Sports, Repetition, and Control in Shane Carruth's <u>Primer</u>

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Sports serve as a metaphor for control and its loss in <u>Primer</u>, a film by Shane Carruth that won the 2004 Sundance competition for Best Dramatic Film and that explores a series of complex paradoxes about time-travel. The two main characters, Abe and Aaron, have to compete with each other and copies of themselves to control the future. This convoluted scenario is initially mediated through basketball and football--sports that the characters are shown playing at a level on their own and also watching repetitively through their temporal loops. After a brief introduction to the film's difficult plot and conceptual structure, I analyze the specific instances of sports as a controlling metaphor and use the concept of <u>agon</u> to describe the contest between Abe, Aaron, and their copies for the control of their demiurgic reality. After this metaphorical analysis, I conclude with a discussion of <u>Primer</u>'s metaphysical claims about repetition, control, and power.

Many viewers have found the film puzzling. Its official website[1] contains a forum where viewers as of November 2005 have posted over 6000 messages, the majority of which relate to the explication of the film. Of the more than seventy reviews indexed at the Internet Movie Database,[2] most remark upon the film's difficulty or even opacity. Here's a representative quotation from Roger Ebert's review:

> The movie delights me with its cocky confidence that the audience can keep up.
> <u>Primer</u> is a film for nerds, geeks, brainiacs, Academic Decathlon winners,

programmers, philosophers and the kinds of people who have made it this far into

the review. It will surely be hated by those who "go to the movies to be

entertained," and embraced and debated by others, who will find it entertains the

parts the others do not reach. It is maddening, fascinating and completely

successful. (Ebert par. 8)

Though not everyone agreed with Ebert's conclusion, the film's apparent intellectual challenge

has been almost universally recognized. I will now briefly describe the film and attempt to

explain why it is so difficult and how this difficulty serves as a representative strategy of a

complex sociohistorical moment.

Four friends in a Dallas suburb--Abe, Aaron, Phillip, and Robert--have a garage

company. They sell hand-assembled JTAG cards, used to allow computers to interface with other

digital devices for diagnostic purposes, to raise capital for their engineering ventures. The

company's research project is determined by one of the members on a rotating basis. Currently,

they are experimenting with some type of superconducting device. Abe and Aaron discover that

it is apparently producing more energy than it consumes for brief periods of time. Alarmed and

intrigued, they decide to keep this finding to themselves until they can more fully explore it. Abe

discovers that there seems to be a time-distortion function involved. Later, he reveals to Aaron

that a fungus growing on a children's toy, a manikin called a "weeble," in the device secreted

more protein than it possibly could have in that amount of time. Having, at this narrative

iteration, figured out the implications for the device first, Abe tells Aaron about how he built a

large enough box to contain him and used it to go back in time.

Abe introduces Aaron to his device slowly, leading him through the chain of thought that

led him to discover its properties. At this point in the narrative, it becomes particularly difficult

to determine at what point in the embedded sequence we are. As the characters discover that they can use the boxes to travel backwards in time,[3] they create copies of themselves within the same time-line; and we have no way of determining how many times the characters have used the boxes by the time the film's first revelation of their use has occurred. There is a phone message, played at different intervals and apparently made by one of Aarons' avatars,[4] that may suggest that Aaron was the first to build the box and travel backwards in time.

From the moment of the time travel revelation, Abe and Aaron first attempt to utilize their ability to make a fortune on the stock market. Gradually, however, they realize that their technology gives them a limited degree of omniscience. The next event that they choose to recast involves a party where an ex-boyfriend of Abe's current girlfriend Rachel threatens her and other partygoers with a shotgun. It is hinted that many, many cycles are needed to manufacture the desired outcome. A further complication arises when Rachel's father, Thomas Granger, who was originally tapped by the four friends[5] as a source of funding seems to have somehow created his own box and followed Abe and Aaron through one temporal loop. Abe's proximity to Granger caused the latter to go into a kind of recursive shock. From here, things become complicated. Aaron attempts to overwhelm his past self/selves through tampering with his own food and possibly through the use of an enervating gas. After a confrontation of uncertain provenance at the airport between Abe and Aaron, in which Abe warns Aaron that he does not know what he's capable of and to stay away from "them,"[6] the film's final scene shows Aaron at what appears to be a large warehouse or airplane hangar, shouting instructions through a French translator: "Every half-meter, everywhere." We are left to conclude that this might be a very large box, perhaps capable of taking an army back in time, though Aaron's motivations are unclear.

