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Video Games Caught Up in History

*Accessibility, Teleological Distortion,
and Other Methodological Issues*

One notices that each generation of historians performs a selection, neglects certain traces, on the contrary exhumes others, for which no one, for some time, or since the beginning, showed interest. Consequently, the view we have of this detritus is already subjective; it relies on a specific interrogation . . .

—GEORGES DUBY¹

At the foundation of history as a discipline, lies the necessity to synthesize vast bodies of information in order to represent the evolution of human cultures. The exclusion of sources and artifacts constitutes its inevitable shortcoming. The self-proclaimed objective accumulation of facts—thematically organized, chronologically ordered—associated with positivistic methodology fails to conceal the same unavoidable reality: the selection of relevant information is always subjected to the world vision of contemporary historians. Following Duby's introductory quote, a cautious and self-aware historical approach should be able to piece together a series of phenomena through a conceptual lens that can account for the complexity of its object, while remaining conscious of how this lens partially constructs the object. Gazing at the past thus becomes an inevitable window into our own contemporary fascinations. The current state of a given culture, its obsessions and its ideals, often acts as an implicit telos which already conditions the gaze, preselects relevant information in order to piece together a teleological causal chain. Whether to serve the glorification of a national

identity or to create a comforting illusion of mastery over the informational chaos that surrounds us, these forms of exclusion only echo the selection carried out by any given period under examination; this chain of exclusions greatly complicates the work of historians. What holds true for historical science as a whole cannot be avoided by a more focused subfield like art history.

In an article that exposes the methodological problems encountered by early cinema historians, André Gaudreault notes the partial nature of his practice on two distinct levels.² First, only part of the early film strips is still accessible to today's historians; second, it is impossible for any historian to look back on such a distant object in an unbiased manner. For post-Brighton cinema historians, the emphasis on narrative figures in moving pictures before 1906 (and the corollary praise afforded to filmmakers such as Edwin Porter), at the expense of more widely spread practices, constitutes a teleological travesty; only after 1915 did cinema become the storytelling institution we now take for granted. Of course, such biases influenced film conservation and thus contributed to the accessibility problem underlined by Gaudreault. On the surface, things might appear simpler for video games historians. A strong community constantly feeds online documentation resources, seeking to preserve the memory of games, and some historians experienced the emergence of arcade games firsthand. The commodity of the computer age, with its data storage, organization and transcoding abilities, promises to solve accessibility problems. Yet in spite of these resources, and to a certain extent because of them, the challenges in bringing the young, new medium to history books are considerable. Moreover, this medium appears to constantly vie for perfection through the evolution of imaging techniques, processing power, and interactive devices. How is one to avoid a progress-laden teleological discourse when faced with an object that seems to be defined by its constant evolution? Drawing on historical research experience, notably field and conceptual work for Bernard Peron's research projects on interactive cinema and horror games, as well as a postdoctoral research project on the evolution of game design, this essay seeks to expose both the trivial and conceptual challenges pertaining to the methodology of video game history.

LOOK BACK IN ANGER: ACCESSIBILITY ISSUES IN THE COMPUTER AGE

Relatively little has appeared regarding older games and game systems, arcade games, or video game history in general. Part of the reason is that many of the old games are already gone or very hard to find and play; although this may

make writing about them more difficult, it also suggests a greater need for historical research, before it is too late.

— MARK J. P. WOLF³

In spite of the vigorous wake of video game studies in the past 10 years, video game equivalents of film conservation institutions are merely starting to emerge. For many years, the closest approximation of such an essential resource came in the shape of the itinerant Videotopia exhibit. Acknowledging “the destruction of the majority of these games and fearing the loss of their historical importance;”⁴ the Electronics Conservancy organization set out to find and restore 400 rare arcade cabinets, while also collecting home video game systems. The Computerspielmuseum opened in 1997 in Berlin; the new permanent exhibition “Computer Games: Evolution of a Medium” opened in January 2011 and features more than 300 exhibits. In 2007, following a proposition from major universities led by games researcher Henry Lowood from Stanford,⁵ the Library of Congress announced it would preserve a “game canon” formed of the ten “most significant” titles.⁶ Academia-related collections are emerging along dedicated games programs, but with obvious budget and conservation space limitations. Since the end of the 1990s, Stanford Libraries has amassed a significant number of video game artifacts as part of the “History of Science and Technology” collections, curated by Lowood; it features thousands of games on systems ranging from the Atari 2600 to the Microsoft Xbox. English Scholars from the Nottingham Trent University, in cooperation with the National Media Museum in Bradford, recently announced an ambitious conservation project; the National Video Game Archive specifically seeks to avoid “the ‘mistakes’ made in the film industry that lead to the loss of historically significant materials in the past.”⁷ Still, in the realm of video games today, the most exhaustive equivalents of conservation institutions are purely virtual ones. The following observations should not be seen as a rebuttal of the incredible contribution offered by online databases and emulation endeavors; rather, they seek to expose the almost inevitable drawbacks associated with such projects.

