The Game Theory Narrative and the Myth of the National Security State

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> With the Soviet Union, you did get the sense that they were operating on a model that we could comprehend in terms of, they don't want to be blown up, we don't want to be blown up, so you do game theory and calculate ways to contain.
>
> —Barack Obama, September 2004

"You can never underestimate the willingness of the state to act out its own massive fantasies." So says Eric Deming in the novel *Underworld* (1997), Don DeLillo's weighty stocktaking of postwar U.S. culture.[1] As Matt Shay listens, Eric, stoned and introspective, repeats this statement: "*You can never unterestimate the villingness of the shtate . . . to ahkt out its own massif phantasies.*" The accented repetition signals that this is a clichéd phrase, likely lifted from some half-remembered antifascist B movie. But the following day, as Matt thinks about the phrase, he wonders if it was not "paying tribute" to "all those émigrés from Middle Europe [who] came to do science in New Mexico during the war." This speculation is occasioned by a rambling reference Eric wedges between the first statement and its repetition: "Eric went on in his stupid voice, talking about problem boxes and minimax solutions, all the kriegspielish stuff they'd studied in grad school, theory of games and patterns of conflict, heads I win, tails you lose." With this pairing, DeLillo implies a connection between game theory—"minimax solutions, all the kriegspielish stuff"—and fantasies of state control. Although paranoid narratives about the hand of the state manipulating individual lives are familiar aspects of cold war rhetoric, scholars of midcentury U.S. culture have paid less attention to what such narratives have to do with game theory.[2] The connection is a vestige of what I call the "game theory narrative," a cultural narrative that told the story of game theory's potential to prevent nuclear exchange by conceptualizing the cold war as a game, and by playing this game according to specific rational strategies.

As the cold war got under way—and proved to be chiefly a conflict of competing ideologies and their attendant narratives—the white-coated scientist and the horn-rimmed mathematician became symbols of the new war effort's

intellectual heft.[3] In the "Atomic Age," eggheads found themselves the most consequential of soldiers, an idea that survives in recent reconstructions of the era. *A Beautiful Mind* (2001), for example, the Oscar-winning biopic of mathematician and sometime game theorist John Nash, opens in the Princeton mathematics department in 1947. Professor Helinger (Judd Hirsch) stirs the patriotism of the new class: "Mathematicians won the war. Mathematicians broke the Japanese codes and built the A-bomb. Mathematicians like you. The stated goal of the Soviets is global communism. In medicine or economics, in technology or space, battle lines are being drawn. To triumph, we need results. Publishable, applicable results. . . . Who among you will be the vanguard of democracy, freedom, and discovery?"[4] This narrative, that "global communism" would be defeated only if seemingly pure disciplines such as mathematics yielded "applicable results," had its singular expression in game theory, a system of rational decision making that would, it was claimed, give Americans an advantage in the global game against the Soviets.

Although game theory's mathematical underpinnings were complicated enough to flummox a nonspecialist, in the late 1940s and early 1950s it was popularized in the print media as America's "secret weapon."[5] In 1950, John McDonald, a journalist who first brought the game theory narrative to the reading public, described game theory in almost messianic terms: "Mathematicians are discovering a perfect, fool-proof system for playing all cut-throat games including poker, business—and war."[6] McDonald's sweeping assertion is a visible manifestation of the game theory narrative, a popularized (if imperfect) understanding of game theory's capabilities that gained significant authority and privilege in U.S. culture in the early 1950s.

The first part of this essay describes how the game theory narrative popularized the idea that the rationality of pure mathematics could be applied to manage major threats of the cold war—the menace of an unknown enemy and the specter of an accidental nuclear exchange. The following sections explore how this narrative was exemplified by a variety of creative works (most of them critical) and other artifacts of cold war culture.[7] Taken together, these sections show how, in the game theory narrative, the promise of scientific redemption combines with the power of rationality to triumph over the threat of chance, and, ultimately, with the power of the United States to triumph over the Soviets and their perceived goal of global communism. Attention to this narrative helps us understand classic cold war texts in a new light. It demonstrates, for example, that Stanley Kubrick's *Dr. Strangelove* (1964) is a satire not only of nuclear brinksmanship, but also of the particular game-theoretic rationality that was claimed to prevent such escalation from actually coming to war; or

that Philip K. Dick's first novel, *Solar Lottery* (1955), offers a critique of postwar politics by imagining a future universe whose fundamentally flawed political systems are governed by the dictates of the game theory narrative. In these and other works, writers and cultural observers registered the pervasiveness of the game theory narrative, but also probed the potential dangers of relying on it too exclusively when engaging real-life problems.

In many ways, the game theory narrative was a perfect fit for the culture of the cold war, and, as such, it explains some of its peculiarities. As a narrative that both exploits and presupposes the dominance of certain subjectivities, it is insistently rational, it forecloses possibility by managing chance, and it seems an extension of what Suzanne Clark calls the "hypermasculinity of [cold war] national policy."[8] In this essay's concluding section, I suggest that these features help explain why the cold war has tended to be conceptualized as a two-person contest despite the fact that the "stakes" of this contest were, at least in part, the hearts and minds of the third world. According to the logic of the game theory narrative, the particularities of various third-world countries are less visible than their status as stakes, and thus the world is mapped as a "two-person, zero-sum" game.

The Game Theory Narrative Explained

The development of game theory owed much to the needs—and financial backing—of the U.S. military, which by the late 1940s found itself waging a new sort of war. Philip Mirowski has articulated the conflicted relationship game theory had with the cold war: "In the first two decades of its existence, to discuss game theory was to discuss 'strategy,' and from there attitudes toward militarism and the arms race rapidly took over. Some laid the blame for the escalation of nuclear weaponry directly at the door of game theory; other, cooler heads claimed that game theory was symptomatic of an apologetic bias in favor of the military-industrial complex; still others asserted it was an expression of abstract rationality ideally tuned to the technological character of the Cold War."[9] Whatever the specific material connections between the military-industrial complex and the rise of game theory, we might take Mirowski's point to be that game theory was linked to the special demands of the cold war; in this connection, it made concepts like "strategy" and "abstract rationality" especially urgent in their power to manage the nuclear age.[10]

For the reasonably informed nonspecialist in 1950, game theory was a language used by scientists—in comforting collusion with the government—to help control the inherent risk of war. Although game theory had its most

influential and far-reaching articulation in John von Neumann and Oskar Morgenstern's *Theory of Games and Economic Behavior* (1944), this book, dense with mathematical proofs, was not widely read by nonprofessionals. But by the late 1940s and early 1950s, discussions of game theory began to appear in magazines like *Fortune, Scientific American, Newsweek*, and *Time*, many of which echoed the *New York Times* review of *Theory of Games and Economic Behavior*, which was quick to note game theory's potential "military application."[11] In 1948 and 1949, *Fortune* magazine published a pair of articles by John McDonald, "Poker: An American Game" and "A Theory of Strategy," that would later form the core of his cartoon-illustrated introduction to game theory's potential, *Strategy in Poker, Business and War* (1950).[12] As this title implies, McDonald's principal claim is that game theory demonstrates affinities between poker, business, and war because it offers a theory of strategy for excelling in all three arenas. By emphasizing the link between poker scenarios and nuclear war, McDonald not only suggests that the latter is manageable, but also that the ultimate importance of game theory is its potential for real-world military application. It is on this seemingly necessary connection between game theory and U.S. military strategy that most public conceptions of game theory rested. In the opening paragraph of "A Theory of Strategy," for example, McDonald draws the association between game theory and national security that would come to dominate the public's conception for the next decade:

> In the spartan surroundings of a Pentagon office a young scientist attached to the Air Force said, "We hope it will work, just as we hoped in 1942 that the atomic bomb would work." What he hoped and in some sense implied will work is a newly created theory of strategy that many scientists believe has important potentialities in military affairs, economics, and other social sciences. The theory is familiarly known to the military as "Games," though its high security classification wherever it has actual content is a sign that its intent is anything but trifling.[13]

Here, as in *Strategy in Poker, Business and War*, McDonald emphasized that the U.S. military was relying on game theory as a key weapon in the global game of the cold war. Whereas von Neumann and Morgenstern's innovation was to link game theory to economic behavior, McDonald's dramatic sense that scientists and the military alike were putting all their "hope" into game theory intimates what many game theorists in the 1950s found themselves pursuing: a winning military strategy. However simplified the mathematics were, articles and books like McDonald's suggest game theory's defining characteristic became its potential real-world application to military strategy in a nuclear age.[14]

The association of game theory with military strategy was cemented by the connection both had to the RAND Corporation. Founded in 1946 with support from the Air Force, RAND was a nonprofit "brain factory" where much of the theoretical work was performed with an eye toward practical, military application. As historian Fred Kaplan has succinctly put it: "Game theory caught on in a very big way at RAND in the late 1940s."[15] And it was at RAND that game theory and military strategy would be united by the media in the early 1950s. A 1953 *Newsweek* article, for example, suggested that "the average man might not understand Rand's preoccupation with the new and highly mathematical 'theory of games.' Yet games are vital to Rand's work, for the theory of probability, in its risk-versus-gain aspect, looms big in modern scientific warfare."[16] The adjective the *Newsweek* writer puts before "warfare" is significant: in this view, game theory has helped to make war "scientific"—that is, less risky, more controllable. This early sense that RAND experts would employ game theory to manage the randomness of war—randomness that became more acute as the arms race escalated—was an important aspect of the game theory narrative. By the early 1960s, RAND was even more well known to the public as the "Brain Power for the Air Force," as one 1960 *New York Times* article asserted.[17] Despite such laudatory press, the more exposure RAND received, the more skepticism mounted about its ties to the military, and about their combined ability to head off accidental nuclear war.

But in the early 1950s, game theory was attractive to those looking for a way to "reduce war by accident." John McDonald was especially optimistic; he closes *Strategy in Poker, Business and War* by imagining that a nuclear strike has been launched against the United States, and that it "cannot be assumed that every rocket contains an important bomb—a large proportion of them are likely to be feints, or bluffs."[18] A dire scenario indeed, but, by noting the strategic parallel to a game of poker (the dummy bombs are "bluffs"), McDonald begins to suggest that minimax, one of game theory's best-known concepts, would help the United States win the hand: "War is chance and minimax must be its modern philosophy."[19] McDonald thus anticipates the *Newsweek* article proclaiming that "modern scientific warfare" is war in which chance can be managed by the "modern" philosophy of minimax. McDonald writes:

> In brief, then, the theory of games says this: Strategical games give a player a choice of action in a situation where all the players are interdependent. Uncertainty in a game may derive merely from a practical limitation on foresight, as in chess. But more often it derives from a chance element (controllable by the theory of probability) and from imperfect information on the part of one player regarding what his opponents may do (uncontrollable except in the theory of games). Strategy is a policy devised to reduce and control these uncertainties.

> Strategy may require the introduction of chance moves by the players to prevent their pattern of play from being discovered, that is, to increase the imperfection of information. Good strategy requires the use of the principle of "minimax," that is, a policy in which a range of possible high and low gains is adopted on the assumption that one might be found out. But to avoid being found out one obscures the specific pattern of play by randomizing the strategy with chance plays.[20]

As McDonald explains it, minimax's relationship to chance is paradoxical: it controls chance (war) by invoking chance (random moves). Minimax is therefore simultaneously pro- and anti-chance. To meet the unknown, random aspect of war—or business, or poker—a good strategist becomes himself an avatar of the unknown by incorporating randomness. The narrative of game theory—that it was a "fool-proof system" enabling the United States to gain a strategic advantage in the cold war—was thus tied to its perceived ability to both manage and incorporate chance. Such was the popularity of this idea that, by 1949, the *Reader's Guide to Periodical Literature*'s entry for "Chance" directed readers to "Games, Theory of." If the prospect of an accidental nuclear exchange came to weigh heavy on the minds of the American public, then game theory's promise seemed so powerful because it could erase this chance by rational means.

The Game Theory Narrative Explored

Reverberations of the game theory narrative can be heard throughout cold war culture. With respect to game theory's relationship to chance, for example, one might note how Beat writer William S. Burroughs described the origins of his infamous "cut-up" method: "*Theory of Games and Economic Behavior* introduced the cut up principle of random action into military and game strategy. . . The cut up method was used in *Naked Lunch* without the author's full awareness of the method he was using."[21] In Kurt Vonnegut's first novel, *Player Piano* (1952), the symbolic role of a character named "Professor von Neumann" would have been clearer to those readers familiar with his real-life namesake.[22] In 1963, Milton Cannif explored the military's use of games in his popular *Steve Canyon* comic strip.[23] In a 1955 essay for the magazine *Astounding Science Fiction*, editor John W. Campbell Jr. suggested how the game theory narrative encouraged Americans to conceptualize life as a specific type of game: "Now Game Theory has considered two essentially different types of games; the open game, and the concealed game. . . . Poker . . . is a concealed game; the rules are known, but the actual situation at any instant is not known to *any* player. . . . The Game of Life as currently played by this

culture is, in essence, a concealed game; it's based on Privacy of Action. . . . People raised in a concealed game culture are going to have some horrendous psychic problems."[24] The problems Campbell has in mind concern the civic logic such a concealed game encourages: citizens are left to second-guess their own actions and regard the behavior of others with suspicion. This analysis in fact implies a fundamental critique prevalent among those who engaged and criticized the game theory narrative. Campbell suggests that although the narrative passed for a natural or scientific aspect of reality (like gravity), it was really a metaphor that would prove itself imperfect when pressure was applied. Whether the specific metaphor was poker or rational game playing, this pervasive critique concerned the nature of the metaphor itself, which normalized the abnormal by viewing real life only through the strictures of a bounded game. To see the various ways the game theory narrative came to be viewed in cold war culture, let us look at some of the more sustained and complex ways it was explored.

The connections between game theory, national security, and chance come together in what is, to my knowledge, the first full-scale fictional engagement with the game theory narrative, Philip K. Dick's novel, *Solar Lottery* (1955). A prolific science fiction writer, whose work was the basis for the film *Blade Runner* (1982), Dick became interested in the promise of game theory in the early 1950s. In *Solar Lottery*, he imagines a universe in which political structures are based on the principles of game theory as articulated not by its expert practitioners, but by John McDonald, the journalist who popularized the game theory narrative. The novel's epigraph is in fact taken from the passage quoted above from McDonald's *Strategy in Poker, Business and War*. Building on McDonald's sense of game theory, Dick's universe is set in 2203, when every inhabitant of every planet has a "power card" with a unique number. In the great solar lottery of the title, a specially constructed bottle, "the socialized instrument of chance," twitches at random and delivers a power card number.[25] Whoever holds this power card, no matter what his or her status, background, or education, is immediately elevated to the universe's most powerful position, Quizmaster. Although it is not quite an example of democratic freedom, the system is intended to forestall despotism since no person, in theory, "can plan to be a dictator: it [the bottle system] comes and goes according to subatomic random particles" (*SL*, 38).[26]

This system is the logical extension of what Dick perceives to be the marriage of game theory and military policy during the early 1950s. He prefaces the novel in this way:

> I became interested in the Theory of Games, first in an intellectual manner (like chess) and then with a growing uneasy conviction that Minimax was playing an expanding role in our national life. Although specialists in related fields (mathematics, statistics, sociology, economics) are aware of its existence, the Games Theory has been little publicized. Yet it was instrumental in the Allied strategy in the Second World War. Both the U.S. and the Soviet Union employ Minimax strategy as I sit here. While I was writing SOLAR LOTTERY, Von Neumann, the co-inventor of the Games Theory, was named to the Atomic Energy Commission, bearing out my belief that Minimax is gaining on us all the time. (*SL*, n.p.)

