The Construction of Civilization

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My approach in this paper is not a comprehensive history of Sid Meier's *Civilization* series. I have little interest in reciting a general account of the series' development or the early history of its developer Microprose, the company founded by Bill Steele and Sid Meier. My purpose is to provide a few methodological incursions into different, fragmentary pieces of the series history and engage with the games on technical, social and design-centric grounds not usually mentioned in general popular histories. I want to highlight the process of historical study and the many paths revealed in looking deeply into a computational object; seeing it situated in a design tradition and in the context its larger influence on a society of players.

Most histories of computer games are framed in popular or journalist language (see Herz, King, Kushner and Sheff for examples) aimed at selling to fans of games in general or of a particular title. Such histories are not looking deep into the technical underpinnings of the objects, and are generally uncritical. They seek to entertain and popularize, not problematize and explain. Computer games are complex items, a new media form situated at the convergence of computation and society. They are the expressive medium most apt to examine and reveal life in the current century and they deserve a deeper historical foundation.

The work presented below is simply my examinations of the various types of historical narratives revealed as I chipped away at the fractal, crystalline complexity of the *Civilization* series. My initial interest stemmed

from archival work for the Preserving Virtual Worlds II project. I wanted to telegraph how future researchers might use an object like *Civilization* and from there developed a number of fragmentary, non-linear, and multicursal perspectives on the games in series and individually. To clarify, this examination is of both the evolution of Sid Meier's *Civilization* series and a sometimes micro-focused look at its individual titles.

All details of the games development will be introduced through a fragmentary structure, the important thing is that each narrative is a perspective on the historical study of games in general. The *Civilization* series served as a model because of its long history, involved player community, open sourced code and interview-able constituents.

Fragment 1: Popular

The popular perceptions of the development and importance of the *Civilization* series tend to center on Sid Meier's position as its principal designer. His name has preceded the titles of numerous games, beginning with Sid Meier's Pirates in 1987, and cemented a popular perception of Meier as a modern day game design "god" (PC Gamer, "Game Gods"). The attention paid to Meier's contribution to the series generally overshadows the deeper development story, one that involves countless individuals working for literally decades to get the *Civilization* series to its current cultural prominence. The history of the series in modern gaming press is generally relegated to either a blurb in a "top games of X" list, a fan-centric evaluation of how "awesome" the game is or a nod to its addictive play.

This singular designer focused, fan serviced history is no better encapsulated than in a G4 TV special on the creation of the *Civilization* series. Featuring short interviews with Sid Meier himself, the half-hour documentary finds other designers and members of the press lauding the achievements of his work as "perhaps the greatest game ever", paying little attention to its design influences, its growth as a series, or the contributions of the designers past the game's first installment. The focus on the initial game and its initial designer clouds the perception of the series as a whole. The most significant omission

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being that the series has had seven principal designers and that even the first title in the series was co-developed with another Microprose employee, Bruce Shelley. The G4 example is a single manifestation of a general trend in pop game journalism. There are other more developed popular histories that account for some of the criticism here, but not all of it (see Bogost and Montfort, Maher and Peterson).

Perhaps the two most prominent popular and journalistic accounts of *Civilization* are Benj Edwards's history of *Civilization* for the Gamasutra website, and Troy Goodfellow's history in the companion booklet for the *Civilization* Chronicles boxed set. That the most extensive resource for the *Civilization* series development is in a rare collector's edition should hint at the level of historical inquiry this series has received. The Gamasutra article does a decent job recounting the multiple influences on the design of the original *Civilization* and does highlight Bruce Shelley's role as a fervent tester and design influence, but there are still references to Sid Meier's "genius" and the history is presented as a chronology of events leading to the game's release, there is little mention of why certain design choices were made and how the game itself was organized, experienced or received.

Troy Goodfellow's work is probably the most comprehensive general history of the series, highlighting the major designers and enumerating numerous design influences (*SimCity*, *Empire*, *Populous*) on the development of *Civilization*. The voice of the article is still partial to sometime superlative exultations of Meier's skill or the designers' acumen for addictive game play, but on the whole it presents a balanced, un-nuanced account of the series development. It does not mention much in the way of community involvement or the evolution of game play features, choosing to mostly focus on the major designers and the history of the series' trajectory through different development studios. The history provides good context for some of the series' design decisions and influences but it's still possible to explore further below the surface and excavate some more meaningful layers.

Fragment 2: Development

The development history pursued here differentiates from the popular history in that it is primarily concerned with details of technical design decisions and how they shaped the played experience of the *Civilization* series. A major aim is to make targeted interventions into the main narrative of the series' development in a way that can inform and aid future programmers and designers. To focus this example, the narrative here will briefly follow the implementation of user modifiable content (mods) in the *Civilization* series. It will outline the roots of the implementation strategies, the motivations of the designers and offer descriptions of how mods are created and integrated into the history of the series.

