered psyche and a poisoned innocence. Unlike Mario, who valiantly sets out to save his princess and battle monstrous creatures, Tim, a differ-

ently figured knight-errant, confronts deep-seated guilt that resists the teleological heroic redemption typical of the quest romance. The game places a subject who has become psychologically dispersed and unstuck in time at the center of its narrative and procedural logic. In the same texts, the player learns that the Princess has been kidnapped "because Tim made a mistake. Not just one. He made many mistakes during the time they spent together, all those years ago. Memories of their relationship have become muddled, replaced wholesale, but one remains clear: the princess turning sharply away, her braid lashing at him with contempt."

It is these mistakes that lead Tim to reflect on the connection between time and forgiveness, causality and social relations, error and historical fulfillment. The text reads: "Our world, with its rules of causality, has trained us to be miserly with forgiveness. By forgiving them too readily, we can be badly hurt. But if we've learned from a mistake and become better for it, shouldn't we be rewarded for the learning, rather than punished for the mistake?" Tim imagines a reality in which he can reverse time in order to undo otherwise irreparable damage. This meditation leads him to the realm of romance: "Tim and the Princess lounge in the castle garden, laughing together, giving names to the colorful birds. Their mistakes are hidden from each other, tucked away between the folds of time, safe." This transitory fantasy carves out a "safe" space separate from the violence of history. Even so, the aggression of love—the princess's "braid" that lashes Tim—already reveals the potential violence of desire that remains latent in the game's opening world and surfaces only in the final level's encounter with history.

The platform game genre is in many ways continuous with the narrative romance in its focus on fantastic discovery, quest-oriented progress, and battles with unnatural creatures.[12] At the level of mechanics, however, Tim's ability to reconfigure time disrupts the linear flow of the romance. While the player moves through quests organized as sequential levels, *Braid* resists narrative progress through its constellation of worlds, each with its own discrete rules. The increasingly fragmenting story, which channels its postmodern intertexts, similarly resists the satisfying resolution that the genre leads the player to expect. Beyond its reliance on the literary romance and ludic platform game, *Braid* incorporates other significant forms. The game's media interact in often uncanny and jarring ways, compromising its generic purity. The music, which undergoes its own phase shifts and iterations,

includes several haunting folk tracks from composer Jami Sieber, which evoke a paradoxical mood of hopeful mourning and generalized loss (see Tong 2008).[13] The impressionistic background art, described as "a painterly, hand-made look" by lead artist David Hellman (2011), employs vivid watercolor-style graphics. Hellman's impressionism suggests a fantastic and psychologically mediated reality that departs from the supposedly realist art of mainstream videogames. The visual design reinforces the "splitting" of reality through odd placements of domestic objects (such as furniture) throughout outdoor environments (including swamps and ancient ruins). The unnerving audio track combines with the surreal graphics to complicate the fairy-tale innocence of the platform game.

Braid presents what may appear an ahistorical hodge-podge of genres, forms, and intertextual allusions. Even so, the game departs from the two dominant twentieth-century forms of literary appropriation: modernist parody and postmodernist pastiche. As Fredric Jameson (1991, 17) observes, while parody generally proceeds with "ulterior motives" and a "satiric impulse," pastiche operates as "blank parody, a statue with blind eyeballs." Parody, in Jameson's sense, persists at the surface of *Braid*. For example, the game repurposes the famous line that the player of *Super Mario Bros.* encounters at the end of each level but the last: "The princess is in another castle." Comical as the allusion may be, the declarative sentence no longer carries its earlier referent. Instead of fueling a drive for completion, as it did in its original context, this line's changing iterations destabilize the figure of the princess and complicate a desire for progress and closure. The blankness of pastiche is, similarly, present at the level of *Braid*'s graphics. Retro invocations of *Super Mario* "goomba" enemies, chomping piranha plants, and the threatening *Donkey Kong* gorilla turn up without explicit narrative motivation. But these visual reference points are not empty anachronisms relocated in unaltered form from one historical context to another. *Braid* settles for neither the sharp critique of parody nor the empty nostalgia of pastiche. Once the components of childhood play, the videogame icons scattered through these worlds now reflexively mark an accumulated past that elicits a critical sense of belatedness. They simultaneously constitute a historical present whose parameters exceed cognitive comprehension (see Berlant 2008a).

Braid's layering of nested media—the romance narrative, impressionistic painting, folk music, and side-scrolling platform game—

marks earlier historical moments and their innovations as thresholds to be *processed*.[14] For much of the game, the player traverses a setting that exists in the romantic imaginary, in worlds beyond historical time. The space that the player inhabits, however, does not allow a complete forgetting of the past that has enabled it, as it juxtaposes the exotic locations of an adventure tale with Tim's own prosaic outfit of the post-war man complete with flannel suit and red tie. History here is not the simple retrieval of some underappreciated historical chronology, but an aesthetic engagement with cultural form and mixed media. *Braid*, as we will see, forges a material link between the player's present, an uncertain future, and a particular past—the post-1945 "American century" that is revealed with scrupulous nuance until it makes itself present, erupting at the climax of the game.

Level 3: uNclear Games (The Atom and the Pixel)

While the word "braid" suggests a plait of hair and an intertwining of media, it can also take on a third meaning of a "deception" (*Oxford English Dictionary Online* [*OED*]).[15] *Braid* does indeed perpetrate a clever trick on the player. In its final moments, through the climax and a playable epilogue, the game reveals its core figure to be the atom bomb. The game hints at this historical context on several levels—via text, images, audio, and mechanics—but it does so obliquely. It is far from accidental that *Braid* waits until its closing moments to reveal its nuclear secret explicitly to the player. Since so much depends on how a problem is staged and encountered, the nature of the game's deception requires analysis. Some players have felt the final turn to apocalypse (a word with a Greek root meaning "revelation" or "unveiling") is sudden or unmotivated. But this can only be true for those with the most literal or text-centric demands. As early as the opening screen, the game's graphics, audio, and mechanics insinuate that something is amiss in the land of realism. These details are subtle, easy to miss in an initial run-through when a player is still learning the core mechanics and seeking progress. These signs become apparent, however, in replay. *Braid*—a fairly short experience by contemporary commercial video-game standards—does not promise a great deal of what is conventionally called "replay value." Compared to open-ended "sandbox" games, *Braid*'s six worlds offer little variation upon replay (except for extremely difficult challenges to collect eight special "stars," to which I will later

return). Nevertheless, play does not, properly speaking, take place until a second play-through.[16] Once the atomic revelation arrives, a repetition of the game serves as both mastery attempt and traumatized return.