Though the events depicted and suggested in <u>Primer</u> are extraordinary, the film's

representation of them retains exceptional fidelity to ordinary suburban white-collar life and the social norms of middle-class America. Abe and Aaron dress, act, and think like the American engineer moyen sensuel--they are pragmatic, diligent about their work, and frugal with their expenditures, at least at first. Carruth's director's commentary suggests that the only two cities in the United States were New York and San Francisco; everywhere else is a just interchangeable suburbia with different weather. The use of basketball and football within the film would seem to just be part of Aaron and Abe's frame of reference. Team sports are part of the mental backdrop of American life at various social classes. In white-collar corporate culture in particular, team sports provide a way for unequals within the corporate hierarchy to communicate and bond with each other. Prominent social critic Noam Chomsky has observed that the level of knowledge the average American accumulates about sports is remarkably detailed--a fact that would seem to serve as an instrument of social control, as citizens who were as well informed about political decisions that actually affect their lives as they are about sports which do not, at least on a direct level, then there would be far greater potential for social change.[7] So, then, the interest in sports shown by Abe and Aaron in the film is explainable as simple realistic detail. Most people like them are in fact habitual observers of college and professional athletics, and a sizable minority participated in these sports at some level in their schooling.

I want to describe how Primer's immanent logic works, however, and within the film's system of ideas, sports takes on a greater meaning. One of the more direct ways in which athletics is used within the film is to distinguish Abe and Aaron and to shed more light on the nature of their previous friendship. There are three moments in the film where one or both of the characters are shown engaging in some type of sports-related activity. Aaron and Abe shoot wadded-up pieces of paper at a wastebasket in their hotel room, while they sequester themselves

in an attempt to avoid causality paradoxes. Also, Abe and Aaron are shown casually tossing a football to each other in the same hotel room. Finally, Aaron shoots hoops with some coworkers, during a point in the film that is meant to reveal the extent to which the pair is engineering the future encounter with Rachel's ex-boyfriend at the night's party. Two other spectatorial events occur, with Abe and Aaron watching a basketball game they have already seen in their hotel room, and Aaron claiming to be listening to the University of North Carolina versus University of Michigan basketball game[8] on his earpiece during the first revelation of the time-travel machine.

In each of the athletic events that the characters engage in, Aaron is clearly not skilled. His basketball shot, both on the regular court and--to a lesser extent--with the wastebasket is halting; and he cannot throw a football as naturally as Abe. The actor who plays Abe, David Sullivan, played football at Baylor University. Assessing the relationship of athleticism to material success in American culture is difficult, but there certainly exists the stereotype that more athletic males tend to be more successful in their future careers and more successful, generally speaking, socially than their peers. A further, even better known and more likely to be universal, stereotype is that the very studious and clever tend not to be athletically gifted and consequently are socially awkward. This awkwardness translates most familiarly into a lack of courting success.

Aaron, however, is married and has a child. Abe has a girlfriend, Rachel, to whom he appears more indifferent than Aaron does to his wife. Though in itself this relationship status does not suggest anything, it does shed some light on the final confrontation between Abe and Aaron in the airport. Abe warns Aaron against coming back to do anything to "them," also advising in a minatory fashion that Aaron does not know what he is capable of. If "them" refers

to Aaron's wife and child, why does Abe think that Aaron intends to do something to them? Why is he worried about protecting them from Aaron? One explanation might be that Abe was formerly in love with Kara, Aaron's wife. They have, after all, been friends for a very long time. The film's voice-over, which seems to be a phone message left for Aaron (or Abe) by one of his avatars, emphasizes that one Aaron lost a conflict with another because he simply did not want it enough. Perhaps this sentiment may reflect back on an earlier struggle (or imagined struggle born of resentment) for Kara's favors between Abe and Aaron, one which has subsequently constrained the development of their relationship. To consider this dynamic between the characters, I want to return briefly to the concept of immanent logic.