Little more than a decade after the worldwide explosion of the Internet, there is a staggering amount of general-purpose video game databases available online. Every major gaming publication on the web (IGN.com, 1Up.com, Gamespot.com, etc.) eventually incorporated titles that predate their own creation. However, these corporate databases only echo the most basic information (such as release date, platform, and genre) about older titles; with the exception of IGN.com’s retro section (<http://retro.ign.com>), publications focus first and foremost on creating editorial content for new

releases. Competing for the web-surfer's click, major gaming sites create an echo chamber of basic information, artificially multiplying results on search engines, which only burdens the work of the researcher. Thankfully, extensive data collecting projects have emerged. Founded in 1999, Mobygames.com officially set out to amass information about computer, console, and arcade games, such as release history, developer bios, screen captures, and box art. Limited to a few platforms before 2001, it eventually included most major home systems, all the way back to the Odyssey. As of 2011, it contains data about more than 56,000 games on 95 different platforms. More than 180,000 digitized visual elements (such as box covers and game media) also provide invaluable information.⁸ To this day, the arcade portion of the database has not been developed. However, other dedicated projects have gained the respect and admiration of the community. The Killer List of Video Games (KLOV) database (<http://www.klov.com>) focuses exclusively on coin-operated arcade video games. Its origins can be traced back to the bulletin board system (BBS) era, where enthusiasts gathered to share information. The project eventually led to the creation of The International Arcade Museum and now encompasses the entire coin-operated entertainment phenomenon. The site has detailed pages with technical descriptions, gameplay information, cabinet pictures, and screenshots for more than 4,400 arcade video games. The Arcade History project is even larger and has information about arcade video games, pinballs, slot machines/pachislots, pachinkos, bat games, bingos, gun games, bowlers/shuffle alleys, jukeboxes, musical instruments, trade stimulators, fortune tellers, strength testers and much more.⁹

Literally dozens of smaller websites dedicated to a specific platform (Lemon Commodore 64/Lemon Amiga, PC Engine Catalog Project), developer (AtariAge, the Nintendo database at Gamespy.com, The LucasArts Museum), genre or theme (Dragon's Lair Project, Home of the Underdogs) supplement the larger databases.¹⁰ These projects grew to considerable proportions by relying heavily on user-contributed content; similar in concept to a wiki, editing descriptions on Mobygames or the KLOV is a matter of being a registered user.¹¹ Closed editorial resources about older games do exist, and sometimes prove to be the only detailed source of information about rare or lesser-known games and systems. From short reviews on a great variety of consoles (The Video Game Critic) to extensive evaluation of graphic adventure games (JustAdventure+), amateur enthusiasts often spend incredible amounts of energy on these projects.¹² Clearly, the community's genuine concern and dedication to preserve the history of games is commendable. Both open contribution and restricted editorial

resources, however, are ultimately amateur endeavors and face the same challenge of providing accurate information.

The appeal of retrogaming review projects lies precisely in the surrogate firsthand experience of rare or inaccessible objects. Despite the guarantee of an actual encounter with the object, however, game descriptions cannot always be taken at face value. Even with firsthand experience, one can misinterpret the actual algorithmic complexity of a game. This raises the fundamental question of the researcher's competence to examine historical objects; the ever-changing technical aspect of video games makes this medium even more demanding than cinema. As Wolf observes, "The history of video games now spans over four decades, and while this is a relatively short time compared to the histories of other more traditional media, it is fast moving and exciting, with innovations and advances occurring at a rate unparalleled in other media."¹³

Acute technical information about a game is not always readily available in the professional press, and relying on promotional material, which often overemphasizes or blatantly distorts technical features, is not an option. *Cruise for a Corpse* (Delphine Software, Amiga, 1991), *Axelay* (Konami, SNES, 1992), and *Doom* (Id Software, DOS, 1993) have all been promoted as achievements in 3-D graphics, even though neither the manipulation of vector shapes, the "mode 7" bitmap scaling, nor the "2.5-D" texture interpolation engine truly correspond to the contemporary definition of a 3-D game engine.¹⁴ Moreover, the "omnidimension 4-D" touted on the box of *Beyond the Forbidden Forest* (Cosmi, Commodore 64, 1985) is highly suspicious.

The question is certainly legitimate: would a programmer or technician familiar with the various creation tools be the ideal video game historian? Researchers should possess sufficient knowledge to contextualize information given by the publishers or made available in databanks. A few noteworthy contributions that take into account these aspects have already been made. In "Video Games in Computer Space: The Complex History of Pong," Henry Lowood explains how the first arcade cabinets are often discussed as computer games, when to a large extent they were created by repurposing television technology.¹⁵ Ian Bogost and Nick Montfort's *Racing the Beam* (2009) provides in-depth information about the Atari VCS 2600's inner workings and its decisive influence on game design. The author's Platform Studies collection seeks precisely to explain "how certain platforms facilitate certain types of computational expression and innovation."¹⁶ Similarly, Noah Wardrip-Fruin makes a case for a closer inspection of the actual computational processes involved in the video game experi-

ence; in *Expressive Processing: Digital Fictions, Computer Games and Software Studies* (2009), he begins to trace the historical developments of this procedural reality—including authoring systems and A.I. routines.

EMULATION AND TECHNICAL PROFICIENCY

Needless to say, all the previously listed resources are useful inasmuch as firsthand experience of the historical objects (both in their material aspect—the original boxes, manuals, cartridges—and the experience of the game itself) is not easily accessible. Some older systems and games can be bought in online auctions (prices are potentially restrictive, particularly in the case of arcade cabinets), but many early consoles and arcade games have already disappeared, and specific types of hardware (such as the first generation CD-ROM add-ons, consoles, and discs) are unlikely to be found in optimum functioning state. Thanks to the transcoding abilities of the computer medium, however, there is another opportunity for researchers to experience their object: emulation. An emulator attempts to duplicate on a recent system the functions and instruction sets associated with previous hardware. Dedicated software can be used directly (if the media reader, such as a disk or CD-ROM drive, is available in the host machine) or from digital copies (typically referred to as ROMs, from “read-only memory,” or ISOs, from the ISO archive file system, in the case of CD games). Preservation of the software is taken very seriously by emulation enthusiasts. The Old School Emulation Center project (TOSEC) established a clear protocol to archive and name ROM sets; users constantly update lists about software released on more than 200 platforms. Emulation remains a delicate issue, for the creation or appropriation of ROMs for games that have not been declared public domain by the copyright holder is considered illegal in many cases.