Generally a game program will consist of a main executable file that then allows various asset files to be loaded into the game as needed. That single executable file contains binary code that has been compiled from the game's source code. In this case the resulting file is a binary representation of x86 assembly code. The important thing here is not the specific processor encoding but the fact that after compilation it becomes much harder to modify the game executable. Many people did modify the original *Civilization*'s byte code ("Modding *Civilization I*"), but this required specific technical knowledge beyond the level of even an avid computer user. Modders managed to update the art asset files and even decompile the byte code, but it was far from a user-friendly process. As a result the original *Civilization* is the least extensively modified of the core series.

Brian Reynolds, the designer of Sid Meier's *Civilization II*, had a background ripe for modifiable fruit. As a child he learned programming, in part, from modifying the open source FORTRAN code for the seminal text adventure game Adventure. In college he spent a lot of time hacking on the code for the strategy game Empire, to the point that he was, "thoroughly steeped in the lore of just-one-more-turn 4X games even before I 'wrote one' in the form of Colonization" (Reynolds, "CivFanatics Interview"). Sid Meier's Colonization, his first original design for Microprose, was effectively a

modification of *Civilization* that focused on the exploration and conquest of the New World. As a result of his strategy experience and his development of Colonization, Microprose asked him to begin work on what would become *Civilization II*.

Unlike the development of the first title, Reynolds decided that the new game's architecture should actively encourage modification. Although there was still a core, closed executable file, the games rules and some features were actually located in plain text files easily readable by any player. Many aspects of the game: units, civilizations, technologies, even the credits, could be modified through readable text without the need for programming skill. The art assets were also editable and included as sprite sheets, large bitmap files containing most of the game art in a single image that is then partitioned into the smaller images for use inside the game. In addition to the opening of assets, Reynolds also developed a map and scenario editor to accompany the main game. His dedication to this feature resulted in a frantic scramble towards the end of development with him ignoring numerous bug fixes and game polishing to ensure that players could create their own campaigns and maps (Reynolds, "PVW II Interview"). The work paid off, however, in that many of the user-generated scenarios enabled by the game ended up included in future, official releases and expansions. Reynolds background as a modder allowed him to create a game that he himself would have loved to toy with in his childhood.

The modification tradition continued with Sid Meier's *Civilization III*, but followed the implementation strategies from the previous title. More importantly, Soren Johnson joined Firaxis (Meier, Reynolds, and designer Jeff Briggs had left Microprose to found their own company) to help co-design and program *Civilization III*. His interest in the series developed while completing his Computer Science degree at Stanford, leading to participation in online forums about *Civilization II* and it attendant scenario creation. Johnson took the role of lead designer on Sid Meier's *Civilization IV* and began a total redesign of the games core architecture. Besides moving the game into three dimensions, Johnson also used his deep knowledge of the *Civilization* mod scene to implement features that he knew would be appreciated. The game's engine was

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then split into two separate code bases, the major graphics engine and non-gameplay code was written in dynamically compiled C++ while the game play and rules were written in Python, an interpreted language. Because interpreted code does not need to wait for compilation, it was now possible to modify game rules and immediately see the results. An interface was used in which the core C++ engine would have hooks designed to call specific Python functions, functions that could now be modder defined. Firaxis also released the full source code for the core engine shortly after the game's release, giving modders the ability to totally rewrite any aspect of the title. This allowed for "total conversions" where a game is modified to the point that most assets and core gameplay have been altered to express a new theme.

Civilization IV's modifiability bestowed it a rather long life, with an active modification community now eight years after its initial release. Sid Meier's *Civilization V*'s main developer, Jon Shafer, was a *Civilization IV* Python modder before being hired by Firaxis to work on future *Civilization* titles. Essentially, individuals who had learned to program through modifying *Civilization* games ended up architecting newer entries in the series to allow the customizability they had hoped to have as players and modders. This feedback loop is particularly strong in the *Civilization* series due to its open nature, but also applies to many other popular games. It is generally ignored.