By "immanent logic," I mean how the elements of the film (or a text, more generally speaking) relate to one another as opposed to referents without. When a film such as Primer contains fantastic elements, it is tempting to consider them specially revealing transformations of the film's latent core. For example, if Carruth wanted to dramatize an ordinary homosocial conflict between two male friends, the increasingly apocalyptic struggle with time might only represent emotion otherwise unexpressed. There is a literally enacted repetition-compulsion in the film's time-travel scenario. Repetition, which Freud called "the expression of inertia inherent in organic life" (612), is the basis for the struggle between Abe and Aaron (and their created selves). The last revision of history is the only one that matters, but the trick is to be able to prevent the desired outcome from being altered. The parabolic form of the time-travel mechanism subverts inertia by allowing it to be turned back against itself. I want to discuss how the psychological conflict between Abe and Aaron is represented in the film's symbolic economy and explain in particular the role of repetition within their agon.

The term "agon" is particularly suited to describe the film's events because of how it

entails the site of a specific conflict and how it invokes a highly ritualized contest between two competitors, to be judged by a listening audience. Another, less immediately obvious, reason is its suitable alliteration. Though there are several reasons why "Abe" and "Aaron" might have been chosen as the characters' names, the alliterative congruity with "avatar" and "agon" should not be overlooked. In the analysis of games, "agon" was used by Roger Caillois to describe one of the four fundamental categories:

> A whole group of games would seem to be competitive, that is to say, like a combat in which equality of chances is artificially created, in order that the adversaries should confront each other under ideal conditions, susceptible of giving precise and incontestable value to the winner's triumph. It is therefore always a question of a rivalry which hinges on a single quality (speed, endurance, strength, memory, skill, ingenuity, etc.) exercised within defined limits, and the winner appears to be better than the loser in a certain category of exploits. (14)

Caillois' other categories,[9] "Alea," "Mimicry," and "Ilinx," are relevant to Primer and other fictive representations of the game situation, as the categories are not mutually exclusive. "Alea," which emphasizes the role of chance, is particularly interesting in that chance is almost wholly excluded from the film's metaphysic, but it still intrudes. "Mimicry" is of direct relevance, as the characters have to communicate with their past and concurrent selves who may also have been contacted by different versions of themselves, with different and often competing motives. Finally, "Ilinx," or the pursuit of delirium or vertigo (literally "turning in a circle," befitting the film's obsession with the recursive), becomes an unavoidable existential motivation.

How does the agon between Abe and Aaron begin? There is no clear answer to this question. To answer it requires the establishment of priority, i. e., which character first built the

box in the initial timeline and which was able to go to most distant point backwards in time to reestablish his initial priority. The scale of Aaron's ambition in the final scene could be, if the French-speakers are taken to mean that he has hired Foreign Legion mercenaries in Africa, to extend to the dawn of human evolution. In any case, the ending of the film suggests an imperial ambition.

The characters' ambition becomes imperial through repetition and paranoia. Carruth has indicated in an interview with Anne Strainchamps that he was very influenced by <u>All the President's Men</u>. The dynamic of two characters who are attempting to solve a mystery piece-by-piece is how Carruth described the influence, but Alan Pakula's exploration of paranoia and the political also seems important. Fredric Jameson has described the centrality of the Library of Congress in particular and that of architecture and space in general to <u>All the President's Men</u>:

> For it is the impossible vision of totality--here recovered in the moment in which the possibility of conspiracy confirms the possibility of the very unity of the social order itself--that is celebrated in this well-nigh paradisal moment.[10] That is then the link between the phenomenal and noumenal, or the ideological and the Utopian. This mounting image, underscored by the audible emergence, for the first in the film, of the solemn music that so remarkably confirms the investigation's and the film's <u>telos</u>, in which the map of of conspiracy itself, with its streets now radiating out through Washington from this ultimate center, unexpectedly suggests possibility of cognitive mapping as a whole and stands as its substitute and yet its allegory all at once. (79)

Abe and Aaron, by contrast, do their research into the future and totality in a local branch library. The library itself, like the other locations in the film, is purposefully without identity. It could be

any suburban public library in the country, with its bank of slightly obsolescent terminals and vaguely modernist architecture. All the President's Men takes place in an almost pre-Internet era, of course,[11] and Primer maps the ultimate center of its progressive totality from Anywhere, U. S. A. The public library is where Abe and Aaron carefully begin accumulating their fortune in stock trading, in order to attain security. This mundane economic activity, what Carruth noted humorously begins within twenty film seconds of discovering time travel ("Interview"), establishes the necessary repetition which will spiral, in Primer's telos, into imperial paranoia.