For Dick, Dwight Eisenhower's appointment of von Neumann to the Atomic Energy Commission was a symbolic event that implied the power game theory had—and would come to have—over U.S. political life.[27] Dick understands game theory as intimately tied to cold war "strategy," a situation that the novel analyzes as it explores the ways game theory manages what one character calls the "universe of chance" (*SL*, 34). One running theme is the sense that game theory has imposed its own set of rules on the universe, and that when those artificial, perhaps arbitrary, rules get codified by governments, people have trouble distinguishing the narrative from the laws of the universe. Discussing the theory of minimax (or the "M-Game," as the lottery is called), one character remarks: "The whole system is artificial. This M-Game was invented by a couple of mathematicians during the early phase of the Second World War" (*SL*, 57). This notion is countered with the argument that minimax is a law of the universe: "You mean discovered. They saw that social situations are analogues of strategy games, like poker. A system that works in a poker game will work in a social situation, like business or war" (*SL*, 57–58). This dispute over whether game theory and minimax are accurate discoveries of universal laws, or merely arbitrary impositions on the universe reflects a growing reservation that many observers would come to have about the promise of the game theory narrative. We might understand Dick's critique as a more complex version of Campbell's concern about how metaphors are confused with objective reality, making it hard to say whether game theory was "invented" or "discovered."

Although the universe Dick imagined may seem at first to endorse the potential of game theory to become "the basis of Government" (*SL*, 20), the novel also suggests the danger of confusing metaphor with objective reality, a danger intimated in the author's note, with its ominous sense "that Minimax is gaining on us all the time." Minimax indeed holds as much promise in Dick's future as it does in his present. One character explains it this way: "Minimax was a brilliant hypothesis. It gave us a rational scientific method to crack any strategy and transform the strategy game into a chance game, where the regular

statistical methods of the exact sciences function" (*SL*, 58). In this conception, the promise of minimax is that it can convert the chance inherent in poker or war into a scientifically managed aspect of the conflict. Yet minimax and the game theory narrative are ultimately viewed with skepticism in *Solar Lottery* because in the end chance cannot be manipulated; Dick's universe is subject to chance, and we learn that the "Uncertainty Principle is on the level" (*SL*, 177). As an early engagement with the game theory narrative, *Solar Lottery* expresses ambivalence about the narrative's promise. In debating whether the narrative was "discovered" or "invented," the novel also poses questions about the role of chance in the universe, and the way that the popularized versions of midcentury strategy engaged this universe.

Eight years after *Solar Lottery*, Robert Coover published one of his earliest short stories, "The Second Son," about a solitary accountant who entertains himself with an absurdly complicated baseball game played with dice, in the *Evergreen Review*. "Second Son" forms the germ of Coover's second novel, *The Universal Baseball Association, Inc., J. Henry Waugh, Prop.* (1968).[28] This novel explores the tensions between chance and design in the imagined world of J. Henry Waugh and derives much of its force—and indeed its plot—from a metafictional meditation on the natures of fiction and reality, a meditation that is explicitly extended to the game theory narrative. Protagonist Waugh creates a fictional universe dominated by the game of baseball and governed by the roll of three dice. Although Waugh is responsible for the rules of this universe—he has elaborate charts and meticulous record books—the outcomes of each season are ultimately "committed" to chance—the roll of the dice.[29] Although Waugh's lackluster real life occupies some of the novel, most of the book is concerned with the baseball association and its colorful players—characters who have not only backstories, but also complex personal histories, loves, and inner lives. The crisis of the novel occurs when, at a crucial point in a game, Waugh rolls three ones, which means that Damon Rutherford, one of the Association's stars, is "struck fatally by [a] bean ball" thrown by pitcher Jock Casey (*UBA*, 70). The turning point of the book, in other words, hinges on a moment of chance—although this is Waugh's universe, he is still beholden to the roll of the dice. After this "one chance in 216," an emotionally affected Waugh struggles with whether he should violate his own rules by deliberately positioning the dice to determine an outcome (*UBA*, 70). Ultimately, when Jock Casey comes to bat in a later game, Waugh rigs the system: "Holding the dice in his left palm, he set them down carefully with his right," so that Casey, too, is killed by an errant pitch (*UBA*, 202).

It may be apparent from this description that Coover's novel is a canny engagement with some of the questions the game theory narrative invited: in the universe of the Universal Baseball Association, the results of Waugh's intervention are paradigm shifting because a chance roll was converted into a willful strategy. The novel is about the veils between fiction (or myth) and reality: once Waugh intervenes to adjust the dice, the characters in his universe demonstrate the guiding hand of the association's author and deify the players involved.

The final chapter of *The Universal Baseball Association* thus invites readers to consider how the association could be an allegory for religious narratives—after all, J. Henry Waugh, an echo of Yahweh, has created the rules of his universe, but has (for a time) allowed chance to mimic free will and ability in the rolls of the dice.[30] Once Waugh intervenes, predetermining an outcome, the players themselves wonder "if there's really a record-keeper up there or not" (*UBA*, 239). Although the affinities between J. Henry Waugh and Yahweh or a deist clockmaker are manifest, the game theory narrative helps us see how *The Universal Baseball Association* is also about cold war politics—between baseball games, Waugh reads newspapers with headlines about the "Makings of another large war," and he contemplates a game about the "space race" (*UBA*, 130, 132). By the final chapter, in which pseudo-religions and mystery cults have proliferated in Waugh's imagined universe, one available faith is "the folklore of game theory" (*UBA*, 234). As the yoking of religion to folklore to game theory implies, Coover's critique of the ways that religious myths govern reality extends to the game theory narrative. One recurring element is how the cold war is figured as a game:

> [Waugh had] always played a lot of games: baseball, basketball, different card games, war and finance games, horseracing, football, and so on, all on paper of course. Once, he'd got involved in a tabletop war-games club, played by mail, with mutual defense pacts, munitions sales, secret agents, and even assassinations, but the inability of the other players to detach themselves from their narrow-minded historical preconceptions depressed Henry. Anything more complex than a normalized two-person zero-sum game was beyond them. (*UBA*, 44)

The "war-games club" plays out a modern military conflict on paper, a pastime that is a wink to the tendencies of game theorists to play out their versions of conflict on paper. This particular war game in fact exudes the very language of game theory—the "normalized two-person zero-sum game"—that is used in numerous books like Duncan R. Luce and Howard Raiffa's *Games and Decisions: Introduction and Critical Survey* (1957).[31] That Waugh thinks of

such language as "narrow-minded historical preconceptions" is in keeping with the notion that the game theory narrative was tied to a specific historical and political moment. Although the theory was supposed to have been discovered rather than invented, Waugh finds its particularized games so depressing precisely because they lack the rich and multilayered imagination he displays throughout the novel.

