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NUCLEAR CRITICISM AFTER THE COLD WAR:

A RHETORICAL ANALYSIS OF TWO

CONTEMPORARY ATOMIC CAMPAIGNS

by

Bryan Hubbard

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Arts

ARIZONA STATE UNIVERSITY

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ABSTRACT

Today is a nuclear-powered era. Since 1945 nuclear technology has mutated into a cloud filtering human experiences. Despite the apparent end to the Cold War, nuclear technology remains a critical subject. This study constructs a contemporary framework to continue the project of nuclear criticism in a post-Cold War world to contribute to the discussion of nuclear issues. Building on a comprehensive review of critical nuclear discourse since 1945, this project suggests intertextual analysis of current nuclear discourse can encourage politically-meaningful public participation and can promote a better understanding of assumptions influencing the current shape of conversations concerning nuclear policy. It draws attention to a sphere of rhetoric directly affecting nuclear policy that critics have largely ignored. It builds on the work of nuclear criticism, updating and revising the project with a politically-enabling voice for a post-Cold War era.

With this perspective for nuclear criticism, this study analyzes two current nuclear campaigns. The first involves the Department of Energy's Closing the Circle on the Splitting of the Atom as state-sponsored rhetoric reflecting a sustained influence of nuclearism. The second involves the Canberra Commission as a contemporary oppositional nuclear rhetor. The findings suggest successful management of nuclear resources rests with creating an inclusive public discussion and providing perpetual criticism articulating how literary and critical assumptions shape material and discursive action as humanity deals with a lingering nuclear legacy.

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CHAPTER 1: AN INTRODUCTION TO THIS CRITICAL PROJECT

We live in a nuclear age. Our global and personal security rests on humanity's ability to govern successfully its technological capacities and destructive impulses. The means of management necessarily involve communicative assumptions and actions. The conversation about the atom must involve the widest number of voices and the diversity of their values and simultaneously must take care to admit the widespread material dangers of a nuclear world. Rhetorical critics have a role to play in this conversation and can offer unique insight based on their discursive expertise.

Rhetorical criticism grappling with the nuclear dilemma is not new. On the afternoon of Nagasaki's bombing (August 9, 1945), Kenneth Burke wrote in a personal letter to Malcolm Cowley:

> Has the recent inauguration of the new Power Age disgusted you as much as it has me? The era of the Mad Scientist of the B movie now seems with us in a big way. There seems now no logical thing to do but go on tinkering with this damned thing until they have blown up the whole damned world. They may as well blow it up in one big chunk and be done with it. For the fantasies of power (as per money and technology) are now given a whole new vigor in their appeal to the imagination -- and so the life of desiccation must move to its finish, and all the better if it all vanishes with natural affections. I have really learned to thank God for it. And the damned ingratitude of human greed, as reduced to terms of

> money and scientific power, is gradually implementing such motives as make life not worth living . . . (in Jay, 1988, p. 268)

Five years later, K. Burke (1969) dealt more formally with the rhetoric of nuclear science in A Rhetoric of Motives.[1] K. Burke recognized dual possibilities for science which helped create atomic weapons and (in 1947) urgently sought "to dissociate the idea of atomic war power from the idea of national security" (p. 32). Though science endeavors a noble project, K. Burke observed:

> Lying outside the orbit of the scientists' specialty, there are psychological considerations which are nearly always slighted, since they involve identifications manifestly extrinsic to atomic physics in itself. Possibilities of deception arise particularly with those ironies whereby the scientists' truly splendid terminology for the expert smashing of lifeless things can so catch a man's [sic] fancy that he [sic] would transfer it to the realm of human relations likewise. It is not a great step from the purely professional poisoning of harmful insects to the purely professional blasting and poisoning of human beings, as viewed in similarly "impersonal" terms. And such inducements are particularly there, so long as factional division (of class, race, nationality, and the like) make for the ironic mixture of identification and dissociation that marks the function of the scapegoat. Indeed, the very "global" conditions which call for the greater identification of all men with one another have at the same time increased the range of human conflict, the incentives to division. It would

> require sustained rhetorical effort, backed by the imagery of a richly humane and spontaneous poetry, to make us fully sympathize with people in circumstances greatly different from our own. Add now the international rivalries that goad to the opposite kind of effort, and that make it easy for some vocalizers to make their style "forceful" by simply playing up these divisive trends, and you see how perverted the austere scientific ideal may become, as released into a social texture unprepared for it. (K. Burke, 1969, p. 34)

Quoting K. Burke at length has two motivations. First, he invokes a mission for critics and hints at the obstacles facing them. Second, he suggests the dilemma facing nuclear citizens is discursive as much as it is material.[2]

Though "[a]rms are the tools of war" state Seabury and Codevilla (1990), they are "not necessarily the most powerful tools. Words, ideas, and reputations, may be even more powerful" (p. 160). The system of deterrence which governed the Cold War depended as much on textual perception, interpretation and argumentation as it depended on the archives of weapons and material capacity for destruction. The profession of arms after all is the practice of politics through other means as Clausewitz (1976) theorized. This textual construction of the nuclear age prompted Derrida (1984) to call it "fabulously textual" (p. 23). This label grew from a desire to draw attention to how the nuclear age was being "shaped by literary or critical assumptions whose implications are often, perhaps systematically ignored" (Klein, 1984b, p. 2) and not from an intention to obscure the material condition of proliferating arsenals. Because the nuclear age

involves textual practices concurrent with scientific and political expertise, Derrida claimed critics can exercise competence because "[w]e are specialists in discourse and in texts, all sorts of texts" (p. 22). His claim to competence extends to everyone. To encourage the cacophony of voices the nuclear discussion needs, everyone must assert their limited competence and seek dialogic (Bakhtin, 1981; Volosinov, 1973) exchange with other voices in the nuclear chorus. Taking the responsibility for dialogic action means learning as much as one can about the other voices participating in the conversation.

This study takes up this challenge to remind critics and general citizens that we still live in a nuclear age and atomic arguments still need critical attention. Though our contemporary era is increasingly being labeled post-Cold War, this label tends to obscure the reality of nuclear dangers that continue to inhabit our world and the discursive residue that continues to inform textual practices. Labels are intended to describe the nature or essence of a thing. When we call our contemporary era the post-Cold War era, the label helps us imagine the dangers brought about during the Cold War are disappearing. This imaginary demarcation of time is one of the micro-textual fragments conditioning nuclearism. In this nuclear obstacle course, critics must provide constructive counsel and not herald doom without recourse. To practice this politics of criticism, this study reviews the archives of nuclear criticism to offer a politically-enabled perspective in a post-Cold War world, demonstrates the agility of this perspective by looking at two current public campaigns representative of the post-Cold

War world, and finally, suggests several trajectories for future scholarship contributing to the nuclear discussion.

Before reviewing nuclear criticism's archive, this study needs to explore why the world needs a nuclear criticism. "Contrary to the conventional wisdom, the danger of the use of nuclear weapons is greater now than at any time since Hiroshima" (Powers & Muckerman, 1994, p. 99). In updating Nuclear Madness, Helen Caldicott (1994) observed "nuclear power had metastasized around the globe, with a total of 422 nuclear power plants worldwide and forty-five under construction . . . The nuclear facilities stand to inherit the earth" (p. 21). These observations run counter to popular perception that nuclear danger has passed and its corresponding desire to claim a peace dividend.

LIVING IN A NUCLEAR AGE AND THE NEED FOR A NUCLEAR CRITICISM

Ken Ruthven (1993) opened Nuclear Criticism by writing, "In a nuclear age, nuclear criticism ought to be everybody's business. When it is not, the reasons are worth looking into" (p. 1). This statement implies two things about the state of the world. First, it implies we live in a nuclear age. Second, it suggests people currently lack interest in the project of nuclear criticism.

The first assumption, that we live in a nuclear age, needs some examination. To justify calling our moment a nuclear age, one turns to evidence that "nothing we do or feel -- in working, playing, and loving, and in our private, family, and public lives -- is free of their [nuclear technologies] influence. The threat they pose has become the context for our lives" (Lifton & Falk, 1982, p. 3). "Since Hiroshima, we have been

captives of nuclear weapons. We rely on them and we flaunt them, but psychologically and politically they have imprisoned us" (Lifton & Mitchell, 1995, p. 302). "As no doubt we all know, no single instant, no atom of our life (of our relation to the world and to being) is not marked today," Derrida (1984, p. 20) explains, directly or indirectly, by nuclear technology. Simultaneous to our dependence and fascination, we fear and dread the absolute experience of nuclear knowledge, and since 1945 people have "sensed in their bones that the world would never again be the same" (Clark, 1980, p. 128). Though "Hiroshima marked the start of what was called the 'atomic age'" (Ungar, 1992, p. 60), the nuclearism[3] that "has crept from the inside into all the cracks of daily life" (Baudrillard, 1983, p. 58) has grown more directly from nuclear technologies taking "their place as the dominant technology of permanent, self-propelling American megamachine that seems almost independent of human control" (Lifton & Mitchell, p. 304). The centrality of nuclear technology has succeeded because of the linkage of "nuclear plants and electricity to cultural symbologies of political economics and growth . . . [that shows progress is impossible without] electricity and the marvels of an industrially expanding social order" (Vickery, 1990, p. 143). To be against nuclear technology is to be against progress and business which according to dominant American ideology is to be un-American.

During the years of the Cold War, the terror of annihilation made the public willing to "accept practically any measure that promised to sustain their [the American] supremacy; terror was to be held at bay by augmenting terror" (Ungar, 1992, p. 68). Even benign cartoons and popular narrators like Disney (Mechling & Mechling, 1995)

contributed to the early construction of a powerful nuclearism. Robert J. Lifton and Eric Markusen (1990) marked the psychological similarities between the mentality enabling the Nazi holocaust and the frame of mind which sustains our pathological nuclearism. They stated:

> . . . the nuclear system takes on the configuration of a vast industrial corporation, sprawling and loosely connected but centrally animated by a deadly purpose in the form of end products . . . That "industrial organization" spans much of American society, and the "higher standards" of control and development intensify the genocidal dynamic. (Lifton & Markusen, p. 182)

At its critical acceleration, "[b]elief in the virtue of science and technology could be so strong that even a threat of destruction might sound like a promise of peace" (Weart, 1988, p. 28). The trajectory of Cold War technology continued virtually unchecked through the 1980s and resulted in the huge arsenals that challenge present attempts to manage the nuclear genie and any efforts to reduce the threat of a nuclear apocalypse.

History is speckled with periods described by the dominant technology of the day -- the stone age, iron age, bronze age, industrial age, etc. If the ability to use stones as tools radically changed human relations and deserved signification as a distinct era, unlocking the power of the atom also deserves special denotation. In each of these periods, technology has interacted with the symbolic abilities of its users to create unique circumstances, to impel the tool users with the logic of their tools in a desperate search to perfect them. In the past each era has given way to a new era and a new technology. The

nuclear era may have no successor. If we live in a nuclear age, any awareness of what it means to do so must grow in the present tense.

Ruthven's second assumption, "nuclear criticism ought to be everybody's business" (1993, p. 1), suggests people do not widely practice nuclear criticism. Christopher Norris (1994) also laments the fact that by 1994 nuclear criticism had "receded almost to the point of becoming a topic of memorial review" (p. 131). This condition of nuclear criticism is troubling because it suggests scholars have conformed to popular convention that nuclear issues either have passed or lie beyond the competence of discourse scholars. Neither of which is true. For a cacophony of voices to inform the nuclear debate, everyone should and can become nuclear critics.

When one soberly looks at nuclear affairs around the globe, one sees the end of the Cold War did not bring an end to nuclear perils. The context of a nuclear-capable world continues. The passing of the Cold War also has not radically changed the operation or dangers of our nuclear epoch. Though disarmament progress between the United States and the republics of the former Soviet Union deserve applause, it will leave 7,000 deliverable warheads between the two parties and does not alter arsenals of the other nuclear powers.[4] Further recent international progress includes renewed commitment to the Nuclear Nonproliferation Treaty (originally ratified in 1968) and steps toward a Comprehensive Test Ban Treaty. However, these commitments remain untested and their effect on global nuclear dependence hangs greatly on continued "good faith" actions of the current declared nuclear powers. These inclinations toward

disarmament provide hope, but horizontal nuclear proliferation continues as the greatest single threat to international security (Mandelbaum, 1995).

The reasons for the increasing nuclear dangers involve "political instabilities throughout the world fueled by ethnic conflicts, militant fundamentalism, and terrorism; fundamental economic problems . . . and unbridled proliferation of nuclear weapons and their means of delivery" (Powers & Muckerman, 1994, p. 99). The present nuclear potential threatens any hope of democracy's survival. According to Fred C. Ikle (1996), "Democracy cannot survive in a highly uncertain world in which a smuggled nuclear bomb might be detonated in Paris or Manhattan" (p. 127). The continued nuclear threat can justify increasingly panoptic measures toward security which involve "new global networks of sensors keeping track of worldwide targets" (Robins & Levidow, 1995, p. 124) reducing these threats, human or inanimate, to "precise grid locations" (Robins & Levidow, p. 121). Any freedom or privacy becomes illusory and expendable in pursuit of nuclear security. This "technology of power" (Foucault, 1980, p. 148) acts to decontextualize human interaction and decisions and already exists "in a variety of settings, both public and private" (Bogard, 1991, p. 335). Despite the need for nuclear security, the impulse toward totalistic panoptic measures must "be balanced against the protection of civil liberties" (Ikle, p. 128). As occurrences of crises increase, the line between necessary security and intrusion becomes increasingly fuzzy.

Present efforts to deter proliferation and reduce global arsenals also fail to deal articulately with threats created by potential nuclear terrorism, black market nuclear availability seeping from the former Soviet Union (Zimmerman & Cooperman, 1995)

and the "emergence of a transnational defense technology and industrial base" (Bitzinger, 1994, p. 170). Significant obstacles face current and future nuclear management including instability regarding disarmament verification and inequitable distribution of nuclear benefits and risks, nuclear terrorism, regional conflict, undeclared nuclear states, continued scarcity of critical resources and nuclear profiteering.

Even efforts to create an international legal framework to govern nuclear abolition face challenges presented by jurisdictional arguments, lack of enforcement mechanisms, and national sovereignty claims (Mendlovitz & Weiss, 1996). As a governing body, the International Court of Justice faces stark limitations and holds no power to "compel a nation to do anything it chooses not to do" (Moore, 1996, p. 39). With these limitations noted, the World Court ruled on July 8, 1996, that "the threat or use of nuclear weapons was generally unlawful" (Moore, p. 39). At the same time, the court admitted it could not "definitively conclude whether the threat or use of such weapons would be lawful or unlawful 'in an extreme circumstance of self-defense, in which the very survival of a state would be at stake" (Moore, p. 39). In light of an operating theory of deterrence which suggests national survival requires the presence, threat and will to use nuclear weapons, this decision fails to impact world political practice beyond providing one more citation of an organized body endorsing the principles and goals of global disarmament. The difficulty of creating a international framework is taken up later in this project as it deals with the Canberra Commission,[5] but needs to be emphasized here as an extreme example of the limits of the textual approach

to nuclear criticism where judgment has been so cast into doubt that normative statements become impossible.

Ironically, even if the dream of a nuclear-free world can be achieved, nuclear danger will persist. The removal of nuclear weapons does not remove the cataclysmic threat of nuclear power from the globe. As world leaders and publics begin to grapple with closing the circle on the splitting of the atom, they start to realize the first 50 years of the nuclear age represent only the initial grains of sand in the hourglass measuring our nuclear responsibilities. The residue of 50 years of nuclear build up will remain radioactive for the next 100 centuries and require continuous monitoring, technical expertise and policy-related decisions. The challenge facing scientists, managers, policy makers and citizens to govern the atom exceeds that which faced the Manhattan Project scientists. The decisions, people collectively make today regarding the nuclear resources, must "endure for 100 centuries in the face of all uncertainties, mishaps, and surprises the future will undoubtedly bring" (Flynn, et al., 1995, p. 1).

When one combines the obstacles facing disarmament, the difficulty of finding global authority for nuclear abolition and the residue of 50 years of nuclear industry, one sees nuclear technologies and capacities will inhabit our planet for the foreseeable future. For this reason, Caldicott (1994) stressed "it is of the utmost urgency that we refocus our attention on the problems posed by nuclear technology" (p. 23). This brief discussion shows why our moment is a nuclear age and how nuclear issues continue to play paramount roles in global survival. In addition to living in a nuclear age and recognizing the tantamount primacy of nuclear issues, scholars must realize that continued

governance of the nuclear age necessarily involves discursive and communication issues requiring skills of material, textual and discursive analysis. Today, corporations and federal agencies make decisions about nuclear regulation and policy which often involve textual negotiation with wider communities through environmental impact statements, risk-analysis briefings and town meetings. The decisions and perception resulting from these communication-based decision-making processes rely on the intertextual nature of public dialogue as much as on accurate scientific analysis or textual accuracy. This realization must occur prior to nuclear criticism playing an important role in our nuclear future. For nuclear criticism to contribute to the present and future management of the nuclear age, it must overcome an assumption that governing the technically-driven nuclear age rests outside the scope of communication scholars' competence or, even more definitively, the problems of the nuclear age are not communication issues.

An awareness is growing among public policy advocates that the successful management of risk depends on widespread democratic participation and dialogue in the decision-making process (Chess, Salomone, & Hance, 1995; Chess, Salomone, Hance, & Saville, 1995; Coleman, 1995; Fischoff, 1995; Heath & Nathan, 1990-91; Limoges, Cambrosio, & Davignon, 1995; F. Rowan, 1996; K. E. Rowan, 1991; Stern, 1991; Viscusi, Magat, & Huber, 1991; Young, 1990). Currently, structural, material and textual obstacles exist to obtaining widespread meaningful participation in nuclear decisions, this situation leaves the management of a nuclear day in the hands of a small elite. A sustained nuclear criticism can point out how and where in the conversation obstacles like nukespeak affect the conversation.

An elite cannot safely govern post-Cold War nuclear risk without the wider public. It demands "storytelling and the sharing of our individual and communal stories" (Fasching, 1993, p. 314) to treat the pathology of previous nuclear experience and forge positive partnerships for future politics. Such democratic communication has not been characteristic of the first 50 years of the atomic age. Because of a long known "culture of secrecy" (Chess, Salomone, & Hance, p. 127), trust is exceedingly rare in the nuclear conversation. Further discursive practices like nukespeak have also obfuscated issues (Hilgartner, Bell, & O'Connor, 1982; Kauffman, 1989; J. Smith, 1984) and discouraged public participation (Aubrey, 1982; Chilton, 1985; Schiappa, 1989). If the solution for our nuclear dilemma rests with unleashing human communicative freedom and creativity, critics must help undo the barriers of 50 years of experience that continue to assert themselves in current textual practices. As Krug (1995) notes "nuclear writings continue to proliferate" (p. 205) in the post-Cold War era.

A WORD ABOUT THE ATTITUDE AND TONE OF THIS PROJECT

This project will challenge the patience, endurance and tolerance of the reader. It necessarily engages language on a literary level drawing attention to the multiple levels of meaning present at any single moment. It takes an attitude of play in a deadly serious discussion. Recognizing with absolute soberness the inappropriate pairing of play and the nuclear subject, I walk this path with a passion for the victims of the nuclear age. Though the degrees of victimage differ, we all feel the atom and have the ability, though perhaps unrealized, to create something from our experiences. Krug (1995) demands:

> Writing about nuclear issues demands a critical language that does not continue in the lines already laid out, a language that does not mere[ly] recapitulate the bleakness of power. If we write like that, we write like that; nothing changes. Either a new language, or silence. (p. 205)

I will not be silent. I will do the best I can to celebrate a creative spirit where other terministically saw decay and half-life. Nuclear criticism must celebrate the affirmative nature of criticism (Williams, 1988).

Though some will accuse this project of growing from a veil of nuclearism, contaminated with embedded metaphors. I embrace this criticism admitting that all nuclear thought grows from nuclearism and only through an awakened consciousness of nuclearism can new constructions begin to grow.

A PREVIEW OF FOLLOWING CHAPTERS

This introduction provides an opportunity to let readers know what to expect from the following chapters. Chapter two introduces the reader to the background of our present nuclear condition. It attempts to historicize present discourse around the atom by tracing continuities through key moments of the nuclear legacy. It reaches back to highlight ancient human impulses toward perfection and control and our innate fascination with the apocalypse to look forward through the early atomic pioneers, through the Manhattan Project and the Cold War, to arrive at our present historical address. A history of the atom would necessarily repeat the history of the universe; so this introduction falls far short of tracing all the influences of the nuclear age. It does, however, acquaint the reader with a tradition of issues that extend deep into the

construction of our present nuclearism including material events and textual artifacts. This chapter readies the reader for a more descriptive discussion of the literature informing the analytical perspective of this project in chapter three.

Chapter three performs a more traditional literature review of the key texts of the critical nuclear tradition. Alone, a comprehensive review of critical nuclear discourse holds great value for critics who wish to ground their textual observations in a wider intertextual economy. Though this review looks beyond Diacritics (Klein, 1984a), it will necessarily deal with that influential journal and Derrida's (1984) "No Apocalypse, Not Now (full speed ahead, seven missiles, seven missives)." As the review will show, Derrida's article has influenced a great volume of nuclear criticism and has also been the root of much difficulty for nuclear critics (C. Norris, 1987, 1992, 1994; J. F. Solomon, 1988, 1990).

The structure of this review reflects several general threads which make up the tradition of nuclear criticism. First, it reviews the direct contribution of those articles included in the special issue of Diacritics (Klein, 1984a) in 1984. Second, it looks to the Communication discipline to survey its contribution to nuclear criticism. Third, it turns to those within the English discipline to review their work in the representational issues of the nuclear age. Fourth, it looks to the work of few scholars who stand apart and critique these other threads of nuclear criticism from a postmodern interdisciplinary position. This fourth group of scholars begins to suggest the limits of previous nuclear criticism and point to a need for a post-Cold War perspective for nuclear criticism. Finally, this project fashions an intertextual[6] perspective for a contemporary nuclear

criticism from the work of a variety scholars from within communication (Mechling & Mechling, 1991, 1992, 1995; Taylor, 1990, 1992, 1993a, 1993b; Williams, 1988) and from without (J. F. Solomon, 1988, 1990). This intertextual perspective will suggest certain injunctions to guide nuclear criticism in a post-Cold War world. These injunctions will form the basis of the methodological approach to the analysis of two contemporary nuclear texts performed in chapters four and five.

Chapters four and five look at two representative examples of post-Cold War rhetoric. First in chapter four, this essay looks at a publication by the United States Department of Energy (DOE) (1995) entitled Closing the Circle on the Splitting of the Atom. This text serves as the first and only comprehensive overview of the department's program and serves both wide educational and specific agenda purposes. Published as part of the department's "openness initiative," this text marks the first comprehensive attempt to articulate uniquely post-Cold War positions and agendas. This text openly admits questionable previous textual and material practices while trying to build awareness and support for the department's efforts to deal with the Cold War legacy. The dominant mode of engaging the public with nuclear communication has come through practices of risk communication which have been employed as a strategy to manage public conflict and support in order to prop up nuclear policies. This text exists in a larger economy of texts like those of risk communication which make up nuclear discourse but deserves to be singled out because of its proximity to policy and the immediacy of its effect. This analysis encourages the creation of a dialogic nuclear

communication practice from the tradition of risk communication and previous nuclear communication strategies.

Chapter five takes a second example of post-Cold War rhetoric, but this time looks at an appeal for nuclear abolition made by the international Canberra Commission on th Elimination of Nuclear Weapons. This text more uniquely demonstrates contemporary textual practice and experiences. Though a single comprehensive text is available from the commission, most people experience the commission through a web of Internet sites, news stories, speeches and summaries. This study takes that textual collection as a distinct archival body. The completeness of its abolition claims are unique to the Canberra Commission and deserve analysis both because of the influential potential they suggest and the textual strategy they employ. The diverse membership of the commission also makes its rhetoric noteworthy including Jacques Cousteau, Robert F. McNamara, and the commission's chair and spokesman General Lee Butler, former commander of U.S. Strategic Command, responsible for the management and employment of American nuclear forces.

Chapter six takes the observations made from this unique post-Cold War perspective for nuclear criticism and looks to their implication for political activity in the future. This final chapter also outlines future trajectories for scholars interested in nuclear issues from a communication stand point. It suggests communication critics will play an increasingly important role as counselors and facilitators in the nuclear conversation.

The intent behind these chapters and this project is not modest. It tries to renew a project of nuclear criticism out of a sense that perceived importance of nuclear issues has eroded. This project can not be taken at the expense of other politically salient endeavors and must recognize itself as one critical agenda among many. This critic does not see a world without nuclear danger or technology nor do I endorse the abolition of nuclear technology. This critic does feel that lack of public participation in current nuclear decision making must be reversed to manage the technology successfully in the future. Here, I can be accused of conservatism and managerial rhetoric, but this project exceeds that criticism through an emancipatory, if not liberating, agenda. The critic can facilitate such participation by noting practices which discourage participation and obfuscate assumptions. Furthermore, the critic contributes to the quality of this conversation through providing a unique voice equipped to articulate the assumptions, strategies and textual constructions behind our nuclear experience.

This introduction made several points worth summarizing. First, we live in a nuclear age filled with nuclear dangers. Second, both textual and material practices discipline our nuclear age. Third, because textual practices and constructions weigh heavily in our nuclear experience, the management of our nuclear future needs the participation of the critic and a wider public. With those observations in hand, this study turns its attention to the nuclear archive.

CHAPTER 2: AN INTRODUCTION TO THE NUCLEAR AGE

> Often it is difficult to estimate correctly the factual elements involved in the origins and descent of arts and sciences. Most of the essential branches of learning emerge into the light of sober recording at a comparatively late date and when the subjects themselves are well-advanced in both theory and practice. Actually we have no adequate knowledge of mathematics, astronomy, music, medicine, or chemistry. These divisions of man's [sic] thoughtful inquiries about life and living are rooted in a dark, unknown earth, and emerge gradually from prehistoric sphere of legendary to bear their fruit in the light of historic times. (M. P. Hall, 1949, p. 9)

Manley P. Hall's words about the history of alchemy relate directly to a review of nuclear history which simultaneously includes works of science and fantasy, fact and fabrication. Creating an introduction to our nuclear history involves a number of extravagant pretensions, conflations and exclusions. What should a review of the nuclear legacy look like? When should it start? What should it include? Who should be allowed to engage in nuclear criticism?

A primer in the history of the nuclear age necessarily violates some assumptions of the new history Foucault (1972) articulated in The Archaeology of Knowledge. Where Foucault (1972) saw the object of "the history of thought, of knowledge, of philosophy, of literature" to find and articulate "more and more discontinuities" (p. 6), a discursive history of nuclearism must articulate the apparent similarities and continuities of thought

that have maintained the trajectories of nuclear culture despite the always already present ruptures of the stability around power. The nuclear text creates a situation where seeing the instabilities of text and localization of claims is not enough to alter the flow of discourse and human action. Like fallout drifting over borders and radiating from an explosive epicenter, the subjects of the nuclear critic are the apparent continuities and patches to the discontinuities of the nuclear age which flow over borders between states and disciplines. Derrida (1984) understood that deconstruction faced a radical limit with nuclear texts because of the real effects and impulses which exist independently of texts in apparent contradiction to his claim "[t]here is nothing outside the text" (1976, p. 158). Derrida recognized that the nuclear subject may be the one absolute referent empowered by a literature that "gives us to think the totality of that which . . . is exposed to the same threat, constituted by the same structure of historical fictionality, producing and then harboring its own referent" (p. 27).

Though this primer constructs a version of history which may appear monolithic and epic, it does not suggest this history is the only history of humanity. While Foucault might reject the appearance of continuity in this primer, he would likely welcome the use of history to suggest the chance accumulation of events which have occurred in the quest for nuclear power and knowledge has affirmed this "knowledge as perspective" (Foucault, 1971/1984, p. 90) and not unalterable truth. The ebb and flow of sentiment toward nuclear technology and its applications reflect similarities and continuities of human endeavors but also mark the potential for rapid and radical change within synchronic moments. This primer, then, respects Foucault's appeal to genealogical

history which seeks differentiation, but suggests that while one cannot deny the local play and differentiation of particular moments, one must attend to the often unapparent continuities that extend from period to period though their localized expression may often mutate.

So, though Foucault (1972) may accurately describe a world which has "doubted the possibility of creating totalities" (p. 8) and Lyotard (1984) announced an age of incredulity toward metanarratives, they do not deny humanity's inclination toward creating and relying on such totalities or the appearance of such totalities. Despite the weight of history, individuals always possess the potential to reconstruct symbolic situations to choose other material strategies. Foucault attacks "total history" (p. 9) for creating a place of "tranquilized sleep" (p. 14), tucked in by a seamless notion of a universal theme used to lend privilege and legitimate form. Instead Foucault suggests history is dispersed and local, full of discontinuities and the appearance of seamless cohesion. Continuous history, for Foucault, is an illusion used to order knowledge and experience. If we step further back from the script of history produced by Foucauldian methods one may see a continuous series of discontinuities.[7]

What if the appearances of a discontinuity or a denoted limit also turned out to be illusory -- another layer of meaning? In the nuclear age the fragmentation of meaning and of history has served a conservative project to deflect attention from universal issues and continuing themes. Though these themes may be deconstructable and versed in textual construction, they become *functional totalities* and *continuities* which need the critic to articulate their influence intertextually. Jameson (1981) provides the spirit for

this chapter in his slogan "Always historicize!" (p. 9). In doing so, we might find our present cultural text constructed of "fragments" (McGee, 1990) written in the past.