Classic computers and consoles tend to attract the most attention from the emulation community; four major emulators exist for the Atari 2600, and many projects associated with the Super Nintendo Entertainment System are being developed. Exclusion of lesser-known systems and games is just one of many issues raised by emulation. As a general rule, more accurate emulation of original components requires more powerful host machines,¹⁷ and many consoles or specific hardware parts are difficult to emulate perfectly. Relatively old computers, like the Commodore Amiga (1985), already featured a complex assemblage of co-processing units that can be taxing to emulate even on modern computers. To recreate a playable experience, programmers sometimes rely on emulation shortcuts: leaving out nonessential hardware modules or functions, or using alternate com-

puting methods that are more efficient on the host system. A potential pitfall resides not so much in the obvious performance disparities that occur in CCS64 (for Commodore 64 emulation) or the impossibility of using the original game controllers in Bliss (for Intellivision emulation), but rather the subtle differences in emulation speed or audiovisual output that are not readily apparent. Far from a simple blessing, a journey in the realm of emulation requires researchers to have even more proficiency with technical aspects.

Thankfully, the emulation community is very concerned about creating the most accurate emulation possible. Emulators are constantly updated by their creators. One of the most ambitious projects, Multiple Arcade Machine Emulator (MAME) emulates a number of arcade games. Since its initial release in 1997, over 4,000 unique games have been emulated, encompassing a great variety of chipsets (such as Capcom's CPS-1 or SNK's Neo-Geo boards). The incredible variety of input devices used in arcade cabinets since the early days of the phenomenon adds to the complexity; trackballs, light guns, pedals, and more have to be mapped to present-day devices like keyboards, mice, and third-party control pads. Display technology discrepancy, although not as apparent as previously discussed difficulties, can also be a significant issue. Beyond the theoretical specifications of the visual assets stored on the game disk or cartridge (e.g., resolution and color depth), display technologies affect how the actual image appears to the user. Different types of cathode-ray tubes have been used in arcade cabinets during the period covered by MAME (at the time of this writing: 1976–2007). Without getting into complicated technical details, we can observe that the phosphorescent end of cathode-ray tubes—the area scanned by an electron beam whose intensity is modulated to reproduce the signal—had specific characteristics that came to be associated with the video game experience. In an attempt to mimic screen artifacts such as scan lines and red/green/blue dots, MAME offers the possibility to overlay a visual representation of these artifacts on top of the emulated game (Fig. 1.1).¹⁸ Even with the use of these masks, an exact reproduction of original monitor effects on modern-day LCD panels, and even on the CRTs used with computers in the 1990s, is nearly impossible. The clarity of modern computer displays is making the blurriness associated with arcade monitors a thing of the past. This is not an improvement or a way to belatedly do justice to the original experience; this blurriness, resulting from less efficient luminance and color handling, often masked the imperfections and aliasing of the original source visuals or contributed to the illusion of deeper color depth with the use of dithering.¹⁹

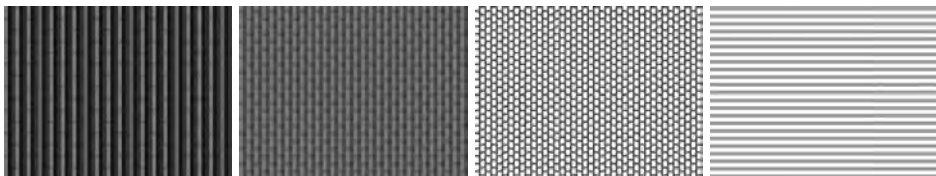


Fig. 1.1. Visual masks in MAME (blown-up sections of tiled patterns)

THE INCOMPLETE OBJECT

It is now clear that the inaccessibility of objects and the palliative resources available to researchers open many methodological issues. Even when first-hand contact is possible, given the highly technical nature of the medium, it is the researcher's competency (or lack thereof) that can become a source of misinformation. The ultimate accessibility issue, however, goes beyond the availability of the object or the technical expertise of the researcher. Video games require nontrivial effort, and in many instances, actual proficiency in order to evaluate the object in its entirety. As Wolf points out, "Gameplaying skills may be required to advance beyond the first few levels, or some puzzle-solving ability may be needed just to enter a locked door encountered early on in the game."²⁰ It is technically possible for researchers to use cheat codes or other tricks, or to simply access later stages in the games. However, cheats are clearly a distortion that prevents proper evaluation of gameplay mechanics. Skipping to later stages is even more likely to push researchers to their limit because it will place them right in the middle of the learning curve. Most emulators offer a save-state functionality, allowing the user to create a marker that can complement the game's checkpoint, password, or save system. These various save points could be used to facilitate researchers' access, but the same proficiency issue would surface.

A dedicated community, yet again, has answered the call: thousands of hours of archived audiovisual playthroughs are available online, including "speedruns," where apt gamers record their fastest performance of any given game, and "longplays," where gamers try to expose the content of the game as thoroughly as possible. The commented playthrough is also a growing Internet meme; unrelated members of the gaming community compulsively started to produce content under the same "Let's Play . . ." name, with hundreds of examples to be found on YouTube. Quick-thrill classics such as *Jungle Hunt* (Taito, 1982) are of course well suited to this archival process, but the number of playthroughs of lengthier games, such as interactive movies and role-playing games, is surprisingly large. *Phan-*

tasmagoria: A Puzzle in Flesh (Sierra On-Line, 1996) is divided into 25 ten-minute segments; the typical *Kingdom Hearts* (Square, 2002) playthrough lasts several hours. Needless to say, archived playthroughs should not act as a substitute for firsthand experience and, in themselves, are prone to misinterpretation. In the context of the *Ludiciné* research project on interactive cinema (<http://www.ludicine.ca>), Bernard Perron decided to invest resources in the archiving of an actual playthrough for many games. The database built for the project allows researchers to tag the videos with a consistent set of descriptors that seeks to dissipate any confusion regarding the gameplay. In conjunction with other information, audiovisual archives provide access to content that can take several hours to reach under normal circumstances, while minimizing the risk of distortion.