Many of the earliest signs of the game's nuclear theme are visual and spatial rather than textual. Visually, as the game progresses from world to world, the foreground and background graphics begin increasingly to contrast. Practically, this design decision minimizes confusion for the player who must recognize which objects are intended for interaction (for example, the avatar and the platforms) and which ones exist for atmospheric effects (the painterly backdrops). Aesthetically, this visual layering conveys the increasingly visible levels of knowledge to which players have access as they move through the game. The opening world, for instance, features a blue sky and a sun. This background is simple, but it includes a sun that is already oversized, pulsing, and uncannily bright. By the time the player reaches World 6, the background becomes more distinct and multilayered. In the backdrop beyond the playable foreground, ashen snowflakes fall, followed by layers of fiery colored cityscape, each darker and less distinct than the one before. These distant layers suggest a ruined city disappearing beneath smoke and flame. In a subsequent level of this world, gray platforms are decorated with outlines of cowboys, astronauts, and corporate executives. These figures mark a history of American empire that emerges with Western expansion, crystallizes with the atom bomb and Cold War nuclear brinksmanship, and expands in a networked and informatic society. These ambient atmospheric effects, while seemingly peripheral to gameplay when first encountered, are nonetheless profoundly discomfiting.

Other visual signs are more direct but require specialized information and reflection, neither of which is conventionally required of videogame players. Each world ends, for instance, with a nautical flag. At one level, these banners allude to the flags that mark the end of each level in *Super Mario Bros.* However, the careful player discovers that *Braid*'s flags are not identical to those that appear in the *Mario* games but rather nautical signaling flags used to communicate messages by the navy during moments of radio silence.[17] Each of the flags in *Braid*, once deciphered, proves to be a warning. For example, the flag in World 2 ("N") translates to "No" or "Negative" and the one in World 5 ("X") means "Stop carrying out your intentions and watch for my signals" (Marine Waypoints website). Instead of marking an achieve-

ment, as they did in the *Super Mario* series, these flags are now signs that dissuade the player from moving forward to subsequent worlds and to the discovery of the atom bomb.

From the beginning, then, *Braid* offers premonitions and anticipatory symptoms of the atom bomb, an object that it only foregrounds in the game's final moments. It is worth noting that analyses of the first atom bomb dropped on Hiroshima often emphasize the impossibility of predicting this unprecedented event. However, as Paul Saint-Amour (2000, 59–60) points out, in 1945, Hiroshima was teeming with rumors of a coming disaster. Inhabitants of the city used the word "bukimi" to mark the "weird, ghastly, or unearthly" but also the "ominous" and "uncanny" nature of Hiroshima's improbable evasion of aerial bombing at that late date in the war and the looming possibility of annihilation.[18] Rather than mitigating the horror of the event, Saint-Amour argues that "a certain preparation for trauma may amplify . . . the ensuing post-traumatic syndrome" (64). In fact, for the citizens of the Cold War, "a more overt and permanent variant of the uncanny *frisson* felt in Hiroshima before the bombing" became "a structuring condition of everyday life" (61). The repetition, rather than singularity, that characterizes such perpetual anticipation plays out, formally, in *Braid*'s mechanical repetitions and sequential accumulation of puzzle pieces (a compulsive "acting" if not quite an "acting out"). Much of *Braid*'s gameplay requires a bracketing off of the game's premonitions for the player who wishes to advance. Just as the Cold War nuclear subject sees the possibility of nuclear annihilation everywhere, so the contemporary gamer, in another kind of repetition compulsion, sees the opportunity for games and advancement everywhere.

In *Braid*'s traumatic anticipation, time becomes spatialized, as Saint-Amour (2000, 63) observes is a common effect for the survivor of trauma for whom "the traumatic event can seem to scatter the shrapnel of its symptoms evenly across the past and the future." The interactive worlds of the game are depicted as subjectively constructed spaces littered with latent meanings. They suggest what Hellman (2011) has called "a living work in progress" that exists "in varying states of finish." The same is true of the central space from which the player enters the sequence of worlds: Tim's now-abandoned childhood home (fig. 3). The player opens rooms of Tim's house, which serves as an incomplete model of the protagonist's unconscious. The space is the product of myriad defense mechanisms: Freudian displacements and

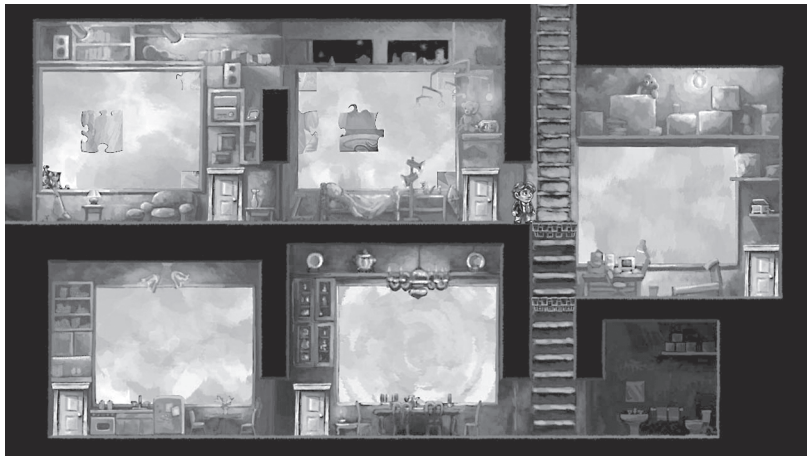

Figure 3 The central game hub from which the player enters *Braid*'s sequence of worlds.

condensations in pictorial form. Dreamlike as it may seem, this space is less an oneiric labyrinth than a paramnesiac confabulation, a proliferation of fantasies and figures. The childhood home overflows with romances of scientific discovery and controlled love. Particular meanings of the bomb are nested within a more generalized childhood sense of secrecy, shame, and aggression. Spatially, the nuclear secret is broken down into discrete elements and compartmentalized into rooms without being fully domesticated in the process. This interworld hub similarly refuses to domesticate the well-established platform game genre, making it feel ominous and unfamiliar through painterly impressions of Tim's life that refuse a progressive or serial quest narrative.

Only in the epilogue—once it is too late to change anything—does the game make manifest, at a textual level, that Tim was an atomic scientist who participated in the Manhattan Project. In this final wrecked world, the player passes through a heavenly ruin in the clouds. Tim engages in a number of spatiotemporal actions to unlock a fractured symbolic world filled with scattered detritus and elements from the preceding game. He opens thick tomes that reveal textual fragments and encounters scenery that initializes a haunting voice (singing a single note in vibrato) whenever he passes behind it. At the beginning of the epilogue, one textual fragment discloses that Tim was a scientist and that the "Princess" might not be a character but an altogether dif-

ferent figure: "He worked his ruler and his compass. He inferred. He deduced. . . . He was searching for the Princess, and he would not stop until he found her, for he was hungry. He cut rats into pieces to examine their brains, implanted tungsten posts into the skulls of water-starved monkeys." The next fragment, which gestures toward Los Alamos, further suggests how Tim's experimentation drives him to transgress epistemological limits: "He scrutinized the fall of an apple, the twisting of metal orbs hanging from a thread. Through these clues he would find the Princess, see her face. After an especially fervent night of tinkering, he kneeled behind a bunker in the desert; he held a piece of welder's glass up to his eyes and waited."