Our inclination to celebrate the end of the Cold War as the end of the nuclear threat creates such a misleading denotation, creating a cloud of particles that obscure the continuing influence of nuclearism and centrality of nuclear issues. Our critical desire to localize experience and relativize importance in explicating difference becomes an obstacle in opposing the pathology of nuclearism. Like a virus that continuously mutates as it infects its host, nuclear questions may differ locally but act globally. The scope and level of analysis always asks for specificity and generalization.

Recognition of this dilemma informs this chapter and urges it to look back beyond previously drawn boundaries of the nuclear age to see continuations of older themes. It looks for previously unarticulated archival continuities that link the nuclear experience with other textual experiences and previous historic moments. Instead this review must suggest the roots of the nuclear age, its birth, childhood, maturity and decline.[8]

NUCLEAR ROOTS (BEFORE 1895):
PERFECTION, CONTROL AND APOCALYPTICISM

This is not a project of history. Yet, it concerns the rhetorical weight of history and the continuities which have waxed and waned throughout history as recorded in texts. The roots of the nuclear age involve the origins of myth and science and extend far beyond Hiroshima into memory and consciousness. Call it innate curiosity or a will to

knowledge, the quest to find out how things work and how to make them better enabled the nuclear age.

To trace the origins of the nuclear age is to trace the origins of the universe back to the College of Angels[9] which included alchemy in its curriculum.

> The basic axiom of alchemy is that man [sic] perfects Nature through art. Art is the wisdom to know and the skill to do. Wisdom perfects art, and art perfects wisdom; and wisdom perfected by art is the wise man's [sic] Stone. He [sic] who possesses it is master of the world. (M. P. Hall, 1949, p. 11)

When reduced, alchemy sought to change one element into another. In this sense, alchemy is a spiritual parent of nuclear science. The basic atomic reaction involves converting one element into another. Whether through bringing together two hemispheres of critical mass or through natural atomic decay, the art of nuclear science comes when we attempt to control and manipulate this natural process. Philosophically, alchemy concerned the perfection and control of matter and spirit. Since humanity is riddled with imperfection, such perfection seemed impossible without spiritual enlightenment, revelation, transcendence. The spirit of this science continues to inform the philosophy of science in our age and suggests three basic historical continuities: a principle of perfection, a desire to cut and control, and an apocalyptic belief.

K. Burke (1966) suggests humans are "goaded by the spirit of perfection" -- the notion of unrealized potential. K. Burke (1969) sees our symbolic ability enabling our impulses toward perfection and suggests that language carries an entelechy which

"classifies a thing by conceiving of its kind according to the perfection (that is finishedness) of which that kind of thing is capable" (p. 14). In Rhetoric of Religion, K. Burke (1961) explains perfection by saying, "Milord, do I understand you to mean that their symbolicity, for all its imperfection, contains in itself a principle of perfection by which the symbol using animals are always being driven" (p. 296). Simply, the desire for life seeks perfection in the desire for immortality. The desire for power accelerates toward absolute power, the quest for weapons collapses to a race for the ultimate weapon. Perfection can involve revolutionary or evolutionary change but always suggests a direction of progress. Bigger, faster, stronger, smarter, better!

Brummett (1989) notes the entelechial drive toward perfection at work in the rhetoric of nuclear weapons strategy. Hirschbein (1989) also saw the eventual progress of nuclear science enabling an "ersatz immortality -- immortalization through making a lasting monumental impact on history" (p. 167). This impulse to power is not new. Humanity has always feared death, seized the greatest power available to avoid death and then created rationalizations to romanticize death. Like other continuities flowing into the nuclear age, the drive toward perfection accelerates with nuclear knowledge and its accompanying industrial capacity. The drive toward perfection informs the other two continuities present in the nuclear age -- the desire to cut and control and a shared fascination with the apocalypse.

Since humanity became a problem-solving organism, it has strived to cut and control its environment in hopes of improving its strategic situation. Harris (1991) claimed the drive to control the environment involves an attempt to master energy. He

traced the search for energy through ancient times noting that the control of energy enabled the control not only of the environment but of its inhabiting organisms. As people became more organized and specialized, the control of energy became centralized. The modern experience of nuclear energy enables an acceleration of this process placing virtually unlimited power (energy) in the hands of an unprecedented few (Mumford, 1980). The tendency Harris observed is one continuity flowing through our current nuclear experiences. J. Burke and Ornstein (1995) call this continuity the drive to cut and control.

This desire to cut and control nature makes human beings human and links our creativity and destructive capacities, our tool-using nature, and our problem-solving inclinations (J. Burke & Ornstein, 1995). In The Chalice and The Blade: Our History, Our Future, Eisler (1988) sees the modern nuclear predicament as the logical perfection of ancient traditions which claim authority and legitimacy through the "power of the lethal Blade" (p. 184). She sees the current path of society set along a grim trajectory and says, "[a] dominator future is therefore, sooner or later, almost certainly also a future of global nuclear war -- and the end of all of humanity's problems and aspirations" (Eisler, p. 184). This trajectory for her originates thousands of years prior to the *discovery* of the atom. The cult of the blade originated in the "Initial Kurganization" of Old Europe from 4000-3500 B.C.E. according to Eisler (p. 250). The impulse to cut and control (J. Burke & Ornstein, 1995) guides the development of humanity from its earliest tool-making days. The potential destructive power parallels the productive capacity of humanity's tools. This trajectory accelerates into the twentieth century creating a situation where,

according to Eisler, would-be totalitarians and their "faith in the power of the lethal Blade as the instrument of deliverance" (p. 184) become one source of today's nuclearism.

Today's nuclear industry has created a global complex bordering on panoptic proportions. Lifton and Markusen (1990) show that within the United States the system of highways and nuclear production facilities creates a grid of security touching most Americans. Kato (1993) explained the creation of global theory of nuclear strategy places the entire globe within a system of control reducing every threat to "precise grid locations" (Robins & Levidow, 1995, p. 121). Because nuclear capability and industrial capacity go hand-in-hand, nuclear technology further entrenches control for industrial powers because the only solution to nuclear dilemma from within nuclearism is bigger science and more control. The drive to control becomes perfected in a nuclear-capable world because the arms industry becomes a cooperative global process (Bitzinger, 1994) demanding complex theories of mutual security, arms and trade agreements, and interaction. Though this process of globalization may weaken Western states, Bitzinger says, in their place will grow megafirms of multinational corporations without loyalties to creed, country or citizenry. Because of the huge economic incentive in the arms industry, proliferation and technology diffusion destabilize the global situation while increasing the means to control masses. Profit, control and the desire for advantage provide a rationality behind the nuclear technology and the arms race (Hamlett, 1990). An irony develops: as nuclear technology escalates the reaction to strengthen our impulses to control also grows (E. Lewis, 1990). The mission of research and

development becomes "enhancing capability and cost-effectiveness" and "outperforming potential adversaries" (Greenwood, 1990, p. 417). The desire to control, the will to perfect our control and the inability to achieve control make technology difficult to constrain. Again this dilemma is not unique to the nuclear age and only marks a continuity which accelerates when fueled by nuclear technology.

The last continuity to inform our present nuclear predicament concerns a recurring apocalyptic compulsion in humanity. Brummett (1991) notes Western ideology expresses a religious faith in science and technology to provide for and solve the problems nature presents. Naive apocalypticism "predicts a radical end to this epoch by way of cosmic, total, cataclysmic change" (Brummett, 1984, p. 84). Where jeremiad sees the potential for atonement to avoid an apocalyptic fate, apocalyptic compulsion sees the end as unavoidable, even if uncertain about its time or means. At the same moment apocalypticism fears the catastrophic experiences and hungers for the new millennium an apocalypse will bring. Apocalyptic fascinations grow out of latent desire for deliverance.

Apocalyptic rhetoric has accompanied the desire for perfection from the earliest days of humanity's articulating experience (see Hanson, 1979, 1983; D. H. Lawrence, 1980; McGinn, 1979; Zamora, 1982; Zulick, 1992). Mixon and Hopkins (1988) trace the origins of apocalyptic to ancient Greece and note the Greek use of *apokalupsis* "which means 'an uncovering' or 'removing the veil'" (pp. 245-246). These meanings suggest an apocalypse serves as a moment of enlightenment as well as tragic end. Marcus (1996) distinguishes between apocalyptic attitudes of Christianity, Islam and Judaism but admits

the notion is one of transcendence whether "in twinkling of an eye" or "little by little" (p. 26).

Apocalyptic myths have sprung up throughout the ages to help order our experience and serve as another well from which nuclearism springs. Brummett (1984) points to the Book of Daniel and The Revelation to St. John as "ancient examples" (p. 84). Apocalyptic myth (and discourse) has several traits common to its diverse examples, it

> . . . bemoans the distressing state of the world, predicts a radical end to this epoch by way of cosmic, total, cataclysmic change (the arrival of the messiah, return of Christ, etc.) and foresees a millennium -- the establishment of a radically new order in which good and righteousness are triumphant. (Brummett, p. 84)

In the modern age, these apocalyptic ideas run with our traditional faith in technology and progress to foster the perception of a potential for human perfectibility. The pursuit of perfect technology according to Lifton and Markusen (1990) leads directly to today's nuclear mindset and taps into a belief that perfection can be obtained through secular means. Secularization of the apocalypse leads to a corruption which Derrida (1984) points out risks "absolute self-destructibility without apocalypse, without revelation of its own truth, without absolute knowledge" (p. 27). Several texts trace the power of apocalypticism in modern rhetoric (Brummett, 1984, 1988, 1991; Derrida, 1993; Heald, 1975; Mixon & Hopkins, 1988; O'Leary, 1993; O'Leary & McFarland, 1989; Reid, 1983). Other texts look to how literature makes use of the apocalypse

(Bartter, 1988; Dewey, 1990; Gery, 1996; Ketterer, 1974; Kreuziger, 1982; D. H. Lawrence, 1980; May, 1972; Osteen, 1990; D. Robinson, 1985; Schwenger, 1992) while others see apocalyptic rhetoric as a radical pressing of textual limits (Baudrillard, 1994; Derrida, 1984, 1993; Eco, 1994).

Hirschbein (1989) explores apocalypticism as a psychological force in our contemporary nuclear consciousness. For Hirschbein, the nuclear discussion simply continues a 2,000 year tradition of "trying to save the world" (p. 22). The difference comes when people recognize the real potential of a traditional fable of destruction. Chasseguet-Smirgel (1988), Meissner (1988) and Ostow (1988) and further articulate the role of apocalyptic thinking in the nuclear age stressing the deliverance of the apocalypse is rumored to be brought by the forces of good but borders on the pathological when the fascination becomes fixation. Such thinking elevates the position of the nuclear elite beyond ecclesiastic level to that of the messiah. Ostow (1988) goes on to document the appeal of apocalyptic rhetoric has for individuals and groups. Pairing an overarching drive toward perfection with apocalyptic fascinations, stories of the end become longing for an absolute end and deliverance.

My decision to invoke apocalypticism as another spiritual ancestor of modern nuclearism should not suggest to readers that this will be an apocalyptic analysis. Instead, it simply suggests philosophical influences and traditions of ancient apocalyptic thoughts are an example of a *continuity* within our nuclear experience. Furthermore, a richer notion of apocalypticism can help us understand the eschatological issues of nuclear criticism. Because contemporary nuclear criticism engages dialogically with the

intertextual economy, nuclear critics must be aware of the apocalyptic continuities under our feet. Apocalyptic thought vexes so totally because it simultaneously suggests endings and a new beginning. D. Robinson (1985) notes the roots of eschatology in the Greek word *eschaton* to suggest apocalypse may refer to *an* end versus *the* end because *eschaton* invokes both "the last thing" and "a boundary." Ends make beginnings and middles important (Kermode, 1966). To create a sense that the end is near lends importance to current experience and urgency to current activity.

One could easily say all of history has contributed to positioning us where we are today. Caldicott (1978/1986) in her revised Missile Envy claims the trajectories of our nuclear pathology began with America's founding fathers, their principles of mercantilism, independence and Manifest Destiny. The military-industrial complex that grew in the twentieth century resulted from the strategic thinking which sought to perfect control and advantage. These continuities flow from the ancestors of the atomic age into its infancy. At this point, this literature review can turn from a preliminary discussion of philosophical roots at work behind today's nuclearism to tracing more traditional influences of the nuclear age which began in earnest near the turn of the century between 1895 and 1938 which mark the infancy of the atomic age.

ATOMIC INFANCY (CIRCA 1895-1938):

PIONEERS, VISIONARIES AND PROPHETS

As this introduction turns its attention to the atomic infancy it cannot forget the continuities of perfection, the desire to control and apocalyptic compulsion. In fact these themes appear throughout the literature of the atomic genie's infancy and childhood as it

grows throughout the first half of the 20th century. The early 20th century provided ripe ground for the nuclear seed to germinate. Three factors helped foster atomic growth during this early stage: advances in science, growth in industrial capacity and developments in political-military thinking.

The advances in science during the early twentieth century rivaled any revolutionary period which preceded it (J. Burke & Ornstein, 1995). At the pinnacle of science were a few thinkers who began to question the very foundations of science given to them. Those physicists like Ernest Rutherford, Frederick Soddy, and Marie Curie[10] who pioneered work in the field of radioactivity and atomic theory left lasting marks on the second generation of physicists who would labor in the Manhattan Project.

The relationship of Soddy (1909) to the nuclear legacy is unique as he began to envision the atom's potential after joining Rutherford in a continuation of the work of Curie. Several volumes document his contribution to atomic science (Jungk, 1958; Kaplan, 1983; R. Rhodes, 1986, Sclove, 1989). Soddy openly invoked the terminology of ancient alchemist and envisioned the dangers of the atom if unleashed (Sclove, 1989). This vision and the early work of physicist inspired scientists of the 1930s who contributed to the development of the technology behind the atomic bomb (R. Rhodes, 1986). This period witnessed a growth in discourse surrounding nuclear technology, its social implications and application. Experiments in radioactive fertilizers and x-rays began to appear in medical journals and the popular press.

By 1919, Rutherford's work had shown "conclusively" that "[b]y bombarding the element of nitrogen with tiny alpha particles he had transformed it at various times into

oxygen and hydrogen" (Jungk, 1958, p. 3).[11] This work marks an important milestone in the atomic legacy. In addition to Soddy's alchemic language, Rutherford (1930/1937) entitled a 1930 volume of his The New Alchemy.[12] "The 'transmutation of matter' for which the alchemists had searched so long was now a fact," Jungk recalls, but the modern physicist and ancient alchemist differed in that "those precursors of modern science, who took the whole world as their province, considered not only the material but also the moral consequences of such an undertaking" (p. 3). Rutherford recognized the power of his work reportedly missing a meeting of British experts to discuss World War I under the pretenses of being "engaged in experiments which suggest that the atom can be artificially disintegrated. If it is true, it is of far greater importance than a war" (qtd. in Jungk, p. 3). This work accompanied Einstein's theory that matter could be converted directly into energy to undermine all physics and explanation of natural phenomena which went before (J. Burke & Ornstein, 1995). Others, like Werner Heisenberg and Erwin Schrodinger added to the long shadow of doubt cast on conventional wisdom and science. The new physics growing in Cambridge, Copenhagen and Gottingen created an excitement in the scientist community of a new dawn of discovery suggesting a final ultimate knowledge of energy and matter.

During this atomic infancy a widespread period of optimism and "nuclear hope" (Weart, 1988, p. 3) flourished. Idealized growth and naive attempts to capitalize on isotopes and radium in everything from fertilizer to vitamins marked this period. Simultaneously, people felt a foreboding potential about the rapid technologizing of the world which paralleled an increasing desire for an international force of peacekeepers.

Fear and progress go hand-in-hand and despite hope that atomic energy could power Utopia, Soddy (1903) introduced atomic energy when he called our planet a storehouse stuffed with explosives. The idea that science and humanity's quests to know the secrets of nature would result in catastrophe is not new. It continues the apocalyptic fascinations mentioned earlier. But the idea that the foundations of matter could be fashioned into a weapon with theoretically unlimited power grew not from literary imagination but from the laboratories of science. Rumors even existed near the turn of the century that Thomas Edison "was building an electrical device that could annihilate a city from a distance" (Weart, 1988, p. 25). Soddy's suggestion of the atom's power inspired science fiction writer, H. G. Wells (1914) who first suggested the new science could fashion atomic bombs. Interestingly, Soddy drew inspiration from legends of alchemists (Sclove, 1989) while inspiring H.G. Wells to write The World Set Free (1914) which in turn influenced later scientists like Leo Szilard (R. Rhodes, 1986). Other scholars (Cooper, 1987; Weart, 1988) point to H. G. Wells' The World Set Free as an important moment of synthesis between latent potential and apocalyptic vision. In his review of apocalyptic fiction, Weart notes prior to "1914 two-thirds of fictional apocalypses had been due to natural causes, after 1914 two-thirds were caused by humans, and of these, three-quarters of the doomsdays came in world wars with scientific weapons" (p. 26). Wells' work marks the first novel in what is now a long tradition of nuclear apocalyptic novels (Bartter, 1988; Brians, 1987; Dowling, 1987; Kreuziger, 1982; D. Robinson, 1985).

In addition to the advances and accompanying fear of scientific progress of the early twentieth century, the period also saw significant growth in industrial capacity which contributed greatly to the ability to convert science into production. Roszak (1989) chronicles the advance of industry in the 20th century and documents a pervasive attitude of our technocracy:

> The message is clear. The ills that plague urban-industrial society are not techno-genetic in essence; they are not the result of a radically distorted relationship between human beings and their environment. Rather they result from as yet incomplete or poorly co-ordinated application of scientific expertise. (p. 37)

Industry put to practical use the advances of theoretical and engineering sciences to answer the "central problem of the age [which] was how to feed and clothe and employ generations of children outnumbering by far those of any earlier time" (Ashton, 1948/1969, p. 111).

Fruits of industry blossomed in this period. In the first decade of this century, Henry Ford organized assembly lines to bring the powered automobile into mass production. Flight became possible and useful. Not long afterward, the fruits of industry would sour on the battlefield as World War I used mechanization to its darkest potential. "Technology in the nineteenth century made it possible to mass-produce weapons which were not only increasingly effective but easy to manipulate" (Howard, 1976, p. 120). Gas, machine guns, armor personnel carriers and flame throwers approached the limits of

total war. War had always been nasty, brutish and tragic, but industrial power enable the means of war to approach total war slowly eroding the limits and rules of warfare.[13]

As science and industry accelerated, political and military thinking scrambled to keep up in order to manage and employ these tools to garner a strategic advantage. "Ceaseless technological advance was structurally embedded in the cultural, economic, and political institutions of modern society" (Weart, 1988, p. 35). The unprecedented destructiveness of World War I raised questions for the professions of arms and institutions of government. Glynn (1992) points to 1919 and not 1945 as the breach of modern morality toward total war; for him, Hiroshima only punctuated an expression which began in World War I.

World War I only hinted at the potential airpower would have to revolutionize warfare, but established the roots of the experience that would inform the rest of history. Douhet's Command of the Air (1942) circulated in the 1920s and suggested that strategic bombing and airpower could determine the outcome of battle independent of naval and ground forces by inflicting intolerable losses upon the enemy. The principles growing in airpower strategy paralleled those of science. The early enthusiasts and proponents of airpower envisioned aircraft providing "quick, clean, mechanical, and impersonal solutions to problems with which others [military and political theorists] had struggled for centuries" (MacIsaac, 1986, p. 626). Douhet's principles of airpower which informed later practitioners were:

> (1) modern warfare allows no distinction between combatants and noncombatants; (2) successful offensives by surface forces are no longer

> possible; (3) the advantages of speed and elevation in the three-dimensional arena or aerial warfare have made it impossible to take defensive measures against an offensive aerial strategy; (4) therefore, a nation must be prepared at the offset to launch massive bombing attacks against the enemy centers of population, government, and industry -- hit first and hit hard to shatter enemy civilian morale, leaving the enemy government no option but to sue for peace; (5) to do this an independent air force armed with long-range bombardment aircraft, maintained in a constant state of readiness, is the primary requirement. (MacIsaac, p. 630).

These ideas extend through World War II and the Cold War and make one of the most critical legacies of our nuclearism yet predate the atomic bomb by decades.[14]

The maturity of statecraft or politics at the turn of the century also leaves a lasting influence on the shape of our present nuclearism and must be included in a context of the larger economy of discourses which make our experience with the atom so complete. One looking at nuclear discourse of the period should remember this period for its dynamic political flux as exemplified by the rise, fall and rise of Germany as a world power, the Russian revolution, and upheaval in China and Asia. Recalling these historic upheavals serves to announce that the power of destruction seems always to exceed humanity's means of management. To isolate our nuclear experience from a continuous struggle toward perfection is to ignore potential lessons gleaned from the fields of other struggles. Additionally, C. S. Gray (1990) notes, "the potential mischief of a work of

historical scholarship is singularly great if it attains fashionable status in a society which is not historically literate" (p. 15). He continues:

> The United States in the closing years of the twentieth century is a political culture characterized (inter alia) by a short attention span for difficult issues of international security; by a proclivity to seek pragmatic solutions to problems which may be conditions to be accommodated rather than puzzles to be solved; and by a very noticeable historical ignorance and general disinterest. (C. S. Gray, p. 15)

So once again, this thesis seems to emphasize the events of history. Here, I take brief liberty to suggest that this thesis does not do what it seems to do. Instead of drawing attention to the events of history, readers should take these highlights and spurs of the long-term nuclear legacy as the archive of history, as the texts of history. The events of history remain largely unknown. What scholars and publics have are the diverse records and interpretations of these events which people cling to at times and at other times forget. This long observation of the historical/discursive influence of the nuclear age should simply remind readers that for every new and unique experience of our current nuclearism, another is a continuation of a running historical theme.

The period between 1895 and 1938 saw the infancy of the atomic age characterized by revolutionary advances in science, growth in industry and particular developments in political-military thinking. In this age, the three continuities of a drive toward perfection, a desire to control and a fascination with the apocalypse endure. Though we can hardly call the discourse of the day critical, it reflected both optimism

and fear toward the progress of science. Readers may already note the problems of atomic infancy seem to be those of modernity. As we continue to walk through the developments of the atomic age toward our present nuclearism we turn from the atomic infancy to its childhood as scientists began to envision practical means of sculpting the power of the atom into usable, if horrible, weapons. The next period in the life-cycle of the atomic age occurs between 1938 and 1945 in the discursive space of the Manhattan Project.

ATOMIC CHILDHOOD (1938-1945):

THE MANHATTAN PROJECT YEARS

Until 1939 the work to harness the power of the atom was largely unfocused and left to the academic theoreticians. A list of names and milestones of nuclear science recorded by history would reach back to Rutherford and Soddy, Einstein's 1905 equation about the transformation of matter into energy, James Chadwick's discovery of the neutron in 1932, and Otto Hahn and Fritz Strassman's discovery of fission in 1938 (Craig & Jungerman, 1986). The implications of this fission were grasped by Leo Szilard and others that fission could result in the release of massive amounts of energy and create a sustained chain reaction.

Yet as late as 1939 Neils Bohr expressed his feelings that "practical exploitation of the fission process would be improbable" (Jungk, 1958, p. 71) and Einstein added that "he did not believe in the release of atomic power" (Jungk, p. 71). However, the potential of the atom alarmed enough scientists to seek the involvement of their political counterparts. The few scientists who grasped the destructive potential of atomic

physicists discussed the idea of self-censorship to prevent totalitarian forces like Hitler from obtaining atomic weapons. When self-censorship failed Szilard and his comrades approached the United States government. First the scientists brought their concerns to Admiral S. C. Hooper, director of the navy's Technical Division with little effect.

Then in April 1939, the scientific community caught wind of German physicist work on an "uranium machine" (Jungk, 1958, p.79). Though the German project intended to create alternative means of propulsion and not the weapons Szilard feared, the Allied community used this perception to justify asking for their own government-backed project. After persuading prominent scientist, Einstein, to help convince President Franklin Roosevelt of the atomic danger, Szilard drafted a memo and two letters to the president. The scientists (Szilard, Wigner, Teller and Einstein) opted to allow a friend and benefactor of the president to deliver the scientists' words for them. This man was Alexander Sachs. Instead of reading the letter prepared by Einstein and Szilard, Sachs thought best to convince the president of the urgency of the situation in his own words. This exchange marks perhaps the first interpretation of nuclear science for political ends and marks a key moment in the nuclear legacy. Though the letter and memorandum prepared by the scientists were left with Roosevelt, the president was convinced by the time Sachs finished his presentation (R. Rhodes, 1986, p. 318).

Gears accelerated with presidential approval. At first a simple presidential committee formed to discuss the potential of uranium. That committee gave way to the National Defense Research Council in mid-1940. The government got behind the research of Enrico Fermi and others to study the potential for sustained chained reactions

produced by an atomic "pile" (Craig & Jungerman, 1986, p. 10) which in 1941 reported success. After Pearl Harbor (December 7, 1941), Roosevelt authorized a "crash program" on an atomic bomb project.[15]

By June 1942 the project had become an army project under the auspices of the U.S. Army Corps of Engineers. The tension among the military, political and scientific communities was great. The personalities best known for project S-1 or the Manhattan Engineer District (Commonly known as the Manhattan Project) began to take their places.[16] One maneuver which helped to ease tension involved the appointment of a civilian scientist to head the scientific side of the project; this job went to Robert J. Oppenheimer. General Leslie R. Groves received his assignment September 17, 1942, to head the military management of the project's infrastructure. Work was underway in Washington by military and political bureaucrats, in Chicago by Fermi and Szilard to conduct a full-scale chain reaction, and across the country with Oppenheimer and his "luminaries" (R. Rhodes, 1986, p. 415) at Berkeley developing the practical theory and plans to create an atomic bomb. By the time of the Trinity Test in July 1945, the project would consume several billion dollars, involve several hundred thousand employees at three separate sites, and remain a near-complete secret, at least to the American public.[17]

The Manhattan Project years do not reflect a period of critical discussion about nuclear science and its implication although some critical issues were present. For a discussion of the discursive influences of the nuclear age three aspects of this period's growth need highlighting: the impulse toward secrecy, the presence of a technological

imperative, and the discursive situation of the decision to use atomic weapons to end World War II.

The culture of secrecy which dominated our 50-year experience with the atom began in the 1930s by the scientists themselves. Astutely aware of the potential they had to affect the outcome of the developments in Europe, the international scientific community spoke softly discussing potential secrecy and moratorium on publishing work which could facilitate the war efforts of their national adversaries. This informal secrecy transformed into official secrecy as the governments of these country's became involved in the projects and realized the nature of the physicists' work. Secrecy around the atom at this early stage influenced the shape of its discourse in three basic ways. First, secrecy limits the number of participants in the discussion. This aspect of secrecy meant that those few people with knowledge and influence over the direction of atomic science would retain that power while the cloak of secrecy held. Second, limiting the number of discursive participants also enabled secrecy to close the discussion to a limited number of "terministic screens" as K. Burke (1966, p. 45) theorized. K. Burke explains terministic screens "direct attention into some channels rather than others" (p. 45). The fewer the number of screens available the fewer the number of potential directions discourse can take. Because secrecy occurred so early in the process of atomic development, a very limited number of possibilities were available. Third, the maintenance of secrecy through technical language, codes and bureaucratic procedure provided the early origins of nukespeak.[18]

The second discursive root at work in the atom's childhood involves the presence of a technological imperative (Taylor, 1990, 1992). This drive to achieve the "technically sweet" (qtd. in Taylor, 1992, p. 438; also qtd. in Dower 1995, p. 1129) continued the themes of perfection and the drive to control to produce an engine of motivation. Taylor (1990) articulates how the attitudes of Los Alamos laborers combined "scientific pursuit of 'knowledge'" with a "national ideology construing that knowledge as best possessed by the United States" (p. 409). Furthermore, Taylor (1992) points out the early classification of the "device" as a military weapon "dismissed the possibility of ethical debate" (p. 441) over its development and use. Combine these "technological and scientific imperatives" (Dower, 1995, p. 1129) and the insulating nature of secrecy, tragic trajectories developed early on without the discussion necessary to alter their direction. The terminology around these imperatives could "so catch a man's [sic] fancy" K. Burke (1969) says, "that he [sic] would transfer it [atomic science] to the realm of human relations" (p. 18). Freeman Dyson (1979), a nuclear physicist involved in weapons development and a later peace activist, notes:

> Nuclear explosives have a glitter more seductive than gold to those who play with them. To command nature to release in a pint pot the energy that fuels the stars, to lift by pure thought a million tons of rock into the sky, these are exercises of the human will that produce an illusion of illimitable power. Oppenheimer and Teller each came to perform these exercises of the human will for good and honest reasons. (p. 91)

Secrecy and the force of technological imperatives bring this discussion to the third discursive topic that this early stage of atomic experience provides -- the discourse about the decision to use atomic weapons to end World War II. To fully discuss the discursive issues at work in the decision to use atomic weapons would require a separate thesis. Yet, to discuss our current nuclearism we must have some familiarity with the decision as it stands as the only wartime use of atomic weapons. A similar discursive situation which influenced its use in 1945 would have global and potentially absolute effect today.