TELEOLOGICAL ILLUSION: FROM EARLY CINEMA TO EARLY VIDEO GAMES

The significance of the accessibility problem cannot be overstated. The conceptual organization and presentation of a phenomenon's development over time, by definition, depends on the available historical traces. The ongoing and rapid technological evolution partly responsible for these accessibility problems also favors a teleological view of video game history. *Teleology* can be defined as the tendency to conceptualize the evolution of a phenomenon as a purposeful development toward a clear goal. From 1978 onward, cinema historians sought to evacuate teleological distortion from history books. André Gaudreault and Tom Gunning, among others, exposed the numerous manifestations of teleology in the work of traditional cinema historians. The primary form of exclusion is so readily apparent in the books of Sadoul and Mitry that it might not have been completely unconscious: cinema's recognition as a noble art form is strongly tied to the development of its storytelling abilities, and pre-Brighton historians were keen to underline the early manifestations of this very specific and noble practice,²¹ while promptly discarding the residual information, a protean landscape of practices that truly defined early moving pictures. Gunning clearly summarized the problem:

The history of early cinema, like the history of cinema generally, has been written and theorized under the hegemony of narrative films. Early filmmakers like Smith, Méliès and Porter have been studied primarily from the viewpoint of their contribution to film as a storytelling medium, particularly the evolution of narrative editing. Although such approaches are not totally misguided, they

are one-sided and potentially distort both the work of these filmmakers and the actual forces shaping cinema before 1906.²²

Focusing only on figures and codes that *retrospectively echo* those privileged by the institution of cinema—and the corollary obsession to establish a list of their first incidences—is clearly a teleological distortion. In this period of *primitive* cinema, not everything seems to be equally primitive. Incidentally, this very designation of “primitive” is not only a contemporary value judgment alien to the object studied, it also happens to be part of a biologic metaphor that reinforces the teleological illusion. By listing the first occurrences of these primitive figures—just like proud parents cataloguing their child’s first footsteps and words—such historical discourse places the phenomenon on a pre-written progressive path going from naive infancy up to the great accomplishments of maturity. Is it any wonder, then, that historians kept looking for the fathers and forefathers of narrative editing? To paraphrase André Gaudreault: by putting early cinema in a crib, this historical account is rocking us with comforting illusions.

Through this teleological conception of history, each period simply becomes the antechamber of the following one. Post-Brighton cinema historians proposed some guidelines to avoid teleological pitfalls. Resorting to a falsely objective decoupage of time, for example by matching periods with decades, would constitute a naive abdication with respect to the historian’s duty to conceptualize history. The main idea was not to completely abandon chronological periodization, but rather to emphasize the insurmountable heterogeneity of the early period by documenting the multiple ongoing, and often contradictory, practices. The end result was the promotion of a unique yet multifaceted concept to better understand the early days as a continuation of cultural series that existed prior to the invention of cinematography: the attraction. “The cinema of attractions directly solicits spectator attention, inciting visual curiosity, and supplying pleasure through an exciting spectacle . . . It is the direct address to the audience, in which an attraction is offered to the spectator by a cinema showman, that defines this approach to film making.”²³ This exhibitionist mode of address contrasts most clearly with the voyeuristic aspect that Noël Burch and Christian Metz, among others, associate with narrative cinema. Interestingly, an attraction doesn’t refer solely to the enticing content of the film strips (exotic travelogues, Hale’s vehicle rides, saucy vignettes, etc.), but also to the apparatus itself or to new cinematographic tricks and innovations (splice effects, close-ups). Such a concept encompasses larger cultural manifestations and thus favors an historical account based on cultural paradigms that can overlap at any given time rather than discrete successive

periods; attraction and narration both coexist during the early days, and the resurgence of attraction in later stages of the medium's development (musical numbers, special effects) is a frequent observation.²⁴

The video game medium poses an interesting challenge in terms of historical conceptualization. The industry has grown to considerable proportions over the course of the past four decades, and in spite of the undeniable frailty one can observe in the constant acquisitions, mergers, and studio shutdowns, this growth has triggered the establishment of major players, production molds, specialized roles, and training. Many history books focus on the anecdote surrounding the development of the industry and the creation of landmark games. Steven L. Kent's *The Ultimate History of Video Games* was built from a previous account by Leonard Herman (*Phoenix: The Fall & Rise of Videogames*) and 500 interviews with major figures in the industry. The industrial account often provides a first convenient period marker for the history of video games: the Crash of 1983. Kent places the Golden Age of the medium right before the Crash, Van Burnham's account of classic games range from 1971 to 1984,²⁵ and *The Video Game Explosion's* first major historical demarcation is titled "The Industry Rebounds (1985–94)." Not surprisingly, the great fathers of the medium are often pioneers of the exploitation aspect: Ralph Baer as "The Father of TV Games"²⁶ or "Home Video Games,"²⁷ and Nolan Bushnell (inventor of the first mass-produced coin-operated arcade video game, *Computer Space* in 1971) as the "Father of the Industry."²⁸ Video games have been put in a crib, and it's the promise of a great cultural industry that seems to call for paternity examination.

The classic paternity dispute between Willy Higinbotham (inventor of a table tennis game displayed on an oscilloscope, in 1958) and Steve Russell (who "hacked" the PDP-1 supercomputer to create *Spacewar!* in 1962) points toward the clearest source of teleological distortion in various video game accounts: technology. Since the original technical principle has been developed, a constant onslaught of seemingly perfected yet constantly perfectible machines has been associated with the medium. The first obvious consequence of this constant technological development is a tendency to give particular attention or significance to the hardware and games that represent a technological breakthrough. Symptomatically, on top of the obvious industry landmarks, the timelines integrated in history books put significant emphasis on the first occurrences of specific technological aspects. The launch of major consoles and computer systems are listed along *important* games: the first game integrating ROM chips to store graphical information (*Tank!*, Kee Games, 1974), the first game to use a microprocessor (*Gunman*, Taito, 1975), the first game to use a laserdisc (Electro Sport's

Quarter Horse, 1981), the first full-color game (*Galaxian*, Namco, 1979).