The Universal Baseball Association ultimately suggests that the promise of salvation through control is a feature common to both religious and game theory narratives. The critique, in other words, is that, although we live in a universe of chance, both religion and game theory offer disingenuous methods for controlling or managing chance. When the chancellor of the association, Fennimore McCaffree, ruminates about the nature of baseball, he does so in the terms of the game theory narrative: "He was forever yakking about distribution functions, the canonical form of M, compound decision problems, relations of dominance; like Fenn had somehow forgot the game was baseball" (*UBA*, 146). Fenn forgets "the game was baseball" because he is actually meditating on game theory and its relation to real-life problems. In *The Universal Baseball Association*, baseball functions as a metaphor for both religious control and the control of game theory: "the canonical form of M," like the M-Game in *Solar Lottery*, alludes to minimax, the notion of balance and equilibrium, so that "old strategies, like winning ball games, sensible and proper within the old stochastic or recursive sets, are, under the new circumstances, *insane!*" (*UBA*, 148). In a world where Waugh has loaded the dice, former normative standards ("old stochastic or recursive sets") become irrational—"insane"—because the rules of the game are no longer chance governed. Although manipulating the dice is a way out of the "loneliness" that came when "pattern dissipated, giving way to mere accident," this control of accident has religious reverberations as well as secular ones. In Coover's world, many Americans, like the fans of the Universal Baseball Association, looked to the "folklore of game theory" to salve their anxieties about the game being played with atomic bombs instead of baseballs.

The Game Theory Narrative and Irrational Rationality

By the early 1960s, another aspect of the game theory narrative had found important expression in popular culture. Game theory, this story went, relies on rationality, and rationality alone will cope with the nuclear situation—if not ultimately to prevent nuclear exchange, then to manage its effects. This narrative is best illustrated by looking at how one landmark treatise, Her-

man Kahn's *On Thermonuclear War* (1960), was satirized in a landmark film, Stanley Kubrick's black comedy *Dr. Strangelove, or: How I Learned to Stop Worrying and Love the Bomb* (1964). Although *On Thermonuclear War* is not about game theory in the way that *A Theory of Games and Economic Behavior* is, it is still an important part of the game theory narrative since it aims to work through several rational "national strategies" to deal with hypothetical situations created by the arms race and the ascendance of fail-safe systems. As one letter writer put it to the *New York Times* in January 1965, "'The Return of Dr. Strangelove' might have been the title of the [recent] interview of . . . Herman Kahn. . . . It is great comfort to see that the advanced techniques of mathematical operations research and war games theory have finally reduced the baffling complexities of nuclear war to the simple equation of tit-for-tat."[32] This comparison of Kahn with Dr. Strangelove was on the mark: numerous historians have shown that, in the early 1960s, Kubrick read widely in the literature of nuclear strategy and carefully studied Kahn's work when conceiving the film that would become *Dr. Strangelove*.[33] As Kubrick absorbed the arguments of real-life strategists, he became convinced that the insistent rationality of a thinker like Kahn was actually irrational, and that "the only way to tell the story was as a black comedy, or better, a nightmare comedy, where the things you laugh at most are really the heart of the paradoxical postures that make a nuclear war possible."[34]

Kubrick's principal target is Kahn's basic insistence—so measured and rational as to be chilling—that global thermonuclear war would not result in complete annihilation of the human race. By implementing the right strategy, Kahn argued, human life would survive: "If proper preparations have been made, it would be possible for us or the Soviets to cope with all the effects of a thermonuclear war, in the sense of saving most people and restoring something close to the prewar standard of living in a relatively short time."[35] This premise demands that the United States think strategically about both the escalation building to nuclear exchange, and the aftermath of this exchange. In what is perhaps the most notorious section of *On Thermonuclear War*, Kahn analyzes how many human losses are "acceptable" in a nuclear war, and includes tables such as this:

TRAGIC BUT DISTINGUISHABLE POSTWAR STATES

Dead .	Economic Recuperation
2,000,000	1 year
5,000,000	2 years
10,000,000	5 years
20,000,000	10 years
40,000,000	20 years
80,000,000	50 years
160,000,000	100 years

Will the survivors envy the dead?[36]

The sort of no-nonsense scientific clarity embodied by this table character-ized Kahn's argument as a whole. Even though Kahn's professed goal was to increase the prospects for peace by outlining the practical aftermath of nuclear war, many people were shocked and offended by the pointed way he incorporated human lives (and deaths) into his strategic analyses. James R. Newman, for example, writing for *Scientific American* in 1961, asked: "Is there really a Herman Kahn? It is hard to believe. . . . No one could write like this, no one could think like this. Perhaps the whole thing is a staff hoax in bad taste."[37] Newman was not alone in recoiling from the bad taste left by Kahn's emotionless charts and statistics.[38] In fact, *On Thermonuclear War*—connected as it was to RAND and to the game theory narrative's promise of rational control over an irrational global situation—came to stand for how the con-cept of "strategy" and the game of the cold war had become linked. In sober treatments of Kahn's scenarios such as Sidney Lumet's film *Fail-Safe* (1964), the bad taste of rationality lingers. *Fail-Safe* follows the agonizing decisions required of the president after an accidental nuclear strike against the Soviet Union. In discussing the best strategy for responding to the accident, Pro-fessor Groeteschele (Walter Matthau), resident Kahn-like expert in the war room, lays out the situation in game theoretic terms: "naturally [war] means taking risks, but our intention has always been to minimize those risks. Of course, we can only control our own actions. Our concept of limited war is based on an equal rationality on the part of the Russians; it also presupposes there will be no accidents on either side."[39] The cold war is figured as a game of risk in which each player must assume equal rationality on the part of his

opponent—but as many commentators were arguing by the early 1960s, this metaphor was flawed enough to be dangerous.[40]

Whereas *Fail-Safe* dramatizes a straight version of Kahn's warnings, *Dr. Strangelove* skewers his dogged rationality by showing what happens when rationality itself is exposed as contingent and contextual. *Dr. Strangelove* shares its basic plot with *Fail-Safe*: a nuclear attack is accidentally launched against the Soviet Union, and the U.S. president must work with the Soviet leader to avert an all-out nuclear exchange. But in *Dr. Strangelove*, the idea of "rationality" is not so stable as it is in *Fail-Safe* (or indeed in *On Thermonuclear War*), and Kubrick emphasizes that the nuclear strike is only accidental from the perspective of what the president calls "national policy."[41] From the perspective of General Jack D. Ripper (Sterling Hayden), the Air Force commander who ordered the strike, it was not accidental at all. This difference in perspective points to the problem with the stridently rational approach insisted on by Kahn. Ripper, who is, as British Group Captain Mandrake (Peter Sellers) observes, "as mad as a bloody march hare," nevertheless proceeds from a rationality of sorts. His motive for launching the strike against Russia is a parody of the paranoid civic logic encouraged by the cold war: he believes it is necessary to strike the Russians preemptively because they are actively conspiring to sap "our precious bodily fluids." Kubrick links this initially outlandish statement to actual cold war controversies about water fluoridation: "Do you realize," says Ripper, "that fluoridation is the most monstrously conceived and dangerous communist plot we have ever had to face?"[42] This technique of connecting the absurd to the real is used throughout *Dr. Strangelove* to suggest the dishearteningly familiar brand of rationality employed not only by Ripper, but also by the world's two superpowers.

The sense that the people in charge of preventing nuclear war are blind to their own irrationality is tied to a critique of the game theory narrative, which is rooted—insistently so—in rational decision making. *Dr. Strangelove* shows that what game theory dictates is good strategy does not necessarily translate to favorable outcomes in the real, human world. A central idea of the game theory narrative as inflected by Kahn—that the cold war is a global game—is visually present in *Dr. Strangelove*'s famous War Room set. According to production designer Ken Adam, even though the film was shot in black and white, Kubrick wanted the enormous round conference table covered in green baize "to give the impression that these characters sitting around this table are involved in a gigantic poker game for the fate of the world."[43] It is around this enormous poker table that Kubrick most devastatingly echoes *On Thermonuclear War*. A parody of the hypermasculine cold warrior, Buck

Turgidson (George C. Scott) is a hawkish, gum-smacking general who recalls Kahn's substance and style as he tries to convince the president to launch a full-scale nuclear strike:

> Now, the truth is not always a pleasant thing, but it is necessary now to make a choice, to choose between two admittedly regrettable, but nevertheless distinguishable postwar environments: one where you got twenty million people killed, and the other where you got a hundred and fifty million people killed. . . . Mr. President, I'm not saying we wouldn't get our hair mussed. But I do say no more than ten to twenty million killed, tops. Uh, depending on the breaks.