The game waits until the final moments to articulate a direct connection between Tim and the atom bomb (fig. 4). A series of five disjointed splinters that appear in close succession—footnoted text without a referent, decontextualized quotations, and personifications of the bomb—can be unlocked by the player. They read:

> On that moment hung eternity. Time stood still. Space contracted to a pinpoint. It was as though the earth had opened and the skies split. One felt as though he had been privileged to witness the Birth of the World . . . [1]
>
> Someone near him said: "It worked."
>
> Someone else said: "Now we are all sons of bitches."
>
> She stood tall and majestic. She radiated fury. She shouted: "Who has disturbed me?" But then, anger expelled, she felt the sadness beneath; she let her breath fall softly, like a sigh, like ashes floating gently on the wind.
>
> She couldn't understand why he chose to flirt so closely with the death of the world.[19]

This arrangement of fragmented text exceeds Tim's technoscientific reason. The opening passage proves to be an excerpt from the science writing of journalist William Lawrence (known as "Atomic Bill"), one of the first people to describe the powerful new weapon in the 1940s (Lawrence 1959, 116–19). The next two quotations, neither of which is explicitly attributed to a source, mark an observation supposedly made by J. Robert Oppenheimer during the first Trinity test ("It worked") and the response of Harvard physicist Kenneth Bainbridge ("Now we

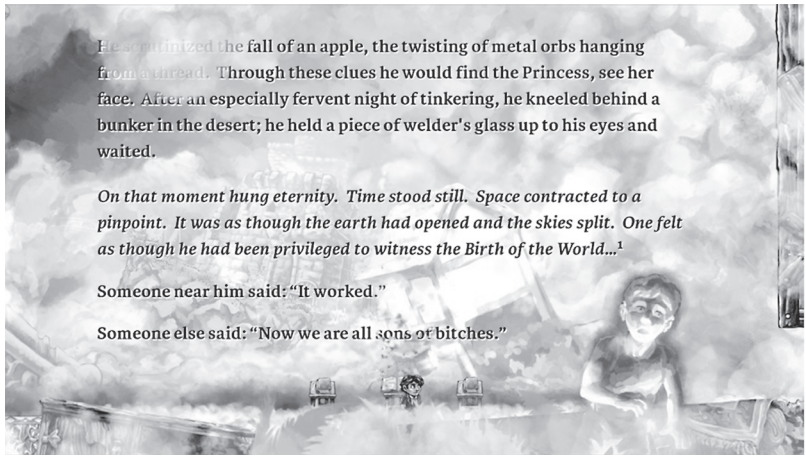

Figure 4 Disjointed splinters of text in the epilogue of *Braid*.

are all sons of bitches"). In the final two passages, the atom bomb takes on anthropomorphic qualities. The human princess, the love object the player has pursued for much of the game, transforms into a physical force that questions why Tim would "flirt" with the world's end. In this metamorphosis, the atom bomb becomes deliberately gendered, radiating a "fury" ported from the romance plot, which reflects back Tim's now explicitly masculine desire for mastery. The Princess takes many forms, as the polysemous word "braid" already suggests. She appears, through the game's connotative plenum, as the love object, the mother, the ultimate platform game trophy, the sovereign, the atom bomb, and "the end of history." Tim's relationship to the Princess is, in all its forms, gendered, imperial, and world-destructive. This allegory makes the underlying thematic of the atom bomb, in particular, approachable in a way that a direct treatment could not, transforming a global doomsday project into a child's pastime.

Although its psychological orientation may suggest otherwise, *Braid*'s secretiveness about the atom bomb does not exist for the sake of some empty Hollywood-style plot twist. *Braid*'s apocalyptic disclosure takes on a historical dimension. The game's surreptitiousness comes formally to figure the epic concealment of the Manhattan Project itself.[20] Indeed, even after Hiroshima and Nagasaki, the atom bomb's "mystique of secrecy," as Robert Jay Lifton (1979, 356) calls it, intro-

duced an obsession with security that has driven American policy and war making since the early Cold War. Through its secrecy, *Braid* signals this history. More profoundly, it evokes the continued dimness with which we, the citizens of the atomic era, invariably perceive the full effects of nuclear arms and the security state they produced.

Nevertheless, the game cannot be said to be ultimately about the atom bomb or nuclear war, as the destructive finality of this event might compel us to conclude. Such a hasty deduction—a cognitive operation toward which speed-oriented videogames may incline players—too easily equates the game's meaning with its central object. The bomb, then, is not a secret to decipher so much as, in Roland Barthes's (1977, 147) sense, a thread to disentangle.[21] Even so, the pairing of a nuclear object with a videogame is hardly arbitrary. The American techno-scientific apparatus assembled to fight World War II gave birth to the bomb, but it also produced a second technology that has, arguably, influenced our world in an equally dramatic manner: the digital computer. These two technologies reveal convergences through the Cold War years when computers were used to coordinate air defenses, early warning response systems and C4I systems, and to sustain the rapid growth of the military-industrial complex.[22] In the movement from mathematical computation to the recent proliferation of digital media, the computer has proven to be more than the benign counterpart of the atom bomb or its redemptive coemergence.

Videogames (arguably the most popular of the expressive art forms made possible by computer technology) have become increasingly naturalized, especially in the overdeveloped world, but their history reveals darker origins. This is already evident in early computer-run nuclear simulations and the game theory of the 1940s and 1950s. It is equally apparent in the first popular computer game: Steve Russell's 1962 combat shooter *Spacewar!*. In its themes and gameplay, this pioneering videogame lays bare the military-industrial research roots of the medium (see Kline, Dyer-Witheford, and De Peuter 2003). The nuclear game—the competition for the bomb and the global dice contest of the arms race—already draws both metaphorically and materially on many of the fundamental features of a game. It includes rules (weapons protocols), an objective (strategic dominance), and feedback system (the real-time matrix of global monitoring). Perhaps the only core feature of a game that is not available is voluntary participation, which is made impossible with the construction of arms that threaten

both incalculable accidents and calculated annihilation.[23] *Braid*, which is acutely aware of gaming history, does not reproduce the Cold War game genres of the nuclear simulation and the war game. Employing the procedural game mechanics of the platform game, to which I now turn, it instead processes the atomic era through noncognitive means and foregrounds its own historicity as a videogame.