Repetition and the desire for control combine, in a recursive process, to create an ethical strange loop within the film's immanent logic. By "strange loop," I refer to Douglas Hofstadter's definition in Gödel, Escher, Bach: "The 'Strange Loop' phenomenon occurs whenever, by moving upwards (or downwards) through the levels of some hierarchical system, we unexpectedly find ourselves right back where we started" (10). Carruth's director's commentary indicates his strong interest in nonlinear dynamics, where the concept of "strange attractor" figures prominently. A strange attractor is a mapping of a dynamic system with a complex or chaotic structure. It reveals unusual sensitivity to initial conditions. Once the time travel has begun, the feedback process resulting from the "endless permutations" of the characters' travel and duplication confirms to an unperceivably chaotic master pattern, a strange attractor. Through the film's sequential movement through this convoluted system, however, the basic struggle for control between Abe and Aaron returns in a strange loop, however. The one bit of information which Carruth claims is left out of the film is how Thomas Granger, Rachel's father, discovers the time travel device. Admitting in the director's commentary that he himself is not sure of this point, he suggests that perhaps Abe, in an attempt to save Rachel from the possibly predestined encounter with her shotgun-wielding ex-boyfriend, has enlisted out of desperation her father's

aid. Granger, with his own motives, would complicate the agon between Abe and Aaron. But, in a manifestation of the film's strange loop, when Abe encounters Granger, the latter goes into a coma. He is taken out of the loop, and it returns to the original conflict.

The characters think of this as a side-effect, a causality paradox. Abe, more sensitive to these issues than Aaron, at least initially,[12] devises a list of four rules for "Avoiding Causality Paradoxes or Generally Screwing your Life up!":

> 1. Do not disturb the box after you exit it. You or your double is in it.

> 2. When re-experiencing time stay away from your double until he/she has started his/her journey backwards.

> 3. Worry about yourself first. Now is the only moment that has to make sense.

> 4. Don't be too curious about your surroundings.

Abe's list of rules is violated flagrantly by both Aaron and himself, but it is important to determine who violates them first and why. I do not think that Primer offers an unambiguous answer to this question within its narrative logic. That is, the sequence of events themselves can be reconstructed with either character having ultimate priority on the basis of the filmic evidence. In terms of its immanent logic, however, the agon reveals this priority. To establish it, I will now consider the ethical dimensions of the characters' conflict and how the concept of "control" determines it.

The characters' names are not accidental. Robert and Phillip, those members of the Amoeba Devices (the name of their company, from the Greek for "change") left behind, have generic enough names. But, in addition to the alliteration which emphasizes their basic similarity, Abe and Aaron's names have a theological resonance. Abe's full name is "Abram Terger." "Abram," of course, is Abraham's name before the covenant with the God of Israel

(Gen. 17.5). The ethical conflict between Abe and Aaron also invokes Kierkegaard's discussion of the teleological suspension of the ethical (55). Abraham, for Kierkegaard, has become holy by being an embodied paradox: "as a single individual he became higher than the universal" (66). He disobeys the universal law against murder, against filicide, in the service of faith. For Kierkegaard, this faith renders him unique: "But the person who gives up the universal in order to grasp something even higher that is not the universal--what does he do" (60)? Abe, if his name does suggest priority, has elected to divide and subdivide the universal progress of time in order to first, make money, and then perhaps ultimately save his girlfriend's life. The teleological suspension that Abe undertakes involves simply usurping the power of the deity if considered as the arbiter of the universal, or also of the entire world system if not.[13]

The key "rule of causality" that they violate is the third: "worry about yourself first. Now is the only moment that has to make sense." Once either Abe or Aaron begins to worry about someone other than himself, they violate the rule that will enable to maintain their continuity and coexist with the alternate time-lines and avatars that they have created. Putting others before yourself is in some sense a universal moral code, but for Abe or Aaron to do this requires them to suspend the more apparent universal code that governs causality in their created world. They must suspend their demiurgic control, and, in so doing, usurp a power beyond their ability to control. Narratives of time travel almost inevitably involve paradox; Primer also intertwines moral paradoxes within the more conventional temporal ones. To explore how this moral paradox is mediated within the film, I will consider how Abe and Aaron parallel each other even before the creation of their avatars.