Turgidson's notoriously folksy metaphor for nuclear annihilation ("I'm not saying we wouldn't get our hair mussed") lampoons a cowboy sensibility that couched the absurdity of cold war logic in a straight-talking, matter-of-fact style that was meant to make such logic seem reasonable.[44] If the game theory narrative had elevated a particular kind of abstract rationality to the forefront of nuclear strategy, then speeches like Turgidson's demonstrate how this logic was crumbling by the early 1960s—it was sensible only given the bounded terms of the cold war "poker game," but irrational and irresponsible from a real human perspective.

The notion of insane rationality is embodied by the eponymous Dr. Strangelove, played by Peter Sellers as a wheelchair-bound ex-Nazi. Strangelove is the president's expert consultant, who represents what Kubrick saw as the increasingly alarming logic of Kahn and the RAND crowd. Asked about the viability of building an Earth-destroying "Doomsday" machine (an idea lifted from the pages of *On Thermonuclear War*), Strangelove informs the president: "Under the authority granted me as director of weapons research and development, I commissioned last year a study of this project by the BLAND Corporation. Based on the findings of the report, my conclusion was that this idea was not a practical deterrent, for reasons which, at this moment, must be all too obvious."[45] If the favorable responses to *Dr. Strangelove* are any index of public opinion on nuclear strategy, the not-so-subtle allusion suggests that RAND's cultural star had plummeted since the late 1940s.[46] By the end of the film, when it is clear that a Soviet-built Doomsday device will be triggered as soon as the American bomb strikes, Strangelove advises retreating into "some of our deeper mineshafts." In a manic plan that unites Kahn-like rationality with Nazi ideology (Strangelove is prone to absentmindedly addressing the president as "mein Führer"), a nuclear holocaust becomes an opportunity to cherry-pick the human race: "a computer could be set and programmed to accept factors from youth, health, sexual fertility, intelligence,

and a cross section of necessary skills. Of course it would be absolutely vital that our top government and military men be included to foster and impart the required principles of leadership and tradition." Strangelove's reliance on an emotionless, calculating computer demonstrates the flip side to the game theory narrative's elevation of science—in 1953, as we have seen, *Newsweek* lauded the promise of "modern scientific warfare"; in 1964, the science of selecting survivors was a disturbing corollary to Kahn's approach to the arms race. Thus *Dr. Strangelove* argues that, far from preventing nuclear war, the rationality of the game theory narrative could actually precipitate it.

A year after Kubrick's wild vision of game theory gone awry, the *New Yorker* published an early story by Donald Barthelme, who would become a strong practitioner of what was soon labeled "postmodernism." Like *Dr. Strangelove*, "Game" puts a surreal spin on the rationality of deterrence. The story is simple and repetitive: the narrator explains that he is one of two men tasked with manning an underground missile bunker. Inadvertently forgotten by their superiors, the men have been locked together for 133 days, and the rational decision making that is supposed to govern their behavior has begun to break down. Writing in the context of game theory's history, Philip Mirowski remarked that Barthelme's story "captures in a concise way what game theory meant to someone living in the United States in the early 1960s."[47] "Game" is governed by the logic of the game theory narrative and explores how such a logic was proving to be increasingly absurd. The narrator describes his stalemate with his fail-safe partner, Shotwell:

> Shotwell and I watch the console. Shotwell and I live under the ground and watch the console. If certain events take place upon the console, we are to insert our keys in the appropriate locks and turn our keys. Shotwell has a key and I have a key. If we turn our keys simultaneously the bird flies. But the bird never flies. . . . Meanwhile Shotwell and I watch each other. We each wear a .45 and if Shotwell behaves strangely I am supposed to shoot him. If I behave strangely Shotwell is supposed to shoot me.[48]

The game of the cold war is dramatized by the edgy standoff between Shotwell and the narrator. This connection implies not just that both situations are absurd, but that they are absurd because the situation itself stalls linear progression (or, in narrative terms, plot). To tell a story about the rational situation created by the cold war, conventional plots are insufficient: the repetition of this passage characterizes the story as a whole and implies how the game theory narrative has imposed a set of norms that are no longer sustainable. "In the beginning," writes the narrator, "I took care to behave normally. So did Shotwell. Our behavior was painfully normal. Norms of politeness,

consideration, speech, and personal habits were scrupulously observed. But then it became apparent that an error had been made, that our relief was not going to appear. . . . the norms were relaxed. Definitions of normality were redrawn in the agreement of January 1st, called by us 'The Agreement.'"[49] "Game" suggests that the military demands of the cold war (being stationed in a missile bunker) are so affected by the demands of the game theory narrative (Shotwell's behavior must be rationally evaluated, even as he reads, in another echo of McDonald's connection between business and war, "*Introduction to Marketing* by Lassiter and Munk") that the whole situation amounts to a stalled narrative. As in *Dr. Strangelove*, when the U.S. president and the Soviet premier endlessly talk past each other on the hot-line phone, genuine human communication has broken down between Shotwell and the narrator because both men have defined themselves according to the game theory narrative and so have become players instead of people.

Throughout the 1960s, the sense that the game theory narrative had stalled was explored by game theorists themselves. Among the more strident critics was Anatol Rapoport, a respected academic who also wrote for a more general audience with the aim of correcting what he perceived as the unrealistic popularization of game theory. In his professional work, Rapoport became increasingly interested in arguing against the notion that pure rationality in strategic decision making was possible or even desirable; in writing for nonprofessionals, he explicitly engaged some of the signal features of the game theory narrative I have been describing. To cite one example: in a 1962 *Scientific American* article, Rapoport challenged the notion that the "fashionable technique" of game theory can "really be used to solve the problems of human conflict."[50] Rapoport's opening move returns us to the paeans to scientists one encountered in the early fifties: "We live in an age of belief—belief in the omnipotence of science."[51] For Rapoport, allegiance to science's power and potential had led to game theory's promise being exaggerated in public discourse for reasons that, as we have seen, were met with resistance in numerous creative engagements. "A thorough understanding of game theory," Rapoport wrote, "should dim these greedy hopes. Knowledge of game theory does not make one a better card player, businessman or military strategist."[52] Here he is not necessarily arguing against the uses of game theory as articulated by von Neumann and Morgenstern and in RAND working papers, but rather against the "misuse" of game theory as it was popularized in the game theory narrative.[53]

From about the mid-1960s, many professional observers came to concur with Rapoport's more tempered view of game theory's promise: its specific effect on U.S. foreign policy had waned considerably since the early 1950s.[54]

Over the next few decades, in fact, the uses of game theory were evident less in foreign policy or military strategy and more in complex economics and social science. Still, it is tempting to locate some lingering effects of the game theory narrative even in the 1980s, when the Reagan administration acted from the belief that a nuclear war was winnable, given the use of rational strategies.[55] It seems worth noting, for example, that some critics of the Reagan administration's stance on nuclear strategy gestured toward the earlier conceptualizations of the cold war as a game that I have been describing. In 1984, Robert Jervis wrote about the "illogic" of a nuclear strategy that supposes a winnable nuclear war: "A rational strategy for the employment of nuclear weapons is a contradiction in terms"; from this premise, he concludes that "the poker game model of bluffing is misleading."[56] In his critique of contemporary applications of "abstract rationality," Jervis alludes to the ways that the game theory narrative linked war with poker, and how it promised to control nuclear war by making chance manageable. By the 1980s, this promise was largely viewed as false, policymakers were turning elsewhere to manage a new era of nuclear relations, and the game theory narrative was beginning to be associated with the bygone era of the early cold war.