Level 4: Fabulously Procedural

A "braid" signifies a weaving of hair, a formal tangle, and a historical trick, but at a fourth level, the word takes on a mechanical meaning: "a brisk movement," a sudden start, a jerk that passes in the twinkling of an eye (*OED*).[24] Indeed, *Braid* unfolds through rapid clicks and button pushes, dashes and jumps, spatial solutions and modulations of time. *Braid* may convey a narrative through nested media but it is, at its core, a game composed of procedures enacted within a changing set of rules.[25] The process of playing a videogame can be described as interfacing with graphical representations or participating in an interactive story. But it more properly involves negotiating the imposed parameters of a designed system. To complete a game, a player must functionally reverse-engineer its algorithm (Chun 2008, 315). *Braid* uses its game procedures to explore the rules that emerged with the American development of the atom bomb and the digital computer. In this world, total planetary extermination by technological means became possible for the first time. This emergent technology threatened human survival and shook psychic life on a global scale. The bomb introduced a new category of disaster through its shocking instantaneity, unprecedented scope of destruction, and horrifying contamination of survivors—through both radiation and trauma. The weapon introduced an unprecedentedly wide gap between experience and action, emotion and consequence. With such changes, nuclear war has been pronounced by critics to produce "unspeakable" or even "unimaginable" effects.[26] *Braid*, however, avoids such mystifications and renders the experience and rules that compose the "atomic age" in another way—via ludic processes and videogame procedures (Hersey 1946).

Through its mechanics, *Braid* enables a player to apprehend what we might call the historicity of our ongoing atomic era and our complex dependencies on nuclear technologies. The game suggests that even if we insist on the unspeakability of the nuclear or the irreducible

complexity of its emergence in the mid-twentieth-century world, it can still be accessed, however indirectly, via nonverbal processes. Unlike antinuclear novels and films, a videogame does not simply depict nuclear catastrophe or speculate about it. Nor does *Braid* extend the Cold War impulse to simulate a scenario. It instead executes algorithms that reproduce the mechanisms of contemporary technoscience. *Braid* offers what Ian Bogost (2007, 9) has called "procedural representation" by explaining "processes *with other processes*." Processes, as Bogost observes, "define the way things work: the methods, techniques, and logics that drive the operation of systems" (3). Precisely in this sense, *Braid* is procedural. It uses gameplay processes—jumps, dashes, and especially temporal operations—to explore the logics that found a world produced by the bomb and the computer. The sensorium expands in these rule-bound moments. The player becomes aware, on a phenomenal level, of processes and procedures, rules and limitations that characterize the historical present. Through play, techniques become both sensible and intelligible, approximating the experience of computer programming itself.[27]

Warfare of the mid-twentieth century entailed expansions of space and contractions of time—changes expressed, for instance, in postmodern literature and experimental film. While World War II introduced several degrees of acceleration, its ultimate developments, the atom bomb and the arms race, entailed a qualitatively different experience of speed.[28] *Braid* requires the player to oscillate among multiple tempos and to reflect on the asymmetrical velocities of a postwar world. Different challenges call for varied speeds. The game even features a "speed run" option. In this mode, swiftness is not the frenzied opposite of a reflective mode in which one stops to smell the roses. This is no mechanical "race to the bottom" or simulated "arms race." This "run," in fact, is intended only for experienced players who understand the programmed system intimately enough to traverse it with ease. To succeed, players must internalize the game's rules, instead of sleepwalking through its puzzles.

Rapidly though first-time players of *Braid* may move, knowledge of the bomb does not reach them until they encounter the iconic atomic flash in the final level—an event that is the game's first explicit invocation of the atomic age. As Georges Bataille suggests in his compelling 1947 essay about Hiroshima, there is an unsettling connection between this particular event's incomprehensibility and the unfathomable

nature of history as such. In a reading of John Hersey's *Hiroshima* (1946), Bataille (1995, 222) observes that unlike the victims of that first bomb, who could not yet imagine the nature of their fate and who, even in survival, were cast into a deeply traumatized unknowing, "Our case is different. We know." The nature of this knowledge for those absent from Hiroshima is by no means straightforward. Unlike those caught in the microcosm of the emergent world that began within the bomb's epicenter, most Americans learned from President Truman, on August 9, 1945, about the "historic event" of the atomic invention and its use (224). Unlike the methodical reporting of "the immediate experience of the catastrophe" in Hersey's nonfiction novel, which seeks to capture something of the survivor's experience, Truman's announcement "situates the bombing of Hiroshima within history and defines the new possibilities that it has introduced into the world" (225). For Bataille, this speech is "historic" insofar as it introduces an event and projects its "consequences into the future," though it is not yet a revelation of the incomprehension of historical consciousness (224).

The incomprehension of the event, in particular, is critical to the experience of *Braid*. As Derrida astutely observes, the "event" simultaneously "opens itself up to and resists experience" (Derrida, Habermas, and Borradori 2003, 90). He continues, "The event is what comes and, in coming comes to surprise me, to surprise and to suspend comprehension: the event is first of all *that which* I do not first of all comprehend. Better, the event is first of all *that* I do not comprehend." In *Braid*, "that which" the player does not comprehend, in the initial run-through, is the nuclear situation and the periodicity that the bomb produces: a traumatic afterlife into the midst of which he or she is thrown. Even so, the game suggests a deeper layer captured by the second part of Derrida's formulation. The gameplay is an experience that gestures toward the foundational state of being, the objectless fact "*that* I do not comprehend." This revelation, which underlies the game's manifest and latent levels, and is indeed constitutive of both, is the realization of its own historicity.

To make sense of how *Braid* deploys and engages with the history of the atom bomb and its own historicity as a videogame, it is necessary to explain what the game does through its interactive gameplay. The nuclear situation, as Derrida (1984, 23) notes, compels us to "re-think the relations between knowing and acting." In *Braid*, this relation is felt acutely. From the start, we act even as we cannot know the conse-

quences of our actions. The platform game genre makes action available, even requisite. We move forward through the first level, and then the next, left to right, completing the goals as quickly as possible, because this is how we, gamers, have been trained to play, time and time again. We expect, of course, that action will lead ultimately to victory, not to our world's annihilation. Regardless, we act. Videogames, after all, are not the passive activities they are often assumed to be. They demand activity. They absorb and obsess players. To be sure, playing *Braid* is a blast. But it is also active work that demands motivation and deep focus. A player who treats a videogame like *Braid* as if it were a television sitcom, to be experienced ambiently, experiences frustration and finds him- or herself incapable of progressing. At the same time, it is easy enough to concentrate only on the procedures that allow one to collect puzzle pieces, to progress, to beat the game, to master its mechanics. It feels natural to pursue the objectives, to keep one's eyes on the prize: the Princess.