The editor of *The Video Game Explosion* clearly expressed a desire to let the games take center stage. The games are thematically organized in accordance to a technical aspect in many instances: vector games, laser-disc games, CD-ROM games, handheld video game systems, online role-playing games, and so forth. Moreover, the temptation to use the multiple generations of hardware—associations of systems released around the same time frame—as historical period markers is very strong. On the *Wikipedia* account of video game history, generations play a major role: from the Magnavox Odyssey to the PlayStation 3, seven major generations have been outlined. In his 2001 account, Kent dedicates two chapters to “The ‘Next’ Generation” (the mid-1990s competition between the Sony PlayStation, Sega Saturn, and Nintendo 64), and further underlines the relative nature of this “next” phase in “And the Cycle Continues.” *The Video Game Explosion*’s other major period distinction is titled “Advancing to the Next Level (1995–Present)”; Wolf notes that by the end of 1994, “the industry was booming again, providing the revenue to invest in new technological advances, like 32-bit home game systems, that were just around the corner.”²⁹

Technical aspects of early games are often described with adjectives such as *basic* and *primitive*.³⁰ Besides blatantly eclipsing the historical reception of objects that were appreciated as technological attractions, these references to the naive infancy of the medium also points the other way, toward an ideal apparatus. The true offspring of the forefathers, it seems, is not yet completed. To this day, hardware designers, game developers, and gamers have their eyes set on the future of games. In “L’appel de la simulation” (Therrien, 2005),³¹ I outlined a game design tendency influenced by the simulation ideal: development of open-ended worlds (The *Grand Theft Auto* series), integration of complex physics algorithms (the Havok engine), refinements to artificial intelligence (*Halo: Combat Evolved*, Bungie, 2001), and so on. The marketing campaign for Nintendo’s Wii console (code-named “Revolution” during its design phase) focuses on the seemingly perfect synchronism between the actual manipulation of the user and the resulting action in the game world. The frequent assumption that better game mechanics involve greater realism already traces a privileged path for the future of games.³² Writing about immersion and presence in video games, Alison McMahan declares:

A recent shift in computer game design involves a move away from 2-D level design in games like *Prince of Persia* (1992) [*sic*] to 3-D design and a first-person point of view. This shift increases

the sense of immersion by replicating the aesthetic approaches of first-person shooter games in other types of games, such as adventure games, role-playing games, and even strategy games, which previously used 2-D levels or isometric views. *The shift in design is indicative of an overall trend to make desktop video games feel more like virtual reality.*³³

The ongoing technological evolution generates an overarching narrative that defines the ideal stage of the medium in terms of immediacy,³⁴ feeding on actual techno-military devices (complex simulations, virtual reality interfaces) as much as fantasized versions of these experiments (the *Star Trek* Holodeck).

With its biological infancy metaphors and presentation of the great fathers, and historical periods chronologically organized and conceptualized in terms of progress, it is clear that video game history integrates the aspects of teleological discourse to a great extent. The focus on technological evolution contributes to the promotion of immediacy as a *telos*, potentially distorting historical inspections into the early days of the medium. What defining aspects of the video game experience are likely to be obscured by such a progress-laden organization of the past? Is there a way to account for the undeniable evolution of the medium while exploring other means to conceptualize its history?

RECONFIGURING HISTORY

In their 2003 book *Digital Play*, Steven Kline, Nick Dyer-Witheford and Greig De Peuter suggest that a thorough historical examination should address the evolution and interactions of three circuits: technology, industry, and culture. The development of technological innovations and the establishment of the major industrial players that successfully marketed these innovations has taken the center stage so far in the young history of the new medium. But in order to better understand video games and conceptualize its history, the evolution of the cultural circuit, where games are created and consumed for the quality of the experience provided, deserves a lot more attention. Closer inspection reveals that any technological aspect is intertwined in a web of often conflicting design imperatives that go far beyond the fascination with immediacy. At the risk of aggravating the cultural bias toward vision, let's take the visual aspects of games as an example. Dozens of techniques have been developed over time to create in-game visuals, each strongly dependent on technological and production resources. Yet newer techniques don't simply replace those of older games;

rather, they can be classified somewhere between the conflicting imperatives of increasing the representational potential of the image, its malleability (and potential reactivity to the player), and its readability for gameplay purposes. Early video game visuals didn't simply "remediate" older audiovisual media like cinema and television; because of their procedural nature, the visual elements to be assembled and reformulated have long trailed behind the visual realism of their predecessors. Yet this very abstraction is a decisive factor in just how engaging these early games can be. Very little resources are necessary to suggest useful or harmful elements: a few carefully arranged pixels (the scorpion in *Pitfall!*, 1982) or primary colors with culturally reinforced meanings are sufficient. Elements relevant to the goals of the game are clearly detached from the background. The growing proficiency of audiovisual techniques brought with it the question of readability, and game designers have used a wide variety of strategies to address it: cinema-influenced composition and framing, translucent rendering of 3-D objects that come between the player's virtual point of view and her avatar, and sometimes obvious directional arrows or other visual cues to indicate relevant information. In the early 1990s, the development of full-motion video (FMV)³⁵ represented the pinnacle of visual realism in video game graphics, yet the technique quickly lost momentum because these sequences could not be manipulated as easily as the 2-D bitmaps, and thus came to be seen as a step back in terms of reactivity. Filled-polygon 3-D graphics, a technique that was developed as early as 1983, became the center of interest even though it was a clear regression in terms of visual fidelity.