Fragment 3: Community

Community involvement began on Usenet following *Civilization*'s release in 1991, expanding dramatically with the co-temporaneous adoption of the World Wide Web around the time of *Civilization II*'s release. The series' most popular user communities, CivFanatics and Apolyton, initially formed at that time as places to share player-created *Civilization II* maps and scenarios. Daniel Quick, Apolyton's co-founder, attributes the community's formation as incidental to the modding community, players would come for the files and realize that others on the forums also liked to talk about *Civilization* (Quick). Apolyton began as the "Ultimate *Civilization II* Fan Site" in 1996 and then merged the next year with a popular Greek fan site, thus the Greek origin of the

site's name. The community steadily became influential in the development of the series, with developers frequenting the site for feedback and publishers sponsoring contests. Key future developers Soren Johnson and Jon Shafer began their involvement with the series as Apolyton forum members, with Johnson discovering job openings at *Civilization III* developer Firaxis from a forum post (Johnson 73). The back and forth with the community resulted in the foundation of the "Frankenstein" group, a collection of forum members and hard-core players that functioned as an extension of development efforts (Quick). Granted early access to game play builds, these player provide expert level feedback as ambassadors for the concerns of the larger player base.

Communities are significant factors in the development of most games, especially those popular titles with established communities, and they deserve a focus historically beyond the simple fact of their existence. How do the communities shape design and influence play styles? What has been the player legacy on the formation of the *Civilization* series? These and similar questions still need focused and significant consideration for a wider view of the design landscape.

Fragment 4: Lineage

The core gameplay of the *Civilization* series revolves around the management of the map. Each game world is broken into tiles, representing different geographic features: water, mountains, plains, etc. The player founds a city tile and proceeds to expand by using resources available to that city in the construction of units or buildings. All production is centralized in the city tiles, and each different production goal requires a set numbers of turns to complete. Because expansion happens sporadically and resources arbitrarily placed, production queues become temporally disjoint. Any new turn brings with it the potential for a new unit or advance, and leads to the addictive "just one more turn" game play highlighted by its developers as a key appeal of the series. This core dynamic, tile-based production based on discrete resources, is found throughout the strategy genre. The focus here will be to explain how this feature may have leaked into the *Civilization* franchise and illuminate a piece of

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the long, transmedial history of its creation. The point is not to fixate on who was the first to use this trope, but to show that with even a cursory snoop (around the Internet and through interviews) it's possible to immediately problematize the idea of the originality of any game concept. The genius inspiration is actually based on the compilation of previous ideas and the *Civilization* series, and by extension the development of game mechanics and dynamics, is no exception.

In 1938 a group of UC Berkeley alumni, including Stillman Drake, developed and played a strategy game that featured production of units by specific tiles based on discrete resources. The rules of the game feature instructions like, "one steel and one oil on any seaport... could be converted into a ship…" and "one gold and one steel fortified a point" ("Summary of 1938 Rules"). While this is the earliest mention of the mechanic I have found, the importance is that when the game was revived by Stillman's son, Dan, in 1960, the basic gameplay was also reintroduced. Dan Drake had been a fan of Diplomacy, released in the late 1950s, and remembered a game that his father had mentioned years before. He reintroduced it to Reed College and formed a club of players whom shared a board in one of the common areas of their dorm. The game play was complex in the pre-computation era, and the board was left out at all times so that players could devote sporadic free time into their long (sometimes over thirty minute) turns. The game was a staple of Reed culture for the next decade and inspired digital conversion almost immediately.

Peter Langston in 1972 and Walter Bright in 1978 both developed computational versions of Empire for PDP workstations. Langston's earlier version is a direct descendent of the Reed College version, as he had visited and seen it played (Langston). Bright is adamant that his Empire, derived from his own physical version, was completed independent of the Reed game. Although Bright's Empire is very similar mechanically to the other versions, including the use of tile-based production turns, it is also possible that he was only influenced by general table-top gaming trends. The important thing is that the transmedial adaptation of the game's basic mechanics translated well to a network computer. Turns could be completed much more quickly with the

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computer now keeping track, and the turn-based structure created definitive state for saving, recording and sharing games.

The digital versions of Empire remained popular well into the 1980s, to the point that the game is credited by Reynolds, Meier and Shelley as a major inspiration for *Civilization*. Reynolds initial motivation for a modifiable *Civilization II* was based on his experience with Empire. And according to Shelley, at one point "Sid asked me to list 10 things about the game Empire that I would change…" during the research for *Civilization* (Shelley). The basic structure of Empire and its core resource mechanics both ended up as a staple of the *Civilization* franchise but this lineage was not a foregone conclusion. Meier and Shelley iterated through real-time simulation and a timer-based game before incorporating the pace and play of Empire. The form of tile-based unit production and resource management has a deep and still unmined history. It should be possible to follow most other aspects of *Civilization*'s play in a similar manner.