There is violence at the core of videogames, which *Braid* reveals through action, not exposition. This point is made most apparent in the ingeniously designed final level. Tim runs across the bottom of an automatically scrolling screen that is no longer under the player's control while the computer-directed Princess keeps pace on the top half. He leaps across lava pits, climbs ladders, and waits for the Princess to pull levers that open doors and help him to outrun the pillar of fire always at his heels. He seeks to fulfill his promise and rescue the Princess from the monster, a brawny knight, from whom she is ostensibly escaping (fig. 5). The level, following 2D game conventions, moves from left to right. Once Tim reaches the Princess's bedroom, however, a bright flash fills the screen and the action changes. In order to complete the level, the player must now wind time back to watch the entire level in reverse. This time, the characters move uncannily from right to left, allowing the player to revisit all of his or her actions in the opposite order. Instead of helping Tim, the Princess now performs these same actions to block his path. In this moving sequence, Tim becomes a villain who pursues the princess, obsessively, as she seeks to evade him. Ultimately, she leaps back into the arms of the knight whose presumably failed attempt at abduction we now understand, in reverse, as a successful attempt to save the Princess from Tim. During this final reversal, the player can only sit back and reflect on the consequences of Tim's violence. The protagonist's latent aggression is also

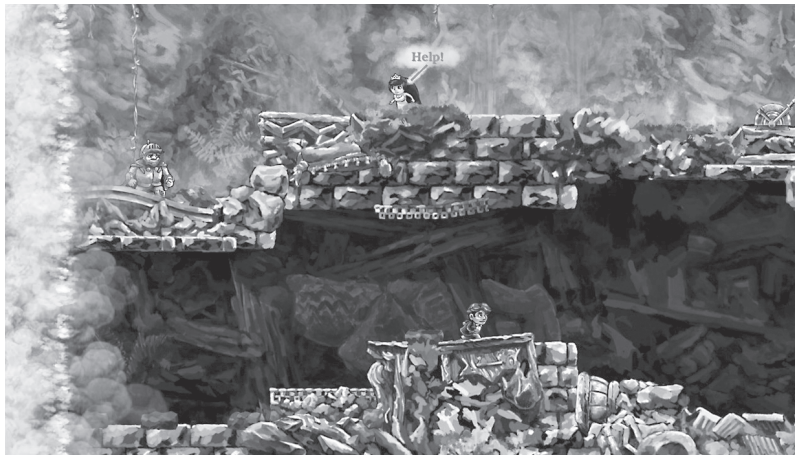

Figure 5 Tim pursues the Princess in *Braid*'s final level.

the violence of the gameplay itself, which instrumentalizes the Princess, converting her into a mere condition of victory.

This violent aspect of gameplay is revealed in an even more painstaking way in the optional and largely unintuitive star challenge—a bonus trial that can be pursued by only the most obsessive players. This challenge was originally undertaken as a collective quest among gamers who worked together across online forums, produced YouTube walkthrough videos, and contributed to a *Braid* wiki.[29] To acquire the second of eight stars, for example, the player must explore the second level of World 2 and discover that a cloud on the right side of the screen is actually moving to the left, albeit at an imperceptibly slow speed. In order to reach the star, the player must bounce off of a goomba enemy to reach the cloud once it reaches a particular position. She must then wait for approximately two hours for the cloud to move to the left side of the level where a star becomes accessible. If the player has the patience and skill to acquire the first seven stars, an eighth becomes available in the final level. In pursuit of that star, Tim must participate in a timing challenge that enables him, finally, to touch the Princess, causing her to explode (instead of continuing on to her bedroom) and leaving the player with a temporarily white screen. This conflation of princess as love object and atom bomb offers the game's most direct statement about the dangers of obsessive, goal-oriented behavior. In

the eruption, the game reproachfully upbraids the gamer for a desire for total closure by suggesting a parallel between this achievement and the triggering of a nuclear weapon.

It is significant that the disclosure of the violence inherent in both nuclear weapons and videogames, in *Braid*'s final level and the star challenge, is not text dependent. Derrida (1984, 23) has famously argued that nuclear war, a still-unrealized event that is mediated completely through political rhetoric, fiction, and theory, is "fabulously textual." As he explains, "Nuclear weaponry depends, more than any weaponry in the past, it seems, upon structures of information and communication, structures of language, including non-vocalizable languages, structures of codes and graphic decoding." While it is the linguistic aspect of Derrida's argument that is frequently taken up, nuclear weaponry suggests for him levels beyond rhetorical speech and textual fabulation. As *Braid*'s multidimensional experience demonstrates, nuclear weapons, in their reliance on information and communication, take on a *fabulously procedural* dimension. *Text*, no matter how broadly defined by poststructuralist criticism during its linguistic turn, proves inadequately specific to a nuclear problem that is, from its origins, animated by computer programs and codes. Indeed, the direct textual explanation of the atom bomb is, in *Braid*'s procedural fable, presented as a belated afterthought, made available only in the epilogue.

Braid does not simulate nuclear war in the way that a game such as Atari's *Missile Command* (Theurer 1980) does, by offering a simplified one-to-one correspondence model between videogame mechanics and weapons deployment processes. Most of *Braid*'s procedures gesture toward a world informed by nuclear arms but do not invoke it directly. In World 5, for example, Tim encounters a new set of rules. He enters a level that, unlike all the others, remains unnamed, thereby suggesting a process beyond language. In every instance that he rewinds time, a shadow figure (that can affect the surrounding world) carries out the exact actions that Tim performed just a moment earlier. Upon surveying the screen, the player discovers a key that must be carried across a treacherous pit filled with spikes (fig. 6). However, given the span of the trench, Tim is unable to make the jump on his own. The only way to solve the puzzle is to jump, with key in hand, and reverse time at the very end of the arc. At that point, Tim must quickly climb to the other side of the pit and wait for his shadow self to repeat the action. When the shadow leaps across the pit, Tim stands on the other end and grabs

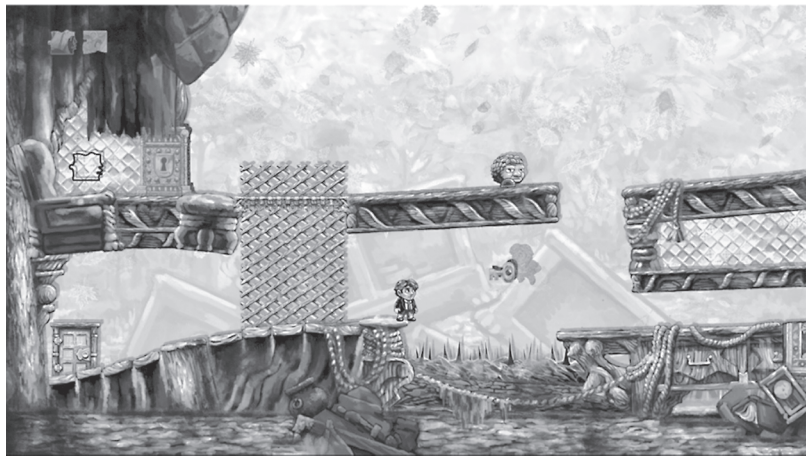

Figure 6 Tim and a shadow figure in an unnamed level of World 5.

the key. In the process, the shadow figure plummets to its death. To acquire the key and collect the puzzle piece, in other words, Tim must treat his shadow as a means to an end. While the fate of the figure is unknown, the solution to the puzzle, however satisfying the achievement, is fraught with unease. The instrumental act urges the player to think, even if parenthetically, about the responsibility for consequences that such action-oriented games generally bracket or disregard.