Finding inspiration in the long history of visual representation has been a great way for games to simply circumvent the fascination with verisimilitude: abstraction has been a recurring visual style (*Tetris*, Pajitnov, 1985; *Rez*, United Game Artists, 2001), and caricature dominates at certain periods and for certain game developers such as Nintendo.³⁶ Both styles clearly accommodate the readability imperative. The evolution of video game visuals cannot be seen as a simple linear progression toward greater immediacy. Moreover, the influence of previous media, most notably cinema, is clearly visible.³⁷ Even with the development of 3-D imagery, the visual experience of games, most interestingly, is far removed from the virtual reality utopia emphasized by McMahan: a majority of 3-D games propose to control an avatar from a third-person camera perspective, which can also be controlled to some extent. This highly mediated experience—*hypermediatic*, to use the expression coined by Bolter and Grusin—might have prospered out of the simple imperative to present visual problems relevant to the game's objectives as clearly as possible to facilitate gameplay. Similar

observations can be made about the integration of complex physics, artificial intelligence algorithms, and other simulation elements in games. These developments should not overshadow the defining aspect of gaming experiences; the very nature of a game is to clearly prescribe relevant actions in order to limit the range of possibilities that the player has to consider. The purely conventional nature of certain rules and the qualitative spacing of the experience with regards to reality are major contributors to the incredibly satisfying nature of this experience. Even in simulation-inspired games, conventions abound and clear restrictions and objectives are put forward in order to maximize the potential gratification. Even when they wrap their rules in highly sophisticated and ever more realistic algorithms, games and the immersive journey they propose constitute a highly mediated experience.

Tom Gunning suggested that “every change in film history implies a change in its address to the spectator, and each period constructs its spectator in a new way.”³⁸ Defining different modes of address requires acute knowledge of the rationales that shape the decisions of game creators at any given time. To define different modes of address and their relative importance at any given time, video game studies would benefit from an extensive account of gameplay mechanics. Academic books discussing gameplay are mostly synchronic affairs; historical accounts of gameplay evolution are hard to come by. *The Video Game Explosion* features a few chapters on specific genres (“Adventure Games,” “Interactive Movies,” etc.), and the development of genre studies might attract attention to the evolution of specific mechanics. In *Half-Real*, Juul outlines two types of games, two ways of creating challenges and regulating success. Emergence involves a simple system of interacting rules that can lead to infinite variations and many satisfying performances, and is said to be “historically dominant”; “progression games are a historically new game form where the game designer explicitly determines the possible ways in which the game can progress.”³⁹ Yet this historical hypothesis is not developed further.

Similarly, conceptual propositions focused on player attitudes are seldom organized historically. Building on previous distinctions between play/game (Winnicott) and ludus/paidia (Caillois), Bernard Perron defined two major attitudes in the experience of video games: the *gamer* seeks to complete clearly defined objectives in order to win the game; the *player* can define his own objectives with no clear valorization of outcomes.⁴⁰ The integration of deeper simulation elements in games would seem to favor the player attitude,⁴¹ yet the development of this tendency doesn’t mean the progressive exclusion of the gamer attitude. In *Man, Play and Games* (1958), Roger Caillois proposed a typology of games based on psychologi-

cal attitudes: competition (*agôn*), chance (*alea*), make-believe (*mimicry*), and vertigo (*ilinx*). The typology has often been criticized for being too broad,⁴² and as Juul has argued, all these components can be found in a typical modern video game.⁴³ The historical dimension of Caillois's thesis is often overlooked, but the author did organize his typology historically by associating the rise of major civilizations with the promotion of chance and competition in games, at the expense of the make-believe and vertigo impulses.

Even if the abstract video games of early days had already strong representational undertones,⁴⁴ even if their audiovisual resources could overwhelm the senses to some extent, it is clear that the make-believe and vertigo components have been developed considerably in parallel with the technological evolution of the medium. From Pac-Man to Solid Snake, from the infinitely looping alien invasion of *Space Invaders* (Taito, 1978) to the takeover of Liberty City's criminal world, players are invited to project themselves into specific fictional characters and events that go beyond the arbitrary nature of rules; as Juul pointed out in *Half-Real*, the fictional element of games cannot be ignored. As for the vertigo component, the development of interactive imagery opened the door to vertigo-inducing effects that play a significant part in many genres (such as racing games and 3-D action games). Such an observation is rather trivial and seems to feed on the immediacy *telos* discussed in the context of this essay, with its promise of ever more realistic virtual worlds and ability to address the senses viscerally. Indeed, it should be complemented by another one, regarding the evolution of the agonistic component.

To great extent, early games correspond to Juul's definition of emergence, but his emphasis on a permissive regulation of success can potentially misrepresent the actual challenge of these games. Emergent rule systems in the early days are typically not static; as the player progresses through simple repetitive scenarios, the balance is constantly adjusted to be more competitive. Randomization (chance) did represent a low-cost means of introducing interesting variations from one playthrough to the next, but also played an essential part of increasing the difficulty level. Emergence games all obey the basic "easy to learn, hard to master" principle outlined by Salen and Zimmerman,⁴⁵ but early games appear harder to master than contemporary games. The notorious difficulty of titles such as *Donkey Kong* (Nintendo, 1981) and *Pac-Man* (Namco, 1980) encouraged a highly competitive environment where the display of proficiency in arcade parlors became an attraction in itself. As the industry progresses from this highly competitive model—where technological attractions are presented in the context of an arcade parlor in order to maximize the potential "attraction of

the self”—to the domination of home-based entertainment geared toward the gratification of casual gamers, we might have witnessed already a major change in video games’ mode of address that is echoed by the evolution of the industry as a whole.⁴⁶