Why Truman decided to use the bomb has been a topic of debate since August 6, 1945. Largely the product of critical historians and the traditional realists who respond, few of these works explain how the decision occurred.[19] The communication discipline has offered some work to show that Truman acted in a situation in 1945 where he could not avoid using the bomb because the rhetoric of unconditional surrender demands the vanquishing of a foe (Hikins, 1983). This argument suggests discourse provided a physical constraint on the actions of those responsible for using the bomb. Today, the discourse around the decision suggests that Truman and his administration were influenced by a host of considerations in addition to trying to save lives and end the war as early as possible including bureaucratic pressure to use a weapon which consumed nearly $3 trillion, to influence Stalin in a post-war environment, and to exact a vengeful price from Japan for the horror of Pearl Harbor and the atrocities throughout east Asia. Regardless of the real reasons behind the decision, its expression remains perhaps the most formative utterance of the nuclear age.

Despite a conversation in the elite circles of how best to capture and manipulate the atom, discourse in this stage of our nuclear conversation can not be considered critical nor public. Cooper (1987) notes the absence of popular articles discussing the atom and its potential during the years of the Manhattan Project. The nature of the debate changed however when Little Boy announced the maturity of the atomic age on August 6, 1945.

ATOMIC MATURITY (1945-1979):

TAMING THE ATOM

If the childhood of the atomic age was marked by secrecy and technological imperatives, its maturity showed a proliferation of these tendencies. If only a handful of people knew and understood the implications of the atom prior to Hiroshima, the entire world quickly learned of the atomic genie's escape. The maturity of the atom spans more years than any other stage of our atomic experience. It includes the growth of technology in weapons, power production, and spin-off technologies like medical and domestic applications. The maturity of the atom belongs to the era which extended the paradoxical fear and fascination of the atom into international doctrine. It was not a uniformly progressive experience, instead it was an age of contradictory practice and rhetoric pushing science and industry forward escalating arsenals and their capacity while demanding limitations and restraining theories. The desire to cash-in on technology and the nature of nuclear power provided great obstacles to maintaining the secrecy of an arms race.

The image of Hiroshima emblazoned on the memories of the public had to be transformed into acceptance of the technology and justification for its use had to be maintained by the nuclear management. The attempts to spin Hiroshima strategically mark perhaps the first critical public discourse of the atomic age. Three texts need to be singled out here. The first involves Stimson's article which appeared in Harper's in 1947. This article provides the official side of why the bomb was used and interprets the results of the bomb. The second text comes from a series of official documents produced by the war department, the United States Strategic Bombing Survey, which assessed the damage and effect of the use of airpower in the Pacific campaign and specifically detailed the damage of the atomic weapons using both physical assessment and survivor interviews. The third is the Smyth Report (Smyth, 1945) prepared by Henry D. Smyth of Princeton University as a sort of audit of the Manhattan Project. The Smyth Report addressed main lines of research and obstacles facing the Manhattan project. All three texts produced after the fact use the events in strategic ways to promote a particular world view. All three texts serve as flash-points for future discourse. Early attempts also occurred to record the human aspects of experiencing Hiroshima and Nagasaki (Hersey, 1946/1985).

The same popular magazines that ran traditional justifications for the use of the weapon also ran articles addressing the change in attitude beginning at the time. The significance of August 6, 1945, did not escape observers in their day. Baldwin (1945) notes:

> August, 6, 1945, will remain forever a milestone in human annals. On that date the world's first atomic fission bomb was dropped upon Japan.

> The action may have been necessary for the purpose of saving American lives. But it was not merely another episode in the long history of man's [sic] inhumanity to man [sic]; and it was even more portentous than the final victory over Japan which quickly followed. For it marked the first harnessing of the sun's power on a large scale, with all the untold consequences for good and evil implicit in the achievement. The new chapter may end in man's [sic] reversion to a troglodyte, or it may lead to the establishment of a world brotherhood [sic] in which the forces of nature, including man's [sic] own passions, are harnessed to the common good. (p. 26).

In July 1947 Harper's Magazine asked, "What are we afraid of" (Spigelman, 1947, p. 124). Reading that article, one notes the uncanny accuracy of its forecast of later work detailing nuclearism. I quote the passage at length both for its content and eloquence:

> The end of war did not allay our fears. But it did change their character. . . . Instead of deliberate, sharply-focused action, there is indecision and apathy, or else an indiscriminate wasting of energies in impulsive and haphazard ventures. . . The truth is that nothing we might do, nothing that might happen to any of the things that particularly worry us would lessen our anxiety or the reasons for it. For the particular dangers on which we try to focus our anxiety are no more than the superficies of our peril. . . . But if it were possible to destroy the atomic bomb, to destroy it utterly and forever, as it had never been and could not be, we would not therefore be

> in any less jeopardy. The weapons already standard in warfare -- all, of course, marvelously improved and multiplied -- will quite suffice, in the event of war, to ruin us. (pp. 124-125)

These texts mark the first ruptures in atomic discourse as well as the attempts to manage these fears.

The management of nuclear perceptions involved political, industrial and popular industries. Significant milestones for the nuclear technology speckled the years between 1945 and 1979 as the attempts to manage and deal with nuclear perception add the veneer of our experience. The first breach of the atomic monopoly came in August 1949 when the Soviet Union exploded its first atomic bomb. To up the ante, work began on a project to build a hydrogen bomb began at the urging of Edward Teller and after the reservations of Oppenheimer, Fermi and others (Craig & Jungerman, 1986). The scientists began their harvest in 1951 when a test at Eniwetok Atoll demonstrated the release of energy from nuclear fusion, but the fruit only ripened in 1954 on Bikini Atoll when the United States exploded a deliverable H-bomb in Operation Bravo. The test yielded a greater blast than expected and spread fallout about 160 miles down wind covering about 7,000 square miles (Craig & Jungerman, 1986). The test covered the crew of the *Lucky Dragon* with radioactive ash and brought fallout to a global audience.

Three months prior to Operation Bravo, Dwight Eisenhower (1953) added a significant text to the management of the atom by presenting his "Atoms for Peace Speech" which suggested atomic power could be harnessed for humanitarian projects. Medhurst (1987) provides detailed analysis of this speech as a veiled attempt to position

the United States as global benefactors while gaining " a 'psychological' victory over the Soviet Union" (p. 204).

The next significant event of the early Cold War involves two little friends who were introduced to the American public in 1957, Disney's "Our Friend the Atom" and Sputnik. To produce "Our Friend the Atom," Disney teamed up with the nuclear industry to create a cartoon account of nuclear science to help domesticate the atom (Mechling & Mechling, 1995). In October, the Soviet Union launched Sputnik and gave the appearance of having the capacity to deliver its nuclear forces anywhere, anytime. Despite inaccuracies of this perception, it granted a sense of urgency to two campaigns within the United States -- the campaign for civil defense and the drive to create a meaningful force of intercontinental missiles. Within these two events and their intertextual ripples, one can see a long standing contradiction in the nuclear era -- the desire to tame the atom for domestic use while admitting its danger as a military threat.

Popular texts like Nevil Shute's On the Beach in 1957 also started to reach wide audiences. One must remember the atomic rise also occurred during the age of television and the height of movies. Taylor (1995) explains that atoms contaminate every textual expression and the culture industry was complicit in the management of our nuclear fears facilitating their sublimation and transferral to fictive radioactive beasts, reborn dinosaurs and aliens. Despite attempts by military-political-popular attempts to domesticate the bomb and satisfy popular fears, popular expressions of anxiety and dissatisfaction existed.

Popular movements began in this era to oppose aspects of nuclear technology with some success. Scientists began to take a more active role in the political implications of their work calling the first Pugwash Conference on Science and World Affairs in 1957. In 1958 the National Committee for a Sane Nuclear Policy (SANE) emerged as an educational body attempting to lobby for a comprehensive test ban (Kurtz, 1988). Mechling and Mechling (1991) also document the attempts popular movements made in reaction to the civil drills and duck-and-cover mentality which offered bomb shelters as a reasonable precaution.

In 1961, reaction to the discovery of radioactive strontium-90 in milk inspired a women's movement against testing which involved 50,000 women in rallies, telegram campaigns and a general labor strike (Kurtz, 1988). Test schedules on both sides of the Cold War accelerated as missile technology became feasible. Erich Fromm (1961) offered his analysis of the nuclear culture and asked about the potential for global survival in May Man [sic] Prevail? An inquiry into the facts and fictions of Foreign Policy. Physicians around the globe followed suit and formed the Physicians for Social Responsibility which campaigned to increase awareness of the medical affects of radiation.

Then in 1962, the world peered into the nuclear abyss for almost two weeks during the Cuban missile crisis. Though this event added energy to immediate demands for test limits and polarized the debate, the public's memory of the event seems short as Mechling and Mechling (1991) indicate that by 1963 fallout shelters and the need for civil defense ranked at the bottom of seven important issues facing Americans at the

time. Dissent existed throughout these years but remained limited and unable to motivate large numbers of the public. Reasons for the decline in urgency after the Cuban missile crisis can be attributed to a variety of reasons. First, the public saw progress toward arms and test control through a series of treaties and agreements. In 1963 the Atmospheric Test Ban Treaty (or Limited Test Ban Treaty) took effect. A "hotline" agreement between the White House and the Kremlin began the era of the red phone. The Outer Space Treaty prohibits nuclear weapons and other weapons of mass destruction from being stationed in outerspace and forbids military bases and testing on "celestial bodies" (Kurtz, 1988, p. 283). The Treaty of Tlatelolco prohibits testing, use, manufacturing, production or acquisition of any nuclear weapon by Latin American countries. The Nuclear Non-Proliferation Treaty of 1968 prohibits the transfer of nuclear weapons (technology of control) to any recipient from current nuclear power states. The Sea-Bed Treaty of 1971 prohibits the placement of nuclear weapons in the ocean floor. The Strategic Arms Limitation Treaty (SALT) I limits the number of anti-ballistic missile sites. These treaties provide one reason public passivity grew toward atomic technology in the 1960s and through the 1970s.

Additional reasons for public disinterest in the atom could have grown from other more immediate issues which diverted attention away from the atom. Civil rights, the Kennedy assassination, the Vietnam conflict and its accompanying protest, and Watergate all demanded the public's eyes and ears. Cast on a single screen of experience for individuals, these events also formed the nuclear age though they are not nuclear events.

Despite the general calm of these years, accidents and near accidents at a variety of nuclear sites around the world forced the public to question nuclear safety and pushed the nuclear industry to readdress its campaign for public perception. Rocky Flats saw fires in 1957 and 1969 which cost "$45 million and sent at least 2,200 pounds of plutonium up in smoke, enough for 220 warheads" (Piller, 1991, p. 42). Though news coverage was limited, concerned citizens formed the Rock Flats Action Group in 1974 to argue for peaceful uses of the plant.

The nuclear industry benefited from the oil crisis of the mid-1970s. Because nuclear power provided seemingly inexhaustible amounts of energy that did not require dependence on external sources, the industry was able to link its product with a vision of national security while meeting the consumption habits and perceived energy needs of the general public even though at no time has the nuclear industry provided more than 30% of this nation's energy.[20]

At the end of this stage of our atomic experience one is not very far in theory and perception from where our attitudes where in 1945. The atom provided both a terrific and terrible potential. Politics, industry, military and public advocates struggled with this paradox creating a great depth of intertextual experience and layering to our nuclear knowledge. The lasting legacy of this era involves the volume of arsenals, nuclear residue, and strategies of deterrence and atomic diplomacy; it also consists of an archive of texts which begin to interpret what it means to live in a nuclear age in fear and fascination of the atom. The age continued our innate drive to perfect our control over nature and our adversaries. It also brought us tantalizingly near to our apocalyptic

visions. If this period culminated in general apathy and anxiety toward the atom, events in 1979 would alter public attitude toward nuclear science and the tranquillity of the nuclear age. These events mark the beginning of the next stage of our atomic experience, an age of atomic decline.

AN AGE OF ATOMIC DECLINE (1979-1984):

CRITICAL QUESTIONS

In casual conversation most people place the height of the Cold War in 1962 with the Cuban missile crisis and mark the beginning of nuclear strategy's decline with the series of treaties signed throughout the 1960s and 1970s. Reviewing the history of the period as a continuation, one might see the years under President Ronald Reagan as the climax of nuclear tensions reaching back to Truman. But before Reagan would take the presidency from President Jimmy Carter in 1980, another event shattered American confidence in nuclear technology.

In March 1979, news of Three Mile Island dominated public attention and required presidential attention (SITE). This event marked a breach in our perceived ability to control atomic power, the fundamental force behind the stars. This event challenged the rhetoric of the nuclear industry and raised public attention to the potential dangers of atomic power.[21] It built upon the seeds of doubt of earlier accidents and blows made to public trust. Though Three Mile Island marks the first widely public nuclear power crisis, another event of the political nature raised the stakes of the nuclear discussion more notably.

In 1980 President Carter, a trained nuclear physicist and naval nuclear commander, signed Presidential Directive 59 which shifted the targeting of the American nuclear arsenal from countervalue (city-busting) to counterforce (military-busting) targets (Kurtz, 1988). Though this action sought the symbolic moral highground, the directive "improved the capacity for prolonged nuclear war" (Craig & Jungerman, 1986, p. 35) and created the perception that American decision makers believed nuclear war winnable and geared toward first strike.

This directive combined with the rise of Reagan's more hawkish attitudes lent the catalyst necessary to alter the public passivity dominant in the 1970s. As one pole in the nuclear debate strengthened so must the other. The campaign for Reagan's election capitalized on appeals for a stronger America and received important support from the Committee on Present Danger which existed since the 1950s. The anti-nuclear movement in America followed on the tails of similar activities in Europe which varied in strength from country to country but began to involve critical educators like E.P. Thompson (1982) in the European Campaign for Nuclear Disarmament. Peaking in 1981 in Europe, the anti-nuclear sentiment erupted in a general encampment around a U. S. military post at Greenham Commons in Great Britain (Cook & Kirk, 1983).[22] In October 300,000 marched in Bonn for a nuclear-free Europe and two weeks later 750,000 marched in London, Brussels, Oslo, Helsinki, Paris and Madrid (Kurtz, 1988).

In the United States, people needed more effort to overcome the inertia toward activism. To inspire a struggling movement, Ken Keyes (1981/1987) published The Hundredth Monkey in 1981 without copyright. After urging readers to pass the book to

friends and reproduce it through whatever means possible, it warned, "The rapid alerting of all humankind to nuclear realities is supremely urgent. If we are wiped out by nuclear destruction in the next few years, how important are the things we are doing today" (Keyes, p. 2)? The strategy of Keyes' fable shifted the agent of change from action to awareness and from materiality to textuality. The act of witnessing and sharing horrific testament about nuclear war had value in itself because "when a certain critical number achieves awareness, this new awareness may be communicated from mind to mind" (Keyes, p. 17).[23] Interestingly Keyes' fable played on the nuclear realities by using a mythic vision combining material realist motivations with textual constructivists strategies. In later years, this combination weighed heavily in a more general nuclear criticism.

In the United States an anti-nuclear sentiment still waited in an infantile stage in 1980 and 1981. Publications opposing the atom, discussing risks, offering alternatives and demanding public action began to appear more readily while politician renegotiated the nuclear terrain (Bundy, et al., 1982). Helen Caldicott's (1978/1986, 1980) work on the medical effects of the radiation and Robert J. Lifton's (1967/1982) work on the psychological aspect of the nuclear age bubbled to the surface. Forsberg (1980, 1982) issued calls to halt the arms race. Others pointed to the complicity between the nuclear power industry and weapons complex (Commonor, 1980; Elmer, 1980; Gogel, 1980; Gravel, 1980; Ognibene, 1980). Texts discussing the rhetorical strategies of the nuclear industry surfaced (Farrell & Goodnight, 1981; Mumford, 1980) and others began to cope

with aspects of risk management (Otway, 1980; Ravetz, 1980; Vinck, 1980). Anti-nuclear sentiment fermented.

If anti-nuclear sentiment peaked in Europe in 1981, it climaxed in the United States in 1982. At this point, a variety of texts approached the atomic dilemma from every possible aspect. Lifton and Richard Falk (1982) published a political and psychological case against nuclear weapons which documented the psychological effect of the nuclear experience. Perhaps their most significant contributions involve the concepts of psychic numbing and nuclearism which suggest that the sustained paradoxical experience of the nuclear age and continuous anxiety created a mental distance for nuclear citizens. Two significant texts deal with the unique language of the nuclear age and suggest that language so deforms perception that it becomes a determining factor in public attitude and political decision making (Aubrey, 1982; Hilgartner, Bell, & O'Connor, 1982). The medical effects of nuclear technology on children also received attention (Rogers, et al., 1982). The nation's most visible scientist, Carl Sagan, teamed with other concerned scholars to explain the potential effects of nuclear winter (Turco, et al., 1982). Jonathan Schell (1982) gave us The Fate of the Earth further forecasting the effect of prolonged nuclear war.[24] Scheer (1982) adds a critique of political powers and their attitude toward atomic weapons in With Enough Shovels: Reagan, Bush and Nuclear War. Forsberg (1982) also appealed to scientific audiences to demand a nuclear freeze. Perhaps the most important text of 1982 came from Senators Edward M Kennedy and Mark O. Hatfield (1982) entitled Freeze! How

You Can Prevent Nuclear War. Though this text saw limited circulation its impact should not be understated.

Combined these texts leave a strong archive for those who seek reason and arguments to oppose nuclear technology and nuclear weapons. The events of 1982 record the pervasive influence of these texts. In the fall, 750,000 participated in a rally sponsored by the American Friends Service Committee to the National Federation of Temple Youth and marched by the United Nations where the Second Special Session on Nuclear Disarmament was underway (Kurtz, 1988). Two days later 1,700 were arrested during a sit-in at the UN and before 1982 ended 4,000 were arrested for various forms of civil disobedience carried out in the name of nuclear disarmament (Kurtz).

The Freeze movement which symbolically subsumed the other anti-nuclear communities in the United States experienced mixed and short-term success. On the wake of Vietnam-like protests and marches, Congress passed support for the MX (Peacekeeper) missile program.[25] The passing of the MX missile appropriation did not eliminate public discussion over nuclear technology. Reagan provided the text issue and milestone of our nuclear experience on March 23, 1983, in "National Security Address to the Nation." Reagan's speech became the basis of much rhetorical analysis (Bjork, 1988, 1992; Goodnight, 1986; Hunter, 1992; Ivie, 1984; Rushing, 1986; Zagacki & A. King, 1989). This speech undermines the stability of Mutual Assured Destruction which operated since the 1950s and created a rhetoric around the potential for a first-strike capability. Bjork (1988) notes Reagan's appeal intended to provide an answer to the "demands of the nuclear freeze movement" (p. 181), return faith in a technological

answer for the nuclear predicament and claim a moral high ground by garnering support for the Strategic Defense Initiative as an exclusively defensive technology.

Another development in 1983 which would play on the conservative impulses of the times and came from the National Conference of Catholic Bishops (1983) when it issued The Challenge of Peace: God's Promise and Our Response. The letter announced the church's position against the bomb and articulated its stance on just war theory.[26] The divisions over the bomb became drawn at odd angles to one another based on religious, social, political and economic lines. Though gender and racial studies relating to the atom are limited, some point to the nuclear industry as another level of hegemonic infrastructure (Cook & Kirk, 1983; Jordan, 1980; see also Caws, 1984; Cohn, 1987; Taylor, 1993b).

This stage of the nuclear experience can be characterized by division and realist appeals in defense or opposition of atomic technology. This debate might characterize the exaggerated climax of high modernity both in a technological and a philosophical sense. Though this period began to address nuclear issues from many angles, critical theory interest in nuclear issues occurs sparingly before 1984. As the Cold War mapped the globe between 1945 and 1984, so it mapped any attempts to come to grip with what it means to live in a nuclear age and within nuclear discourse.

WHERE ARE WE NOW?

CONCLUDING REMARKS ON A NUCLEAR PRIMER

At this point I have taken the reader a long way from developing a rhetorical perspective for a post-Cold War era. I have glanced back to antiquity to observe the

continuities of our spirit of perfection, desire for control and fascination toward the apocalypse. Like a snow ball, the weight of history builds using, shaping and losing matter, texts and events along the way. As the snow ball passes us and we become part of it, we may pause to notice the height from which the momentum began and the great distance it traveled. Any artificial punctuation of the nuclear age could be questioned. One might say our history has always been a nuclear age. While that statement would obscure the uniqueness of our present address, it would highlight the continuities that we must deal with to affect the directions we take collectively.

Along the way, this nuclear primer suggests some of the milestones which lend character to our nuclear legacy and remain influential if not widely recognized. This primer also suggests that the path of our snow ball has not been uniform and has consumed consent and support in a variety of ways to create our present nuclearism. In addition to the events and material milestones of the nuclear age, this primer pointed to key texts which inhabit the nuclear archive and the textual layer of meaning heaped on our nuclear experiences. Though Derrida (1984) says we have no *episteme* to ground an experiential knowledge of the atom, other experiences suggest we do. The Hibakusha and radiation-test subjects know the atom. More than 600,000 nuclear laborers in the United States alone and their families know the atom. Each of the millions of service men and women who exercised nuclear simulations for 50 years without the opportunity to ask, "Is this real?", knows the atom. Every parent who built a bomb shelter during the 1950s and 1960s knows the atom. All the children who practiced curling into a ball during disaster drills know the atom. This primer cannot reach the depth of our nuclear

experiences. It does at least remind us that when this project turns to constructing a post-Cold War perspective for the nuclear criticism, it reacts to longer and wider traditions of textual and material experience than recent analytical practice recorded by discipline-centered journals or publishers. This historicizing has already begun a perspective that chapter three will detail by grounding itself in "shared circumstances" (Mechling & Mechling, 1991, p. 107) of our community. In this sense, critics "draw upon a growing body of interdisciplinary scholarship in which historians, sociologists, anthropologists, folklorists, sociologists, psychologists, cultural geographers, and others collaborate to map the structures of everyday life" (Mechling & Mechling, p. 108). Our nuclear consciousness exists in its particular formation because we participate in "a vast network of structures of signification" and process the bulk of this diversity through a generalizing "gestalt" (Mechling & Mechling, p. 109). Mechling and Mechling urge critics not to isolate a text but to explore them in the "intertextuality of this whole system" because "[t]exts refer to each other, the ability to understand some texts depends upon experience with others, vocabularies from one text bleed into others, and so an" (p. 109). This attitude of inclusion versus exclusion challenges nuclear critics and the readers of nuclear criticism, but the primer in our nuclear age provided by this chapter can go a long way in readying people to see the texture of our present position and opportunities for a new perspective. Describing our present locale and articulating a new perspective for nuclear criticism in a post-Cold War era brings us to the next chapter in this project.

CHAPTER 3: FORGING A NEW NUCLEAR CRITICISM

As this study turns from a primer of our nuclear history, it has already done much to situate readers for a critical discussion of our present atomic locale and the synthesis of new perspective. The continuities noted in chapter two do not disappear but submerge as our discussion turns from past to present. The previous chapter left off at 1984 for several reasons. First, the years between 1984 and 1992 were largely years of transition and growth for nuclear criticism and the nuclear age. With Reagan's re-election in 1984, the tide of the Cold War turned decidedly right and West. Though this event marked a victory for one side of the nuclear debate, it also began the lame duck period for Reagan and his administration which lasted eight years. Second, 1984 brought a symposium at Cornell which solicited critical theory to contribute to the public discussion of nuclear issues (Klein, 1984b). At this conference Derrida (1984) presented his observations on the nuclear age and claimed competence for scholars outside the technical sphere. This symposium sketched the lines of the critical discussion for the next decade. Third, the texts and experiences between 1984 and today belong more properly to our present than our past because the events and policies inhabiting these texts populate the plate of current political and social discussions. This chapter takes the nuclear literature between 1984 and today, evaluates where we presently sit and articulates a methodological perspective for a post-Cold War nuclear criticism which can foster a politically-enabled (Williams, 1988) public discussion of nuclear issues.

NUCLEAR CRITICISM CIRCA 1984

The last chapter left readers hanging at a crucial point in the Cold War and our rhetorical development. Reagan had raised the stakes in the Cold War and escalated his rhetoric toward the Soviet Union. The United States recently experienced a flurry of very negative publications concerning medical, psychological, pedagogical, political and climatic effects of nuclear technology. The field had been fertilized for Diacritics (Klein, 1984a) to blossom in 1984. Though many mark the beginning of nuclear criticism at Cornell in 1984, this author agrees with Ruthven (1993) who urged us to "remember that it [nuclear criticism] has a past, and that it emerged during a particularly bad time in the history of the relationship between the USA and the USSR" (p. 11). That "bad time" saw the transition from a deterrence theory based on mutual assured destruction to a deterrence theory which posits one country may prevail. The time declared "critical theory ought to be making a more important contribution to the public discussion of nuclear issues" (Klein, 1984b, p. 2). The history presented in chapter two belongs to the contextual fabric from which the scholars of Diacritics (Klein, 1984a) fashioned nuclear criticism.

In 1984, Richard Klein, editor of that year's special edition of Diacritics (Klein, 1984a), helped formalize and articulate what constitutes nuclear criticism out of ongoing practices. Klein wrote:

> This proposal arises on the one hand, out of reading a certain amount of recent criticism and critical theory and feeling that without exception it recounts an allegory of nuclear survival; and, on the other, out of the sense

> that critical theory ought to be making a more important contribution to the public discussion of nuclear issues. The field would invite both kinds of criticism, the sort that reads other critical or canonical texts for the purpose of uncovering the unknown shapes of our unconscious nuclear fears, and that which aims to show how the terms of the current nuclear discussion are being shaped by literary or critical assumptions . . . (Klein, 1984b, p. 2)

Klein (1984b) synthesized the practices throughout academia which he saw dealing with our nuclear experience. Due to the growing notion that critics should actively work to affect society in a resistant manner, Diacritics (Klein, 1984a) focuses on the second category of criticism "which aims to show how the terms of the current nuclear discussion are being shaped by literary or critical assumptions" (Klein, 1984b, p. 2). For Klein and the scholars contributing to Diacritics, nuclear criticism fulfilled an ethical duty to emancipate people from a discourse of nuclearism which deceived them and limited their choices.

While illuminating "how the terms of the current nuclear discussion are being shaped by literary or critical assumptions" (Klein, 1984b, p. 2), this ideological orientation provided little practical guidance on how to practice nuclear criticism or where to find objects to study. As conceptualized by Diacritics (Klein, 1984a), I isolate two problems for nuclear criticism during this stage of its development and application. First, this orientation placed a premium on prescription versus accurate description and often resulted in overly partisan analysis. Second, by emphasizing prescription, theorists

overlooked contributing to a description which would facilitate others in drawing their own conclusions and strategies of coping with nuclearism.

The ambiguity of Klein's initial introduction also created difficulty for future nuclear critics seeking a solid practical footing. Klein (1984b) ended his introduction by saying, "[c]ritical theory must play a role in analyzing the mechanism by which nuclear narratives are construed and enacted" (p. 3). Though this introduction to nuclear criticism cleared a general area of inquiry, it failed to provide the necessary framework to give it definite shape.

That special issue of Diacritics (Klein, 1984a) included a variety of articles such as Caws' (1984) voicing of feminist concerns unique to the nuclear age, De Kerckhove's (1984) characterization of nuclear communication, Ferguson's (1984) discussion of the sublime, MacCannell's (1984) accusations that deurbanization results from nuclear ambitions and strategy, McCanles' (1984) exploration of the paradoxes of deterrence, and Sofia's (1984) look at issues relating tangentially to nuclear issues. The one article which deserves individual notice from the 1984 Diacritics is Derrida's "No Apocalypse, Not Now (full speed ahead, seven missiles, seven missives)." This most-often-cited text of nuclear criticism asked the basic questions which future nuclear critics necessarily confront. Its first question concerned the uniqueness of the nuclear age. As this project has already suggested the nuclear age marks both a unique moment in history and an acceleration of tendencies and continuities which predate atomic technology. Derrida (1984) asked the question this way, ". . . is the war of (over, for) speed (with all that entails) an irreducibly new phenomenon, an invention linked to a set of inventions of the

so-called nuclear age, or is it rather the brutal acceleration of a movement that has always been at work" (pp. 20-21)? Next, Derrida claimed no absolute knowledge of the nuclear experience exists. Where one wants an authority with *true* knowledge, "there is a multiplicity of dissociated, heterogeneous competencies. Such knowledge is neither coherent nor totalizable" (Derrida, p. 22). In the absence of "techno-scientifico-militaro-diplomatic" competence concerning the nuclear experience, the discourse and rhetorical critic can claim to be "as competent as others to deal with a phenomenon whose essential feature is that of being *fabulously textual*" (Derrida, p. 23). The dilemma, he claimed, exists as a result of discursive practices:

> There is nothing but doxa, opinion, "belief." One can no longer oppose belief and science, doxa and episteme, once one has reached the decisive place of the nuclear age. In this critical place, there is no more room for a distinction between belief and science, thus no more space for a "nuclear criticism" strictly speaking. Nor even for a truth in that sense. No truth, no apocalypse. (Derrida, p. 24)

According to this argument, the nuclear critic works primarily to undermine concrete claims through the deconstruction of discursive assumptions in a spirit similar to that expressed by Klein (1984b). Once all absolutes have vaporized, nothing is left to "fight in the name of" (Derrida, 1984, p. 30). This logic suggests people would only risk annihilation if they believed to be defending something of absolute certainty and value, without such certainty people would recede to less absolute means of politics.[27]

Derrida's work represents a major thread of nuclear criticism, perhaps the dominant one. However, looking at revisions of nuclear criticism shows many critics fear irresponsible deconstruction as sliding toward empty nihilism (Williams, 1988; C. Norris, 1987, 1992, 1994). Does deconstructing the logic creating the perceived need for weapons eliminate their material existence? Does deconstruction contribute to managing the disarmament once their necessity ceases? Attempts to refine nuclear criticism respond to its partisan origin, the ambiguity of Klein's introduction, Derrida's deferral of extratextual referents in nuclear issues and these questions.