The algorithmic procedure that structures the solution to the puzzle in World 5 resonates strongly with the central problem that Bataille (1995, 229) sees with historical thought after Hiroshima: "In truth, if one singles out Hiroshima for lamentation, it is because one does not dare to look misfortune in the face—misfortune's profound nonsense, which is not only the result of the avoidable violence of war but a basic component of human life. As a consequence, one takes refuge in the world of activity, dominated by the principles of a virile reason." Instead of processing the new form of horrific violence demonstrated at Hiroshima and Nagasaki, postwar American life more frequently took "refuge" in reason-bound activity. The impulse that Bataille describes derives not from a mere circumvention of the concrete nuclear problem but from a more abstract worry for the future that became widespread in the postwar period. This drive to action has indeed fueled

the global spread of American-style capitalism, in both its economic and military capacities, since the mid-twentieth century.

In addition to being facets of American life and postindustrial labor, ceaseless activity and reasoning are also core pleasures of the game form. At a cultural level, the taste for activity that Bataille describes was also made manifest in the growth of game-based leisure activities that served as postwar precursors to videogames. These included the pinball machines, coin-operated amusement devices, and novelty games such as the ones managed by Sega (Service Games) in American military bases from Hawaii to Japan in the 1950s (Kent 2001, 331–43). Bataille's "world of activity," then, is a total world that absorbs and blurs political, economic, and cultural levels.[30] *Braid*, which uses the action-oriented mechanics of the platform game to enable the pursuit of achievements and progress, demonstrates the centrality of such activity to the videogame form in particular. While the game entails complicity with a greater "world of activity," it is a complicity of which the player is made aware through processes. The gameplay experience penetrates in a way that direct exposition alone, however lucid, fundamentally cannot.[31] Wired as human beings may be for language, we also operate procedurally. Computers externalize this aspect of human thought. Videogames in particular are well suited to using procedures to invite experiential engagement. Jonathan Blow (2008b) has even used the term *dynamical meaning* to convey the "idea of game mechanics communicating something emotionally and intellectually to a player, in a similar way that narrative does, through the very structure and interactions." Unlike traditional forms of narrative, including novels, a game invites interactive participation with a system that responds in real time to user input.

Braid's logical mechanisms, which foreground sequential progress, run contrariwise to its sensible features, which convey nuclear secrets through a pervasive anxiety. As demonstrated by the speed run mode, the sensible and the intelligible are not, however, absolute opposites. *Braid*, in its appropriation of the effects of the atom bomb, erodes such sharp distinctions. The game's puzzle solving takes place as much through intuitive maneuvers and procedural experiments as it does through directed reasoning. Some actions become known only at a visceral level. In this sense, *Braid*'s procedural activity depends principally on something other than thinking. As Lauren Berlant (2008b, 5)

has observed, "not thinking" is, however, "not the opposite of thinking." There is certainly activity in Bataille's sense, which compensates for an unknown present through an obsessive fixation on the future. Even so, *Braid*'s gameplay leads to a different type of activity: a *processing* of a historical present that exceeds pure reason. The present continues to be parameterized by scientific problems (for example, the atom bomb) and solutions (nuclear energy). But a historical sense of our age also depends on elements that are aesthetic, sensory, and affective. *Braid*'s videogame form traces the phenomenal residue of a historical convergence between technoscientific and aesthetic horizons.

Bataille (1995, 230) reflects on the importance of the historical present through what he calls a "sovereign sensibility" that refuses to allow future prosperity to stand in as compensation for existing misfortune. This mode of awareness, which merges the sensible and the intelligible in the temporal span of the instant, serves as a response to the "goal-oriented activity" of the atomic era. This "excessive" sensibility, as Bataille dubs it, is nonetheless "not unrelated to the birth of the atomic bomb" (231). While this mode is "doomed, from beginning to end, to a vanishing splendor," he insists that "a movement that carries me beyond limits is more helpful than an oppressive worry and a fear of the future, which lead to eloquence and the common overemphasis on action" (233). A politics of the instant, which disappears in a flash, is of course unsustainable. Nevertheless, it challenges the primacy of the future as a site of redemption. In the interruption afforded by the instant, thought becomes something other than a prelude to immediate action. The instant is a break (a pause rather than a rupture) that invites reflection on complexes of guilt, numbness, complicity, apathy, and anger. It opens up an explosive potential that was previously unavailable.[32] In a game, as in life, an instant is sometimes all it takes to create a conceptual breakthrough that allows us, now, to see an arrangement of puzzle pieces in a wholly different light.

Epilogue: Videogame Subjects

The promotional trailer to *Braid*, which serves as this essay's epigraph, asks what would happen if you could "learn from your mistakes . . . but undo the consequences"? What if you could "see multiple realities," "reverse death," and "warp time"? If these processes were possible, "Then what would you be"? *Braid*, in fact, makes sensible the connec-

tion between aesthetic form and historical experience that is implicit in the trailer's question of a subject formation. As Derrida (1984, 27) observes, elaborating on Heidegger's terms, "the atomic age" is "an age of in-formation which forms and in-forms a new figure of man." The nuclear is framed here as productive of human beings who both process information and, in various ways, surrender themselves to being informed by it (see Wald 2011). The aftermath of World War II, of course, brought with it more than the atom bomb. As McLuhan (2003) argued, the new media that proliferated in this period were not only novel modes of communication but also, more profoundly, technological augmentations of the human body that transformed the senses and the fundamental means of worldly experience.[33] In this frame, videogames are a paradigmatic contemporary medium insofar as they externalize and channel aspects of the postwar period's in-formation processing, algorithmic behavior, distributed operation, and (inter)activity.

Braid's most powerful accomplishment may be its dynamic expression of the process by which historical events inscribe themselves into the desires, ambitions, risks, and responses of subjects. This mediation accomplished by the videogame form is not a break with history, but in Jameson's (1981, 225) sense, "a projected solution, on the aesthetic or imaginary level, to a genuinely contradictory situation in the concrete world of everyday social life."[34] That gamers can celebrate rationality, progress, and activity while opposing the prospect of nuclear war suggests a "genuinely contradictory situation." That player-consumers in the overdeveloped world can affectively support world peace without evaluating the ways in which everyday ways of being contribute to systems of global antagonism suggests a similar inconsistency. *Braid* not only makes visible such tangles but also involves the player, actively and complicity, in their creation. Each time players move through the game, they are imbricated in winning a world that, through their very actions, is already lost.[35] On its final screen, the game foregrounds this complicity through a concrete indictment of achievement: an empty toy castle (sans Princess) made of children's blocks that represent each completed level of the game.

