INTRODUCTION

In 1997, Janet Murray wrote, "For my experience in humanities computing has convinced me that some kinds of knowledge can be better represented in digital formats than they have been in print." Her book, *Hamlet on the Holodeck: The Future of the Narrative in Cyberspace*, speaks strongly to all disciplines that use computing in their endeavors, and especially strongly to history where print articles and monographs have been the norm.[2]

In 1989 the Bradley Commission on History in the Schools set out to reinvigorate the role of history in American Education. Their "Habits of the Mind," as the commission called them, emphasized the idea that history teaching needs to focus on helping students understand complex processes rather than merely the collection and memorization of discreet facts. Among their epistemological goals were the following:

- to prepare to live with uncertainties and exasperating, even perilous unfinished business, realizing that not all problems have solutions,
- to perceive past events and issues as they were experienced by the people of the time, to develop historical empathy as opposed to present-mindedness,
- to grasp the complexity of historical causation, respect particularity, and avoid excessively abstract generalizations,
- to recognize the importance of individuals who have made a difference in history, and the significance of personal character for both good and ill,
- to appreciate the force of the nonrational, the irrational, the accidental in history and human affairs, and
- to understand the relationship between geography and history as a matrix of time and place, and as a context for events. [3]

Since the commission's report came out in 1989 I have thought long about these goals and how they affect what we do as historians. As I thought of them I began to wonder if there were other methods, other mediums, that historians could use besides traditional narrative to convey these essential experiences about the past. As I thought about them I attended the 1990 Social Science History Conference (SSHA) in Washington D.C. As I often do at conferences after my paper session, I wandered into a session I knew little about, figuring it was a good way to be exposed to something new in the field. This session, it turns out, was dedicated to the mathematics of history. The panelists argued that historians were hampered by a lack of mathematical sophistication. They did not mean we should all be number crunchers and run regression analyses but rather that historians were often locked into a kind of simple algebra of "a then b then c" and that if we wanted to really understand the complexities of the past we need to take the emerging field of chaos theory and the mathematics of fractals seriously.

These mathematical systems, they argued, offered a more complex way to understand causation (in the case of chaos theory) and the relationships between historical phenomena (in the case of fractals). By a long and twisted road that session led me to take a serious look at "historical simulations." I began to
Simulations can make strong contributions to present historical processes. To illustrate this I would like to focus on a concrete example from my teaching experience. I first became interested in historical simulations through a colleague in a conversation over beer at the American Historical Association (AHA) meeting several years ago. I had worked for a long time in the microcomputer lab while in graduate school at the University of Minnesota but the focus of this lab was overwhelmingly on quantitative methods. I had played "pong" on a friend's TV but that was about it. In the course of our conversation I mentioned to my AHA colleague that I was redesigning, again, my introduction to modern world history course and I was thinking about using Paul M. Kennedy's The Rise and Fall of Great Powers: Economic Change and Military Conflict from 1500 to 2000 (New York: Knopf Publishing Group, 1989). I was very impressed by Kennedy's argument and the integration of a variety of factors to explain the shifts in global power in the last 500 years. I thought it had the potential to provide a strong narrative by which to integrate the course. The problem was that while I loved its strong quantitative, structural argument, freshmen might have a more difficult time grasping this model. My colleague suggested that I consider looking at a new computer game that had come on the market, "Civilization." The game's designers had used Kennedy as a central text with which to model their game. I used Civilization and its successor Civilization II in my class over the last five or six years. I had students read Kennedy and use his text to critique the historical accuracy of the software and I used the software to animate Kennedy's model. I have found this simulation to be a great way to represent the complexities of Kennedy's model in a dynamic, visible way.