RESPONSES TO DIACRITICS AND GROWTH OF A NUCLEAR CRITICAL TRADITION

The responses to Diacritics (Klein, 1984a) take nuclear criticism to several different disciplines and draw upon a variety of discourses and perspectives. From these responses however, one can see a tradition develop for nuclear criticism, united more by purpose than by theory or method. For the sake of clarity, I divide these responses into three schools: the Communication school which focuses on speech and public discourse; the English school which extends the original project of exploring nuclear representation primarily in written texts and literature; and the postmodern school which includes an interdisciplinary group of critical theorists.[28]

COMMUNICATION AND NUCLEAR CRITICISM

The Communication discipline has a tradition of addressing nuclear issues and rhetoric relating to war. Some communication scholars have dealt specifically with American attitudes toward war (Ivie, 1980), the rhetorical situation of World War II and

the decision to use atomic weapons (Carpenter, 1986; Hikins, 1983; Medhurst, 1988, Newman, 1995a, 1995b), rhetorical origins and aspects of the Cold War (Medhurst, 1987), popular representations of atomic history (Mechling & Mechling, 1995; Taylor, 1993b, 1995) and the rhetorical analysis of nuclear-related texts (Bjork, 1988; 1992; Farrell & Goodnight, 1981; Fisher, 1984; Goldzwig & Cheney, 1984; Goodnight, 1986, 1988b; Hogan & Dorsey, 1991; A. King & Petress, 1990; O'Leary, 1988; Rushing, 1986; Zagacki & A. King, 1989). Other communication scholars have also provided important insight into the rhetorical nature of written history (Blair, 1992; Carpenter, 1995), how historical events later serve rhetorical intentions (Kane, 1988), the nature of evidence and factual validity in nuclear argumentation (Dauber, 1988), the role of metaphor in the Cold War (Medhurst, Ivie, Wander, & Scott, 1990) and the nuclear-technology industry (Dionisopolous & Crable, 1988; Medhurst, Gonzalez, & Peterson, 1990). Additionally, mass communication scholars and some rhetorical critics also documented how the media contributed to nuclear attitudes (Andeyenkov, J. P. Robinson, & Popov, 1989; Bruck, 1989; Corner, Richardson, & Fenton, 1990; Foss & Littlejohn, 1986; Gamson & Modigliani, 1989; Manoff, 1989; Meyer, 1995; Nimmo & Combs, 1982; J. P. Robinson, Chivian, & Tudge, 1989; Taylor, 1993b; Werstch, 1987). Though these many texts address nuclear issues and belong to the archive of inquiry from which a nuclear critic can draw, they do not participate in the same interdisciplinary tradition of nuclear criticism with Derrida (1984), Williams (1988) or Ruthven (1993).

The first attempt at this brand of nuclear criticism in the Communication discipline comes from Williams (1988) in an issue of the Journal of the American

Forensic Association (Goodnight, 1988a) dedicated to "Argumentation in a Nuclear Age." Williams contribution to that issue both expands and reacts to Derrida (1984) and Diacritics (Klein, 1984a) and builds on the works of Kenneth Burke, already popular with communication scholars. The other four articles (Bjork, 1988; Dauber, 1988; Hynes, 1988; Kane, 1988) contribute to an understanding of the nuclear experience but apply communication perspectives separate from those of nuclear criticism.

In "Nuclear Criticism: In Pursuit of a 'Politically Enabling' Deconstructive Voice," Williams (1988) claimed, "[nuclear criticism] has yet to emerge within the academic community as a leading agenda item" (p. 193). He criticized practitioners by saying, "we have yet to devise a critical or philosophical perspective specifically derived from, and therefore adaptive to, the quandaries of a nuclear world; in other words, we have yet to formulate a 'nuclear criticism'" (Williams, p. 194). Reacting directly to Klein's (1984b) introduction to Diacritics and to Derrida (1984), Williams observed six "methodological injunctions" to improve and focus nuclear criticism. He assumed our nuclear dilemma does not belong exclusively to science but has textual components. This assumption placed him with, but more moderate than, Derrida. Williams explained:

> From this vantage point, "nuclear criticism" is like an auger boring into the structures of language which threaten to motivate humanity to obliterate itself in a fiery perfection of dialectical oppositions, in a gloriously perfect war to end all wars. (p. 194)

This compromise becomes further stressed by this project's methodological perspective later.

The six injunctions that Williams (1988) provided start naturally from this "vantage point" and his own belief that K. Burke's Dramatism and Derrida's Deconstruction best meet the challenge of nuclear criticism. William's injunctions included: (1) nuclear criticism must "denucleate" our "centered structures of meaning" (pp. 200-201); (2) it must "operate from *within* the structure of nuclearism" (original emphasis) (p. 201); (3) in exploding the traditional center of rhetoric, truth, it challenges critics to reconsider their role and that of rhetoric (pp. 201-202), (4) though nuclear criticism deconstructs truth, it "needs to attest to its affirmative stance; it needs to emphasize its liberating quality" (p. 202); (5) "[n]uclear criticism must be rhetorically forceful and publicly accessible" (p. 202); and (6) "[n]uclear criticism must work to generate a new 'myth' of human relations and national interactions" (pp. 202-203).

These injunctions provided additional framework to Derrida's missives and point nuclear criticism toward a more applied purpose. However, Williams (1988) recognized his injunctions placed critics in a paradoxical situation by asking them to "'attack' ideological configurations without being ideological" (p. 201), and created a situation where "nuclear criticism may be seen as genuflecting toward its own abyss, toward obliteration in destructive nihilism" (p. 202). The fear Williams showed about "being ideological" came from an understanding that ideological criticism often falls into polemic partisanship. To avoid this pitfall, critics can emphasize description prior to prescription; a point further emphasized by Ruthven (1993). Furthermore, if nuclear criticism should have both political efficacy and public accessibility, critics must struggle not to "alienate lay publics" (Williams, p. 202) by using the theories of K. Burke and

Derrida. Wander (1996) recently noted the complexity of these concepts has not stopped bell hooks from putting "'[d]econstruction' on the street" (p. 415).

Williams (1988) attempted to deal with Klein's (1984b) ambiguity and Derrida's (1984) extreme, and made significant additions to nuclear criticism by providing specific "methodological injunctions" and pointing out that critics must avoid "a call to arms, for such measures replicate our pre-nuclear modes of thinking . . . such treatment must follow from 'fearsome appreciation' of our textual condition, of our symbolic capacities" (Williams, p. 204).

THE ENGLISH SCHOOL:

REPRESENTING THE NUCLEAR REFERENT

Separate and almost simultaneous to the work done in communication in the late 1980s, the English discipline also began to cope with representational (Messmer, 1988; Nadel, 1988) and pedagogical issues (Bosmajian, 1990; Raymond, 1988; Totten, 1983, 1984; Zins 1985, 1990) of the nuclear age. This work resulted in a significant collection of articles in a special issue of Papers on Language and Literature (Scheick, 1990a) in 1990.

In the introduction to that issue, Scheick (1990b) attempted to synthesize works populating nuclear criticism between 1984 and 1988. With his synthesis came some narrowing of the objective of nuclear criticism in a particular direction. Scheick (1990b) began by noting nuclear criticism's ambiguous definition:

> If only a few sentences toward a working definition of nuclear criticism appeared in that issue [Diacritics], an uncertain explanation and an

> incomplete self-consciousness still remain as problems for its practitioners today. Nuclear criticism includes writers who vary from those with a fervent social commitment to denuclearize the world to those who engage in its practice somewhat more abstractly as an interesting philosophical or critical concern. (p. 3)

For Scheick (1990b, 1990c) and those contributing to Papers on Language and Literature (Bosmajian, 1990; Brians, 1990; Osteen, 1990; Schwenger, 1990; Smetak, 1990; J. F. Solomon, 1990; Weiss, 1990; Zins, 1990), nuclear criticism's diversity and lack of theoretical focus posed no particular problem. Instead of being theoretically united, these critics formed a loosely knit practice of hope. Any attempt to uncover and oppose nuclearism qualified as nuclear criticism from this perspective. Scheick (1990b) wrote:

> In this sense, nuclear criticism endeavors to penetrate to the core of human mental constructions, including literary or cultural criticism itself, in order to expose the one ultimate concern that has always mattered to humanity throughout history: the preservation of life. Nuclear criticism seeks (sometimes directly, sometimes indirectly) to become the nucleus of renewed ethical critical discourse. (p. 5)

Claiming the moral highground for nuclear criticism presents several problems. First, assuming a moral highground exists (even if founded on survival) deposits reality and external *truth* back into the nuclear equation after Derrida (1984) and Williams (1988) attempted to remove it. It also sets a particular hierarchical relationship between

experts and audiences which can discourage participation. This positioning confuses Derrida's (1984) claim to competence with an exclusive authority to dictate solutions and interpretations of nuclear experiences. Such claims create more conflict than they offer means of deliverance. In the nuclear age, no method exists to determine righteousness between nuclear advocates and nuclear opponents. Both sides claim to serve the interests of humanity and both claims commit the sin of hubris when they do. Scheick extended and amplified the ideological role of nuclear criticism but did not provide a perspective which can contribute to the practical management of our nuclear age without repeating the privileging of experts at the expense of a wider participative discussion.

Klein (1990) picked up on the growing ambiguity and entropy of nuclear criticism apparent in Papers on Language and Literature (Scheick, 1990a) and hoped to reignite the theoretical work needed to create a "critical or philosophic perspective specifically derived from, and therefore adaptive to, the quandaries of a nuclear world" (Williams, 1988, p.194). With the unique legitimacy of writing the original introduction to nuclear criticism for Diacritics (Klein, 1984a), Klein recognized the internal contradictions within nuclear criticism that undermine material reality while seeking to create another. This attempt at retargeting nuclear criticism in "The Future of Nuclear Criticism" (Klein, 1990) did not depend so much on providing a clearer definition as it does on *playing* within those apparent aporias and contradictions of our present condition. Klein (1990) saw nuclear criticism's value primarily in exploring the "existence of an alternative concept of the future whose logical consequences for the possibility of anticipated certainty might, in certain crucial circumstances, alter the calculations of our strategies,

and effect the very conditions of strategic thinking itself" (p. 82). He used an extended explanation of the "Class-A Blackout" paradox first presented by Donald John O'Connor to demonstrate the dilemma of basing rhetoric on projected future certainties. In summary, the paradox states one cannot draw binding conclusions about the future based on statements of probability. The paradoxical parody shows instead of a textually constructed reality as Derrida (1984) suggested or a materially constructed reality as Scheick (1990a) and others exploit, text and material co-construct reality in a type of negotiated compromise. For Klein (1990):

> Nuclear criticism is not an answer, it is a question -- a way of asking how to ask the question of whether the production of culture in our society is being shaped and determined, mediated down to the smallest details, by the implications engendered by the nuclear fable for the way we think about the future. (p. 99)

Klein also paid attention to the difficulty and complexity of verb tense in nuclear criticism. The nuclear critic served as historian for an event which has yet to occur because once it occurs it may leave no historians to record it, balladeers to sing about, or critics to interpret it. "The time or tense of the nuclear sublime is the already of a not yet, the mimetic reassurances of a future anterior," Klein says (p. 77).

Despite Klein's (1990) reconciliation of textual and material realities and his acute observation of the paradoxes within nuclear criticism which attempt to record a history yet to occur, nuclear criticism continues to suffer entropic fission from its originally ambiguous conceptualization and priorities which favor partisan prescription

over astute description and theory building. However, Klein brought compromise to nuclear criticism which is often absent from nuclear negotiation. He showed how our experiences have practical roots in reality and textuality despite the apparent contradictions of that situation.

Klein's work and the Paper on Language and Literature (Scheick, 1990a) essays marked the midpoint between Diacritics (Klein, 1984a) and today. Since that point in the string of nuclear criticism, three other significant critics have tried to refine and reassess what nuclear criticism is and what it contributes. Because of the interdisciplinary appeal and approach of these critics and their orientation, I call them the postmodern school of nuclear criticism.

THE POSTMODERN SCHOOL:
THE LAST WORDS ON NUCLEAR CRITICISM?

The postmodern school of nuclear criticism includes three diverse theorists who try to address basic questions of postmodernity present within the nuclear age as outlined by Rosenau (1992). "Post-modernism," she says, "questions causality, determinism, egalitarianism, humanism, liberal democracy, necessity, objectivity, rationality, responsibility, and truth" (Rosenau, p. ix). Though no unified idea of postmodernism exists, postmodernists generally challenge privileged interpretations which are based on any of these previous key terms. I hope postmodernists will embrace the inclusive spirit of this review and welcome its tentative incompleteness and labeling.

Another important consideration goes into bracketing the postmodern school from the others. These texts begin to explore how the change in the geopolitical environment

at the end of the Cold War should affect nuclear criticism. These scholars author their works largely after the fall of the Berlin Wall, the reunification of Germany, the dissolution of the Soviet Union, and apparent success of coalitional warfare in the Middle East during the Gulf War.[29] If the primary role of nuclear criticism intends to undo the nuclearism of the Cold War, it appears at this point nuclear criticism may have run its course. These three critical theorists take up this dynamic political environment and examine the limits of our textual experiences with the atom often reacting to the fantastic claims of scholars like Baudrillard (1983, 1994, 1995) about the nature of experience in the 1990s. These three scholars are Luckhurst (1993), Ruthven (1993) and C. Norris (1987, 1992, 1994).[30]

The first of these recent efforts comes from Luckhurst (1993) in "Nuclear Criticism: Anachronism and Anachorism." Luckhurst defends popular texts and suggests nuclear criticism has neglected these representations of our nuclear experience. He encourages nuclear critics to turn their attention to popular texts *in the name of* their contributions and cohesion to the kind of nuclear criticism which believes "that there can be no real representations of nuclear war, only 'real' representations that operate precisely through repetition" (Luckhurst, p. 93). Though Luckhurst primarily intends to alert nuclear critics to the multiple representations of our nuclear experience in newspapers, science fiction and popular fiction, he also endorses a nuclear criticism which identifies exclusively with a textual reality. This textual-centered nuclear criticism deflects from the political-material experiences of the nuclear age. Uninterested in management of archives and arsenals which pose material threat or in affecting the vast budgets which

influence cultural production through academic-industrial-bureaucratic liaisons, Luckhurst's criticism commits the kind of textual sophistry attacked by the other late nuclear critics (C. Norris, 1987, 1992, 1994; J. F. Solomon, 1988, 1990).

The second postmodern nuclear critic is Ken Ruthven (1993). His Nuclear Criticism catalogs and describes nuclear criticism in the only book written on nuclear criticism *per se*. Ruthven sees nuclear criticism playing a critical role in the present and future. In fact, he opens his book by saying, "In a nuclear age, nuclear criticism ought to be everybody's business; when it is not, the reasons are worth looking into" (Ruthven, p. 1). He points to a wider claim for nuclear criticism existing outside the small body of critical theorists contributing and reacting to Diacritics and lists the many scholars who contribute to our understanding of "the ways in which the discovery and control of nuclear energy have been represented, bringing to bear on this matter the panoply of disciplines which constitute the humanities" (Ruthven, p. 5). Ruthven, however, carefully points out:

> [Nuclear Criticism] . . . has tended to not to be applied collectively to that heterogeneous bundle of discourses produced when people situated in different disciplinary domains address the common problem of nuclearism. Instead, the term has been appropriated and used self-consciously by a group of critical theorists whose activities first became widely known [in Diacritics in 1984]. (pp. 8-9)

Ruthven (1993) displays some insightful guidance for nuclear criticism. Among his contributions, Ruthven describes a means of balancing intertextuality and an ethical

(ideological or prescriptive) role for nuclear critics without absolutizing like earlier modes of nuclear criticism. Critics, according to Ruthven, should give priority to the *living* relationships between texts without forgetting the material arsenals on which the textual layers rest. The concern for living relationships plays a resonant chord in making nuclear criticism an ethical concern and explains the effort this study makes to announce its location at the current end of a long chain of nuclear experiences. In Ruthven's practice, critics satisfy their ethical obligations primarily by providing insight into a situation through observations grounded in particular communities. "Another way of negotiating the ethical issue," according to Ruthven:

> is to shift the debate from prescriptive to the descriptive mode, and instead of trying to determine the ethically proper responses to those various dilemmas which nuclearist doctrines and activities pose, to concentrate rather on recording and classifying the variety of responses such dilemmas have in fact elicited. (p. 30)

Nuclear criticism should attempt an ethical project to prevent or postpone a manufactured apocalypse and can do so by analyzing "those linguistic and rhetorical devices by means of which we have constructed discursively a nuclearism which in turn has profoundly affected our awareness of human possibilities in the nuclear age" (Ruthven, p. 97). In this way the nuclear critic provides a useful voice in a chorus of voices discussing nuclear issues without asserting exclusive authority which tries to dictate the direction of nuclear policy.

Ruthven (1993) makes important progress for nuclear criticism in two areas. First, he reconciles the prescriptive and descriptive roles of critics. Second, he shows how ambiguity creates room for a plurality of nuclear criticisms which suggests ambiguity does not necessarily lead to entropic loss. By allowing theory building and practical description to coexist with prescription and ambiguity, Ruthven avoids stagnating nuclear criticism and pushes it toward making visible contributions to the academy and society in general. In this way, nuclear criticism acts to integrate rather than divide.

The third and most critical of the postmodern nuclear critics is Christopher Norris (1987, 1992, 1994). Though C. Norris (1987) argues against postmodernism, his perspective belongs to postmodernity as a reaction to "irresponsible word-spinning sophistry that can turn anything (nuclear war included into grist for the well-oiled 'textualist' mill" (1992, p. 40).

In the years between 1984 and 1994, C. Norris sees the bulk of nuclear critics misusing Derrida. Instead of recognizing deconstruction as a means of undoing textual obfuscation, C. Norris sees scholars like Baudrillard (1994, 1995) ignoring the potentially real effects of rhetoric and the already real arsenals of nuclear weapons. While accepting Derrida's claim that in the nuclear age, "there is a multiplicity of dissociated, heterogeneous competencies. Such knowledge is neither coherent nor totalizable" (Derrida, 1984, p. 22), C. Norris emphasizes Derrida does not so much suggest the nuclear age has no material ground as he suggests that textual practices discipline how we deal with those material experiences and challenges.

C. Norris (1994) calls this justification for the critic to enter the nuclear discussion based on the absence of all authority and competence, "the weak or negative justification for nuclear criticism" (p. 135). He suggests a different reading of Derrida which he calls the "'strong' thesis":

> . . . deconstruction has a special affinity with the discourse on nuclear war since it belongs to an epoch that has confronted the prospect of the absolute, remainderless catastrophe, one that would leave no trace of a civilization -- or written archive -- by which to assess, to represent or to commemorate the strictly unthinkable event. (C. Norris, p. 135)

C. Norris' reading of Derrida supports the claim that methods must not forget material reality while dealing with textual layering. Deconstruction's value for nuclear criticism comes in its ability to describe how interpretations become privileged and to help map intertextual systems of meaning. In this way, the critic applies Derrida's tools to our nuclear experience to free us from preconceived paths and determined futures not to deny the real dangers of nuclear age but to encourage the exploration of other potentially real roads.

In articulating the limits of the textual threads of nuclear criticism, C. Norris (1994) issues the challenge igniting this project. He observes:

> Thus "nuclear criticism" is somehow to be thought of as a radicalization -- a pressing to the limit -- of those issues posed by a deconstructive reading of Western "logocentric" tradition of thought . . . In which case -- the strong thesis again -- deconstruction would inhabit that critical zone where

> thinking comes up against the absolute limits of truth, knowledge, reason, logic, or adequate representation. (C. Norris, p. 136)

At this point nuclear criticism as it exists in the archives has reached its boundaries and outstayed its welcome. However, a need for *a* nuclear criticism still persists. To meet this need this project turns its effort to articulating its post-Cold War perspective for nuclear criticism.

A METHODOLOGICAL PERSPECTIVE FOR POST-COLD WAR NUCLEAR CRITICISM

In constructing a nuclear criticism for a post-Cold War era, one necessarily grapples with the issue of textuality and the recognition that the nuclear criticism born of Diacritics (Klein, 1984a) was largely a textualist project that believed critical theory ought to make a more important contribution to the public discussion of nuclear issues by reading "other critical and canonical texts for the purpose of uncovering the unknown shapes of our unconscious nuclear fears, and . . . to show how the terms of the current nuclear discussion are being shaped by literary or critical assumptions" (Klein, 1984b, p. 2). This methodological perspective combines several aspects of early nuclear criticism and the elements from a variety of critics who seem to recognize nuclear criticism's role in a post-Cold War environment. Striking a compromise between materialists and textualists, this perspective reflects an intertextual approach to criticism grounded in a tradition of nuclear criticism.

The arrival at an intertextual approach to nuclear criticism necessarily travels the landscape of textualist criticism which ranges from works by Baudrillard (1994, 1995) to

more traditional literary critics like Schwenger (1990, 1992) who departed from Derrida's (1984) description of nuclear age as "fabulously textual" (p. 23). Taylor (1990) explains, "[t]extualism is widely adopted in nuclear criticism, where nuclear issues are considered to be symbolic issues" (p. 396). He later describes that the nuclear age consists of "composite 'text' through which culture" (Taylor, 1993a, p. 268) comes to know and experience the bomb. The intertextual economy of the nuclear age has materiality in that it has affected behavior and policy decisions and exists as part of an archive independent of any human individual yet given unique life at every expression and interpretation.

According to critics like C. Norris (1987, 1992, 1994) and J. Fisher Solomon (1988, 1990), the textual approach to nuclear criticism has reached its limit and at its critical extreme turns even the Gulf War into a "piece of postmodern hyperreality" (Ruthven, 1993, p. 74).[31] Though Baudrillard (1995) provides insight into the pervasive contamination of the globe via media and how image-managing technologies can distort through information campaigns in sometimes unpredictable and sometimes patriarchal ways, his works tend to obscure the material effect of strategies and the historical reality in which events occur.

To answer the limits of textual nuclear criticism, J. F. Solomon (1988) calls for "[a] nuclear criticism that simultaneously assents to this deconstruction of the referent while maintaining its desire to cross from the word to the act, from the text of the critic to the goal-oriented world of political activity" (J. F. Solomon, 1988, p. 30). His solution involves a compromise that recognizes that while the nuclear age is governed by a system of texts, these texts become real because we accept their claims as true or false and base

our actions on information gleaned from texts. He builds a "potentialist metaphysics" (J. F. Solomon, p. 34) that admits "[w]e cannot be certain of our destiny, but we are not therefore abandoned to a chartless destinerrance" (J. F. Solomon, p. 35).

Today's nuclear critics must realize that policy decisions do not solely reflect a single material reality of a situation nor do they exist in a textually-isolated universe. Instead, policy decisions and public discourse reflect a practice co-disciplined by a textual tradition and a material history. This should not alarm material critics. Instead of separating discursive and material reality, this perspective sees textual and discursive practices as part of a material world which take on a material existence through human interaction and as recorded through an archiving process. If material history exists for those without direct experience of certain events, it comes to reality through the recordable and repeatable nature of texts. The works which record particular events become as much a part of the historical exigencies as the actual event with all the deflections and reflections that come in the writing and reading process. The nuclear critic therefore strikes a compromise; while admitting a material reality exists and that discourse is not totally determinant, critics should view discourse as influential (Condit, 1987a, 1987b).

Post-Cold War nuclear criticism, therefore, practices a mode of intertextual criticism as formulated in the works of Mechling and Mechling (1991, 1992, 1995), Martha Solomon (1993; see also Solomon & McMullen, 1991), and Taylor (1992, 1993b). M. Solomon (1993) sees critics entering the next century applying their unique tools to explore "(1) how and where texts are created; and (2) how texts interact with

each other, especially in what I will term 'intertextual interanimation'" (p. 62). By using interanimation, M. Solomon invokes a mystical language and suggests works give life to each other as they fall apart and are reconstructed by rhetors, readers and critics. McGee (1990) saw this process at work as people fashioning discourse from fragments that circulate in an intertextual economy. He explains:

> . . . rhetors *make* discourses from scraps and pieces of evidence. Critical rhetoric does not begin with a finished text in need of interpretation; rather, texts are understood to be larger than the apparently finished discourse that presents itself as transparent. The apparently finished discourse is in fact a dense reconstruction of all the bits of other discourses from which it was made. It is fashioned from what we call fragments. (p. 279)

So, when critics come to a potentially influential work in the nuclear conversation, the critic announces its incompleteness and seeks the fragments and semiotic soup from which it grew. "Within our culture," Taylor (1992) says, "the circulation of nuclear texts creates an 'intertextual' economy through which the meaning of any text is created in its association and reference to other texts" (p. 430). Nuclear critics want to elicit how certain fragments are repeated to guide the decoding of texts in ways that maintain the trajectories of the nuclear age. In order to do that, nuclear critics have to maintain an agility to see continuities between fragments and the relations of potentially distant texts in grand discourse and materially complex situations suggesting the need for genealogical tools.

This role suggests critics use their unique tools to uncover previously hidden influences and tensions within texts that act to serve particular interests. Mechling and Mechling (1991) see the critic mapping how official rhetorics attempt to naturalize nuclear technology and how consuming populations resist the "totalizing language" (p. 107) of America's national nuclearism. Taylor (1993a) sees nuclear organizations increasingly "struggling to redefine their legitimacy and mission, and to reverse their historical obsessions with production and secrecy" (p. 268). Admittedly this discussion of the role of the critic is informed by the continuing discussion of the ideological turn in criticism (Wander, 1983, 1996, see also Crowley, 1992; McGuire, 1990; McGee, 1984; McKerrow, 1989; Ono & Sloop, 1992).

In one sense, nuclear criticism is ideological criticism in that it "recognizes the existence of powerful vested interests benefiting from and consistently urging policies and technology that threaten life on this planet" (Wander, 1983, p. 18). This mode of criticism admits materialist critics' claim that "discourse is not the only thing that 'matters'" (Cloud, 1994, p. 141) and critics should link the "discursive artifact with the exigencies of the historical moment in which it was produced" (Cloud, 1992, p. 321: see also S. Hall, 1985). Though this project admits an ideological awareness, it does not advocate particular action or policy and sees itself serving "socio-rhetorical criticism" by increasing "our understanding of the dialectical relationship between communication and social relations" (Mechling & Mechling, 1991, p. 107).

In this perspective nuclear critics submit their observations back to a community in a manner that participants in the public conversation can use to improve their

discussion of nuclear issues. In this way, critics use their unique tools to provide additional and potentially enlightening information as part of a continuing nuclear conversation. Of course, the critic will not determine the outcome of policy debate but contributes to a better decision-making process by helping participants see the nature of arguments and texts that make up the discourse in which they operate. Articulating the intertextual interanimation of works helps to illuminate "how the rules of discourse communities can be altered through rhetorical exchanges" (M. Solomon, 1993, p. 67) and how "rhetoric works in promoting and impeding social change" (p. 67). Taylor (1992) summarizes this approach to criticism by saying:

> As a critical method, this approach does not refer to a codified set of procedures that systematize the relationship between critic and text. Rather, it reflects an orientation towards the text as an embodiment of larger discourses . . . To uncover these elements, critics explore static patterns of tone and imagery in text, identifying its excesses, absences, and contradictions. As defined here, criticism explores how, under particular historical circumstances, certain texts inscribed with particular beliefs and power-relations achieve cultural authority as "'truth." Additionally, criticism should reflect on its own role in producing social knowledge. (pp. 430-431)

To understand how this method claims to affect the shape of the public discussion of nuclear issues, this chapter needs to include a brief discussion argumentation, decision making and the public sphere. Since Habermas (1989; see also Alario, 1994; Fraser,

1991; Habermas, 1976, 1990; McLaughlin, 1993; J. D. Peters, 1993; Somers, 1995) theorized communicative action and the public sphere, several within the Communication discipline have discussed the effect of discourse within the public sphere as a means to social change (Baynes, 1994; Condit, 1987a; Doxtader, 1991; Goodnight, 1982, 1991, 1992; Olson & Goodnight, 1994; Weal, 1985). Others discussed the ethical relationship between organizational representatives and the public sphere (Bostdorff & Vibbert, 1994; Hearit, 1994; Ice, 1991; A. A. Marcus & Goodman, 1991; Sellnow, 1993; Waltzer, 1988) or the structures which constrain public deliberation (Cheney & Dionisopolous, 1989; Drucker & Gumpert, 1996; Olson, 1991; D. E. Williams & Treadway, 1992). Though these works differ in their characterizations of the public sphere and the degree to which discourse or rhetoric is influential, they agree that words make a difference and sustain rhetorical critique can change previously fixed structures of social action. "The public is a social concept and as such needs social spaces in which to exist, to learn about the public interests, to debate it and to act" (Aufderheide, 1991, p. 169). The public sphere provides that space and is maintained through a network of structural constraints, procedures, legislation and individual action. "Rhetoricians tell us that the public realm [sphere] is the primary crucible of historical evolution" (Sproule, 1989, p. 258). In one sense, the public sphere is the space of intertextual interaction. Baynes describes an intertextual public sphere when he says, "the public sphere must be broadly conceived as a vast array of institutions in which a wide variety of practical discourses overlap" (p. 322). Olson and Goodnight (1994) also celebrate the role of rhetoric in creating, sustaining and constructively using public space as an arena "for

spokespersons, parties, and institutions to advocate and contest matters of shared concern using the available means of persuasion" (p. 250). They also warn of the danger of managerial rhetoric co-opting the opposition to close the space of debate. This project seeks to avoid those closures which discourage public participation in the public sphere of policy debate.