While the Reagan administration engaged in new varieties of rhetorical brinksmanship, one novel discussed the game theory narrative as a historically bounded phenomenon that had lost its real-world potency by the 1980s. To conclude, let us briefly consider this novel, Richard Powers's *Prisoner's Dilemma* (1988), which, with the benefit of hindsight, explores how the game theory narrative was linked to the pressures of the early cold war. Powers takes his title from the best known of game theory's puzzles and uses it as an extended metaphor for the nature of narrative itself.

Prisoner's Dilemma is centered around the patriarch of the Hobson family, Eddie Sr., who is dying from an unknown disease. Because the illness manifests itself only in occasional fainting spells, and because Eddie Sr. has long refused medical treatment, his family members are left to deal with his slow decline in their own ways. Through Eddie Sr.'s puzzling behavior, the matrix of the prisoner's dilemma becomes the guiding metaphor of the novel. Ever the high school history teacher, Eddie Sr. avoids discussing his illness by filling table conversation with quizzes and thought experiments: his "miniature classroom was a prisoner's matrix all its own. Dad diverted them from addressing the real catastrophe by drawing them into this game of defection and cooperation. They had to play his dilemma if he was to play theirs."[57] Connecting the Hobson family history to the history of the United States—with special attention to their respective involvement in the Second World War—Powers

suggests that the game theory narrative distracts from "real catastrophe"—be it Eddie Sr.'s illness, the development of the atomic bomb, or the internment of Japanese-Americans. In other words, the game theory narrative masks the truths of reality rather than making them evident.

Early in the novel, Eddie Sr. again demonstrates how the game theory narrative was linked to high cold war concerns:

> I've been doing a little reading on a puzzle called The Prisoner's Dilemma. The modern form of the paradox comes from a guy at the Rand Corporation, 1951, a year wedged between a couple of dates that ought to go off like bells in your brains. . . .
>
> Two guys are up in Senator Smoking Joe McCarthy's office, sometime in the early 1950s. The gentlemen are both prominent public servants. The senator says, "Fellas, we know that you are both Reds. I've got plenty of evidence for an indictment, but not enough to guarantee the conviction you deserve. Let's make a deal. If either of you comes forward with the dope on the other, the man who talks will go free and the other will fry. If neither of you spills the goods on the other, you'll still suffer public humiliation at the very least."[58]

This is the classic prisoner's dilemma as discussed in nearly every book and article related to the game theory narrative in the 1950s and 1960s—for Powers, by the 1980s, this puzzle had passed into a historical association with that avatar of cold war paranoia, Joe McCarthy. In this conception, the prisoner's dilemma is a story distinctly of the cold war, and one that can never be completely understood or solved. When, late in the novel, Eddie Jr. asks whether the "two guys in the bind ever get it together," his father replies: "even if the game stabilizes with two players, it's certainly hopeless at four billion."[59] This explicit connection between the prisoner's matrix of his own life and the global struggle of "four billion" people is underscored in the conclusion when we learn that Eddie Sr.'s lingering illness was caused by radiation poisoning as a result of his having witnessed an atomic bomb test.

Although the metaphor of the prisoner's dilemma unites game theory with the menace of the atomic bomb, the novel also asks whether the game theory narrative might not have a positive function if recognized *as* a narrative rather than as a vocabulary for articulating reality or a "perfect, fool-proof system" for dominating conflict situations. There are no winners and losers in *Prisoner's Dilemma*, yet the process of engaging the puzzle becomes in itself therapeutic. The novel ends by associating the prisoner's dilemma with stories that literally cope with death: in *The Decameron*, "one of Pop's favorites," we are told that "a handful of people escape the Black Death and keep themselves alive and entertained in their exile by telling one another fantastic stories."[60] The idea that stories are intertwined with life, even in the face of plagues (and

Eddie Sr.'s radiation poisoning pointedly shares physical characteristics with the bubonic plague) suggests that a powerful way to understand the culture of the cold war is as a matrix of narratives describing a reality that cannot ever be fully known. Recognizing these narratives as such allows Eddie Sr. to understand his place in the midcentury tide of history, which for him is the story of stories vying for primacy.

Some Conclusions

One implication of this discussion is that the game theory narrative was another manifestation of the widespread cultural apprehension over the atomic bomb. This narrative promised to defer endlessly the threat of nuclear annihilation by managing the chance inherent in war. If it is true that the twin specters of an accidental nuclear exchange and the psychic incomprehensibility of such an exchange were signal features of the early cold war experience, then the game theory narrative softened these dangers by treating an unknowable, unnatural conflict as knowable and natural—as familiar as a poker game. And yet, as we have seen, the narrative did not always succeed in this regard: many writers and cultural observers challenged its pretense of existing outside ideology as a purely rational law of the universe.

Because scholars of cold war culture have long recognized the profound effects of the atomic bomb, there has been a tendency to view the period as a contest between the two superpowers that might wield such a weapon. Recently, however, some scholars have called for analyses that complicate our sense of a U.S.-Soviet struggle underwritten by the bomb. Christina Klein, for example, has demonstrated how a "global imaginary of integration" was a corollary to the norms of containment that demanded a binary, friend/foe mentality, and Leerom Medovoi has urged us to think of the cold war as "the age of three worlds."[61] Expanding on the work of Carl Pletsch and others, Medovoi has persuasively argued that the "U.S.-Soviet rivalry . . . took the form of a triangulated rivalry over another universe that only now became known as the 'third world.' . . . By the mid-1950s, the 'three worlds concept' has become the globe's dominant topological imaginary."[62] Although thinkers such as Medovoi and Klein have given us ways to understand the scope of a global conflict, the game theory narrative helps explain why the cold war has conventionally been seen only as what Coover called it in *The Universal Baseball Association:* a "normalized two-person zero-sum game." Coover's appropriation of game theory's language indicates the way in which people were encouraged to see the global conflict involving the fates of many nations as

a two-person game of the highest stakes. If the stakes were indeed the hearts and minds of third world countries, then one consequence of the game theory narrative was that these countries were viewed largely in terms of how they related to the game being played.

Consider, for example, a drawing by the well-known cartoonist Bill Mauldin that appeared in the *New Republic* in 1965:

"Call, Raise, Draw or Fold?"

Figure 1.
Bill Mauldin, "Call, Raise, Draw or Fold?" *New Republic*, March 6, 1965, 24.

With the United States becoming ever more entangled in Vietnam, Mauldin pictures stone-faced Lyndon Johnson in his cowboy hat, playing poker with a rank-and-file Viet Cong soldier. The metaphor of a poker game has moved from the war room of *Dr. Strangelove* to an intimate game with two players. But even at this early stage of a war about containing communism, Johnson is not playing with his Soviet counterpart, but rather with a generic Viet Cong soldier. Particular identities or subjectivities are erased, and what becomes important is the soldier's status as an opponent. We might then read this cartoon as a visual example of how the game theory narrative insisted on viewing the cold war world as a two-person game, despite the "dominant topological imaginary" of three worlds.