Braid, in a final sense, offers nothing more or less than a braid: "a moment, a short space of time" for conceptual play (*OED*). To achieve an understanding of the game, beyond mere completion, a player must engage with it at several levels simultaneously. He or she must think and feel, reflect and act, know and not know. *Braid* expresses

these processes through its levels, its layered sedimentations. Over the course of the game, the player, like the protagonist, is shown not to be a sovereign subject but rather a braided being made up of many nested subroutines and sociopolitical loops. The plaits that compose the game reveal complicity, but also the possibility of unknotting a sensorium, which cannot be accomplished with language alone. Whereas a novel systematizes irresolvable tensions through narrative structure, a game plays out such knots. It is not that any artistic form, whether the novel or videogame, is capable of resolving the proliferating contradictions that make up its historical moment. Still, an artwork can translate the dissonance of existence from willful unknowing to a fuller engagement with the unknown.[36]

Braid's temporal experimentation and treatment of the videogame subject suggests the possibility of learning from one's mistakes. As Hannah Arendt (1958, 232, 296) observes, it is largely through action and speech that human beings disclose their identities to others. And yet action, which is "all-important to the modern age" in "its unprecedented concept and consciousness of history," initiates processes whose outcomes are both invariably uncertain and, given the chain reactions that they set off across a web of relationships, functionally without end. For this reason Arendt sees a human actor as "never merely a 'doer' but always and at the same time a sufferer" (190). In *Braid*, the character of Tim and the player who traverses the game are both such agents—"doers" who act or perpetrate and "sufferers" who cannot control their fate or foresee the consequences of their actions. If we encounter the names of the six game worlds *in reverse* of how they are initially encountered, they tell a story that moves from "Hesitance" to "Decision" and eventually (in the first world that one encounters in a linear play-through) to "Forgiveness." Certainly, the history of the American postwar period is a process of no return that cannot be rewound with the mere tap of a key. Nevertheless, a creative interpretation of *Braid* leads to an intervention into the potentially paralyzing contingencies of action. As Arendt observes, forgiveness is "the only reaction which does not merely re-act but acts anew and unexpectedly, unconditioned by the act which provoked it and therefore freeing from its consequences both the one who forgives and the one who is forgiven" (241). Indeed, *Braid* marks forgiveness as both a possibility of renewal and as its own ultimate

limit. Forgiveness, after all, can only come from others and thus cannot be the self-contained outcome of a single-player game.

As cinema did at an earlier phase of modernity, videogames promise to change our relation to media and mediation in the United States and increasingly around the world. Through an analysis of *Braid*, this essay only gestures toward some of the ways that game procedures make available new modes of accessing and processing historical mechanisms. Videogames, for all of their remediations, are not simply the apotheosis of multimedia entertainment.[37] They are aesthetic extensions of an era that has seen a transformation of computers from computing devices to digital platforms for producing and experiencing expressive media. Videogames preserve historical affect through procedures, processes, and protocols that can be accessed at levels that include interface, code, and platform. As *Braid* suggests through its "dynamical meaning," videogames are not mere entertainments but world forms that mediate between subjectivity and history. To understand the parameters and possibilities of that subjectivity, as it is shaped by individual consciousness and a collective life from which it is never autonomous, no game is sufficient. Processing the present, then, remains a perpetual challenge to be undertaken through still more radical forms of play.

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Notes

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1 I emphasize Blow's auteur status with the caveat that *Braid* would likely not have been so successful without David Hellman's graphics and Blow's savvy decision to use licensed music (especially key tracks from composer Jami Sieber). While still rare, a greater number of artistically ambitious auteur-driven games have become possible in both independent and commercial production. This change has had much to do with the rise of DIY, independent, and art games movements in recent years.

2 In fact, even as "Game Over" screens were once the norm in videogames, many contemporary games substitute completion checkpoints, which are more forgiving. For a discussion of this change, see Rogers (2010, 277–78).

3 "Worlds" refer to the six larger areas in the game, each with its own characteristic style and rules. Within each world there are a number of levels that the player must complete, in any order, to move on to the next world.

4 Whenever relevant, I describe the controls for the PC version of the game. On the Xbox 360 version, for example, the player would hold down the X button instead of the Shift key to reverse the flow of time.

5 McKenzie Wark (2007, 225) explains, "Games are our contemporaries, the form in which the present can be felt and, in being felt, thought through. From this vantage point, the whole of cultural history can be rethought." For additional analysis of videogames as a paradigmatic postindustrial form, see Galloway (2006) and Dyer-Witherford and De Peuter (2009).

6 The growth of this field is visible in the emergence of academic journals such as *Game Studies* (gamestudies.org), anthologies such as *The Videogame Theory Reader* (Wolf and Perron 2003 and 2009), professional organizations such as the Digital Games Research Association (DiGRA), and numerous scholarly books. The question of whether videogames are "art" has been raised in many popular and scholarly contexts (Smuts 2005 and Adams 2006).

7 My usage of "sensorium" here follows Miriam Hansen. In her discussion of the centrality of film to modernism, Hansen (1999, 70) argues, "the cinema not only traded in the mass production of the senses but also provided an aesthetic horizon for the experience of industrial mass society." Videogames, I hope to suggest in my reading of *Braid*, provide a comparable "aesthetic horizon" for the experience of our postindustrial society.

8 For key discussions of media specificity, see Krauss (1999) and Hayles (2004). Krauss (296) describes a medium as "a set of conventions derived from (but not identical with) the material conditions of a given technical support, conventions out of which to develop a form of expressiveness that can be both projective and mnemonic." My analysis of *Braid* juxtaposes the conventions of the videogame with the medium's technical and material history. The term *military-industrial-media-entertainment network* comes from Der Derian (2001).

9 The game does not itself work from precise etymologies. Nonetheless, it suggests different connotations of its title, playfully, to mark the historical layering effect I discuss later in the essay (*OED*).

10 Blow (2008b) has noted that *Einstein's Dreams* served as a key inspiration in *Braid*'s early conceptual phase. Although he does not mention it, another novel that addresses the relationship between history and videogames, and explores many of Braid's themes, is D.B. Weiss's 2003 novel *Lucky Wander Boy*. Brian Moriarty's 1986 text adventure game, *Trinity*, also explores similar themes.

11 If read from right to left, the text in the second game world, for instance, reads as a fall from Edenic bliss rather than a memory or fantasy of an untroubled space. Here, *Braid* estranges Western reading practices, encouraging a textual engagement proper to languages such as Hebrew, Arabic, and Japanese writing (including cultural forms such as manga that have influenced American videogames and popular culture).

12 *Braid*'s relationship to the platform game genre deserves more detailed analysis than I can provide here. Blow assumes some knowledge of classic platform games in order to overturn expectations. Several level titles allude to earlier games. For example, World 6, Level 7 is called "The Princess is in Another Castle," invoking the line that is repeated at the end of every level of *Super Mario Bros*. Similarly, World 2, Level 4, titled "Leap of Faith," alludes to a well-known industry term for unfairly designed moments in early platform games that required player to leap blindly into pits (and lose lives in the process) before learning how to progress.

13 This music produces not empty nostalgia but a feeling of loss that is suggestive of the game's invocation of a history that is beyond absolute recovery. *Braid* further reinforces this sense of an irretrievable history through a dinosaur (an extinct creature rather than the fantasy dragon that the quest-romance genre might lead us to expect) that recurs at the end of each world to announce the princess's absence. This dinosaur is also arguably a reference to "Yoshi," a dinosaur who appears throughout the *Mario* game series.