This project attempts to encourage a wider public discussion of nuclear issues. The telos of this project is the creation of a less encumbered dialectical process -- the dialogue. While others may demand critics to advocate policy solutions, this project simply seeks to create a process and an environment in which multiple publics can debate one another to find their own shared solution.[32] It does not suggest that the public sphere has not been discussing nuclear issues nor does it argue that the elite members of decision-making parties are silent about nuclear issues. This argument posits that multiple spheres of conversations are occurring without mutual awareness and interaction. For a sustained dialogue to develop to maintain a managerial process for the Cold War's legacy, these conversation must come to a single table for interaction among multiple interest groups to occur. The state of the present conversation is riddle with multi-directional distrust and failing confidence in representation. The absence of trust and the weakness of current representational methods should not discourage multiple publics from participating in the conversation because only through sustained dialogue can trust and representation grow. Peterson and Horton (1995) call for similar dialogic space regarding environmental issues (which relate very closely to nuclear issues) and argue "[d]ialogue holds great potential for U. S. environmentalism . . . where one's

independence primarily fostered in both the cultural and the biotic communities" (p. 163). This method demands a communicative ethic of honesty and trust to be extend by the critic as well as practiced by the critic. Though the perfect dialogue remains as elusive and Utopian as perfected control technological control, to strive toward the ideal of inclusive public dialogue serves the interest of society and individuals. The critic and conversational participants in this dialogue become armed with a skeptical intellect and optimistic spirit. While the debate may often become boisterous and difficult to manage as the dialogue retrieves lost voices, the discussion of public issues as urgent as our nuclear legacy "rings hollow if it silences" (Peterson & Horton, p. 163) one voices who shares stakes in the outcome of our long-term management of nuclear resources.

When this perspective is simplified, a post-Cold War nuclear critic must anticipate potentially powerful rhetorics and meaningful discussion, seek out the apparently key works within those intertextual economies, uncover the historical exigencies from which those texts erupt, uncover hidden or overlooked fragments which expose critical assumptions or potential agendas, explore how the meanings of these fragments have become entrenched through continuity and repetition, and seek out sites of tension within the text where meaning has not become fixed. Part of the dialogic responsibility of conversational participants is to understand as closely as possible all of the influences and claims being made at the discussion table. As people turn to micropolitics as a solution to macro-issues (De Certeau, 1984), responsible criticism needs to provide individuals a means to meaningful action but often struggles from demanding too much of the public. This perspective for contemporary intertextual

criticism demands that people (critics, politicians, activists and general citizens) read a greater variety of material articulating the stakes and issues of the nuclear debate. This base allows people to make those intertextual observations while finding space for individualization of values and claims. Such dialogic engagement serves the survival interest of local and global communities.

WHERE TO LOOK:

DEPARTMENTAL AND OPPOSITIONAL RHETORICS

To date, the bulk of criticism concerning nuclear policy issues has focused on either literary expression of our nuclear experience (Brians, 1987; Dewey, 1990; Gery, 1996) or presidential rhetoric (Bjork, 1988, 1992; Medhurst, 1987, 1988). While some works have focused on the rhetoric of certain movements (A. King & Petress, 1990; Hogan & Dorsey, 1991), only Taylor (1990, 1992, 1993a, 1993b, 1996) has provided a sustained focus on the rhetoric circulating within the nuclear weapons organization. While his work has been instrumental in articulating the continuing force of perfection in a pervasive technological imperative working within the organization to discipline its attitudes and goals, it has largely ignored departmental rhetoric generated by parent organizations like the Department of Energy. Though the leaders at the departmental level of government are not-elected officials and do not have legislative or judicial authority, they exercise a great deal of executive privileges, autonomy in policy decisions and command great resources for affecting public opinion and shaping important discussions of key nuclear issues. When one considers that the day-to-day management of nuclear arsenals and resources falls on bureaucratic versus legislative shoulders, one

can understand a need to widen critical focus from its exclusive legislative and presidential targets. Additionally, because these departments can often anticipate upcoming issues, they commonly have the opportunity to define conversations and can exercise a preemptive "definitional hegemony" (Dionisopolous & Crable, 1988). The trajectories in their current rhetoric often define issues that will extend well into the future. Taylor (1996) also documents a lack of scholarly interest toward nuclear elite organizations and suggests these imbalances contribute to the lack of dialogue between groups, "compound activists' powerlessness" (p. 122), and alienate both sides from the potential contributions of concerned scholars.

At the same time leaders of governmental departments influence the discussion from a place of privilege, they face many limitations in their rhetorical choices and strategies based on their largely public-provided budget, politically-sensitive environment and press scrutiny. As the Cold War thaws such organizations face tremendous pressure to downsize in ways that affected their performance, credibility and prestige. The demand for a peace dividend forced these organizations to redefine their relationship with their mission and the public, as Taylor (1993a) noted. Historically, these departments have waxed and waned with public and political mood but have provided a sustained source of nuclear rhetoric. As this project earlier argued that nuclear issues will continue for the foreseeable future, it also suggests these departments will continue to provide a focal point for nuclear decision making and a fertile field for active rhetorical scholarship.

Departmental rhetoric provides critics interested in the nuclear discussion with a wealth of texts which circulate and compete with popular and oppositional texts for public attention and constituent support. Texts surface from government departments for a number of reasons. First, organizations may sanction texts for external educational and public affairs purposes. These texts have dual informational and image-management responsibilities and may range from weekly departmental newsletters to less frequent brochures or books covering significant issues like restructuring or new programs. Second, laws and statutes may require the periodic publication of performance reports under the principle of creating an informed electorate. These texts usually involve a technocratic discourse (Salvador, 1992) and are written primarily to fulfill a legislated responsibility like Environmental Impact Statements. A third type of text produced by organizations are reactive texts that appear because of a Freedom of Information Act request, institutional "leak," some sort of crisis or public demand. These texts tend to make and respond to news and are generally solicited by consumers rather than created as proactive voluntary efforts of organizations. An example of this text is the large report on the history of radioactive testing produced by the Department of Energy in 1993 or news releases issued by departments immediately after crises. This project looks at the first category of texts and a publication of the Department of Energy entitled, Closing the Circle on the Splitting of the Atom (1995). This text surfaced at a particular formative moment of the Department of Energy as its first woman secretary attempted to remake the department into an open, public-friendly, environmentally-sound and

fiscally-responsible organization. This text represents a significant example of how departmental organizations practice rhetoric in a post-Cold War environment.

The second source of texts involves grand-scale oppositional rhetorics. Though notable exceptions exist (O'Leary, 1988; A. King & Petress, 1988), nuclear criticism, to this point, pays little attention to the rhetorics of large foundations that exist to oppose nuclear-political organizations and the continued operation of nuclear technology. These oppositional organizations are not new and have existed since the 1950s (Kurtz, 1988). The literature they produce is vast, and they engage this nuclear-lobbying with resources much greater than general popular expressions of discontent or celebrated efforts of individuals. Often multinational in nature, the membership, funding and management of these organizations are not often known to the general public. Currently the loudest voice among oppositional organizations belongs to the Canberra Commission on the Elimination of Nuclear Weapons.

A glance at the membership of the Canberra Commission would make it hard for one to recognize this organization as an oppositional institution, as it includes government and military officials from around the globe. This group approached the global nuclear dilemma after being chartered by the Prime Minister of Australia in November 1995. The Canberra Commission takes advantage of a variety of media for its texts. It has produced a comprehensive report on the geopolitical nuclear situation calling for the complete abolition of nuclear weapons and an international regime to govern the security and verification of nuclear resources and disarmament. Its spokespeople run the same circles as political leaders hawking their policies and agendas

by giving speeches at conferences, luncheons and public forums. Additionally, the commission boils its longer statements down into thinner versions for popular press consumption.

These two sources of rhetoric make up the balance of this post-Cold War nuclear criticism project. As it turns to the texts of these two groups, readers should keep in mind the few general objectives and injunctions implicit within the methodological perspective of the previous section. By observing those injunctions, looking to the intertextual economy of contemporary nuclear rhetoric, and observing the continuities of nuclear history at work in these textual interactions, the nuclear critic can provide a sustained and empowering voice in a crowded conversation over our nuclear future.

CHAPTER 4: TODAY'S NUCLEAR CRITICISM AND CLOSING THE CIRCLE

In 1995 a publication surfaced from the U. S. Department of Energy [DOE].[33] Intended to reach a wide swath of interested nuclear stakeholders, this work documents and tells the story of an organization remaking itself. An opening letter from Energy Secretary Hazel O'Leary makes the tone and the objectives of the document clear:

> In 1993 we launched our "Openness Initiative" by coming clean with our past and opening many of our files to the public. We did this to earn public trust and foster informed public participation in Government decision making. This book will help advance this critical obligation by illuminating the challenges and accomplishments of nuclear weapons facilities cleanup and putting a human face on the work being done to close the circle on the splitting of the atom. (DOE, 1995, p. v)

The Department of Energy published Closing the Circle on the Splitting of the Atom in two lots. The department printed the first lot in January 1995 which included 50,000 of the 106-page, heavily illustrated, glossy paperback books. Of this first printing 20,000 circulated in mailings to Congressional members, staffs and stakeholders. The other 30,000 were scooped up primarily by Department of Energy contractors who perform the daily tasks of the organization at various sites around the United States. The second printing of 50,000 came in January 1996 and included a 15-percent overlap on strategic mailings like key congressional committee members and stakeholders, contractors who did not receive one of the first printings, while the remaining copies went to schools and

libraries in regions with large facilities (Werner, personal communication, August 1996). The document is also avalaible on request from the department.

The document received additional exposure from reviews in the Bulletin of Atomic Scientists and Environment (Stadie, 1996), public display of the book's photographs in the Russell Rotunda outside the Senate Armed Service Committee in an exhibit sponsored by Senators John Glenn and Dirk Kempthorne (1995), inclusion in courses by socially active educators (Nelson, 1995) and in the discussions of environmental groups like the Sierra Club (Deegan, 1995).

Produced by the Office of Strategic Planning and Analysis of the Department of Energy, the document responds to a particular historical situation and repeats a variety of fragments circulating in nuclear discourse. James D. Werner, then Director of the Office of Strategic Analysis, put the document together and explains that the title first surfaced in 1993 in a speech he wrote for an Assistant Secretary of Energy (Werner, personal communication, August 1996). According to Werner, the document resulted from a "Herculean effort" fighting against bureaucratic inertia for more than two years, and in crafting the book, the author tried to keep plain language in a spirit of inclusion and dialogue. Since then the phrase, "Closing the Circle," has been adopted by the White House for its environmental awards (Werner, personal communication, August 1996).

The situation facing the Department of Energy in 1993 and 1994 as Werner put this document together provides several issues which need highlighting. In 1993, newly inaugurated President Clinton appointed Hazel O'Leary as the first woman Secretary of Energy. O'Leary's appointment generated a variety of responses (Corn, 1994; Wilkinson,

1994). As she took the reins of the department, it faced attacks by Congress to downsize (Kriz, 1995), interdepartmental politics (Cordes, 1996a; Crow, 1996; P. Gray, 1994), adverse publicity from the release of information concerning a history of environmental mismanagement (Kuznetsov, 1994), radioactive experiments (Erikson, Colglazier, & White, 1994; Kriz, 1995; Marston, 1994; Post, 1993; Wasserman, 1994, 1996; Watson, 1993) and the announcement of plans to deal with environmental restoration (J. King, 1994).

According to Werner (personal communication, August 1996), the publication grew out of the need to justify $6 billion annually to Congress, explain the new roles and missions of the organization to a wider public and differentiate the department from other federal agencies. The identity crisis for the organization stems from its relative small size compared to other federal agencies, a history of secrecy and lack of opportunity for public involvement.

Unique challenges face the energy department as it enters the second fifty years of the atomic age as punctuated by traditional discourse. It serves as the focal point of nuclear decision-making discourse, holds the responsibility for making and executing policy, and suffers from a legacy of malpractice and distrust. The physical obstacles facing the organization also reach Himalayan proportions. The residue and waste created in the first fifty years will be present when the "earth eventually hits the sun" (Werner, personal communication, August 1996). Nuclear resources and waste require a new perspective about environmental management and a new decision-making process which demands a wider public role "in the elaboration of nuclear energy policies" (Galliot de

Galzain, 1992, p. 44). Closing the Circle (DOE, 1995) attempts to take the first steps toward a new relationship between experts, officials and the general public. As such this document represents a significant work within our contemporary nuclear age as the first large scale, highly visible work of a government agency trying to forge a fresh relationship from previous practices of risk communication to help create the kind of open debate necessary for the long-term management of nuclear resources to avoid repeating the hegemonic results of previous rhetoric which have discouraged public participation and creativity. This project looks at Closing the Circle as the first of a new generation of nuclear communication strategies in our post-Cold War era. In looking at this work, one must attempt to place it within its intertextual economy of risk-related policy discourse and discern its intentions and effects. In doing so, this project practices a contemporary nuclear criticism.

A CLOSER READING OF CLOSING THE CIRCLE

"The government builds an industrial plant next to your city and lies about its purpose. Only several years later do you learn that the plant manufactures nuclear weapons. The government tells you not to worry. The plant is perfectly safe" (Ognibene, 1980, p. 52). The simple scenario described by Ognibene sets the stage for the play of risk communication. On that stage other dramas occur. In March 1979, Three Mile Island played out its drama.[34] In April 1986, Chernobyl presented a sequel which reached a wider world audience. Luke (1987) called Chernobyl "an unprecedented event" (p. 351), but not because Chernobyl was the first widely public nuclear accident. Instead, he says:

> Chernobyl is so shocking because it is that unlikely statistical improbability suddenly become an immediately real, transnational, ecological disaster. It starkly contradicts images of technical precision. . . . The catastrophic meltdown that experts had predicted could happen only once in 10,000 years took place less than 10 years after the first unit at Chernobyl went on line. (Luke, p. 351)

In each case, a strategy operated to manage public perception of reality and risk prior to the events. Following the incidents, industry and interested government agencies faced greater challenges in managing perception and opinion. These *real* events showed an untamed and unfriendly atomic genie which contradicted the rhetoric of a safe atomic-powered future. Industrial agents turned to strategies of communication as a means of managing contradictions presented by real events like Three Mile Island and Chernobyl.

By no accident, the literature of risk communication exploded following these two historical events. Three Mile Island and Chernobyl, according to K. E. Rowan (1991), combine with Bhopal and the increasing interest in environmental protection to fertilize "a field which has burgeoned since 1987" (p. 301). Much of this literature "recognizes the integral role the public must play in environmental policy" (K. E. Rowan, 1991, p. 301; see also Heath & Nathan, 1990-1991; Oleckno, 1995) but has turned out products to help practitioners build public-policy compliance and acceptance of expert-made decisions under the presumption that experts make better decisions on catastrophe prevention and management (Brown & Campbell, 1991; Fischoff, 1995;

Guilfoile, 1995; Heath & Nathan, 1990-1991; K. E Rowan, 1991, 1995; Young, 1990). This chapter argues communication practices around the atom must discard its hegemonic tendencies to build more meaningful democratic communication processes and create a more successful environmental restoration and nuclear management decision-making process. This closer look at Closing the Circle (DOE, 1995) takes the reader through three independent but related particles of discussion: 1) the neutron which places Closing the Circle within its cultural context and how it functions as a means of cultural production; 2) the electron which indicates how this work functions as a particular model of risk communication which limits the effectiveness of management and environmental restoration; and 3) the proton which suggests some ways to democratize this process to create a better public nuclear decision-making process.

THE NEUTRON: CLOSING THE CIRCLE AND RISK COMMUNICATION

The first particle of this section shows the intertextual cultural context of Closing the Circle (DOE, 1995) as an expression of risk communication and how it functions as an ideological state apparatus to maintain and reproduce "the conditions of production" (Althusser, 1971/1989, p. 61) in our nuclear age. Gamson and Modigliani (1989) say, "Nuclear power, like every policy issue, has a culture" (p. 4). To explore nuclear communication's culture and how it functions to sustain that culture, this particle must illustrate the dominant ideology of the nuclear age, its crisis and its mechanism for preserving the privilege of the powerful in a nuclear age.[35]

The dominant ideology or hegemony (Gramsci, 1971)[36] of the nuclear age belongs to modernity and late capitalism as postulated by Mandel (1975) and defended by Jameson (1991/1993). Though many paradoxes populate the nuclear age, since 1945 it has tried to present a unified and coherent vision of the world and material relationships. In many ways, the nuclear age must extend the grand narrative of modernity to maintain the image of stability to allow the state to function profitably. Modernity, Carr (1994) says, exists "in the form of an encompassing but often unexpressed grand narrative which provides the underlying assumptions of certain, political, social, and scientific ideas, projects, hopes, and expectations" (p. 45). Carr continues, "This great social narrative of modernity persists to our own day in the idea of progress, whether in capitalist progressivism or, until recently, in socialism" (p. 48). The progress story which promotes the nuclear age frames issues in terms of the "society's commitment to technological development and economic growth" and "must be able to deal with accidents" (Gamson & Modigliani, 1989, p. 4). The pursuit of nuclear energy, as this thesis has already pointed out continues ancient strands of rhetoric found in the narratives of perfection, control, technological development and apocalypticism. In this cultural text, nuclear energy would power Utopia.

The secrecy of the early nuclear age and the great amount of material capital involved in developing the all-pervasive nuclear-industrial complex that encircles the globe further concentrated power in the hands of an elite. The nuclear age demanded the elite expand their means of managing the complex system of risks and exchange on a new level. The theory of ever-expanding trade and global nuclear [in]security produced a

convincing "fiction of the globe as unified whole" (Kato, p. 346). Citizens of this unified whole were denied the primacy of their difference by the emphasis of their similarity as potential victims of the nuclear age. Even the traditional responses against nuclear technology "have been the very media through which globalist discourse has been disseminated" and "the classic teleological narrative of the linear 'progression' of capitalism" (Kato, p. 347) reified. When this project turns to Closing the Circle (DOE, 1995) as an individual work, its survey includes "a surrounding series of constitutive and competing discourses" (Taylor, 1992, p. 432). Taking this approach helps us see around this document to draw attention to the "'exteriority' of the text" which Taylor (1992) describes as "its connection to larger ideological and discursive formations, its contribution to cultural ethics, norms, subjectivity and the opportunity it presents to critique the ongoing production of power and knowledge" (p. 432).

In the cultural ideology of modernity and the nuclear age, the expert enjoys a privileged position. "The bomb was an intellectual project," explains P. K. Lawrence (1996, p. 45), and its management for the next 50-secrecy-shrouded years would depend on "academic and intellectuals" who had "no sense of needing to contribute to public opinion" (P. K. Lawrence, p. 46). The nuclear age and its keepers are inherently undemocratic depending on technological innovation, force and secrecy versus exchange and participative decision making. "Underlying this [nuclear age] was a powerful ideology best understood as a technocratic representation of liberal progressivism, focusing on abstract reasoning as a problem solving tool," P. K. Lawrence concludes (p. 51). The nuclear age presented its problems as technological puzzles needing

technologists and experts to solve them. Taylor (1990, 1993a) also acknowledges the presence of these technological imperatives. The cumulative effect of this discourse limited the number of people who could claim competence to speak in the nuclear conversation.

This ideology proliferated into a physical structure which directly employs more than 200,000 people and enjoys an annual budget of more than $35 billion in the United States (Lifton & Markusen, 1990, p. 182). Department of Energy (1995) figures differ somewhat claiming that the complex "typically employed more than 100,000 contractor personnel at any one time" and has spent $300 billion since the Manhattan Project (p. 3). Lifton and Markusen show nuclear culture's simulation of an accelerated capitalist system.

> In the United States, the nuclear system takes on the configuration of a vast industrial corporation, sprawling and loosely connected but centrally animated by a deadly purpose in the form of end products. Profit making is at the heart of most of the separate elements of the system, together with such social ingredients as labor unions and concerns about jobs and the workplace, political power supporting and being supported by commercial institutions, and vast interlocking arrangements for dividing the economic spoils. (Lifton & Markusen, p. 182).

The success of this system demands progressive technology to fix the problems created by previous technology creating an engine of production.

As the third generation of nuclear citizens mature, the public operates with a "cultural assumption" of nuclear normality or "obligation to view the weapons [all nuclear technology] in certain ways because it is morally right, politically necessary, and personally mature to do so" (Lifton & Markusen, 1990, p. 38). Gamson and Modigliani (1989) summarize the cumulative construction of nuclear culture by saying, "Atoms for peace. Your friend, the atom. Electricity too cheap to meter. . . . Images of cooling towers at Three Mile Island. Chernobyl is everywhere. These are nuggets from a public discourse on nuclear power that most of us instantly recognize" (p. 1). Despite recognition being instantaneous, Lifton and Erikson (1982) suggest people resist critically engaging these images and stories because we suffer a "paralysis of the mind" (p. 275) created by years of simultaneous threat and disempowerment regarding the atom.

These common metaphors reinforce the dominant ideology of nuclear culture. Lakoff and Johnson (1980) explain what happens when the network of metaphors and cultural packages fit our experiences or our perceptions of what we experience. They say when the system fits "the experiences form a coherent whole" (Lakoff & Johnson, p. 140). "What we experience with such reverberation down through the network of entailments that awakens and connects our memories of our past . . . and serves as a possible guide for future ones" (Lakoff & Johnson, p. 140).

Government officials, nuclear theorists, community leaders and citizens cling to this clean seamless discourse of the nuclear age. How long that discursive rope can hold is uncertain. The fall of the Soviet Union, the subsequent end of the Cold War, and legacies of Chernobyl and Three Mile Island provide signs that indicate the nuclear age

faces a crisis. Jameson (1991/1993) commented, "The last few years have been marked by an inverted millenarianism, in which premonitions of the future, catastrophic or redemptive, have been replaced by senses of the end of this or that" (p. 62). Nuclear hegemony depends on the ability to make global or universal claims successfully. Jameson and Lyotard (1984) suggest this practice may not be possible as postmodernity takes hold. Though the nuclear age is "fabulously textual" according to Derrida (1984, p. 23), powerful agents need to claim unique absolute authority to maintain power and manage resources. Postmodernity poses a crises for the nuclear age and its keepers because postmodernity suggests knowledge is neither "coherent" nor "totalizable" (Derrida, p. 22). In postmodernity, the risk experts have little room to claim unique competence to offer solutions. Jameson (1984) accurately describes the crucial moment of the nuclear age when commenting on Lyotard's The Postmodern Condition: A Report on Knowledge; he writes:

> The moment of truth, in this respect, comes when the matter of the ownership and control of the new information banks -- the profitability of the new technological and information revolution -- returns in these last pages with a vengeance: the dystopian prospect of a global private monopoly of information weighs heavily in the balance against the pleasures of paralogisms and of "anarchist science" (Feyerabend). Yet that monopoly, like the rest of the private property system, cannot be expected to be reformed by however benign a technocratic elite, but can

> be challenged only by genuinely political (and not symbolic or protopolitical) action. (p. xx)

Dominant ideologies or hegemonic orders do not die passively. To respond to this crisis, agents interested in preserving the nuclear age turned to strategies of risk communication to help restore public acceptance toward nuclear technology and align nuclear narratives with stronger environmentally-sensitive cultural packages. General risk communication becomes a mechanism for "the reproduction of the conditions of production" (Althusser, 1971/1989, p. 61). The articulated goals of risk communication claim, "Risk communication efforts provide information to individuals so they can make informed decisions about risks they face" (Viscusi, Magat, & Huber, 1991, p. 159). The National Research Council (1989) defines risk communication as:

> . . .an interactive process of exchange of information and opinion among individuals, groups, and institutions. It involves multiple messages about the nature of risk and other messages, not strictly about risk, that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management (p. 21).

Used to promote any particular interest, risk communication as strategy becomes a tool of conformity. Risk communication defends powerful, but threatened, industrial interests against populist concerns. At the same time, risk communication is the mechanism by which organizations provide the public with informations about dangers.

Employed by the U. S. Department of Energy (DOE), risk communication becomes a means for the social construction of reality (Berger & Luckmann, 1966). "Our

meanings and understanding, in short, arise from our communication with others, a notion of reality deeply embedded in sociological thought," explains Littlejohn (1996, p. 179). This cultural machine builds cultural cohesion and works against the obstacles of a history built on previous failed dialogues, relationships, secrecy and unequal distribution of power. It seeks to "ensure subjection to the ruling ideology or the mastery of its 'practice'" (Althusser, 1971/1989, p. 65). Dionisopolous and Crable (1988) call this practice definitional hegemony in which the expert exerts "strategic influence" and creates "terminological dominance" through an ability to define the parameters of the discussion (pp. 135-136). "For nuclear power, as on most issues," Gamson and Modigliani (1989) show, "public officials are often important sponsors" (p. 7). even in a postmodern age, Lyotard (1984) stresses, "The ruling class is and will continue to be the class of decision makers" (p. 14) but points out that "[e]ven now it is no longer composed of the traditional political class, but of a composite layer of corporate leaders, high-level administrators, and the heads of the major professional, labor, political, and religious organizations" (p. 14).

The practitioners of risk communication suggest a particular model of human behavior which states:

> . . . behaviors that reflect opposition to technology are determined by (perhaps inaccurate) perceptions of risks, but perceptions of risk should be determined by "objective" risk data. Further, these perceptions should be amenable to change through rational argument if people could only be provided with technical facts. (Otway, 1980, pp. 35-36)

Often in this model, experts and critics dismiss dissenting members of the public as technically ignorant or irrational. Instead of being irrational, this essay suggests the public simply understands risk through a different lens. The ideological state apparatus is only beginning to deal with the complexity of public resistance to nuclear technological risk.

A good example of this ideological process comes from the ongoing efforts of the Department of Energy which must have a degree of public compliance to sustain itself. More than 100 nuclear power plants provide more than 20 percent of the energy consumed in the United States. Nuclear-related defense contracts continue despite apparent moves away from a nuclear-weapon-centered doctrine. The cleanup and environmental management of nuclear-contaminated sites also present lucrative opportunities for big business if cleanup can garner public acceptance. Currently, "[t]he DOE is engaged in what is projected to become the largest civil works project ever undertaken -- a 30-year, $100 billion cleanup of hazardous waste sites" (Jenni, Merkofer, & Williams, 1995, p. 397). These numbers grow in press reports to $230 billion over seventy-five years (Lepkowski, 1995). The Department of Energy's responsibilities include the management of waste generated by commercial nuclear-power production and residue left by fifty years of nuclear-weapon manufacturing. The success of this endeavor depends on risk communication because "[i]n many cases, the most vexing problems cannot be addressed solely by science but will require a broad-based and informed public debate" (DOE, 1995, p. 86). To handle the dangers involved in conquering the "environmental legacy of the Cold War" (DOE, p. 5), "the nation as a

whole must commit itself to sustained effort that will last for decades" (DOE, p. 91). Apparently, the Department of Energy recognizes the problem of maintaining a nuclear-powered system is an ideological one to be resolved through language and rhetoric and not exclusively through the application of science.

At this point, this project requires pause to readjust its focus and emphasize why it demanded such a long discussion of risk communication. This project recognizes risk communication as a significant discursive strategy employed by interested parties to manage crises. As such risk communication provides the most significant intertextual thread from which Closing the Circle (DOE, 1995) is sewn. Additionally when we remember the responsibilities of contemporary nuclear critics, this review allows us to see the "indirect influences of a text on cultural dialogue" (Taylor, 1992, p. 432). Risk communication provides the rules of engagement for conversations concerning nuclear crisis and management. These rules institutionalize the communication practice around nuclear management in ways that privilege certain actors and perspectives over others. In attempting to revise these rules, Closing the Circle actively participates in this wider intertextual milieu.

The Department of Energy's difficulty in generating support for its program of environmental restoration does not reflect popular disregard for the environment but shows existing distrust toward the agents charged with that mission and the failure of a structural/cultural machine to generate meaning and dialogue consistent with the goals of government-run environmental restoration. The department admits its greatest challenge may come from "institutional hurdles" and not "technical challenges" (DOE, 1995, p. 9).

Where does this distrust come from? What has failed in past communication practices? These questions move this essay to its second particle, the electron which looks at how traditional strategies of risk communication contributed to obstacles now facing environmental restoration and democratic nuclear management.

THE ELECTRON:

RESTORING TRUST AND THE ENVIRONMENT

The second particle of this section, the electron, vibrates with a negative charge and records the previous failure of communication strategies concerning the management of the atom. This particle shows the cultural preoccupation of risk in the United States, and how traditional departmental communication practices contributed to the nuclear age crisis and the overwhelming distrust which hampers industrial-public relations.

Risk communication throughout the 1980s and the early part of the 1990s has served as the primary means of communication between nuclear policy makers and the public. Since the publicity of large-scale environmental catastrophe and the social amplification of minute risk, policy makers have tried to manage risk perception via communication strategies which have primarily relied on one-way communication from expert to citizen (Fischoff, 1995). Initial attempts to remedy the inequities of one-way risk communication later sought feedback channels for the public to voice its concerns (Fischoff, 1995). These feedback loops changed the direction of communication flow but did not make the communication more dialogic. Failing to create dialogic communication around nuclear issues resulted in an increase of voices but not an increase of communication between more members and only further polarized the

decision-making environment. Condit (1994) observed the effect of a disorganized panoply of voices in decision making process and concluded that current structures and procedures of popular-decision making allows for the recuperation of the status quo. Condit also concludes that a critique of this sort of social interaction must not proceed purely "from an oppositional stance" (p. 226) in search of a single dominant ideology; instead, critics should "account for plurivocal contents of public discourse" (p. 226). A new mode of risk communication with facilitators informed by this critical stance can make a difference.