Carruth's voice-over, in a key moment, describes how he always thought of Abe and Aaron as essentially the same guy. Earlier, I wrote that the differences between them was

possibly manifest in their different levels of athleticism, a detail that may in fact be an accident of casting. Assigning intentionality here is difficult. The difference between them, according to Carruth, is attributable to chance. Aaron's girlfriend became pregnant. They got married. Now he has a house, a wife, and a family, and, by virtue of these markers of responsibility, has assumed an unofficial leadership role among the friends. Perhaps this accident, we might surmise, has left Abe somewhat resentful of Aaron's status. More detail into the nature of their relationship before the film's events begin (which, given Aaron's seeming ambition at the end, seems to be a difficult point to establish, as their entire lifespan and even beyond may be being altered) can be gathered from Carruth's comments in his director's commentary about the film's genesis. He says that he began by examining the urge that people have to go back and be able to fix things that have gone wrong. This desire is part of the utopian social imagination in a capitalist technocracy, the strive for optimality and perfection. Famed documentarian Errol Morris's television show, First Person, featured a particularly memorable example of this. Rick Rosner, a highly intelligent man who had achieved some notoriety within Who Wants to Be A Millionaire? circles for his continuous letters to producers after an unsuccessful appearance on the show that argued that the question he failed to answer correctly about the world's highest city was phrased ambiguously, tells Morris about how the desire to repeat the past and do it right is a feature of the "Type-A personality." Rosner took this desire to unusual extremes, however, by indulging his wish to have a typically successful and popular high school experience. He moved across the country several times with faked documentation and enrolled in different high schools, determined to repeat the experience until he got it right. He stopped at age twenty-six or so. Though Morris's interview technique is sphinx-like, I think his motivation for interviewing Rosner had to involve at least partially his recognition that there was something fundamentally American and contemporary about Rosner's

highly unusual quest to reshape his past.

Rosner, Abe, and Aaron also share stereotypes associated with the functioning engineer in the United States: male, introverted, given to systemic thought. Though, as Carruth indicates in his interview with Anne Strainchamps, the hemispherical differentiation metaphors used in folk psychological discourse are largely incoherent and founded on a misunderstanding of the relevant neurology,[14] the systemic/empathic dichotomy popularized by Simon Baron-Cohen has replaced it to a large extent. Baron-Cohen's work <u>The Essential Difference: The Truth about the Male and Female Brain</u> has suggested that autism is an extreme form of male-brainedness, a mental proclivity to seek out systemic explanations of complex phenomena. He further suggests that female brains tend to be predisposed towards empathy. Carruth's commentary on the film suggests that he wanted to see what would happen when the brilliant but ethically childlike engineers were faced with the complex consequences of their actions. Lacking, in this popular imagination, the empathic faculty which would perhaps have cautioned them against the unforeseen effects of their tampering with reality, Abe and Aaron have to rely on their systemic grasp of causality paradoxes and recursive loops, which ultimately fails them because they do not grasp the emotional effect that the discovery has on their friendship.

Abe and Aaron's friendship is transformed completely by their discovery. Just as Abraham, for Kierkegaard, could either be the man of faith or a murderer, with no middle term mediating, Abe and Aaron must either be more complete friends than the world has known, or they must be agonists. This essential mediation of friendship has disappeared because they have become as gods, able to alter both others' past in addition to their own memories. Primer's cinematic grammar emphasizes this disappearing mediation. Throughout, there are many shots of each of the characters framed through windows, particularly the windows of the garage where

they make their discovery. The rest of the screen remains black, but the windows mediate between this void and their conjured reality. Black-outs and white-outs are both used to indicate shifts in temporal frame of reference as well. Carruth indicates in the director's commentary that he thought of using differently exposed film to indicate different time-shifts, but that he thought better of it because of the importance of maintaining symmetry. There would be no difference between the divergent pasts for the characters as they were experiencing them, and there should be no difference for the audience viewing their actions. The altered exposure would mediate falsely what had become an existential either/or.