14 W. J. T. Mitchell (2005a, 216) discusses both "nested" and "braided" media, both of which are relevant to my discussion of *Braid*. He explains that "one medium can seem to be 'nested' inside another" as when "a verbal image can be reborn in a painting or a photograph, and a sculpted image can be rendered in cinema or virtual reality." He also discusses what he calls the "braiding" of media "when one sensory channel or semiotic function is woven together with another more or less seamlessly, most notably in the cinematic technique of synchronized sound" (2005b, 262). Videogames interweave many previous media. In *Braid*, sometimes media are "nested" (though separate) and other times, they are seamlessly "braided."

15 The meaning that I deploy playfully here is "a trick, deception," "an adroit turn; a trick or subtlety."

16 The duration of a play-through, of course, is variable, depending on factors such as skill and familiarity with the game. An expert speed run can be completed in thirty to forty minutes. However, the game may take a moderately skilled player approximately five to six hours and a novice gamer more than ten hours to complete.

17 For this insight, I am indebted to an exchange with N. Katherine Hayles.

18 Saint-Amour draws his discussion of bukimi from Lifton (1967, 15–17).
19 These five texts all appear in the epilogue but not all in a single cluster.
20 The Manhattan Project was funded at President Roosevelt's request and was kept secret from Congress. As Gary Wills (2010, 12) observes, "The degree of silence is astonishing, given the scale of the operation. It involved many dozens of sites, hundreds of thousands of workers, and billions of dollars." Even Vice President Truman did not know the details of the atomic project until he became president, shortly before the United States dropped the first bomb.
21 Barthes (1977, 147) notes, "In the multiplicity of writing, everything is to be *disentangled*, nothing *deciphered*; the structure can be followed, 'run' (like the thread of a stocking) at every point and at every level, but there is nothing beneath: the space of writing is to be ranged over, not pierced; writing ceaselessly posits meaning ceaselessly to evaporate it, carrying out a systematic exemption of meaning." Although I later complicate the treatment of a videogame such as *Braid* as a "text," it refuses "ultimate meaning" in line with Barthes's formulation .
22 It is telling that Vannevar Bush, Director of the Office of Scientific Research and Development during World War II, is remembered for two major contributions to American technoscience. First, he oversaw the production of the atom bomb as part of the Manhattan Project. Second, in the final months of the war, he took an active part in reorienting postwar scientific efforts toward a new technological horizon in which he presciently imagined specialized computing unfolding into ubiquitous digital media. Bush, who was troubled by the Cold War and wanted to leave behind its destructive developments, saw new media as moving science toward the creation of generative connections among people. For a careful history of the development of computers during the Cold War and their relationship to the policies and ideologies of the era, see Edwards (1996).
23 For the voluntary nature of games, see Caillois (2001). Caillois expands, here, on Johan Huizinga's (1955) work on play as a free activity. For an elaboration of this quality of games—as well as objectives, rules, and feedback systems—see Salen and Zimmerman (2003).
24 One of the *OED* definitions of "braid" is "a sudden or brisk movement; a start, jerk; a twist, wrench, strain."
25 The concept of computational "procedures" and "processes" has become increasingly more central to conversations within the digital humanities. One of its earliest theorizations in the humanities appears in Murray (1998). Murray argues that one of the key attributes of digital environments is that they are "procedural" insofar as they "execute a series of rules" (71). Given this affordance, Murray notes, "the computer can be a compelling medium for storytelling if we can write rules for it that are recognizable as an interpretation of the world" (73).

26 William Chaloupka (1992, 8) points out that in the encounter with nuclear weapons, "it has been commonplace to assert that we are in the realm of the 'unspeakable.'" Those who oppose nuclear weapons "implicitly admit that nuclear war is a representation, then put that image in a rhetorical context that evokes (represents) the most profound absence possible." In *Graphic Women*, Hillary Chute (2010, 2) argues that "graphic narratives" complicate this common language of the "unrepresentable," especially in visual encounters with trauma. I would argue that videogames sometimes accomplish a similar feat through graphics but also audio and mechanics.

27 As Hayles (2004, 75) observes, "Code always has some layers that remain invisible and inaccessible to most users." While the layered processes of code are not directly accessible to the player, my contention is that *Braid* makes these "levels" indirectly sensible through its ludic processes.

28 Derrida (1984, 20) suggests that, with the "arms race," we may enter a changed world. He asks, "Is this new? Is it the first time 'in history?' Is it an invention, and can we still say 'in history' in order to speak about it? The most classical wars were also speed races, in their preparation and in the actual pursuit of the hostilities. Are we having, today, *another*, a different experience of speed? Is our relation to time and to motion qualitatively different?"

29 The difficulty of finding these stars converted this task into a collective challenge requiring a large-scale collaboration. Blow has observed that he foresaw that this considerable effort would take on a collective online dimension. He discusses his design of the stars in the question-and-answer session of Blow (2010). The *Braid* wiki offers walkthroughs for the eight stars (braid.wikia.com/wiki/Stars). Perhaps it is not too much of an exaggeration to read this undertaking as an allegory of the collaboration that constituted the Manhattan Project.

30 I expand on the totality of a game-based culture, including its action orientation, in Jagoda (2013).

31 Freud stresses this point when he writes, "To have heard something and to have experienced something are in their psychological nature two quite different things" (Freud and Gay 1989, 580). In psychoanalysis, of course, the analyst cannot simply tell the analysand the source of the repression but must instead initiate a mutual and dynamic process that builds toward a traversal of fantasy.

32 Berlant (2008b, 6) explores the affordances of such interruption in detail: "Such interruption slows and makes more reflexive the activity of the nervous system that perpetuates itself endlessly in reciprocal activity with the world; most importantly, though, it counters the intuitive sense that the world proceeds independently of the human activity that makes it."

33 "Games," Marshall McLuhan (2003, 317) specifically observes, "are extensions of social man and of the body politic, as technologies are extensions of the animal organism."
34 Jameson draws here most directly from Lukács (1971).
35 While *Braid* dwells seriously on the atomic event, the logic of videogames is also a key object of its critique. Blow (2008b) has remarked that *Braid* stands as a challenge to a videogame industry that reproduces the same narrow range of genres when the medium is capable of so much more. Indeed, late capitalism's historical relation to artistic form and subject formation becomes abundantly clear in games such as Blizzard Entertainment's eminently popular *World of Warcraft* (Pardo, Kaplan, and Chilton 2004). The blurring of work and play taking place increasingly in postindustrial society (an acceleration of "the world of activity" that Bataille already foresaw in 1947) is on display daily in those games in which players grind their way through repetitive tasks and undertake managerial responsibilities under the guise of play. *Braid* is not exempt from the contemporary historical moment in which such games captivate millions of players, nor does it purport to be.
36 I am drawing here from Alan Liu's (2004, 317) juxtaposition of what he calls an "ethos of unknowing" that characterizes the "cool" of the information era with what he calls an "ethos of the unknown" that marks history as the ungraspable real or the untranscendable limit of thought.
37 For more on the concept of *remediation*, see Bolter and Grusin (1999).

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