Although the game theory narrative was a powerful reflection of what DeLillo calls in *Underworld* the state's "massive fantasies," it has been overlooked *as* a narrative precisely because it was so insistent in proclaiming itself engendered of pure mathematics and abstract rationality. Once we attune ourselves to the narrative's cultural functions, we can see how it encouraged the sense that freedom and control were complexly intertwined. If we think of freedom as associated with chance—insofar as it foregrounds the importance of personal agency, which is in turn marked by openness and possibility—then the game theory narrative ironically sought to preserve freedom by promising to manage chance. Thus when it claimed that its own special logic was a law of the universe, or when it conceptualized the intricate three-world global situation as a poker game, or when it suggested that even chance was subject to its bounded terms, it did so to diminish the threat of possibility itself. As such, the game theory narrative should be recognized as significant among the cultural narratives that governed the cold war experience.

Notes

1. Don DeLillo, *Underworld* (New York: Scribner, 1997), 421. Obama is quoted in David Mendell, "Obama Would Consider Missile Strikes on Iran," *Chicago Tribune*, September 25, 2004.
2. See Timothy Melley, *Empire of Conspiracy: The Culture of Paranoia in Postwar America* (Ithaca, N.Y.: Cornell University Press, 2000).
3. My conceptualization of the cold war as a conflict of competing ideologies is informed by works such as Alan Nadel's *Containment Culture* (Durham, N.C.: Duke University Press, 1995), and Stephen J. Whitfield's *The Culture of the Cold War* (Baltimore: Johns Hopkins University Press, 1999), particularly the chapter "Assenting: The Trend of Ideology," 53–76. Although scholars in cold war studies have recently begun to complicate or extend the influential containment model put forth in Nadel's *Containment Culture*, there has nevertheless been considerable engagement with the ways cultural narratives can help us understand the complexities of the period. See, for example, Leerom Medovoi,

Rebels: Youth and the Cold War Origins of Identity (Durham, N.C.: Duke University Press, 2005), and Steven Belletto, "Curbing Containment: Cold War Studies in the Twenty-First Century," *Contemporary Literature* 48 (Spring 2007): 150–64. For an explanation of the atomic bomb's cultural reception that includes a discussion of U.S. scientists, see Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Pantheon, 1985).

4. *A Beautiful Mind*, DVD, directed by Ron Howard (2001; Universal City, Calif.: Universal, 2002).

5. Herbert De Ley has noted that "game theory, for some reason, seems to lend itself to popularization, whether for 'hard' scientists, social scientists, economists, military people, or laymen" (De Ley, "The Name of the Game: Applying Game Theory in Literature," *SubStance* 17.1 [1988]: 33–46, 45n2).

6. John McDonald, "Secret Weapon: Theory of Games," *Science Digest*, December 1950, 7.

7. Thus this essay will not attempt to "apply" game theory to literature, as others have done. It is rather my aim to outline the salient features of a historically specific cultural narrative, and to suggest how this narrative was engaged, amplified, and challenged by some fiction and film of the era. For examples of how one might use the hermeneutic power of game theory to read a literary text, see the special issue of *Yale French Studies* titled "Game, Play Literature" (1968), particularly Jacques Ehrmann's article, "Homo Ludens Revisited," 31–57; Steven Brams, *Biblical Games: A Strategic Analysis of Stories in the Old Testament* (Cambridge, Mass.: MIT Press, 1980); Robert Rawdon Wilson, "In Palamedes' Shadow: Game and Play Concepts Today," *Canadian Review of Literature* (June 1985): 177–99; Diane Long Hoeveler, "Game Theory and Ellison's King of the Bingo Game," *Journal of American Culture* 15.2 (Summer 1992): 39–42; Peter Swirski, "Game Theory in the Third Pentagon: A Study in Strategy and Rationality," *Criticism* (1996): 303–30; and Peter Swirski, "The Role of Game Theory in Literary Studies," in *Empirical Approaches to Literature*, ed. Gebhard Rusch (Siegen, Germany: LUMIS-Publications, 1994), 37–43.

8. Suzanne Clark, *Cold Warriors: Manliness on Trial in the Rhetoric of the West* (Carbondale: University of Illinois Press, 2000), 3. On the topic of cold war hypermasculinity, see also Robert J. Corber, *Homosexuality in Cold War America: Resistance and the Crisis of Masculinity* (Durham, N.C.: Duke University Press, 1997); and David Savran, *Communists, Cowboys, and Queers: The Politics of Masculinity in the Work of Arthur Miller and Tennessee Williams* (Minneapolis: University of Minnesota Press, 1992).

9. Philip Mirowski, "When Games Grow Deadly Serious: The Military Influence on the Evolution of Game Theory," in *Economics and National Security: A History of Their Interaction*, ed. Craufurd D. W. Goodwin (Durham, N.C.: Duke University Press, 1991), 229.

10. For more on these specifics, see Robert J. Leonard, "Creating a Context for Game Theory," in *Toward a History of Game Theory*, ed. E. Roy Weintraub (Durham, N.C.: Duke University Press, 1992), 29–76; Angela O'Rand, "Mathematizing Social Science in the 1950s: The Early Development and Diffusion of Game Theory," in Weintraub, *Toward a History of Game Theory*, 178–204. For the early development of game theory, see Robert J. Leonard, "From Parlor Games to Social Science: Von Neumann, Morgenstern, and the Creation of Game Theory 1928–1944," *Journal of Economic Literature* 33.2 (June 1995): 730–61.

11. Will Lissner, "Mathematical Theory of Poker Is Applied to Business Problems," *New York Times*, March 10, 1946.

12. John McDonald, *Strategy in Poker, Business and War* (New York: Norton, 1950) was issued in paperback in 1963 and reissued in 1989 and 1996. Initial reviewers tended to be interested in McDonald's book for the way it articulated game theory's promise. See, for example, "Theory of Games," *Washington Post*, September 3, 1950; Rex Lardner, "How to Make a Sucker Out of Your Opponent," *New York Times*, August 27, 1950; and the brief *New Yorker* review, September 9, 1950, 121.

13. John McDonald, "A Theory of Strategy," *Fortune*, June 1949, 100.

14. See Richard Bellman and David Blackwell, "Red Dog, Blackjack and Poker," *Scientific American*, January 1951, 44–47; "Planned Chance," *Newsweek*, May 21, 1951, 58; J. D. Williams, *The Compleat Strategyst: Being a Primer on the Theory of Games of Strategy* (New York: McGraw Hill, 1954); and Leonid Hurwicz, "Game Theory and Decisions," *Scientific American*, February 1955, 78–83. For introductions aimed at more advanced readers, see J. C. C. McKinsey, *Introduction to the Theory of Games* (New York: McGraw-Hill, 1952); Duncan R. Luce and Howard Raiffa, *Games and Decisions: Introduction and Critical Survey* (New York: John Wiley & Sons, 1957).

15. See Fred Kaplan, *The Wizards of Armageddon* (Stanford, Calif.: Stanford University Press, 1991), 67. For an explanation of how an interest in game theory led RAND to bring on social scientists who could analyze "the actual behavior and values of various nations," see pp. 67–73.