Every day people make decisions based on risk, from choice of food to investment strategies. Rarly are these choices solely based on the calculation of risk. "As a society and as individuals, we Americans are preoccupied with risks, particularly risks to life," argues Keeney (1995, p. 627). Keeney continues, "We allocate significant time, effort and money to reducing risks, and yet most of us feel that our world is riskier now than a generation ago" (p. 627). This social belief, Keeney says, "is simply not so" (p. 627) when one includes a critical view of risk.

The public and policy practitioners suggest and demand the possibility of zero risk despite the impossibility of that request. "[I]f one type of risk is reduced, other risks increase" (Keeney, 1995, p. 628). The sum of all risk equals death. If we remove one risk from the equation, we must assume the other variables increase. One could say though using seatbelts "reduced the risk of dying in an automobile accident," seatbelt use increases "individual risks of dying from cancer" (Keeney, p. 628-629).

The escalation of risk to life-threatening risk makes a particular value statement that suggests all people prioritize risks to life over risks to quality of life. This practice repeats universalizing discourse of modernity despite other appeals toward difference. The automatic escalation of risk discussion to life-threatening risk ignores a plethora of values short of life and death and universalizes criteria for decision making. Experience shows social practices often occur for reasons outside the evaluation of life-threatening risk based on individualized cultural perceptions, tastes and values. People disagree over what they consider a risky activity because of differences in value systems and multiple decision-making heuristics not considered by traditional risk communication which envisions one uniform rational-world paradigm. This difference involves very specific value judgments. Different activities will receive different risk characterization despite their statistical similarity. Ravetz (1980) suggests, "the variety in the public perceptions of acceptable risk partly reflects the variety of life itself in its many dimensions of experience" (p. 47). This does not necessarily point to the failure of risk communication to inform individuals of risk but indicates other criteria also inform decisions that traditional risk communication ignores.

To date, the bulk of academic literature on risk communication seems to have an invested interest in the future of the nuclear industry and modernity. Largely based on social science, the literature has tried to quantify public perception and acceptance of technological risk (Bassett, Jenkins-Smith, & Silva, 1996; Cohen 1995; Farr, 1992; Fischoff, 1995; Garrick & Gekler, 1989; McBeth & Oakes, 1996; McCormick, 1981; McDaniels, Axelrod, & Slovic, 1995; Sokolowska & Tyszka, 1995; Weinberg, 1991).

The results are mixed. Waterstone (1992) reviews this line of study and notes, it "has taken a mechanistic, deterministic view of events and behavior; has been scientific and technocratic; has largely downplayed, if not ignored, the role of social and economic factors in affecting risk; and has represented an ideology of the status quo" (p. 2). Risk communicators, who share a rational-world vision with these social scientists, employ this line of research and disregard public failure to conform as examples of an ignorant irrational publics. This perception decreases policy-makers faith in democratic decision making while creating resentment toward technocrats from the general public who can read the insensitivity toward their concerns. The institutionalization of risk communication as previously conceptualized sanctions nuclear communication as an exclusive technocratic discourse which results in polarizing one-way communication.

As technologists look for better numbers, the public voices concerns which grow from a multiplicity of values. The public views the continued dependence on numbers and technological explanations of risk as a betrayal of public interests (Piller, 1991). Public perceptions of nuclear risks seem particularly sensitive to historical representation, political campaign and social amplification. Despite Chernobyl and other nuclear accidents, large scale nuclear risk remains tenuously theoretical. Vinck (1980) distinguishes nuclear risks from other forms for this reason and suggests an important factor to consider is the "distribution of risk and the distribution of benefit to a society" (p. 110). In the production of nuclear weapons and power, the risk rests on the shoulders of an entire public, while the bulk of the benefits belong to a capitalist few. Farr (1992) also believes "the real problems with nuclear power basically have to do with politics and

public attitude" (p. 121). Public perceptions of risk often differ from technical accounts particularly in the case of nuclear risk. The public seems to understand "risk acceptability involve[s] more than expert estimates of safety" (Kraft, 1991, p. 106). Because risk communication depends on technological quantification of risk, the social amplification and ramification of risk management are more complex than social science models can handle.

Such complexity defies formal modeling according to Shubik (1991). Weinberg (1991) summarizes the predicament of the nuclear industry by writing:

> Similarly, the impasse in nuclear energy -- indeed, the future of nuclear energy -- rests upon the degree to which the public, particularly the articulate public, accepts the nuclear experts' view of nuclear energy as opposed to the skeptics' view. If the public continues to regard nuclear energy with apprehension, distaste, and suspicion, nuclear energy will flounder. What can be done, therefore, to bring the public's view more in line with the nuclear expert's view? (p. 152)

The desire of risk managers to get public attitude in line with expert opinion combine with risk assessors inability to model public reception of risk to alienate the public from the process.

This same dilemma faces the experts of Lyotard's (1984) critique of a science that "legitimates itself with reference to a metadiscourse" (p. xxii). This practice makes those who influence knowledge production disproportionately powerful. Lyotard specifically deals with the legitimacy of scientific "legislators." He says:

> In this case, legitimation is the process by which a "legislator" dealing with scientific discourse is authorized to prescribe the stated conditions (in general, conditions of internal consistency and experimental verification) determining whether a statement is to be included in that discourse for consideration by the scientific community. (Lyotard, p. 8)

Within the United States, nuclear-risk communication has turned to the scientist for verification and endorsement not to members of the general public. This practice has kept the discourse closed to a wider audience since the scientist has the privilege of defining the criteria of judgment (Coleman, 1995; Fischoff, 1995; Flynn, et al., 1995; Fowler & Marshall, 1985; Heath & Nathan, 1990-1991; Kraft, 1991). Despite symbolic gestures toward public participation, risk communication preserved the expert's power and the state's authority. Within the ideology of modernity and scientific rationality, only the scientist has competence.

The residue of these practices accumulates over time to destroy credibility and widen the gap between public and state interests. The universal model of risk weakens the communicator's ability to respond to diversity in risk settings. More importantly, basing strategies on universal concepts of risk marginalizes difference. This practice undermines individual perception of risk in dialogue and creates resentment between the public and the communicator. Because the model of risk communication privileges the scientist and disempowers individual subjective perceptions of risk, the process produces a stratified relationship between the agency responsible for managing the risk and the

public. The effect of this practice culminates in discouraging individuals from voicing their concerns.

The traditional direction of nuclear-risk communication is from expert to the public. For Julin (1993), risk communication is "the process of taking scientific data, related to health and environmental hazards, and conveying it to a lay audience" (p. 14). Some risk communication theorists go so far as to replace the public with "advocates of the public interests" (Heath & Nathan, 1990-1991, p. 15) who try to help people "agree to regulated risk" (Heath & Nathan, p. 15). The expert is tasked with thinking for the public as well as speaking to the public. In a society that privileges scientific knowledge, risk communication "reflects top-down, one-way communication that attempts to bring public beliefs in line with expert views" (Coleman, 1995, p. 65). Viscusi, Magat and Huber (1991) point out the uneven distribution of information in the traditional mode of risk communication. Since the practice favors the expert, the expert is assumed to have more information to distribute than the public. This may not be the case.

One-way models of communication steal away public agency and serve to pacify the public. This brand of nuclear-risk communication usually serves as a reaction and becomes "more likely to be an issue, however, when it comes to the implementation of . . . policies, standards, regulations, or practices" (Oleckno, 1995, p. 20). As a reaction, risk communication does not broaden democratic participation; it simply provides a managerial technique. Practitioners of risk communication measure their success by "the degree to which it [the risk communication] obviates conflict or opposition" (Brown & Campbell, p. 298). The system exists to avoid conflict because conflict is bad for

business. Practitioners openly sell their strategies of risk communication as the best way that "[p]ublic outrage can be neutralized" (Barr, 1996, p. 20). To solve confrontation and conflict, many risk communicators turn to better quantification of public attitudes, "particularly when differences in attitudes may impede effective risk management" (Young, 1990, p. 22). As the story goes, once communicators understand public attitudes they can structure more effective messages to reduce "expensive and divisive political confrontation and litigation" (Young, p. 25).

The result of a history of flawed communication and capitalist-oriented environmental management is summarized by Piller (1991) who says "[a] deep rift has opened between local communities, and the creators and purveyors of technology" (p.16). These shortcomings in traditional communication practices suggest the need to shift between two "distinct ideological lenses, one called scientific rationality, the other, cultural rationality" (Coleman, 1995, p. 65). In sum, nuclear-risk communication has created a practice of one-way communication which privileged scientific values and alienated the public from participating in the decisions (Fischoff, 1995). The third particle of this essay takes up the call for a shift toward a democratic decision-making process which will necessarily emphasize dialogic nuclear communication.

THE PROTON: POSITIVE SEEDS OF CHANGE

The final particle in the atom is the proton. Like the proton, this part of the essay has a positive charge since it describes a style of discourse about nuclear management which "provides the basis for individual, qualitative judgments of risk" (Coleman, 1995, p. 72-73) and empowers the public to "effect policy decisions" (Coleman, p. 77). A

democratic communication process, according to F. Rowan (1996), involves "accepting fears as legitimate, and working to empower people to control their own lives. The public should be involved in two-way dialogue that illuminates values, options, costs and benefits, as well as risks" (p. 28). As implied earlier, the suggestions for a democratic nuclear-risk communication process assume a plurality of values and ways of knowing which inform individual and public decisions differently than those of the expert. The responsibilities for dialogic engagement fall to both sides of the gulf between citizen and expert to learn as much as one can about all of the issues and potential consequences of actions, attitudes and practices.

Admittedly, fixing the communication around the atom to act more democratically appears to reify the "[e]nlightenment narrative, in which the hero of knowledge works toward a good ethico-political end" (Lyotard, 1984, p. xxiii-xxiv), but the end of a democratic communication is not predetermined by detached experts. It remains open to revision.

At the foundation of this project sits the desire for meaningful democratic communication and the desire for negotiated meaning and policy. Admittedly meaning is always "negotiated" through a semiotic process, "the social process by which meaning is constructed and exchanged" (Hodge & Kress, 1988, p. 5). Within traditional nuclear communication, the weight of ingredients favor the state and its agenda at the expense of popular interests. Traditional science-centered and state-administered communication exists to "constrain behaviour by structuring the versions of reality on which social action is based" (Hodge & Kress, p. 3). This style of communication repeats "[a]n excessive

concentration on normative systems . . . [which] contains an inbuilt distortion and reinforces the ideas of their dominance" (Hodge & Kress, p. 7).

For a traditional communication strategies to succeed, it must be able to terminate "the play of meaning by insisting upon 'true' and 'literal' signifieds" (Silverman, 1983, p. 240). Traditional communication practices demand closure around what risks, their consequences, and remedies are understood to be. "Social control rests on control over the representation of reality which is accepted as the basis of judgment and action" (Hodge & Kress, 1988, p. 147). In this model, the rhetoric of the nuclear policy makers presents an already finished text to the public in the form of a readerly text (Barthes, 1974). "The readerly text," Silverman says, "purports to be a transcript of reality which pre-exists and exceeds it, and it tightly controls the play of signification by subordinating everything to this transcendental meaning" (p. 243). The transcendental meaning in risk communication usually rests on assumptions of progress and perfection, technological efficacy and control, or the apocalyptic destructiveness of nuclear wars and accidents. The danger of risk communication producing readerly texts flows from the readerly text's attempt "to conceal all traces of itself as a factory within a particular social reality" (Silverman, p. 244). Traditional nuclear-risk communication obscures its ideology from the public and maintains the mystery granting itself power.

The crisis facing discourse of nuclear management communication shows evidence that cracks exist in their hegemony. At the point where people must interpret their experience, "there begins a process of unlimited semiosis" (Eco, 1979, p. 68). At any point in time, the semiotic process is never final. Derrida's reminder that "[t]he

language is the property of the people" (1976, p. 169) suggests that people have an ability to alter relationships and meaning collectively. This political aspect of our contemporary age points to the first steps toward a democratic decision-making process and dialogic nuclear conversation.

A post-Cold War nuclear discourse can exist as a counter-discourse to traditional communication practices though its participants may include many members historically aligned with hegemonic forces. Where Schultz (1996) understands, "we are still embroiled in the precepts of modernity" (p. 167), an empowered decision-making process would resist being "characterized by the dominance of a controlling culture that imposes order through classifying, regulating, and categorizing nature" (p. 167).

Our current situation marks the limits of both our communication-based decision-making process and our critical skills to describe and affect that process. Derrida (1984) observes, "[i]ndeed: nowhere has the dissociation between the place where competence is exercised and the place where the stakes are located ever seemed more rigorous, more dangerous, more catastrophic" (p. 22). MacKenzie (1994) explains modern thought which relies solely on rational science cannot effectively understand technological discourse "in isolation from organizational, political, and economic matters" (p. 195). Critics who argue science is "hardly objective or free of social values" (Coleman, 1995, p. 70) help shift the center of the decision-making process from the expert. A move toward democratic nuclear-risk communication is simultaneously a move from the ideology of scientific rationality to an ideology of cultural rationality.

A document which seems to break ground toward this dialogic nuclear communication and new style of risk conversation comes from the Department of Energy (1995) in its Closing the Circle on the Splitting of the Atom. This essay has expended significant energy to ground Closing the Circle in an intertextual economy of risk communication and in the material-historical circumstances of its day. Jameson (1981) recognizes the value of such a critique that uncovers assumptions of cultural practices that have gone unarticulated as means of historicizing observation and criticism. The silencing of the public in favor of the expert in the traditional nuclear communication process "reconfirms that structural, experiential, and conceptual gap between the public and the private, between the social and psychological, or the political and the poetic, between history and society and the 'individual'" (Jameson, p. 20). The dominance of such modern practices are already under siege from popular movements and radical academics like Feyerabend (1987) who, according to Lugg (1991), points out, "[l]ike it or not we must not let the experts to do our thinking for us, still less allow them decide how we should act. They are not more reliable, only more pretentious and pushy" (p. 109).

The present impulses toward dialogic debate of nuclear issues are evident within Closing the Circle (DOE, 1995). First, it admits scientists and technical experts do not own a monopoly on the competence to discuss nuclear issues. In fact, the document goes as far to forecast the limits of science in solving these nuclear issues. "In many cases, no safe or effective technology is yet available to address -- or even fully understand -- the contamination problem," admits the Department of Energy (DOE, 1995, p. 7). This

rhetorical stance creates a condition paralleling the situation Derrida (1984) describes. In this world, Derrida says, "[t]here is nothing but doxa, opinion, 'belief'" (p. 24).

From this place of uncertainty and universally limited competence, the Department of Energy (1995) embraces the need for "informed and constructive citizen involvement" (DOE, p. 81) and admits that "the Department must itself undergo a major institutional transformation" (DOE, p. 80) to promote dialogic communication and to facilitate a decentralized process to manage environmental restoration of the United States which for fifty years functioned as a giant nuclear factory. I do not suggest government and corporate agencies will cease acting in their own best interest, but I do envision the potential for positive democratizing change as an outgrowth of perpetual conflict within a contemporary nuclear policy discourse. By focusing on the tension which has always existed in the semiotic process and political system, alternatives can come to light instead of remaining in the shadow obscured by obfuscating textual practices which arrest meaning at strategic points of crisis and decision making. Describing just what this new risk communication process may look like makes up the last task of this chapter.

CLOSING THE CIRCLE AND OPENING DEMOCRATIC COMMUNICATION

A new mode of nuclear communication should stress the dialogic nature of communication and encourage democratic decision making. To accomplish this lofty goal, a practice of communication needs as many voices as possible to participate in the discussion of nuclear issues. Each voice will cut a unique facet. Critics must also

participate to comment on the direction of the conversation, reflecting on its intertextual life and influences which gives other participants useful information with which to make decisions. A new nuclear communication and decision-making process will look different.

First, a democratic decision-making process which embraces cultural rationality would recognize argument and conflict naturally present in exchanges between public, private and corporate interests. Argument can serve a productive end if participants enjoy mutual respect, trust and a presumption of competence. Stratman, Boykin, Holmes, Laufer and Breen (1995) criticize previous policy-making discourse and from their case study call for a shift from a discourse of information to one of argumentation. Stratman and company explain:

> the kind of argumentation they need to develop is not only substantive but that which acknowledges and responds explicitly to other stases emerging in a controversy. The public at Aspen [their case study] clearly wanted to present and receive argumentation, not merely exchange information. (p. 36)

The turn toward argumentation stresses the dialectical nature of policy-making and stresses opportunities for feedback. Leiss (1995) observes participants have reasons not to trust each other and in a constructive argument setting, "each party will have a healthy mistrust of the motives and behavior as all advance various positions on how to manage risks" (p. 687). Most models of decision-making communication have focused on

increasing flow of communication to the public and limiting conflict. This idea of decision-making argumentation actually allows the two differing sides to interact.

Conflict is an inalienable part of democracy and, as Stern (1991), admits is "embedded in a democratic system" (p. 99). Policy making includes conflict because fundamentally it involves competing interests of people. Strategies which try to minimize conflict will fail or become dysfunctional. Consider the failings of nuclear deterrence theory as an example where conflict avoidance became dysfunctional. Since nuclear deterrence theory sought to avoid conflict versus resolving it, dialogue suffered between the "superpowers." Since previous risk communication functioned primarily for government and corporate interests to avoid conflict, public interests were oppressed. Conflict becomes unproductive as a means of political dialogue only when avenues of expression become closed.

Second, a democratic policy-making communication would consider multiple values and value systems. Considering multiple values constitutes an important, if subtle, change in the structural/cultural practice of nuclear-risk communication. Only by letting the conflict unfold without restrictions can all issues be heard and multiple values considered. The consideration of multiple values seems to lead to the third characteristic of contemporary policy-making communication -- the decentering of the entire process.

Third, a contemporary policy-making communication will seek to decenter the decision-making process. This new communication style recognizes a popular role in understanding "risk and the determination of a collective course of action" (Rimal, Fogg, & Flora, 1991, p. 320). New nuclear-risk communication, then, involves "consensus and

negotiation of meaning" (Rimal, Fogg & Flora, 1991, p. 320). K. E. Rowan (1995) advocates a compromise and opts for "embracing the strengths and jettisoning the weakness of each" (p. 304). She suggests, "[g]ood risk management requires both scientific knowledge and social justice" (K. E. Rowan, p. 304) which this chapter sees dialogic communication serving.

A compromise may not go far enough unless the hierarchy which promotes "some speakers over others, and some values over others" (Coleman, 1995, p. 65) disappears. A democratic nuclear policy-making communication understands and allows for the "polycentered nature of controversies" (Limoges, Cambrosio, & Davignon, 1995, p. 706). This approach does not create what is already there; it simply opens its eyes to the presence of polysemy. As a practice, Coleman notes communication sources tend "to be those who hold positions of authority, many of whom are scientists and government representatives" (p. 68). In Coleman's study of 571 news articles, 74 percent of sources represented scientists, government or mining authorities (Coleman, p. 68). This disproportional access to media must change for the nuclear conversation to become decentered. The continued growth of computer access and publication offer hope.

A decentered decision-making process will meet resistance from corporate and authoritarian interests because the process allows for potential decisions which do not serve corporate interests. The process returns risk to its source. In nuclear issues, risk already exists in decentered form. Questions of just how decentered decision-making processes will work remain unanswered or, more accurately, unnegotiated.

To this point, this section looked at the cultural context and ideological role of nuclear-risk communication, its detrimental effect and the potential reconstruction of a democratic policy-making communication practice for our contemporary era. It has at several points briefly looked at the Department of Energy's risk responsibilities and its document, Closing the Circle on the Splitting of the Atom (DOE, 1995). This text deserves closer inspection as an instance of a transitional nuclear-risk communication.

Despite the context demanding Closing the Circle (DOE, 1995) and its intentions of building public participation, a review of the document suggests it only begins the process of "providing for broad-based debate and participation" (DOE, p. 85). The document largely records the department's ability to link "its technical capabilities with democratic values" (DOE, p. 85). In this way, one can see Closing the Circle trying to emphasize a plurality of values by recording public participation success stories. However, alone it does not provide avenues of meaningful public participation.

Though documenting some successful moments of public participation and providing a vision for the restoration process, this document does not alone facilitate participation nor decenter the process. Documents only involve one-way communication, but when a document makes clear that the agency responds to participation, it encourages participation in other avenues. The document can also highlight avenues of exchange previously overlooked or unexecuted by others. Roser and Thompson (1995) show motivating publics to action becomes particularly difficult when concerning nuclear-related discussions. Since historical practices have alienated individuals from means of control and influence over nuclear issues as shown earlier,

greater inertia must be overcome to inspire public action. Closing the Circle (DOE, 1995) tries to strike a balance between domestication and bureaucratization which would "discourage public involvement in and decision-making about nuclear policy," according to Schiappa (1989, p. 253). Striking this balance presents a difficult dance, but the effort promotes "the liberal democratic principle that public deliberation is both necessary and desirable in formulation of public policy" (Schiappa, p. 253).

This review of the Department of Energy's Closing the Circle on the Splitting of the Atom (1995) assumes the department is sincere in its efforts to involve the public. This sincerity may grow from recognition that only through broad public participation and trust building can any work in the management of nuclear waste occur. This review also sees the dilemma facing the management of nuclear waste and environmental restoration as a materially real issue that faces all people and affects everyone though how it affects individuals differ. Though the effects are locally negotiated, only through near-total participation can all interests be considered and equitable solutions be achieved. A contemporary nuclear discourse must allow the meaning of risks to grow at the everyday individual level. Democratic participation must result in voluntary site determination, priority setting and policy development. Analyzing Closing the Circle shows the difficulties facing the establishment of democratic policy making and the continuing residue of the traditional discursive practices which seek control of uncertainty and artificial termination of negotiation.

CLOSING IN ON CLOSING THE CIRCLE

Does this work encourage wider public participation? Does it undo a variety technocratic discourses that have discouraged the public from participating in nuclear discussions? No single text can. However, this work could start a trend of practices and a style of engagement that emphasizes participation and multiplicity of values in the discussion. Skeptics may always question the sincerity of federal appeals to participation while sharing the opinion that solutions need wider participation. A healthy dose of mistrust may serve the deliberative process if it does not break down discussions.

Simple repetition in appeals to mass participation will not change the effects of technocratic discourse. Closing the Circle (DOE, 1995) seems to demand a two-pronge approach to social change. First, it calls for a "change of consciousness" (Mechling & Mechling, 1992, p. 191). Second, it asks for collective action to unite the nation behind a vision of dealing with technologically-spawned crises. In making these two appeals, one can see the Department of Energy competing with other narrators to create functional visions of the present and future which help to "allocate resources" while "they condense information" (Tepper, 1996, p. 30). Though these visions may not reflect an absolute truth, they often function over periods of time and can provide "reliable basis for assessing the future" (Tepper, p. 32).

Appeals for more participation must simultaneously accompany structural changes in the means of participation, elimination of any reprisals taken against dissenting voices and a new language which levels the privilege of discursive agents. Leveling the privilege of discursive agents means the discourse of policy making cannot

continue to appeal for mass participation while depending solely on the scientists for the information and guidance. Finding a new language and decentering the discourse of science within the policy discussions brings up another challenge presented by intertextual relationships of this work.

As the focal point of nuclear policy making in the next century, the organization has taken a bold step in admitting it lacks the technical expertise to deal with the nuclear legacy and a growing sense of uncertainty. Admitting that those responsible for decisions lack expertise and information helps to decenter elitist rhetoric but it also serves identification purposes. A section head makes the appeal to identify with the public clear by labeling "The Challenge Before Us" (DOE, 1995, p. 9). Closing the Circle admits:

> We have large amounts of radioactive materials that will be hazardous for thousands of years; we lack effective technologies and solutions for resolving many of these environmental and safety problems; we do not fully understand the potential health effects of prolonged exposure to materials that are both radioactive and chemically toxic; and we must clear major institutional hurdles in the transition from nuclear weapons production to environmental cleanup. (p. 9)

Closing the Circle repeats the appeal for wider participation, the de-emphasis of science, and the highlighting of the diversity involved in the current process throughout its 106 pages -- from its letter from Energy Secretary O'Leary (p. v) and introduction by Assistant Secretary Grumbly (p. ix) to the statement of its goals (p. 5) and its conclusion (p. 91). It admits that "[i]ronically, many citizens who were shut out are now deluged with

information and invitations to public meetings" (DOE, p. 90). Though more information does not necessarily equal a better informed public nor does it necessarily produce a more active public, responsible agents who recognize the value and importance of democratic decision making can only make opportunities for participation and information. In doing so, Closing the Circle attempts to shift its identity from a publication of the most powerful technocratic bureaucracies to just one of the other groups of concerned citizens without all the answers.

Others note the struggle from within the Department of Energy to change and create dialogic communication. The success of the department to alter its image from enemy of the people and the environment to public and environmental advocate even inspired support for the department from environmental activist organizations when Congress threatened to dissolve the department (Kriz, 1995). The New York Times ("Nuclear Guinea Pigs," 1995) also states "Ms. O'Leary deserves credit for moving promptly to find and release as much information as possible" (p. A14) which takes strides toward dialogic and democratic decision making. The movement toward open dialogic communication has not proceeded without some failures. Barton C. Hacker (1996), an independent contracted historian, explains the difficulty of comprehensively telling parts of the organization's history while respecting classification and bureaucratic sensitivities. Simultaneous to the current consumption of this document, the department faces debates over the departments future continue (Corn, 1996; Freedman, 1995a, 1995b; Goodwin, 1995; Lawler, 1995; Passell, 1995; Veiluva, 1995) and press scrutiny (Ehrenreich, 1995; Hansen, 1995; Wald, 1995, 1996a, 1996b, 1996c; Zerriffi &

Makhijani, 1996). Regardless of the bumps in the road toward communicative progress, the direction seems clear and paved on stones of belief that dialogic communication makes better decisions, and better decisions serve public safety and interests (Kriz, 1995, 1996). With all its limits, Closing the Circle (DOE, 1995) and the Department of Energy seem to be trying to encourage dialogic communication and democratic decision making.

To summarize the intertextual soup in which Closing the Circle (DOE, 1995) soaks, one sees a tension between impulses and traditions of secrecy versus the need for openness, the compartmentalization of knowledge acting against informed participation, and a lingering technocratic discourse facing the limits of science. These three ingredients combine to produce an encompassing broth of distrust. Scientist distrust the emotion-ladened expressions of the general public, and the public distrusts institutional agents spouting technical jargon. For policy makers who have to balance these discourses, finding a new process of interaction between these diverse groups presents a significant challenge; Closing the Circle at least enters thi ring of battle.

The complexity of that challenge cannot be overstated. To understand the significance of that challenge and the position of the Department of Energy, one must shift her mode of analysis from political or scientific to a cultural-based perspective. The rhetoric of the Department of Energy must be seen as part of a cultural production with effects that reach beyond the policies of nuclear management. When one considers the close ties with physics departments (Cordes, 1996b; McIlwain, 1995) and industry (Lepkowski, 1995), the ripples of debates surrounding the Department of Energy extend far from its source. The new nuclear criticism presented in chapter three provides one

useful way of looking at this work in its wider intertextual context as an instance of cultural production and the repetition of established intertextual threads of discourse involving discourse of policy management, risk communication and popular reactions. The analysis provided by such a perspective suggests that Closing the Circle does well to step toward a democratic nuclear communication but faces obstacles as the communication practice evolves and opens to wider participation. Those obstacles include poor relationships and continuing press scrutiny which lengthen the shadows distrust. Additionally, this analysis suggests only sustained discursive practice and combined material results will undo the damage of nuclearism, bridge these obstacles and repair the schism between public and private interests. The intertextual nuclear critic assists this project by providing perpetual critique and insight into the shape and direction of this important conversation.

Though this text represents one significant example of a new style of departmental rhetoric in the post-Cold War era, others exist. Part of the dialogic responsibility of conversational participants and intertextual nuclear critics is to look to competing voices. As this text provided an example of institutional rhetoric the next text gives us an sample of oppositional rhetoric renewing the long-held call for nuclear abolition.

CHAPTER 5: NEW NUCLEAR CRITICISM AND THE CANBERRA COMMISSION

The previous chapter analyzed one strand of federal departmental rhetoric and concluded that document participates on multiple levels with other intertextual threads in an attempt to move the discussion of nuclear policy into a new, if uncertain, mode of discourse. For lack of better terms (and we always lack better terms), I labeled that new discourse democratic nuclear communication. This chapter looks at a series of texts made outside the federal policy-making discourse by an international oppositional organization, the Canberra Commission.

At first glance, one may strain to see the connections between these two organizations and their rhetoric. However, on closer inspection and with the hindsight provided by this project's nuclear primer, readers should discern several important links between these two intertextual threads. On a very macro-level, both organizations respond to the continued presence of nuclear technology in a post-Cold War environment and appeal to a wider public for a strategy of long-term nuclear management. On a smaller level, both texts deal specifically with traditions of discourse around the bomb that must radically change before either organization completes and succeeds in its campaign. Finally on a micro-level, both organizations necessarily deal with responsibilities seized by the other in their claims of authority and articulated means of nuclear management.

These organizations and their texts also differ for obvious reasons. The texts produced by the U. S. Department of Energy necessarily respect established jurisdictional

boundaries and seek to resolve nuclear-management crises within the borders of the United States as sovereign issues. Any actions proposed by the Department of Energy respect previous demands on national security and departmental responsibilities. The texts of the Canberra Commission operate on an international plane demanding parallel unilateral action disregarding national and local political issues. Parallel unilateral actions are actions taken and enforced independently from the actions of other countries but in conjunction with similar actions by other countries. It differs from multilateral actions in that the enforcement and governance of the actions remain within sovereign borders. The Canberra Commission, however, points beyond simple parallel unilateral actions as an interim management strategy to a world body which can enforce and legislate nuclear policy as earth becomes a nuclear-free planet.