In order to investigate these aspects, video game historians would greatly benefit from the elaboration of a comparative tool that is precise enough to account for the great variety of interactive encounters, yet abstract enough to avoid listing all the actual manipulations on the various control devices and their effects in the game on a case-by-case scenario. A figure of interactivity such as “combat” can be procedurally implemented in many ways, including the simple combinations necessary to produce a few kicks and punches in *Karateka* (Mechner, 1984) and the impressive roster of blows, multiform combinations, and countering abilities involved in the contemporary fighting game *Dead or Alive 4* (Tecmo, 2005). Depending on the representation of space, “spatial exploration” could be carried out in first- or third-person perspective, by lateral scrolling, square-by-square, or on the depth axis through depth cues and interpolation of 2-D objects, or in a fully realized 3-D world; the world to be explored could be opened in many directions and organized in a linear or even circular fashion. The monitoring of vital resources might involve basic physical or psychological integrity, or each of these categories could be affected by many other variables (as in the ADD-inspired RPGs that include stats on endurance, strength, dexterity, intelligence, wisdom, charisma, etc.); players might be able to accumulate some capital for each variable, and the variation of these variables might affect gameplay in a binary fashion (life/death), through various distinct stages, or in a progressive manner. Along with manipulation complexity, the study of learning curves, satisfactory performance intervals, tutorials, in-game aids, save systems, and check points from a historical perspective would allow a better understanding of the prevalent modes of address at any given time and help refine the conceptualization of video game history.

Shifting the focus from technological evolution to concepts such as attraction, immersion, and mediation, this essay illustrates some of the components glossed over by utopian teleological conceptions of the medium. Most strikingly, the attraction of immediacy that one can observe in the constant evolution of illusion-making techniques and simulation algorithms is clearly counterbalanced by the gratification principle inherent to games; the evolution of game design in relation to player gratification represents a fruitful avenue for historical investigations. To properly lay out the history of the medium, one should also consider Hans Robert Jauss’s call for the inclusion of reception as a way to reform traditional art

history. Prevalent modes of address at any given time certainly help shape users' horizons of expectations, but other contextual information is also relevant.⁴⁷ Jauss listed three areas of investigation to define these frames of experience: preliminary experience with the norms of artistic forms/genres; relationship of the work with other works in the reception context; and comparison between the poetic and pragmatic uses of language. On top of prevalent genres/influential games and the evolution of their specific gameplay mechanics, a thorough historical examination will have to consider contexts of usage, reception of these games in specialized press and online communities, statistical information about players' preferences and rituals, and much more. If different modes of address can be largely defined through the study of structural elements such as game mechanics, it is the reception pole which ultimately determines usage. The greatest advantage of video game historians, after all, resides in this simple fact: whereas contemporary researchers of the "century of cinema" don't have a single living spectator of early moving pictures, video game historians still have access to early players. Only a closer inspection of the players through interviews and field studies will lead the way to a proper conceptualization of the medium's history. By integrating field work and theoretical propositions from sociology and psychology to reform the unavoidable techno-industrial account, video game history as a discipline can truly propose a synthesizing point of view living up to the complexity of its object.

NOTES

The author would like to thank Henry Lowood for his comments and suggestions.

1. Quoted by André Gaudreault on page 115 in "Distance et Historicité: Problèmes de Méthode de la 'Reconstitution' historique," in *Le Cinéma en Histoire: Institutions Cinématographiques, Réception Filmique et Reconstitution Historique*, A. Gaudreault, G. Lacasse, and I. Raynauld, ed., (Québec: Nota Bene, 1999), 107–50. Translated by the author.

2. Ibid.

3. Mark J. P. Wolf, ed., *The Video Game Explosion: A History from PONG to PlayStation and Beyond*, (Westport, CT: Greenwood Press, 2007), 1.

4. "Electronics Conservency," Electronics Conservency Inc., accessed October 18, 2011, <http://www.videotopia.com/ec.htm>.

5. Lowood was also responsible for the academic research project "How They Got Game: The History and Culture of Interactive Simulations and Video Games." The project led to the creation of a website and the course "History of Computer Game Design: Technology, Culture, Business" in the Science, Technology and Society program at Stanford University.

6. Heather Chaplin, "Is That Just Some Game? No, It's a Cultural Artifact," *New York Times*, March 12, 2007, <http://www.nytimes.com>.
7. Kris Pigna, "U.K. Launches First Official National Videogame Archive," *Iup.com*, October 5, 2008, <http://www.1up.com/do/newsStory?cId=3170366>.
8. Each release of the same game on a different platform counts as one entry. Multiple box/media art from different countries can be stored for any game.
9. "Arcade History," accessed October 18, 2011, <http://www.arcade-history.com>.
10. See the following sites: <http://www.lemonamiga.com>; <http://www.lemon64.com>; <http://www.pcecp.com>; <http://www.atariage.com>; <http://nindb.classicgaming.gamespy.com>; <http://lucasarts.vintagegaming.org>; <http://www.dragons-lair-project.com>; and <http://www.dragons-lair-project.com>.
11. Which is not to say that the content is not reviewed by a core team member of each website; review procedures do exist, but are limited by obvious constraints.
12. See <http://www.videogamecritic.net>; and <http://www.justadventure.com>.
13. Wolf, *The Video Game Explosion*, xv.
14. Among other features promoted on their respective box art illustrations, *Cruise for a Corpse* lists "Completely interactive in full 3-D vision," the cover of *Axelay* mentions "six graphically shocking 3-D levels," and the SNES version of *Doom* boasts "FX2 Chip for screaming fast, real time 3D graphics."
15. Henry Lowood, "Videogames in Computer Space: The Complex History of Pong," *IEEE Annals of the History of Computing*, July-September (2009): 5–19.
16. Nick Montfort and Ian Bogost, *Racing the Beam: The Atari Video Computer System* (Cambridge, MA: The MIT Press, 2009), vii.
17. As of 2010, the PlayStation 2, GameCube, and Xbox consoles have been emulated to some extent.
18. The file names of the masks, from left to right: Aperture 3x6 Aaron; Aperture 2x4rb Aaron; Scanrez1 Althor; Scanlines75dx_j4.
19. Dithering is the juxtaposition of two colors in complex patterns in order to give the illusion of a greater color depth.
20. Wolf, *The Video Game Explosion*, 23.
21. The 1978 FIAF conference in Brighton represents a turning point for the history of cinema; it marks the beginning of a critical inspection of traditional accounts of cinema by a new generation of historians.
22. Tom Gunning, "The Cinema of Attractions: Early Film, Its Spectator, and the Avant-Garde," in *Early Cinema: Space-Frame-Narrative*, ed. Thomas Elsaesser, (London: British Film Institute, 1990), 56.
23. *Ibid.*, 58–59.
24. In 2000, Gaudreault and Philippe Marion proposed a complex "birth" scenario to better understand the formation and evolution of media: the "integrative birth" corresponds to the advent of an apparatus and its appropriation