Fragment 5: Phenomenology of Play

An oft-overlooked masterwork in game studies is David Sudnow's 1983 phenomenological treatise Pilgrim in the Microworld. Unlike most any other book about computer games, Sudnow, a UC Berkeley trained philosopher, presents a 150 page experiential description of Breakout for the Atari 2600. From a game consisting of a single rectangular paddle reflecting a ball towards rows of destructible bricks, Sudnow manages to engage with many of the experiential and narratological issues of computer game studies 20 years before the field's formalization. He expertly articulates feelings of obsession, compulsion and revelation associated with the flow of a good game play experience; constructing his own rationalizations for the algorithms behind the game and focusing a fanatical eye on every design decision.   His quest for perfect play leads him to visit Atari circa 1982 where he obsessively grills the game's programmer (whom he fails to name) about its hidden secrets and combinatorial processes. Sudnow's historical account is positioned far from the staid, chronological popular history of the game. He captures the experiential

underpinnings of a popular game at its peak. His expressive writing is the ultimate in fan history, with pages devoted to the simplest gameplay action. It presents a partial view into the mind of a lead user, a person singularly devoted to revealing the inner workings of the closed systems of a game.

While any attempt here to treat *Civilization* with the same deep fascination as Sudnow would certainly end in failure (I'm interested, not totally obsessed), it is worth investigating how describing the act of engaging with a game as an experience can be fruitful in understanding its historical moment. Here, given the preservationist origin of this inquiry, I'm going to expose some of the annoyances inherent to studying older computer games, and hopefully have something to say about the experience of *Civilization*.

To actually play a 20 year old computer game in anything remotely resembling its original state, one needs to find a copy of the game. Luckily, due to the series' popularity, acquiring original versions of both *Civilization* (for DOS and Windows 3.1) and *Civilization II* (for Windows 3.1 and 95) wasn't too much hassle. A greater hassle was ripping the contents of the 3.5" diskettes using a USB floppy disk drive and then installing them on a virtualized DOS instance running on my MacBook Pro (OS 10.8 Snow Leopard). DOSBox is an open source virtual machine that mimics the functionality and interface of MS-DOS, allowing the user to mount disk images for installation and play. Because Windows 3.1 was actually a DOS-based program I also had to acquire a copy of that and install it as well. Windows 95 is not DOS-based and requires a different collection of software to emulate correctly. During installation additional requirements popped up, selecting a sound card and video driver (both of which are not insignificant emulation issues) and enabling mouse control (as *Civilization* can be played with only a keyboard).

After installing the original *Civilization* into Windows and MS-DOS, noticeable graphical differences arose. The Windows version featured the use of windows for the different partitions of the game screen, had more color and much higher resolution. It also took advantage of system defaults, replacing all fonts and common UI elements (like radio buttons) with Windows analogs. The

MS-DOS version retained the font text Sid Meier had designed for the original version of the game (Meier). This little graphical nuance of the MS-DOS version is effectively eradicated in many modern re-releases of the game. It is a charming detail of a development process that originated with only two people attending to every minute aspect of the game.

Civilization II's installation featured a surprising and nostalgic trifle. A program appeared and attempted to ascertain the graphical capabilities of my virtual machine. A box appeared with a mess of interconnected red ribbons that sporadically jiggled and scaled (probably to test bitmap redraw timing and frame rate) before either disappearing or freezing the installation. This intermediary program is something I remembered from numerous installations in my childhood, but that I had totally forgotten and not seen mentioned anywhere in preservation discussions. How many more diagnostic or forgotten pieces of software are there?

The last note for *Civilization II* is perhaps most telling. According to Brian Reynolds, the development of *Civilization II* specifically for the Windows platform was one of the keys to its success. In fact, the game did not run in a full screen mode by design. Players were expected to take advantage of the window-y nature of Windows and move individual elements of the UI around at their leisure. Reynolds believed that since the game could coexist with other open windows in the desktop ecosystem players ended up leaving it running longer and playing it more since it did not feature a jarring transition to full screen. The Windows 3.1 version of *Civilization II* also took advantage of this windowed style, much in the same way as the updated *Civilization* described above. This historical interface is the type of detail totally absent from most considerations of game scholarship; it's necessary to excavate such details by diving into the past in an informed and properly mediated fashion. Otherwise there's the risk of missing something fundamental and obvious from the player's point of view.

Conclusion

The attempt here, however scattershot, has been to briefly track across different segments of historical inquiry available to someone looking into the history of the playable experience. It is not trying to be totalizing in its approach, if that is even remotely possible, but rather to present the types of inquiry that a game design history would need to consider. To move the medium forward it's necessary to analyze its history as designers, programmers and players, understanding why certain traditions work and why specific objects flourish while other fade away. There is much potential in these histories, we just need to stop ignoring them and their influence.

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