Civilization is not a perfect replication of Kennedy's argument but the simulations animate Kennedy's model and meet the goals of the Bradley Commission. First, when students use this program in class they overwhelmingly note in their evaluations how its helps them "see and experience" Kennedy's arguments. Rather than a series of tables, the students experience the integration of his various factors in a dynamic process that they, in the course of playing the game, intuitively figure out. Geography, leadership style, economic development, and technology, rather than being static "factors" in the text, all become intertwined in a representation that is at least substantially true to Kennedy's model. As one of my students said, "All these factors come together into an interactive, visual learning tool that, to a great extent, models the case studies in Kennedy's book." And as another commented, "Civ II allows history to become interactive, which in turn makes learning fun. And not only fun but it helped me retain what I was learning better. This game really helped me analyze what the readings were arguing." This is an example of work presented by Edward Tufte's, The Visual Display of Quantitative Information, illustrating the power of visualization in comprehending information. Simulations have the capability to take that visualization a step farther by creating a dynamic model that responds to the reader in a very immediate, tangible way.
Second, the game puts the interactor in the position of being an active participant in figuring out how the model develops. Kennedy's model lives on the screen. And the game further stimulates students' understanding of Kennedy because they realize that knowing his argument helps them succeed in the game. One student, for example, noted that, "the readings from Kennedy and Headrick [Daniel R. Headrick's Tools of Empire: Technology and European Imperialism in the Nineteenth Century (NY: Oxford University Press, 1881) [8] was another of the texts used in this course] were like having a help line for Civilization II." The game is an incredibly powerful narrative tool to engage the student of history, whether that student is a college freshman or tenured professor.

Finally, the simulation does not "recreate history." While the newer versions of Civilization, Civilization II and Civilization III have a set of "historical scenarios" they do not tell what actually happened. They do allow for the representation of complex historical process in a way that is more dynamic and visual than a text can ever be. And often as historians we are not primarily interested in "what happened" as much as in understanding the range of experiences possible in a given era. As part of trying to understand what happened we often ask ourselves what could have happened and, as demonstrated by the popularity of Niall Ferguson's Virtual History: Alternatives and Counterfactuals,[9] this type of historical work is making a strong comeback. [10] Simulations, because they are designed to be tried over and over again, give the interactor a vehicle to test the range of possibilities about how a decision at one point in time could affect a wide range of possible outcomes in the future. They demonstrate the law of unintended consequences and are great tools to convey these "Habits of the Historical Mind."

Certainly much of social history's emphasis is on defining the ways in which societies, culture, economy and environment shaped the lives of ordinary people. Social history could be well represented by an historical simulation. For example, one can gain an understanding of Ancien Regime French society by playing a modest but powerful simulation called The Would Be Gentleman, designed by a professor of French history at Stanford—Dr. Carolyn Lougee-Chappell.[11]

.02 Real-Time Decisions

Another important contribution that simulations can make to the historical narrative is their ability to convey thinking in historical time. Ranke, when he defined the essence of our discipline, argued that it was the job of the historian to understand the past as it was understood by the people who experienced it. [12] Historians look to the past and try to understand the past as it was unfolding. What did an historical actor know at the time, what were factors that shaped his/her decision, what decisions could have been made and what would have been the consequences of those decisions? Crucial to this understanding is time. People act in time. A good narrative can convey some sense of the ways in which environment, the press of time, and the uncertainly of outcomes affected decisions. Computer simulations are excellent at this. In recent years computer games have become increasingly "real-time" or LARPS (live action role-playing games) rather than "turn based." What this means is that now the CPU (central processing unit) manages all the decisions, simultaneously keeping track of the actions of the interactor, the machine, multiple interactors or MUDs (multiple user domains) connected over an inter- or intranet connection. Multiple actors can make decisions at the same time. More than any historical work, these games make the player reflect on what it means to understand time's role in historical action.

One example of this sort of readily available game is a Microsoft series called Age of Empires.[13] As one plays the game, managing a society is challenging enough but one also has to respond in "real time" to the actions of all other participants. New games being developed also allow "real time" action involving not just a single decision maker but teams of decision makers, like a cabinet or general staff. Each participant in the team is responsible for an area of policy and decisions must be discussed and coordinated as the scenario unfolds. [14]