Aside from the proximity of subject between these two texts, the methodological perspective detailed in chapter three also provides motivation for juxtaposing these two texts as they mingle in the same intertextual economy of the post-Cold War period. As contemporary nuclear critics look to understand the shape of contemporary nuclear-policy discussions, texts like these compete with each other indirectly and exert an influence on policy debates through several channels. Since both of these texts come from political savvy and wired organizations, there is a direct effect where policy makers personally hear the arguments of these and other organizations. On another level, organizations like these make news, and when distilled into media friendly bites/bytes policy makers consume these cookies of information via news briefs and summaries often in disproportion to their public impact. The last level of influence concerns

constituency consumption of similar news-like information from organizations like these and direct-feed information via mailings, websites and library access. The texts of the Canberra Commission provide contemporary nuclear critics a variety of options for analysis. Nuclear critics may approach the texts as the expression of elite discourse, through metaphorical analysis or as a thread of textuality helping to shape the continued direction of the nuclear age. Staying consistent to this project's perspective, this analysis chooses option three and looks at the nuclear continuities within the works of the Canberra Commission and how they become situated in oppositional rhetoric of a post-Cold War environment. For readers to understand the significance of the Canberra Commission, this project takes a familiar detour to offer a brief background of the Canberra Commission.

THE CANBERRA COMMISSION:

A POST-COLD WAR OPPOSITIONAL PROTOTYPE?

The Canberra Commission on the Elimination of Nuclear Weapons[37] came to life after Australia's Prime Minister Paul J. Keating took advantage of the 50th anniversary of the United Nations and international controversy surrounding French and Chinese nuclear testing in the Pacific (Lund, 1995; see also Suter 1992) to appeal to "something broader and more ambitious" (Keating, 1995). The prime minister offered the potential "of a world totally free of nuclear weapons" and believed "the strategic framework in which nations operate changed profoundly" (Keating, 1995) at the end of the Cold War to allow the pursuit of such a lofty goal. To facilitate this vision, the Australian government committed to establishing a "group of knowledgeable and imaginative individuals from

around the world in a major series of meeting . . . to produce a report submitted to the next United Nations General Assembly and to the Conference on Disarmament in Geneva" (Keating, 1995).

Following that address, the prime minister of Australia announced the Canberra Commission on the Elimination of Nuclear Weapons would meet January 23-25, 1996 (Keating, 1996). His press statement explained that the commission would consider:

> . . . steps that need to be taken quickly to enhance current or planned disarmament and non-proliferation activity, notably in nuclear testing, the [P]roduction of fissile material for nuclear weapons, nuclear weapons free zones and nuclear safeguards.
>
> [V]erification and control arrangements and new international legal obligations which might be required for a nuclear weapon-free world.
>
> [I]ssues relating to the nuclear threshold states how the international community will react collectively to any attempt at 'break-out,' nuclear theft, and nuclear terrorism.
>
> [T]he significant problem of maintaining security and stability during the transitional period and after a nuclear weapon-free world is achieved. (Keating, 1996)

These general responsibilities and the timeline for the commission's report were clarified by the "proposed mandate" for the Canberra Commission (Canberra Commission, 1996d). Prior to the first meeting of the commission, the Australian government provided a list of the commission members who volunteered from their respective

countries. The commission included: Ambassador Celso Amorim (Brazil), General (ret.) George Lee Butler (United States), Ambassador Richard Butler (Australia), Field Marshall Lord Michael Carver (United Kingdom), Commander Jacques-Yves Cousteau (France), Ambassador Jayantha Dhanapala (Sri Lanka), Ambassador Rolf Ekeus (Sweden), Ambassador Dr. Nabil Elaraby (Egypt), Professor Ryukichi Imai (Japan), Datuk Dr. Ronald S. McCoy (Malasia), Robert F. McNamara (United States), Ambassador Oian Jiadong (China), Michel Rocard (France), Professor Joseph Rotblat (United Kingdom), Professor Roald Sagdeev (Russia), and Dr. Major Britt Theorin (Sweden) (Canberra Commission, 1996b). The diversity and uniqueness of this assembled group deserved a complete listing here, though this analysis will later single out General Butler who served as chairman and spokesperson for the commission.

At the conclusion of its first meeting, the commission held a press conference which highlighted the progress of the commission toward its goal of "making a compelling case to the world -- with all the authority and credentials of this group behind it" (Evans & Butler, 1996). The commission met formally again April 22-24, 1996. During this second meeting, the commission "set precise directions for their report" (Downer, 1996a) and should seek to attract "support within the wider global community, including those constituencies who can influence opinion-formers and decision makers" (Downer, 1996a). In this statement the role of the Canberra Commission mutated from solely material advisory-providing body to one that recognized its part in the creation of discourse through awareness. But, this mandate also laid the foundation for the commission's elitist identity. It also overtly claimed a need to balance its "instincts for

idealism with realism" (Downer, 1996a). The products of these meetings of the commission and private working among its members became public August 14, 1996, when the Australian government announced it had received the report of the Canberra Commission (Downer, 1996b). At this point the Australian government shifted attention from its chartering of the commission to the commission's independent and international nature stating, "[t]he Canberra Commission is an independent group of eminent persons. Although they come from all continents and include nationals of all nuclear weapons states, they do not represent any government" (Downer, 1996b). The report was presented publicly twice, once to the 51st General Assembly of the United Nations in September 1996 and once to the Conference on Disarmament in January 1997. Each presentation created a ripple of news coverage with more significant coverage coming on the coattails of General Butler's presentation to the presentation to the World Forum (Butler, 1996), his joint statement with General (ret.) Andrew J. Goodpaster which announced the stance of a group of generals against nuclear weapons on December 5, 1996 (Goodpaster & Butler, 1996), and his receipt of the second Henry L. Stimson Award for Distinguished Public Service in January 1997 (Butler, 1997). To bring a wider audience to its statements the generals ran a quarter-page advertisement in the New York Times on December 5, 1996 ("Nuclear weapons," p. A18). The advertisement also listed those who participated in the statement which included generals and admirals from Canada, Denmark, France, Ghana, Greece, India, Japan, Jordan, the Netherlands, Norway, Pakistan, Portugal, Russia, Sri Lanka, Tanzania, the United Kingdom, and the United States ("Nuclear weapons," p. A18).

Due to the prestige of the individuals on both the Canberra Commission and the generals committee, the arguments and ideas professed by these groups reached a level of policy makers quicker and with greater force than the ideas and programs of traditional opposition groups. Both the White House and the United Nations cited the work of the commission as influential in bringing about the Comprehensive Test Ban Treaty (signed in September 1996) (White House Press Briefing, 1996). These arguments and actions necessarily attracted the interest of the press. In addition to the news coverage of the Canberra Commission and generals statements (Atlas, 1996; Disarmament Times, 1996; Kempster, 1996; Komarow, 1996; Medicine and Global Survival, 1996; Reuters, 1996; R. J. Smith, 1996), on the same days newspapers ran general news stories about potential nuclear crises (Associated Press, 1996; Brooke, 1996; Makhijani, 1996; Wasserman, 1996; Weiner, 1996) and op-ed pieces debating the merits and problems of nuclear disarmament and abolition (Arquilla, 1996, Goodpaster, 1996; Haass, 1996; Rosenfeld, 1996). From this perspective, the arguments brought by these groups either enjoyed serendipitous timeliness or increased editors attention to other nuclear issues.

The difference between the Canberra Commission and generals group becomes muddied in the web of news stories and websites as General Butler, a member and spokesperson for both organizations, made various public statements without distinguishing from which group he was speaking. The blurring boundaries serves the interests of both groups who sought the same goals and by their synchronic presentation capitalized on the publicity that each group would attract and the credibility that each group created. Since January little news coverage has increased public awareness of

either group and their agenda. A number of websites makes the information and claims continuously available as does archival storage of newspapers and United Nations proceedings at libraries. The absence of current coverage of these groups and their texts does not mean the statements made by the Canberra Commission are not influential or should not be seen as a prototype for post-Cold War anti-nuclear organizations. In fact a closer look at the texts provided by the Canberra Commission and its spokesman General Butler reveals that these texts failed to generate widespread debate not because of a lack of evidence or rationality but because of effects rising from their intertextual relationships and discursive identity. The next section of this project looks to the documents of the Canberra Commission to illustrate the intertextual continuities of their texts and how the choices of making these continuities influence the lives of these texts.

THE CANBERRA COMMISSION'S REPORT:

RETRACING PRACTICAL STEPS

Like Closing the Circle (DOE, 1995) responded to a tradition of institutional rhetoric, a discourse of departmental risk communication and a culture of nuclearism; the comprehensive report of the Canberra Commission answers a tradition of anti-nuclear rhetoric, oppositional discourse and that same culture of nuclearism.[38] Like the Department of Energy document recognized both the uniqueness of the post-Cold War environment and the continuities which survive, the documents produced by the Canberra Commission also set out to take advantage of the geopolitical situation after the Cold War.

In looking at this text, a nuclear critic must remember the anti-nuclear campaigns and texts which proceeded the Canberra Commission. Even before Little Boy exploded over Hiroshima, anti-nuclear sentiment existed within corners of the infantile nuclear world. The Franck Report (Franck, et al., 1945), prepared by several Manhattan Project scientists at the University of Chicago, called for an "international agreement on prevention of nuclear warfare" (Franck, et al.) and a demonstration of the weapon versus direct use of the atomic bombs on Japan. To facilitate the international control of nuclear resources and to avoid an armaments race, the report stated the situation "requires study by statesmen and international lawyers" (Franck. et al.). The report further called for "all sides to give up a certain part of their sovereign rights" which would include the rationing of "the raw materials" through an "international Control Board" (Franck, et al.). Immediately following the bombing of Hiroshima and Nagasaki, rationalization (Stimson, 1947) accompanied attempts to tell the bombs' effects on individual human beings and society (Hersey, 1946/1985).

Several years later President Dwight D. Eisenhower made similar comments in his "Atoms for Peace" speech in front of the United Nations General Assembly on December 8, 1953. Whether Eisenhower's speech intended to serve as psychological cold warfare (Medhurst, 1987) or a sincere proposal for the international control of nuclear technology, the text of the speech also continued several significant threads of anti-nuclear rhetoric. In addition to the international governance of fissile material and its attending technology, the speech called for the newly formed International Atomic Energy Agency to pursue atomic applications in commercial and domestic uses. Still

very early in the atomic age, this speech repeated threads of sentiment and ideas on how to control atomic technology which would echo throughout the rest of the nuclear age.

These threads have been repeated in history books (Halle, 1991; R. Rhodes, 1986, 1995), biographies (Jungk, 1958) and anti-nuclear texts for 50 years like Herman Kahn's On Thermonuclear War (1960) and Jonathan Schell's The Fate of the Earth (1982). The report by the Canberra Commission is the latest anti-nuclear text to repeat these arguments though the details of these fragments differ from case to case.

"Discourse ceases to be what it is whenever parts of it are taken 'out of context'" (McGee, 1990, p. 283). The texts which inform the nuclear age and the events that we think we remember become part of that context or the "web of contexts that the audience would use to understand" (Mechling & Mechling, 1995, pp. 441-442) the stories and claims made by rhetors or groups of rhetors repeating similar stories. The Canberra Commission's report provides a number of continuities and plays upon a number of familiar "discursive formulae" (Mechling & Mechling, 1995, p. 442). The task of the contemporary nuclear critic in mapping the intertextual play of the Canberra Commission's document serves as a "way of seeing how relatively 'open' or closed'" (Mechling & Mechling, 1995, p. 442) texts are to allow audience participation in the formation of its meaning. M. Solomon and McMullen (1991) argue all texts have degrees of openness but texts carry more rhetorical force when they highlight how they allow "for negotiation of meaning" (p. 345). At closer inspection, one struggles to see any openness within the Canberra rhetoric.

The nature of nuclear argumentation necessarily seeks to avoid any degree of openness regardless of whether the text supports or opposes nuclear industry and weapons. For rhetors participating in nuclear arguments the stakes are too high to leave conclusions to chance; so, they take care to craft their arguments with tight closure where every bit of information feeds one direction and one conclusion.

When we look at the documents of the Canberra Commission we can see constant care taken to create a *perfect* argument to *control* the outcome of debate and choices made to continue intertextual threads to capitalize on the discursive fertility of anti-nuclear commonsense. The executive summary of its report (Canberra Commission, 1996c) makes the absolutism of its claims clear. The opening paragraph reads:

> The Canberra Commission is persuaded that immediate and determined efforts need to be made to rid the world of nuclear weapons and the threat they pose to it. The destructiveness of nuclear weapons is immense. Any use would be catastrophic. (Canberra Commission, 1996c, p. 1)

The difficulty of the nuclear dilemma involves the fact that it does concern a universal danger while demanding local strategies of management and appeasement. One of the problems of the Canberra's particular mode of universalization involves its choice to elevate action from people to states and describes the process as "a global endeavor involving all states" in a process that "must ensure that no state feels" (p. 2) threatened. The convenience of dealing with the generally manageable state versus the heterogeneous people within nations structures the text of the Canberra Commission as elite discourse which alienates it from its potential global constituency of general

populations. Because nuclear-management organizations typically do involve state agencies, the Canberra Commission made a reasonable choice that recognized the management of nuclear resources involves an elite few who claim to act in the interests of people but are motivated by discursive, political and economic factors (Lifton & Markusen, 1990). In doing so, the commission opted out of popular discourse for technocratic discourse (Salvador, 1992).

The main body of the Canberra Commission's report (Canberra Commission, 1996e, 1996f) repeats many of the anti-nuclear arguments common to anti-nuclear discourse since the early 1960s despite claiming that the Cold War environment marks a new and unique geopolitical environment. It summarizes the "case for elimination of nuclear weapons" (Canberra Commission, 1996e) by saying:

> The destructiveness of nuclear weapons is so great that they have no military utility against a comparably equipped opponent, other than the belief that they deter that opponent from using nuclear weapons. Use of the weapon against a non-nuclear weapon opponent is politically and morally indefensible.
>
> The indefinite deployment of the weapons carries a high risk of their ultimate use through accident or inadvertence.
>
> The possession of the weapons by some states stimulates other nations to acquire them, reducing the security of all. (p. 1)

The report goes on to call for a legal international framework to ban nuclear weapons and govern nuclear resources. This project does not wish to defeat any argument which

serves peace and attempts to create a nuclear-weapon free world. However, critics seeking to facilitate conversation over the direction of our nuclear age must admit that they have heard these arguments before and alone the arguments have failed to create an environment of universal disarmament. Why?

The Canberra Commission seemed to recognize that counter-arguments to these points pre-exist its report in the intertextual economy of the contemporary age. The counter arguments often talk of national sovereignty and security, point to the lack of a legally-empowered international framework to manage a nuclear-free world, the impossibility of verification and the potential of break out (Harkin, 1990). The Canberra Commission's report dedicates sections to each anticipated argument citing a trend reversing nuclear proliferation, the World Court decision in July 1996 (Mendlovitz & Weiss, 1996) providing an advisory opinion on the illegality of the threat or use of nuclear weapons, the mechanics of global security without nuclear weapons and a system of verification.

The commission uses ten pages to answer individual fragments of arguments for retaining nuclear weapons. Of those pages several specifically deal with the failing logic of deterrence explaining that the North Atlantic Treaty Organization (NATO) tried "to build a credible deterrent based on an incredible action" (Canberra Commission, 1996e, p. 11). In refuting the arguments for a nuclear umbrella where the United States extended the presumed advantages of deterrence to other nations to reduce the incentives of those nations like Germany and Japan from going nuclear, the report capitalized on the fall of the Soviet Union to argue that the Soviet threat "simply vanished" (Canberra

Commission, 1996e, p. 12) and no prospect of any comparable threat exists. Security according to the commission can better grow from economic and mutual conventional agreements. As far as the advantages nuclear weapons provide to deter other weapons of mass destruction, the report simply says no bright-line for nuclear use exists and documents that "[a]ll the nuclear weapons states have formulated negative security assurances, statements that set out the circumstances in which they would not use nuclear weapons" (Canberra Commission, 1996e, p. 12). Although states at times may not discourage the perception that they may consider the retaliatory use of nuclear weapons against the use of chemical or biological weapons, decision-making mechanisms discount such considerations according to the report.

One of the most politically and discursively sophisticated arguments made by the commission against nuclear weapons involves its answer to nuclear weapons on the grounds that they "confer political status and influence" (Canberra Commission, 1996e, p. 13). Though the report does not deal with the pursuit of nuclear weapons by countries like North Korea, Iraq, Libya, Iran or Pakistan, it argues that by cost-benefit analysis countries with developing economies could not afford to maintain the "extreme standards of excellence" (Canberra Commission, 1996e, p. 14) to sustain a nuclear weapons complex. More importantly, it documents that institutions which bestow international prestige and clout, like the Security Council of the United Nations, should be committed to eliminating the perception of a "nexus between such membership and the possession of nuclear weapons" (Canberra Commission, 1996e, p. 13). The haves and have-nots of

the nuclear world provide a very visible demarcation for those who are privileged and those who are literally dispossessed.

The last few arguments for nuclear weapons answered by the commission deal with the potential of cheating and conflict mediation. For these arguments, one should understand atomic diplomacy (Alperovitz, 1965) not as a means of conflict resolution but as means of conflict censoring and termination. The ability of the Soviet Union to quell deep-seated ethnic conflict in its republics through force provides an illustration of how force and the threat of force stops conflict but does not resolve its causes. Once the stop-gap measures of the Soviet Union receded armed conflict returned. Nuclear stability acts similarly and its defendants site the potential for regional disputes to escalate as a reason for retaining nuclear weapons (Mandelbaum, 1995). The Canberra Commission idealistically calls for "[s]trengthening conflict mediation procedures" (Canberra Commission, 1996e, p. 16) as the remedy. Additionally break-out can be remedied by a comprehensive system of verification according to the commission.

Verification required an entire annex of the report as "[t]he elimination of nuclear weapons will not be possible without the development of adequate verification" (Canberra Commission, 1996g, p. 1). Verification involves international trust. With stakes celebrated as absolute and infinite, mechanisms of cost-benefit analysis privileged by elite technocratic discourse cannot function because the risks go "off-scale" at the potential for any uncertainty in the verification process. This situation demands that the Canberra Commission suggests "[t]his potential uncertainty should not deter reductions to small residual arsenals" (Canberra Commission, 1996g, p. 1). To this point every

word of the Canberra Commission report served to close the flux of meaning to create one opinion, that actions must be taken now toward a nuclear-free world and the actions prescribed in these documents should be those actions. At this point, the efficacy of the commission's arguments begin to break down.

Throughout the body of its reports (Canberra Commission, 1996c, 1996e, 1996f) and in the statements supporting and publicizing the report, the Commission creates a reasoned argument that claims only total immediate disarmament would serve global interests and any presence of nuclear weapons threatens global survival as the existence of weapons in the hands of a few is a highly discriminatory situation and therefore unstable. "The possession of nuclear weapons by any state is a constant stimulus to other states to acquire them," the report's executive summary states (Canberra Commission, 1996c, p. 1). So, the presence of a residual arsenal would fuel the same cyclical engine of meaning production and strategy which dominated the Cold War. The situation becomes difficult to manage as the commission allows for the retention of a residual force until systems of verification can become *perfected.* The dynamic of perfection cited throughout this project becomes crucial because as parties are creating symbolic situations where verification may be perfected others necessarily work to create arguments and strategies to defeat those systems of verification. In this move/countermove environment, perfection remains illusory.

Verification is by definition an issue of control where political actors seek to control all the variables of nuclear production. The elite members of the Canberra Commission seek the confidence of the general public and state governments by

suggesting that "a verification regime is composed of both material and technical features" (Canberra Commission, 1996g, p. 1). The necessary steps to absolute verifiable systems builds on the complex web of security systems which grew throughout the Cold War to map the globe and exert panoptic force on populations and institutions. Total verification means absolute relinquishing of self-determination (though this may now be an illusory perception) and freedom (also tenuous) where populations and individual nations depend on the benevolence of an elite technological system to control global security. In this situation, security depends on "access to information" (Canberra Commission, 1996g, p. 5), but information seems capable of mutating and escaping the surface of control. The imperfection of technology to control information suggests total verification is as fleeting as nuclear stability.

This condition of the imperfectibility of science demands that any global disarmament must be preceded by a sustained discourse of trust. Without a system of trust, the potential gaps in the verifying panoptic gaze will create reason to retain nuclear weapons in light of uncertainty and the infinite risk involved with that uncertainty. It is an unfortunate, but enlightening, choice of words for the commission to call its verification measures a verification regime (Canberra Commission, 1996g, p. 7). Regime suggests a new system of global governance shifting from nuclear powers to an elite international body of verification monitors would only repeat the discourse of power at work presently around the globe. Instead of privilege being granted by membership in a nuclear club, those with the means to verify extend a type of security to its neighbors or more accurately to those customers who subscribe to that security service. This situation

largely favors those already with the technology of nuclear weapons and military-industrial strength to be the ones to ensure security through verification because of their perceived expertise in nuclear matters and economic-military strength.

Despite efforts to close the meaning of this text around its anti-nuclear claim, the imperfectibility of technology and the scope of its verification regime provide two defeating issues for the report. First, by creating a text where all other voices are eliminated one by one, the presence of this rhetorical gap in continuing the rhetoric of technological perfection creates a situation intolerable for the audience. The rhetorical rigidity of the text up to that point does not allow for the sudden flexibility and uncertainty brought by the limits of technology. Second, the necessary regime to ensure verification and control further solidifies the privilege of the elite to determine the shape of geopolitical exchange. Though this may seem a tactical gain for many by the removal of the threat of nuclear annihilation, the quality of life does not change where panoptic technologies determine individual and collective security and repeat a nuclearism of dependence on systems of technology as necessary and desirable.

The situation facing the report of the Canberra Commission presents a difficult choice between appeal or expertise, and a single-value cost-benefit analysis or a plurality of values which better reflects the plurality of nuclear risks and experiences. The greatest disappointment in the report of the commission comes from the fact that it does not undo the colonizing effect of nuclear monopolies and seeks to substitute a system of nuclear security with a less visible system of verification and monitoring which function to provide the same sense of security that the theory of extended deterrence did for 50

years (Questor, 1986). In his analysis of the shape of colonialism in the contemporary age, Aijaz Ahmad (1992) explains the military-industrial complex has further institutionalized privilege of economic powers. "[T]he American world was First," Ahmad says, "not because capitalism was superior but because its interlocking military alliances, from NATO to SEATO [Southeast Asia Treaty Organization] were more powerful, with fully global reach" (p. 296). Caldicott (1994) also sees the globalization of nuclear power and arms industry as an expression of high economic imperialism while Kato (1993) contends that the integration of global security only further entrenches power in the hands of technologically- and politically-privileged states as the anti-nuclear discourse of disarmament has been forced to universalize and call for international bodies to enforce additional systems of power.

Though this project wishes to see the goals of global peace and a nuclear-weapon free world met, the system for achieving those goals prescribed by the Canberra Commission face certain difficulty but not from their lack of reason, credibility or facticity. Instead, the shortcomings of the Canberra Commission's arguments grow from their identity as elite rhetoric which sees the solution of technical risk (Questor, 1986) in further exploitation of technical expertise. As detailed by the Canberra Commission, nuclear abolition remains programs of states versus people. The course toward the solution of these problems also stepped only on stones of experts and elite organizations. Whether the Canberra Commission took this strategy by conscious choice to avoid apathetic publics or because it occupied the elite discursive position in advance of its arguments, the strategy alienates a wider audience from participating in the debate and

therefore fails to generate the constituent-level interest and support it needs. For critics seeking the widest possible participation in the nuclear discussion, the repetition of fragments or intertextual threads which discourage public participation in the discussion is disappointing and needs to be aired as an element of the conversation.

This section tried to look at the texts produced by the Canberra Commission within a wider discourse of anti-nuclear texts. In doing so, this project applauds the intent and urgency the commission brings to the nuclear crisis in recognizing the end of the Cold War provides unique opportunities to act to effect our nuclear trajectories. However, this analysis suggests the absolute potential of nuclear issues necessarily precludes arguments from allowing participation and personal-meaning negotiation. Additionally, in its formation as an elitist rhetor the Canberra Commission makes choices from its intertextual environment that repeat the privilege of the Cold War and commit an additional error of believing technology can be perfected to solve the ills of previous technology. This millennial faith in technology (Brummett, 1991) to bring a new order globalizes the Western vision of politics and repeats the principles of perfection, control and apocalypticism which run throughout the nuclear age. E. P. Thompson (1982) saw the discourse of the nuclear age limiting involvement and therefore the opportunity for solution to elite organizational bodies and called for "individuals, East or West, to act for common survival without regard for the interests or prohibitions of national states" (p. 38) and demanded "freedom of communication and exchange of information" (p. 38) as the means to the solution. The stance taken by the elite members of the Canberra Commission may reflect workable and reasoned solutions but fails to motivate masses

and continues to serve interests of states. Dr. Helen Caldicott (1994) recognized and anticipated the failure of elitist rhetoric to deal with and dictate solutions to the nuclear age when she said:

> Out of the growing number of organizations opposed to nuclear power and nuclear arms must come a grassroots movement of unprecedented power and determination. Its momentum alone, will determine whether we and our children, and all future generations of humankind, and perhaps life itself, will survive. (p. 113)

As a corporate rhetor, the Canberra Commission could not avoid errors of generalization and depersonalization which alienate a general audience. Only personal testimony could rectify this distance and create identification with a larger diverse population. One of its dynamic members attempted to provide that personal moral voice to this disembodied nationless report.

BUTLER AND A PERSONAL ANIMATION OF NUCLEAR ABOLITION

The involvement of General (ret.) George Lee Butler in the Canberra Commission and the generals committee against nuclear weapons needs further discussion as an attempt toward personal animation of intertextuality. General Butler served in the United States Air Force for 37 years. Over those years his responsibilities included but were not limited to serving as Commander-in-Chief United States Strategic Air Command and its succeeding organization the United States Strategic Command. As such, the general oversaw the day-to-day operation and management of all of the United States' strategic nuclear forces during a dynamic period in the geopolitical environment toward the end of

the Cold War and the years immediately following its end. He retired from active duty in 1994 and entered the private and business spheres. His private endeavors would soon become public when he volunteered in 1996 to participate in the Canberra Commission to campaign against nuclear weapons.

Though others have moved from supporter to opponent of nuclear technology, Butler's transformation marks a complete reversal of ideology in a very brief period. As late as 1991, Butler testified to the House Armed Services Committee that "[i]n the emerging global security environment, sustaining and when necessary enhancing the strength of these twin TRIADS [bomber, intercontinental ballistic missiles, and sea-launched ballistic missiles]" (Butler, 1991, p. 6) needs the nation's highest priority. The general at that moment occupied a unique discursive position with "a foot in two worlds" (Butler, 1991, p. 5) -- one where he actively pursued the "right-sizing" of the nation's strategic forces and sought additional assurances for arms control and another where he as commander of the nation's nuclear forces necessarily acted as weapons proponent in support of this nation's articulated strategy of nuclear deterrence. In his testimony, Butler called for a dynamic reshaping of strategic forces but also underscored the need to maintain modernization schedules for weapons systems and a "healthy viable, and safe nuclear weapons complex" (Butler, 1991, p. 13). Time has past since this testimony but the dynamics of the world with its regional instabilities, threat of nuclear terrorism (Powers & Muckerman, 1994) and growing nuclear black-market economy (Zimmerman & Cooperman, 1995) have not created a definitive reversal of the scene described by Butler in 1991 where the world was experiencing:

> . . . the intensification of intractable, regional strife and conflict, exacerbated by impatient populations and the proliferation of high technology weapons . . . catastrophic failures in the human condition due to economic and political disintegration . . . and the rise of new centers of power with either hegemonic or strongly competitive goals. (p. 3)

Butler's public comments after retirement reflect a complete reversal toward nuclear weapons and strategy which he helped formulate. In Butler's presentation to the World Forum on October 3, 1996, he expressed the difficulty he felt about departing from his decision made upon retiring from the United States Air Force "not to speak publicly on national security matters" (Butler, 1996).[39] He cites an "inner voice" which he "cannot quiet" (Butler, 1996)for his public involvement to stand against the bomb. In this presentation he briefly points to his unique authority to speak to nuclear matters after having "approved thousands of targets for potential nuclear destruction" and "investigated a troubling array of accidents and incidents involving strategic weapons and forces" (Butler, 1996).

As a result of his role in reshaping the strategic nuclear forces of the United States, Butler (1996) explains he developed a "deeply held conviction: that a world free of the threat of nuclear weapons is necessarily a world devoid of nuclear weapons." Butler (1996) expresses a profound awareness of the resistance of discourse to change by saying:

> Options are being lost as urgent questions are being marginalized, as outmoded routines perpetuate Cold War habits and thinking; and as a new

> generation of nuclear actors and aspirants lurch backward into the dark world we so narrowly escaped without a thermonuclear holocaust.

Butler then deals overtly with the nuclearism which perpetuates those Cold War practices though he sees the "terror-filled anesthesia" (Butler, 1996) slowly wearing off and a new consciousness taking hold. The urgency of the question, Butler says, is too great to leave solely within the "province of governments." Instead opinion leaders must work to "make a powerful difference in swelling the tide of global sentiment" (Butler, 1996). He follows this call with an additional request that each member of the World Forum read and reflect on the full report made by the Canberra Commission believing in the persuasive power of the text he helped prepare and fearing the effect of discursive fragmentation.