I have described the alternate selves created by the use of the time-travel device in this paper as "avatars." The term comes from the Sanskrit for "descent" and refers to the incarnate form of a deity. Employing "avatar" this way implies that there is a separation between Abe and Aaron's copies--that they are not just copies themselves. When the time travel device was created and used, Abe and Aaron (whoever has priority) created an ethical singularity that rendered them as distinct in power from their fellow humans as a god would be. I have argued that onomastic evidence suggests at least some intentional recognition of the existential dimensions here on Carruth's part. In conclusion, I will discuss how the concepts of "godgame" and simulation relate to Abe and Aaron's struggle and will advance an interpretation of Primer's enigmatic final scene.

John Fowles coined the term "godgame" as an alternate title to his novel The Magus (10). He intended to represent the titular character Conchis as exhibiting "a series of masks representing human notions of God, from the supernatural to the jargon-ridden scientific; that is a series of human illusions about something that does not exist in fact, absolute knowledge and absolute power" (10). R. Rawdon Wilson glosses the godgame as when a "character (or several) is made a victim by another character's superior knowledge and power. Caught in a cunningly

constructed web of appearances the victim, who finds the illusion to be impenetrable, is observed and his behavior is judged" (123). Abe and Aaron's invention has in fact allowed them to achieve a limited omniscience. They can, through recursive loops backwards in time, gain a relative degree of absolute power and knowledge. Relative, because it is dependent upon how long they are able to stay in the machine, but absolute in the sense of acquiring exact knowledge about what will happen during that day. Furthermore, when they begin to communicate and eventually struggle with their avatars, they have increased their temporal power to extend over different time-lines. The closest parallel to what they have accomplished is the creation of a private reality. A staple of science fiction and fantasy,[15] the creation of a discrete world has become increasingly common with the widespread adoption of digital technology.[16] Whereas the creator of a private infinity or digital simulation of an entire world would presumably maintain complete control over it, Aaron and Abe have only their projected avatars available through which they can control events in their manufactured timelines. This limit to their power is what they are forced to seek to overcome.

Abe and Aaron's conversation in the airport establishes what context the film provides for understanding its final scene. Aaron apologizes for how things have gone wrong, which may refer to the reorchestration of the scene with Rachel's ex-boyfriend at the party or perhaps to another, subsequent, reorganization of reality. He then entices Abe with the possibility of escape, reminding him that they can make a fortune quickly by betting on sports almost anywhere (but particularly in Las Vegas). Star City, the cosmonaut training facility, is mentioned as a possible tourist destination.[17] Abe declines the offer, while Aaron reminds him that their avatars are escaping their control. Abe insists that he's one step ahead of them, but then Aaron angrily questions his true motivations for staying. He implies that Abe is covetous of his wife and child

and offers Abe the opportunity to create his own copies of them, one in each hemisphere, one for Abe seemingly and also for Aaron's avatar (or original). Abe's ire is aroused here, and he warns Aaron away forever, adding that he has not yet had cause to show his friend what's he capable of doing.

While this conversation at the airport is ongoing, there are shots of Abe surveilling Kara and her child Laney. Also, an avatar or original escapes from the attic. The voice-over, revealed at this point to be a phone message from one of Aaron's avatars or perhaps a thinned iteration of the original, tells his listener--either another version of himself or Abe, or some more general audience entirely--that he has now repaid any debt that he may owe. Presumably the proof provided by the content of the voice-over, interspersed throughout the film, would allow the auditor to reconstruct the reality of the events independent of any subsequent temporal manipulation.