by various cultural series (photography with the Lumière brothers, stage trickery in the case of Méliès, etc.); the “differential birth” refers to the advent of a dedicated institution and a clear hierarchy of practices for which the medium developed specific codes. See André Gaudreault and Philippe Marion, “Un média naît toujours deux fois . . .,” *Sociétés et Représentations*, 9 (2000): 21–36.

25. In the introduction, Burnham nuances the term classic, but refers to the selected era as the “Golden Age”; see Van Burnham, *Supercade: A Visual History of the Videogame Age 1971–1984* (Cambridge, MA: The MIT Press, 2003), 23.

26. *Ibid.*, 18.

27. Steven L. Kent, *The Ultimate History of Video Games* (New York: Three Rivers Press, 2001), 21.

28. *Ibid.*, 27.

29. Wolf, *The Video Game Explosion*, 107.

30. For example, “*Trak 10* had very basic graphics” (62) and “*Tank* had very primitive graphics” (67), in Kent, *The Ultimate History of Video Games*, 2001.

31. Carl Therrien, “L’appel de la simulation: deux approches du design vidéoludique,” in *Le game design de jeux vidéo: approches de l’expression vidéoludique*, ed. Sébastien Genvo (Paris: L’Harmattan, 2005), 175–94.

32. Chris Crawford notoriously defined good game design in terms of consistency and coherence; Janet Murray, in her discussion on agency, proclaims that “the most dramatically satisfying puzzles are those that encourage the interactor to apply real-world thinking to the virtual world.” (Janet Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (Cambridge, MA: The MIT Press, 1997), 139).

33. Allison McMahan, “Immersion, Engagement, and Presence” in *The Video Game Theory Reader*, ed. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2003), 67–86. Emphasis mine.

34. The concept of immediacy is central to Bolter and Grusin’s media genealogy; it is one of the two logics of remediation, defined as “the way in which one medium is seen by our culture as reforming or improving upon another [. . .] Each new medium is justified because it fills a lack or repairs a fault in its predecessor, because it fulfills the unkept promise of an older medium.” J. David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: The MIT Press, 1999), 59–60).

35. FMV is the brand name of various techniques allowing the playback of fully animated sequences created from digitized live-action material or computer-generated assets. It doesn’t stipulate strict norms in terms of frames per second, color depth, compression algorithms, or display size.

36. See Aki Jarvinen, “Gran Stylissimo: The Audiovisual Elements and Styles in Computer and Video Games” in *Proceedings of Computer Games and Digital Cultures Conference*, ed. Frans Mäyrä (Tampere, Finland: Tampere University Press, 2002), 113–28. Thanks to Martin Picard who brought this resource to my attention.

37. See Carl Therrien, “Graphics in Video Games” in *The Video Game Explosion: A History from PONG to PlayStation and Beyond*, ed. Mark J. P. Wolf

(Westport, Connecticut: Greenwood Press, 2007), 239–50.

38. Tom Gunning, “The Cinema of Attractions: Early Film, Its Spectator, and the Avant-Garde,” in *Early Cinema: Space-Frame-Narrative*, ed. Thomas Elsaesser (London: British Film Institute, 1990), 61.

39. Jesper Juul, J., *Half-Real: Videogames between Real Rules and Fictional Worlds* (Cambridge, MA: The MIT Press, 2005), 56.

40. Bernard Perron, “From Gamers to Players and Gameplayers: The Example of Interactive Movies” in *The Video Game Theory Reader*, ed. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2003), 237–58.

41. The complex physics engine integrated in *Halo: Combat Evolved* (Bungie, 2001) incited many players to experiment with the power of accumulative deflagration on different world objects, for example by trying to catapult vehicles to otherwise unreachable parts of a given map. It is clearly this player attitude that Bungie wanted to cater to with the addition of Forge to *Halo 3* (2007); the map-editor module allows direct control over object placement and can become a game in itself.

42. See Colas Duflo, *Jouer et Philosophe* (Paris: PUF, 1997).

43. Juul, *Half-Real: Videogames between Real Rules and Fictional Worlds*, 10.

44. The first arcade games, *Computer Space* (1971) and *PONG* (1972) had strikingly abstract universes that could nonetheless evoke specific referents (outer space and table tennis). In 1972, color overlays (such as tennis and hockey playfields), sold with Magnavox Odyssey games, added some representational value to the abstract shapes on screen.

45. Juul, *Half-Real: Videogames between Real Rules and Fictional Worlds*, 69.

46. Of course, this proposition should be nuanced by pointing out the tremendous development of competitive gaming in certain regions of the world. *StarCraft* (1998) tournaments in South Korea, to name but one example, have reached the level of professional sport in terms of popularity and sponsorship.

47. The aesthetic of reception is not only a plea for the exhaustive study of the interaction between art and its audience, but a strong case for the reformation of literary and art history. For Jauss, the historical approach should focus on the horizons of expectations that define the reception of art at any given time. See Hans Robert Jauss, *Toward an Aesthetic of Reception* (Minneapolis: University of Minnesota Press, 1982).