16. "Games of Survival," *Newsweek*, May 18, 1953, 75.
17. Bill Becker, "RAND Corporation Furnishes Brain Power for the Air Force," *New York Times*, May 22, 1960. See also John McDonald, "War of Wits," *Fortune*, March 1951, 99–157; W. K., "Poker in the Interest of Science," *New York Times*, February 1, 1953; "Games of Survival," 75; "Valuable Batch of Brains," *Life*, May 11, 1959; Joseph Kraft, "RAND: Arsenal for Ideas," *Harpers,* July 1960; Saul Friedman, "The RAND Corporation and Our Policy Makers," *Atlantic Monthly*, September 1963; and Bruce Smith, *The RAND Corporation: Case Study of a Nonprofit Advisory Corporation* (Cambridge, Mass.: Harvard University Press, 1966). For a contemporary critique of RAND-generated theories of "political gaming," see Herbert Goldhammer and Hans Speier, "Some Observations on Political Gaming," *World Politics* 12.1 (October 1959): 71–83.
18. McDonald, *Strategy*, 126.
19. Ibid.
20. Ibid., 81.
21. William S. Burroughs, "The Cut Up Method of Brion Gysin," in *A Casebook on the Beat*, ed. Thomas Parkinson (New York: Thomas Crowell, 1961), 106.
22. Kurt Vonnegut, *Player Piano* (New York: Dial Press, 1999).
23. The *Steve Canyon* comic strip is discussed in Sharon Ghamari-Tabrizi, *The Worlds of Herman Kahn: The Intuitive Science of Thermonuclear War* (Cambridge, Mass.: Harvard University Press, 2005), 160. Ghamari-Tabrizi writes that the *Steve Canyon* strip of June 9, 1963, "leaked" the story that the Pentagon was engaged in war games.
24. John W. Campbell Jr., "Game Theory," *Astounding Science Fiction*, September 1955, 5–7; 160–162, 7.
25. Philip K. Dick, *Solar Lottery* (New York: Ace Books, 1955), 5. Hereafter cited parenthetically in main text as *SL*.
26. In his study of luck in U.S. culture, Jackson Lears briefly mentions how game theory "acquired special resonance as a means of planning moves and countermoves against the Soviet Union" and with this context gestures toward the potential interest of *Solar Lottery*. Lears, *Something for Nothing: Luck in America* (New York: Viking, 2003), 241, 357n29.
27. See "Appointment for a Gamesman," *Time*, November 1, 1954, which reports that von Neumann, "a cheerful, portly professor with a passion for cookies and ionospheric mathematical problems," is "eminently qualified to sit across the atomic table from the Russians in the greatest game in the world."
28. Robert Coover, "The Second Son," *Evergreen Review* 31 (October–November 1963), 72–88.
29. Robert Coover, *The Universal Baseball Association, Inc., J. Henry Waugh, Prop.* (New York: Plume, 1968), 40. Hereafter cited parenthetically in main text as *UBA*.
30. See Larry McCaffery, *The Metafictional Muse: The Works of Robert Coover, Donald Barthelme, and William H. Gass* (Pittsburgh: University of Pittsburgh Press, 1982). For an argument about the connection between *The Universal Baseball Association* and Heisenberg's Uncertainty Principle, see Arlen Hansen, "The Dice of God: Einstein, Heisenberg, and Robert Coover," *Novel* 10.1 (Autumn 1976): 49–58.
31. Luce and Raiffa, *Games*, 57.
32. Sherman Rigby, "Tit for Tat," *New York Times*, January 3, 1965.
33. Whitfield, *Culture*, 218–25; Margot Henriksen, *Dr. Strangelove's America: Society and Culture in the Atomic Age* (Berkeley: University of California Press, 1997), 318–31; Stephen E. Kercher, *Revel with a Cause: Liberal Satire in Postwar America* (Chicago: University of Chicago Press, 2006), 330–42. Fred Kaplan also emphasized the connection between Kahn and Dr. Strangelove on the occasion of the release of the DVD special edition; see Fred Kaplan, "Truth Stranger Than 'Strangelove,'" *New York Times*, October 10, 2004. For more on the connection between Kahn and Kubrick emphasizing the latter, see Ghamari-Tabrizi, *Worlds*, 274–80.
34. Quoted in Whitfield, *Culture*, 220.
35. Herman Kahn, *On Thermonuclear War*, 2d ed. (Princeton, N.J.: Princeton University Press, 1961), 71.
36. Ibid., 34.
37. James R. Newman, "Two Discussions of Thermonuclear War," *Scientific American*, March 1961. Excerpts from Newman's *Scientific American* review were reprinted, for a wider audience, in James R. Newman, "A Moral Tract on Mass Murder," *The Washington Post*, February 26, 1961.

38. See Ghamari-Tabrizi, *Worlds*, 19–21, 284–92. Ghamari-Tabrizi suggests that part of *On Thermonuclear War*'s reception was "repugnance for Kahn's grotesque style," 292.

39. *Fail-Safe*, DVD, directed by Sidney Lumet (1964; Sony Pictures, 2000).

40. See also the 1962 novel on which the film *Fail-Safe* was based: Eugene Burdick and Harvey Wheeler, *Fail-Safe* (New York: Harper Perennial, 1999).

41. *Dr. Strangelove, or: How I Stopped Worrying and Learned to Love the Bomb*, DVD, directed by Stanley Kubrick (1964; Sony Pictures, 2001).

42. See, for example J. C. Furnas, "The Fight Over Fluoridation," *Saturday Evening Post*, May 19, 1956; and Donald R. McNeil, *The Fight for Fluoridation* (New York: Oxford University Press, 1957).

43. "Inside the Making of *Dr. Strangelove*," in *Dr. Strangelove*, DVD, directed by Kubrick.

44. See Clark, *Cold Warriors*, 1–42.

45. For Kahn's thoughts on what he calls the "Doomsday Machine" and the "Doomsday-in-a-Hurry Machine," see Kahn, *On Thermonuclear War*, 144–54 (he agrees with Strangelove that a Doomsday Machine is "not acceptable," 149).

46. For a discussion of what he calls Dr. Strangelove's "often ecstatic reviews," see Kercher, *Revel*, 339–42.

47. Mirowski, "When Games Grow Deadly Serious," 227. Mirowski also notes that Oskar Morgenstern, coauthor of *Theory of Games and Economic Behavior*, kept a copy of "Game" in his files.

48. Donald Barthelme, "Game," *New Yorker*, July 31, 1965, 29–30, 29.

49. Ibid.

50. Anatol Rapoport, "The Use and Misuse of Game Theory," *Scientific American*, December 1962, 108–18, 108.

51. Ibid.

52. Ibid.

53. For a later argument that discusses game theory in light of rationality, see Michael Hechter, "On the Inadequacy of Game Theory for the Solution of Real-World Collective Problems," in *The Limits of Rationality*, ed. Karen Schweers Cook and Margaret Levi (Chicago: University of Chicago Press, 1990), 240–49.

54. See, for example, Anatol Rapoport, *Strategy and Conscience* (New York: Harper & Row, 1964). See also Morton Kaplan, "Introduction" in *Strategic Thinking and Its Moral Implications*, ed. Morton Kaplan (Chicago: University of Chicago Center for Policy Study, 1973), 5; and Luce and Raiffa, *Games and Decisions*, 10.

55. See Robert Scheer, *With Enough Shovels: Reagan, Bush, and Nuclear War* (New York: Random House, 1982). There is a large body of work on the nuclear strategy of the 1980s. In addition to Scheer and Jervis, see Stephen J. Cimbala, *Nuclear War and Nuclear Strategy: Unfinished Business* (New York: Greenwood, 1987), and David Shepheard, "Nuclear Strategy/Nuclear Politics," *Paragraph* 9 (March 1987): 31–48.

56. Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1984), 19, 148.

57. Richard Powers, *Prisoner's Dilemma* (New York: Perennial, 2002), 72.

58. Ibid., 69–70.

59. Ibid., 282–83.

60. Ibid., 327.

61. Christina Klein, *Cold War Orientalism: Asia in the Middlebrow Imagination, 1945–1961* (Berkeley: University of California Press, 2003), 23. Leeroom Medovoi, "Cold War American Culture as the Age of Three Worlds," *Minnesota Review* 55.27 (2002): 167–86.

62. Medovoi, *Rebels*, 10–11.