These types of games are reminiscent of the Kevin Costner Cuban missile crisis movie, Thirteen Days, that came out in 2000. It conveyed the challenges of thinking and responding in time during those crucial days in 1962. Kennedy was flooded with multiple viewpoints from advisors and generals and had to make decisions while Khrushchev, Castro and others were making theirs. As powerful as a movie can be in presenting this drama, a simulation can improve on that narrative type by putting the interactor in the position of not only witnessing decisions in "real time" but having to make them—the interactor being John Kennedy, or Kennedy's cabinet for those 13 days of October. One programmer, Steve Kent, recently noted that such a truly interactive, multi-player artificial intelligence engine "was still years off..."
Emerging technologies, especially in the area of multimedia like virtual reality and digiscents (technology that will project smells through a computer or internet connection), 3-D holograms and haptic devices will allow for tactical feedback and furthermore allow historians to convey the experience of the past in its multi-sensual nature. I have always been a fan of the Annales School and its projects in writing total history. Like many of us I encourage students to travel, to go to historical museums and living history centers as a way to get some feel for the past. Museums and historical recreations have their limits as historical representations, but they have the ability to give some texture to the past in ways a written text often cannot. Gaming technology is already integrating many of these emerging multimedia elements into popular role-playing simulations. A new car race game, for example, will use powerful new physics algorithms to enhance real-time cause and effect so that when a car skids around a corner not only will it screech realistically but it will also leave skid marks that show up when the game passes that corner again. A simulation, for example, using virtual reality technology, digiscents, and maybe even haptic technology may have the ability to provide many of the benefits of these other types of "living histories." As Janet Murray notes in Hamlet on the Holodeck, "the great advantage of participatory environments in creating immersion is their capacity to elicit behavior that endows the imaginary objects with life."

Such a multi-sensory representation of history also has possibilities in helping historians present their research. We all know from our own experience how a wide variety of factors often affect our daily decisions. We are influenced by rainy weather not only to carry an umbrella but also to eat certain kinds of food and maybe be a bit more orneriness with the people around us. Environment, smells, sounds, lighting, textures all affect how we make decisions. As historians we often try to imagine an environment and how it shaped treaty or labor negotiations. We try to glean from the documents how environmental conditions may have affected some historical moment. Might not a virtual world at least give us a tool by which to play with our imagination? Combine the multimedia architecture of the near future with the new "team-structured games" now coming on the market and we may indeed have a tool for intuiting the circumstances by which Kennedy handled the Cuban Missile Crisis or an early modern Frenchman decided to marry his daughter to the local businessman. As Pierre Corbiell said in a recent article, "Since we are trying, as historians, to understand what the historical characters were attempting to do, and how they felt their universe functioned, and trying to explain what, with hindsight and our own perspective, often appears inexplicable, the possibility of using a tool to put ourselves in the other fellow's shoes should be very attractive."

.03 Conclusion

Janet Murray noted that,

Part of the early work in any medium is the exploration of the border between any representational world and the actual world. It is commonplace in the twentieth century to point to elaborate simulations of reality (electronic and otherwise) as a new and dangerous thing, a distancing of human beings from direct experience. But part of our dismay at televised events, wax museums, and immersive theme parks, at what Umberto Eco identified as the "hyperreal" quality of much of American life, derives simply from the fact that we need time to get used to any increase in representational power. During this time our main activities, as creators and audience, involve testing the limits of the liminal world.

Murray's term, "simulation," and the more general term, "game," are interchangeable throughout this article. I have done so deliberately for two reasons. First, as Chris Crawford suggests in Understanding Interactivity, play is an essential tool for learning. And if historians are to do their job in helping students engage the past, games and play can be useful tools of the trade. Many of us in our classrooms use role playing as a way to historicize the past and promote active learning. Simulations in that sense are games but games that can be very useful pedagogical tools and, consequently, should be taken seriously by historians as a way to present their work to all kinds of audiences.
are oriented toward world conquest or military campaigns, causing many professional historians not to take this medium seriously. There is no reason why historical simulations have to be of that genre. Programs like The Would be Gentleman that were created by historians suggest that it is possible to have simulations that do have historical integrity.

For historians to use the technology available to help them present their work we not only need to accept technology's legitimacy as a communication tool but we also need to learn the technology so that a) we can critically evaluate its usefulness and b) we can use technology for what we want to say about the past rather than have the past interpreted by Mattel or Microsoft. Although not a programmer, I do at least aspire to understanding enough about IT in all its aspects that I can meaningfully interact with the programmers of the world (maybe at Mattel or Microsoft) and insure that their games become meaningful historical simulations.