The film ends with Aaron's avatar, wearing a yellow shirt and looking even more haggard than he does otherwise, in what Carruth identifies as an airport hangar. There are perhaps a dozen workers in hard hats.[18] Aaron instructs them through a French translator: "Every half-meter, everywhere." It seems likely that this Aaron desires to build a much larger machine, for either going back further in time and/or transporting more than one person with him. The Francophones combined with Aaron's earlier apparent desire to travel to far-flung areas of the world where people did not speak English suggests perhaps a colonial locale, Africa most likely. Aaron's "great game" has spiraled from his local contest with Abe and his split selves into an imperial ambition. In addition to Kipling's great game, Conrad and the Heart of Darkness[19] become the guiding allusions here. Aaron's imperial ambition, however, is fundamentally restorative. It wishes to fade the divergent time-lines and avatars like a whited sepulcher.

Notes

1. <http://primermovie.com>.The forum is available at

<http://primermovie.com/phpBB2/index.php>.

2. <http://imdb.com/title/tt0390384/externalreviews>.

3. The theory of how they work is described in the film with a brief parabolic diagram. Apparently the device creates a field so that everything within oscillates between moving backwards and forwards in time. An intelligent agent can leave the box on the backwards part of the cycle, thus exiting at a time prior to when the box was entered.

4. I will explain later why I use this deliberately evocative term to describe the copied selves.

5. Curiously enough, Phillip and Robert completely disappear from the film after the early moments. This may be an example of artistic choice (or lack of craft), or there may be a suggestion that these two also somehow were involved in the creation and reproduction of the time-travel technology.

6. Puzzling especially here because Aaron is the one with a wife and child.

7. Chomsky's answer to a question by David Barasmian about why he thought that earlier comments he had made about the role of sports in the American culture were so controversial:

> I got some funny reactions, a lot of irate reactions, as if I were somehow taking people's fun away from them. I have nothing against sports. I like to watch a good basketball game and that sort of thing. On the other hand, we have to recognize that the mass hysteria about spectator sports plays a significant role.
>
> First of all, spectator sports make people more passive, because you're not doing them--you're watching somebody doing them. Secondly, they engender jingoist and chauvinist attitudes, sometimes to quite an extreme degree.

I saw something in the newspapers just a day or two ago about how high school teams are now so antagonistic and passionately committed to winning at all costs that they had to abandon the standard handshake before or after the game. These kids can't even do civil things like greeting one another because they're ready to kill one another.

It's spectator sports that engender those attitudes, particularly when they're designed to organize a community to be hysterically committed to their gladiators. That's very dangerous, and it has lots of deleterious effects.

8. This game is revealed to be part of the NCAA basketball tournament, dating the film's events in March.

9. George A. Wood Jr.'s "Game Theory and The Rules of the Game" is one early example of applying Caillois' metric to the analysis of the ludic aspects within a film.

10. Jameson refers to Pakula's description of the shot of the hallway in the Library of Congress in particular here (79).

11. ARPANET, the military-industrial precursor to the general internet, was in use by the mid-seventies.

12. Only two or so minutes of footage were cut from the movie, according to Carruth. One scene established that Abe was a type-2 diabetic, and thus was very familiar with regulating his schedule.

13. Aaron's name is without such a direct-seeming referent, though he does, after the first shock of recognition of the miraculous, insist that Abe eat a steak with him, perhaps recalling the myriad carnal sacrifices required of Aaron to establish the priesthood.

14. A debunking example drawn from management literature is Terence Hines's "Left

Brain/Right Brain Mythology and Implications for Management and Training."

15. One arbitrary and elegant example comes from Jack Vance's <u>Rhialto the Marvellous</u>:

"Teutch, who seldom speaks with his mouth but uses an unusual sleight to flick words from his finger-tips. As an Elder of the Hub, he has been allowed the control of his private infinity" (582).

16. Philosopher Nick Bostrom's "Are You Living in a Computer Simulation?" presents a sophisticated argument based on Bayesian statistics that the odds are fair that we are currently living in a simulation. Libertarian economist Robin Hanson has even speculated about what measures rational agents living in such a simulation should then take in his article "How to Live in a Simulation."

17. An earlier anecdote in the film involves how the Soviet space program allegedly solved a writing problem NASA poured millions into with a pencil.

18. Purchased from and then returned to Lowe's, according to a post by Carruth on the film's website forum.

19. I want to thank Laura Carroll for making this suggestion.

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