Civilization in its various incarnations has sold well over a million copies. Age of Empires and SimCity must be up there as well. These are international sales. A colleague of mine who teaches Chinese history told me about a good friend in China whose teenage daughter had fallen in love with Age of Empires. There are Civilization game and discussions sites on the web from at least a dozen countries. As an historian, I have always felt that historians have a responsibility to help not only our colleagues and our students, but also the wider public embrace and understand the past. And the reality is that when those millions of people, of all ages and nationalities, play Civilization they believe that in some way they are doing history. It is our job to insure, as much as we can, that these games have historical value.

Movie reviews are now a regular part of the American Historical Review. Films like The Return of Martin Guerre have shown the power of that medium to present history accurately when an historian is involved in the project. I hope that the games of the present will also become meaningful representations of history in the near future. Historical simulations are, by definition, not history as it actually happened. But few historians today hold on to that "noble dream" that traditional historical narratives are either. The past is, at best, a jigsaw puzzle for which we have half the pieces. It is the job of the historian, using rigorous methodology and imagination, to finish the picture. New breakthroughs in information technology give the historian powerful new tools to represent the past in all its complex, dynamic, multi-sensual nature and to help us imagination how the pieces may fit together.

To read panel introduction, click here.

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NOTES

1. An earlier version of this article was presented at the American Historical Association meetings in Boston on January 6, 2002.


10. See also William Honan, "Historians Warming to Games of 'What If?'", *New York Times,*


14. Such technology may help dampen one concern with simulations, namely that they place too much emphasis on a single decision maker—the so-called "God complex."


17. Digiscents, the company developing the iSmell box that could project various odors when interfacing with a computer, was forced in the recessionary times of the past few years to close it doors. It is uncertain what will happen to the company but it is likely that the technology will reemerge in the not too distant future. Ronna Abramson, "Sniff-Company DigiScents Is a Scratch," The Industry Standard, (April 2001): http://www.thestandard.com/article/0%2C1902%2C23654%2C00.htm, (November 11, 2002).; For #D holographic advances see http://www.technologyreview.com/articles/focuson1102.asp, (November 11, 2002). For emerging haptic technology see http://www.computerworld.com/cwi/story/0,1199,NAV47_STO52067,00.htm (November 7, 2002).

18. Brad King, "They Weren't Meant to be Games," Wired Magazine On-Line, (September 2, 2002), http://www.wired.com/news/games/0,2101,54233,00.html. King notes, for example, how Hollywood is creating simulation games based on movies like James Bond and *Lord of the Rings* that have video quality to the graphics. Sports video games are another huge market for these emerging technologies.

19. Murray, p. 112.


22. See *SimCity* at http://simcity.ea.com/.

23. See, for example, the multilingual *Civilization III* site at http://www.civ3.com/.

If we think that "history" should be informed by the ways in which historical events were experienced by individuals, then we must also address the question of how to use the evidence of memory as a prism for attributing subjective, lived experience to the people who lived this history. If we are interested in the Great Leap Forward famine years, for example, we need to know more than the timeline of harvest failure or the map of grain distress across China; we need to know how various groups experienced this time of hardship. Another important contribution of the volume is the emphasis it offers to the idea of the agency involved in memory. Memories must be created; agents must find frameworks within which to understand their moments of historical experience.
In contemporary historical theory the topic of narrative has been the subject of extraordinarily intense debate. Looked at from one perspective, this is surprising; for on the face of it there should be very little to debate about narrative. Narration is a manner of speaking as universal as language itself, and narrative is a mode of verbal representation so seemingly natural to human consciousness that to suggest it is a problem might well appear pedantic. But it is precisely because the narrative mode of representation is so natural to human consciousness, so much an aspect of everyday Historical simulations and the future of the historical narrative. Journal of the American Association of History and Computing, 6(2). Retrieved March 16, 2007, from http://mccl.pacificu.edu/JAHC/JAHCVI2/ARTICLES/taylor.HTML. 53. Todorov, T. (1971, Autumn). The 2 principles of narrative. Diacritics, 1(1), 37-44. 54. STARPOWER is a powerful simulation that shocks participants into a realization of the effects of power on both ruler and ruled. Its effect depends partly on the absence of a time horizon to guide the relationship between the groups and to give perspective STARPOWER is a powerful simulation that shocks participants into a realization of the effects of power on both ruler and ruled.