For his lifetime of public service and recent work to end the nuclear era, Butler received the Henry L. Stimson Award for Distinguished Public Service which singled out Butler's work to "encourage a new way of thinking about nuclear weapons and nuclear danger" (The Stimson Center, 1997). In his acceptance speech, Butler (1997)[40] noted that "six years after the end of the Cold War we are still prisoner to its psychology of distrust, still enmeshed in the vocabulary of mutual assured destruction, still in the thrall of the nuclear era." After noting his involvement with the Canberra Commission he expressed regret that it had not inspired the "interest and debate its subject so urgently warrants" (Butler, 1997). To inspire further reaction, Butler took a stand with other military leaders and produced a generals committee against nuclear weapons in December 1996. Butler

explains that our 50-year experience of the nuclear age has "contrived a new desperate theology to ease our moral anguish" (Butler, 1997).

In these two anti-nuclear speeches, Butler continues many older arguments made popular in the early 1980s as anti-nuclear movements peaked in the United States. He even quotes Shell's The Fate of the Earth (1982), makes several mentions of a "numbing reality" in overture's to thinkers like Robert J. Lifton (1967/1982), and repeats the turn of phrases popularized by Herman Kahn in 1960 of forcing us to think the "unthinkable."

General Butler's turn around from nuclear advocate to nuclear abolitionist is not unique among political and military personalities once they cease participating in the reinforcing discourse (Cohn, 1987, 1988) of nuclear strategy making. Hirschbein (1989) documents the phenomena of nuclear elite members falling from the fold as they leave nuclear management organizations. Hirschbein calls members of the nuclear elite part of a "Brotherhood [sic]" (p. 218) which behaves like an ecclesiastic order but explains that once retired members of the elite often renounce that power and those nuclear strategies as a false dream. He says:

> This conditioning sometimes wears off when leaders leave the Brotherhood [sic]: they gain a perspective as they distance themselves from the group, and come to realize that nuclear weapons threaten the very possibility of human history. Upon retirement, Lillenthal, Eisenhower, Kennan, McNamara and Rickover all had second thoughts about atomic diplomacy and nuclear war-fighting. (Hisrchbein, p. 170)

Hirschbein sees this phenomena implying that the players in the play are replaceable and suggests that the play determines the vision and drive that operates among members of the nuclear elite. Recently Bormann, Cragan and Shields (1996) show the dominant Cold War mind set as part of a rhetorical vision that sanctioned a certain consciousness and rhetoric. Taylor (1993a) also explains the symbolic structures dominating the experiences of organizational members that "create symbolic relations . . . as a condition of their existence" (p. 369). These discourses operate within nuclear culture, Taylor (1996) says, to "powerfully constrain" (p. 121) the rhetoric and actions of individuals within the group. However, it is possible to interpret this data to emphasize that a governing factor in nuclear strategic thinking is an alterable symbolic discourse. As Butler and his predecessors no longer wallowed in the symbolic muck of nuclear theology, they took different discursive positions which enabled new symbolic arrangements and meanings to govern their opinions and ideas. This transformation is promising on two levels. First, it suggests that participants in the management of nuclear resources from the institutional side are not immobile ideologues. Second, it indicates that discourse and symbolic action can play important roles in creating situations where material change is possible.

For that new symbolic reality to take hold from the seeds sewn in texts like the report by the Canberra Commission and the speeches of General Butler the fragments of that new reality must become pervasive to ensure that their chance arrangement by an overwhelming population will result in relationships that support nuclear abolition versus atomic escalation and encourage further nuclear dialogue. Looking at why these text did

not generate wider debate is an important step for a nuclear critic interested in facilitating a wider nuclear discussion.

CANBERRA CONCLUSIONS:

FAILURE OF CONSCIOUSNESS OR LAYER OF DEBATE?

Noting the intertextual repetition of these oppositional documents suggest several adversarial processes at work when rhetors reassemble "fragments" (McGee, 1990) from their intertextual economies. The failure of these texts to generate the sustained public debate they ssought may result from their choice to continue much of the vocabulary of previous nuclear abolitionists. The general public has heard appeals of "unthinkable" circumstances, cataclysmic threats and "practical steps" toward arms limitation before with little change to their lived experience and symbolic environments. Like Lifton and Falk (1982) explain the public has become sensitized to nuclear danger, the public has also become sensitized to the discourse of nuclear abolition. The failure of these texts to generate interest stems from their failure to achieve a revolutionary vocabulary and rationale that is immediately recognizable by a wider audience which must include the general public, media and decision-making members of the nuclear management organization. These discussions continue to "disappear into the government technocracy or private hands" (Goodnight, 1982, p. 225) instead of remaining public.

Since these texts necessarily explain their goals and agenda in the language developed in the Cold War, they also cannot avoid the discouraging effects of nukespeak (Schiappa, 1989). The irony and danger of this situation becomes rhetorically interesting when nukespeak produces an unintentional effect by those opposing nuclear technology

versus a conscious effort to domesticate and naturalize the atom (Schiappa). Powerful dignitaries who come to the atom from a position of authority and privilege are still limited by their vocabulary to make sense of the nuclear age.

But how could these prominent players come to their anti-nuclear opinions, if the language of nukespeak dominates their mentality and ability to make cogent arguments? To answer this question, one must remember that the statements and ideas behind these texts already existed within the discourse of the nuclear age. By pointing out that these anti-nuclear ideas have been apart of the intertextual economy of the nuclear age since the earliest moments of our atomic experience, this project suggests that no overwhelmingly new mentality needs to be created to sustain the progress toward disarmament. In their noble efforts to create a program of nuclear abolition, the Canberra Commission deserves congratulations but should not be considered a completely new endeavor. Instead, this project points to a failure of the Canberra Commission to mobilize local debate and coalitions as a result of their inability to localize the discussion. Yes, certain globally-minded individuals will applaud the appeal to absolute abolition, but the choice to universalize nuclear experiences repeats problems that the Department of Energy (1995) recognized in Closing the Circle.

Suffering from a great lack of participation in the debate of national nuclear policy and local action, new scholarship on risk communication strategies employed by the nuclear management organization suggested a need to move away from global strategies to recognize a plurality of values and voices. The Canberra Commission report results from a number of powerful epic-stanced individuals who approach the global

dilemma supposedly free of local concerns. Even the detachment of producing the report outside of their own national boundaries increased the generalization and internationalism of their report. Nuclear criticism has for more than a decade explained the debate and governance of the nuclear age extends competence to a variety of people and must not be limited to the politicians, scientists and militarists (Derrida, 1984; Shepheard, 1987). Despite this warning, the membership of the Canberra Commission reads like a who's who of the global nuclear elite; the generals statement against nuclear weapons further limited expertise and participation to former and current military commanders. These arguments gamble their success based almost totally on their ethos-grounded credibility. The general attitude of these texts repeat the situation of traditional nuclear-risk communication which positioned an expert who "observed the obvious" then lamented that the obvious is not equally persuasive to others. Had the political powers behind the Canberra Commission also included delegates with pedagogical and discursive expertise as well as popular recognition, perhaps the results would have been different.

Another disturbing reason may exist for the failure of these texts to generate public debate and sustained news coverage. Throughout the Cold War, news coverage framed global events in ways that strategically highlighted the tensions between the United States and Soviet Union (P. Norris, 1995). Following the Cold War the perception that nuclear weapons no longer provided an immediate global threat outpaced the arguments that danger still exists. Despite the continued habits of Cold Warriors as Butler (1996, 1997) saw and the situational urgency documented by the Canberra

Commission (1996c), nuclear abolition no longer made news (P. Norris, 1995). While the Cold War provided a familiar cast of good guys and bad guys for news makers and audiences to use to make sense, the post-Cold War environment provides no easy heuristic to understand the nuclear order. So when the Canberra Commission's texts reach the news media and the public, the implications of these texts on the immediate world do not communicate as clearly as news of the Cuban missile crisis did in the early 1960s. Lack of clarity discourages news agencies from dealing with nuclear-related stories because nuclear issues demand a length and complexity many media channels are not willing to allow and publics are resistant to consume.

Finally, the failure of these texts to generate new debate may grow from the inability of external audiences to distinguish between oppositional and hegemonic nuclear discourse. Historically the discourse of nuclear management worked as a technocratic discourse (Salvador, 1992) and maintained distance from other conversations and voices. Likewise oppositional discourse maintained a position outside the system of governance. Werstch (1987), however, notes that throughout the 1980s nuclear criticism became increasingly dialogic where "one voice may 'infiltrate' another, sometimes to the degree that the two voices can no longer be distinguished" (p. 132). The divisions between institutional and opposing rhetoric no longer provides informative categories for people to choose between. In the case of the Canberra Commission with its members coming from the highest levels for government from a variety of states, the discourse struggled to claim an oppositional identity and could be construed as managerial rhetoric of institutional agents, simply shifting legitimizing authority between

technologies of power. A shift from institutional/oppositional rhetoric along nuclear/anti-nuclear lines to elitist/populist rhetoric along similar nuclear/anti-nuclear lines will suggest why texts from the Canberra Commission could be viewed as elitist and exclusionary toward a wider public. Werstch singles out this kind of argumentation as "decontextualised" (p. 133) not because the arguments do not respond to a nuclear context but because the rationale grows from a system of rationalization which universalizes reasoning and values. In this type of rhetoric "events, intentions, and plans are formally represented in models that exist independently of the concrete particularities to which they may apply" (Wertsch, p. 133). Despite efforts to provide a contextualized legitimation of its arguments, the Canberra Commission could not overcome its elitist position, generalized identity and technologically-based logic to present a compelling populist vision for nuclear abolition. As a result, its arguments did not inspire further discussion because the people it wished to inspire were excluded from participating in their creation and did not see local impetus to act. These conditions create an ironic challenge and a sour victory for the those anti-nuclear pioneers of the past. Today, many representatives of the nuclear management organization recognize and accept the arguments for nuclear abolition, but now that discourse has succeeded to a degree on the elitist level, it fails on the popular level to generate support and discussion of nuclear reduction, management and abolition.

Despite the failure of these texts to generate the consciousness awakening and immediate results they wished, I will not dismiss their efforts nor their contributions to a continuing nuclear conversation. These texts did much to highlight the change of

material situations since the Cold War. These texts also extend an invitation for action which materialist critics must respect as these texts recognize *now* is *always* the best time for action.

Furthermore, the lack of inspiring short-term intercourse resulting from these texts should not sound their death knoll. My own experiences suggests these texts are alive in the intertextual economy of the nuclear conversation. I did not come to the Canberra Commission via direct exposure at the World Forum or the United Nations. Instead, a friend simply wondered aloud about the irony of a general's statement against nuclear weapons. Then out of a curiosity and a penchant for net-surfing and channel-flipping, I encountered fragment after fragment of the Canberra Commission's position repeated in news stories and websites. Finally, I reached the complete texts of the Canberra Commission at their websites (Canberra Commission, 1996a, 1996b, 1996c, 1996d, 1996e, 1996f, 1996g, 1996h, 1996i, 1996j). As I discuss this project and others like Taylor (1996) and Mechling and Mechling (1995) continue nuclear criticism, these texts are picked up and brought to new locations exposing others to these ideas and arguments. Though the choice to seek out the fuller expression of these and related texts will remain with individuals, critics facilitate nuclear conversation by picking up and talking about these ideas. The implications of these choices made by critics will be taken up in the concluding chapter of this project.

CHAPTER 6: NUCLEAR CONCLUSIONS AND CONTINUITIES

Over these many pages this project presented an argument on why nuclear issues need critical attention, a primer on nuclear history and a perspective for practicing intertextual nuclear criticism in a post-Cold War environment to encourage a more dialogic nuclear discussion. Then, this conversation turned to exploring two contemporary nuclear campaigns through an intertextual nuclear criticism. It first looked at a document from the U.S. Department of Energy (1995) which details its approach to dealing with the nuclear legacy. This analysis suggested this document participates in a larger intertextual economy of departmental and institutional rhetoric which has traditionally excluded the general public from the nuclear conversation and contributed to the crises facing nuclear management today. As an instance of a tradition of risk communication, this document moved toward dialogic communication but faces obstacles and limitations. Though Closing the Circle faced many obstacles in creating a new communication process, it took steps in the right direction to add more seats to the table of nuclear debate by recognizing the limits of its own expertise and the strengths of others. The second campaign visited by this project came from an international group of eminent people who oppose nuclear technology and nuclear weapons and created a comprehensive plan for achieving a nuclear-free world under the auspices of the Canberra Commission for the Elimination of Nuclear Weapons. This analysis showed the constitution of arguments produced by the Canberra Commission reflect its elite membership. Despite a wealth of evidence and compelling testimony of the potential horrors of nuclear weapons, the documents of the Canberra Commission suffer from their

identity as technocratic discourse which continue intertextual threads of the Cold War that alienate a wider group from discussing nuclear issues. This alienation occurs for a variety of reasons including the sensitization of a general public toward arguments of nuclear abolition, a discourse contaminated by the nukespeak and news framers who no longer recognize stories of nuclear abolition as news and will not deal with the complexity of nuclear issues. This analysis also pointed to places within the Canberra texts where choices occurred to continue rhetoric of technological salvation which repeat the threads of perfection, control and millennial apocalypticism disciplining the growth of our nuclear age. Together, these two campaigns show a reversal of traditional communication strategies where the departmental rhetoric is appealing to wider grassroots competence while oppositional rhetoric starts from an alienating position of authority and universalizes values. The point of this analysis does not try to defeat either set of arguments. Instead it submits its observation about each text back to those interested in participating in the nuclear discussion with the additional insight of how the intertextual arrangements of each document influenced its dialogic voice. This analysis fulfills its dialogic responsibilities by encouraging an awareness of multiple voices partaking in nuclear conversations and trying to bring a wider awareness of this plurality to an academic audience which has previously focused on one side of the discussion or the other.

Bringing critical attention to these two campaigns and more generally to our continued nuclear landscape serves several purposes. First, this project holds renewed optimism for dialogue in the public sphere. People need to read this project as part of

their nuclear-consciousness forming so that they may more fully participate in the nuclear conversation. The paradox of expanding communication technologies and a shrinking public sphere which Goodnight (1982) needs active repair to sustain a viable democratic dialogue about our nuclear directions. As we still live in a nuclear age, the history and continued management of nuclear resources and residue affect the dispersion of material and symbolic resources touching our lives. The veneer of safety provided by the end of the Cold War distracts critical attention from important nuclear issues which demand the participation of critics and others who can bring a diversity of values and perspectives to the conversation. Managing the conversation over nuclear issues may be as difficult as creating strategies to deal with the continued presence of nuclear weapons and technology but serves to sustain the conversation by seeking out key places of discussion and bringing those conversations to wider audiences with the additional information of how these pieces sit in larger discourses. Opening the conversation to the widest possible constituency also serves practical ends and democratic values. Alario (1994) notes that dialogue provided some success for new social movements like the environmental, peace, women's and anti-nuclear movements, but dialogue must be nurtured actively in an increasing fragmentary society. Nuclear critics actively pursue a more empowered public sphere by working to make "substantive constraints vanish" (Alario, p. 332) and increasing conversational awareness of previously unarticualted discursive and material influences. The limits to the success of this project are defined primarily by the extent to which individuals (critics, politicians, activists and citizens) are willing to read more about their nuclear environment and able to take a responsible participative role in the

discussion. No strategy approaches the nuclear problems from an exhausted totalized knowledge, but in the case of nuclear awareness more is better. This conclusion shares the optimism that Olson and Goodnight (1994) held for creating a more active and responsible public sphere. In this case more proceeds in two directions. First it penetrates down into a discourse. Second it spreads out into neighboring discourse.

Those with less of an impulse toward participating in the nuclear debate should also read this project because it synthesizes important interdisciplinary critical practices and finds a home within communication for a contemporary nuclear criticism. Stephen W. Littlejohn (1996) explains contribution to theory comes either through extension, intension or revolution. Extension changes theory by adding new information to existing ideas. Intension alters theory by refining existing theory. Theories change through revolution if new theories grow to replace older ones because they fail to explain phenomena based on new information and observations. I suggest theory may also change in fourth way -- through integration or synthesis. This project surveys the interdisciplinary fields of nuclear criticism and from those practices synthesized a perspective that allows critics to take a politically-empowered position in the post-Cold War environment. Though this perspective picks its tools from previously existing theories of communication and rhetoric, it uses these tools in a combination to uncover how critical assumptions shape and limit the current nuclear conversation. If theory should "organize and summarize" (Littlejohn, p. 31), then this project fulfills an important function of theory through its synthetic approach to the history of the nuclear age and the current conversation over nuclear weapons and technology.

This project faces many limitations. In choosing to focus on these current campaigns, my analysis regrettably neglects other parts of the nuclear conversation which deserve attention. The texts looked at by this project come to the nuclear table from places of privilege. Though Taylor (1996) says texts of the nuclear elite need attention to balance the practice of nuclear criticism, critics should not forget the personal local narratives which grow around real experiences of nuclear technology. Some examples of the texts neglected by this project include works like those of J. S. Wilson and Serber (1988) who record the experiences of women of Los Alamos during the war years or Cook and Kirk (1983) who document the efforts of women protesting nuclear weapons around Greenham Commons. Even in dealing with the political texts which this project focuses on, it faces limitations by choosing to illustrate the "intertextual interanimation" (M. Solomon, 1993) versus articulating the actual public consumption of these texts. A sustained project to detail how the public consumes nuclear age texts, imagery and ideas still remains a needed and important project for nuclear criticism. Weart (1988) and Taylor (1995) suggest the public consumption of nuclear ideology helps compel and discipline our nuclearism. This project neglects these two important fields of inquiry which would make nuclear criticism a viable project in the post-Cold War environment.

From these limitations, one may discern several heuristic directions for future nuclear critics. First, this project did not exhaust the analytical possibilities for the texts of the Department of Energy or the Canberra Commission. Both families of texts need further metaphorical, ideographic and iconographic attention. Closing the Circle (DOE, 1995) provides a wealth of pictures, graphs and side-bar stories that this project

neglected. These photos are strategically placed and chosen to reinforce the need for collective action and support for policies of nuclear management. Taken independently, these graphics tell a different story from the one presented by the text. Outside of these two texts, nuclear critics can use the nuclear primer provided within this project to seek out other spaces of nuclear conversation. One example of this local nuclear criticism comes from Ratliff and Salvador (1994) who looked at how local grassroots action committees influence nuclear policy. Taking this intertextual nuclear criticism to the campaign of these local groups can further enlighten the nuclear conversation and provide important inspiration to other groups seeking to express their nuclear concerns.

Tim O'Brien (1979) ends his novel The Nuclear Age by saying, "even then I will hold to a steadfast orthodoxy, confident to the end that E will somehow not quite equal mc^2, it's a cunning metaphor, that the terminal equation will somehow not quite balance" (p. 312). The danger of a textual simulacra (Baudrillard, 1983) stems from the lack of an anchor. At that point, critics and textual construction drift on a fabric unconcerned with the political distribution of risk and ignorant of the historical and intertextual threads which break the seamless self-producing knowledge of nuclearism. Tracing the continuities of our present conversation through a history of events and practices shows that each assumption and each step taken in the nuclear age feels the influence of earlier moments and affects future actions and arguments. Critics can facilitate this awareness by talking about nuclear issues and recognizing that these issues affect the shape of political, material and social relations.

This project noted that the nuclear age continues a variety of impulses from antiquity. Though these impulses of perfection, control and apocalypticism impel the search for technology and their accompanying dangers, these are the same impulses that inspire us to try to better understand the communicative aspect of the nuclear age before it is too late. Hope drives us to affect and influence the direction of policy and culture through opening conversation to more views, more values and more ideas. Though control and perfection may escape our reach these impulses can inspire benefits as much as they have inspired our downward spiral toward nuclearism.

Peter Partner (1987) reflected on the crusades of the middle ages by saying:

> The Crusades grew from that part of men's minds in which the boundaries between the real and the metaphorical, the signifier and signified, are shifting and uncertain. They are evidence of man's [sic] idealism, but also of his cruelty and folly: like other episodes in the history of religion they tell us that religious metaphors can be turned into political realities by means of bloodshed and terror. (p. xiv)

Our experience of nuclear knowledge also approaches problems with the zeal of crusaders and romanticism of alchemists trying to save the world for absolute ideals sanctioned by higher powers. Though these ideals often inspire the inhumanity which fills the pages of history, the milestones documenting our humanity are carved from these same stones. So the potential always exists for choices. These choices never occur independently from the discursive influences and weight of history, but always contain the potential for deflection from tragic trajectories as long people can hear the voices

potentially influencing their choices and the other voices expressing concern for where those decisions might lead.

As this nuclear project ends, it recognizes its fate as becoming part of an archive of fossilized talk about nuclear issues. Yet, a compound of fossils may cement into an odd aggregate to pave a nuclear future. At its best nuclear criticism's journey starts and ends with an idea of humanity provided by K. Burke (1966). The disease of nuclearism which infects this organism may be one of those diseases that knows no cure and is only managed through sustained treatment. The treatment for this "symbol-using, (symbol-making, symbol-misusing) animal" (K. Burke, p.16) comes not in global educational campaigns and universal values but small injections "of political patchwork here and there" (p. 20) so that "things might be improved somewhat if enough people began thinking along the lines of this definition" (p. 21) and creating a perpetual practice of nuclear criticism.

ENDNOTES

[1] K. Burke first published A Rhetoric of Motives in 1950. This thesis uses the 1969 University of California edition.

[2] This thesis deals more completely with the tension between textual and material reality in chapter three.

[3] Nuclearism, according to Lifton and Falk (1982), is the psychological and physical dependence on nuclear technologies. It can be expanded to include the ideology which disciplines society to the technologies and administering policies of the nuclear age.

[4] This mention of progress recalls the Strategic Arms Reduction Treaty which calls for the reduction of nuclear arsenals from more than 20,000 to 3,500 for the United States and Russia respectively. The arsenals of France, United Kingdom and China remain unregulated by treaty.

[5] The Canberra Commission on the Elimination of Nuclear Weapons is an international collection of eminent leaders chartered by the Australian government to study the present state of the nuclear security. It provided a comprehensive report detailing steps to a nuclear-free world.

[6] Intertextual analysis means a variety of things for different critics. For the purposes of this project intertextual criticism involves observing threads of textual practices within a wider intertextual system and material/structural context. Mechling and Mechling (1991) explain the necessity for this sort of approach by saying critics need to explore the intertextuality of this system because "[t]exts refer to each other, the ability

to understand some texts depends upon the experience with others, vocabularies from one text bleed into others, and so on" (p. 109). Other examples of this style of criticism come from M. Solomon (1993)and Taylor (1992).

[7] Despite his emphasis of discontinuity and opposition to monolithic history, Foucault (1972, 1977) produces grand-scale monolithic history which trace discursive formations to their origins. Ironically, Baudrillard (1987) points out this contradiction between the posture and product of Foucault which Baudrillard describes as a "mirror of the power it describes" (p. 10).

[8] Admittedly, space and time force choices. Though I opt for inclusion rather than exclusion, I try to include texts based on their influence determined by their use in other texts, the prestige of their authors or their uniqueness of argument.

[9] The College of Angels is the Judeo-Christian mythical source of heavenly knowledge which bestowed the ability to transform matter.

[10] History credits Rutherford, Soddy and Curie with making key pioneering contributions to nuclear science -- Rutherford for discovering the radioactive properties of thorium and the destructibility of the atom, Soddy for recognizing radioactivity a result of the natural transformation of matter and developing the concept of isotopes, and Curie for naming radioactivity and discovering the radioactive properties of radium.

[11] One can read more completely of the contribution made by Rutherford and Soddy and of the early pioneers in atomic science. See Andrade (1964), Bunge and Shea (1979), Howorth (1958), Kelman and Stone (1969), Romer (1964) and Trenn (1977).

[12] For a more complete discussion of alchemic language and symbology see Bolton, (1897), Dobbs (1975), Eliade (1971), and M. P. Hall (1949).

[13] Readers interested in the relationship between technology, society and warfare should see Borowski (1988), C. S. Gray (1990), Howard (1976), Preston and Wise (1979), and Seabury and Codevilla (1989).

[14] There are a number of valuable works documenting the growth and influence of air strategy. See Cooling (1990), Frisbee (1987), C. S. Gray (1990), Mason (1986), Paret (1986) and Sherry (1987).

[15] The archive reveals no document authorizing a United States Manhattan Project. The report which announced the feasibility of such a weapon was reviewed by Roosevelt and returned to James Bryant Conant with a scribbled note that it would be best if Conant kept the report "in his safe" (R. Rhodes, 1986, p. 387).

[16] The personalities involved in the Manhattan Project contain many additional stories (Groueff, 1967). Their biographies add an additional layer of text to our nuclear experience. Of the many names involved, Einstein's receives the most attention (Dank, 1983; Ireland, 1989; Sayen, 1985; Whitaker, 1996). Though key in generating interest for an atomic project, Szilard receives less attention (Grandy, 1996; Lanouette, 1992). Oppenheimer has a number of biographical treatments (Davis, 1986; Goodchild, 1980; Holloway, 1993; Kuglemas, 1953; Rouze, 1965; W. T. Wilson, 1970; York, 1989; see also Oppenheimer, 1980) while only one significant text deals with Groves (Lawren, 1988). Teller (Blumberg & Owens, 1976; Blumberg & Panos, 1990; Broad, 1992; O'Neill, 1994; York, 1989), Bohr (Petruccioli, 1993; Whitaker, 1996), Bethe (J.

Bernstein, 1980), Conant (Conant, 1970; Hershberg, 1993), and others also receive biographical attention.

[17] For a more complete story of the Manhattan Project and the development of the atomic bomb see Kaplan (1983), Kesaris (1977), Lens (1982), R. Rhodes (1986, 1995), Silman (1990), Stoff, Fanton and Williams (1991), Szasz (1992), and J. S. Wilson and Serber (1988).

[18] The concept behind nukespeak states that the language of nuclearism and nuclear decision making is transformative (Cohn, 1987, 1988) in that the words help condition the thoughts and behavior of nuclear citizens through a process of domestication and bureaucratization (Schiappa, 1989). At a very general level, nukespeak demands a special expertise and familiarity not available to the general public. This excluding nature of nukespeak helps limit participation in the public dialogue of atomic issues. For a more complete discussion of nukespeak see Aubrey (1982), Chilton (1985), and Hilgartner, Bell and O'Connor (1982).

[19] Mentioning the decision does not suggest that this thesis will attempt to resolve the debate. The debate has waged for 50 years. Some volumes which contribute to our knowledge of the decision include Feis (1966), Fogelman (1964), Kurzman (1986), Marx (1967) and Schoenberger (1969). The key revisions to this traditional view include Alperovitz (1965, 1995), B. J. Bernstein (1986, 1995), Sherwin (1977), Wainstock (1996), and Walker (1990, 1995). Others like Sodei (1995) and Takaki (1995) extend the need for revision further into practice. The reaction to these revisions has come in

several forms including books (Maddox, 1995; Newman, 1995b; Skates, 1994), academic articles (Newman, 1995a) and popular press (Blute, 1995; Holley, 1995; Newman, 1994).

[20] For more complete discussion of the nuclear industries strategies capitalizing on the energy crisis and its ability to construct public perception see Dionisipolous and Crable (1988) and Gamson and Modigliani (1989).

[21] Several attempts to evaluate and describe the rhetorical features of the Three Mile Island event exist. Dionisopoulos and Crable (1988) discuss the industries ability to maintain "definitional hegemony" in the situation by creating linkage between nuclear issues and emotional issues like national security. Farrell and Goodnight (1981) pointed out that rhetoric following the event failed "to fulfill ordinary epistemological and axiological expectations" (p. 273). Because the rhetoric prior to the accident, presented a picture of clean safe technology, that rhetoric allowed no room for ruptures like Three Mile Island. Therefore, rhetoric could not reconstruct support at the same level on the these grounds of providing clean safe energy. Support would require new or different strategies of rhetoric.

[22] The Greenham Commons encampment is significant for two reasons. First, it focused a European anti-nuclear community and received international attention. Second, it is unique in that it marks only the second primarily women's movements concerning the nuclear age; the first occurred in the early 1960s as reaction to contamination in milk in the United States. Although these two movements standout in emphasizing the role of women in the development of a counter-nuclear discourse, women have played an important part in atomic history in both the development and

opposition of nuclear technology (see Bjork, 1988, 1992; Caldicott, 1978/1986, 1994; Caws, 1984; Cohn, 1987; Dauber, 1988; Sofia, 1984).

[23] O'Leary (1988) provides a rhetorical analysis of The Hundredth Monkey (Keyes, 1981/1987). His analysis points to the weakness of narrative theory to evaluate appeals like Keyes and demands that rhetorical analysis strike a compromise between a realist perspective and a constructivist approach to rhetoric.

[24] Fisher (1984) notes the significance of this text in his demonstration of his narrative paradigm.

[25] A. King and Petress (1990) and Hogan and Dorsey (1991) provide a rhetorical account of the Freeze movement and record its failure.

[26] See Goldzwig and Cheney (1984) for a rhetorical analysis of the Catholic letter.

[27] Critics like J. F Solomon (1988) have taken Derrida to task for ignoring already real events of the nuclear age. This argument also ignores that historically principles and ideas fostered through rhetoric have fueled as many wars as material objectives of land and loot. To this effect, Duncan (1984) warns that the next Hitler will be armed with both symbolic and nuclear weapons. The nuclear critic would do well to concern both.

[28] Organizational categorization presents a host of problems for an attempt to synthesize a perspective from such a broad swath of the academic cloth as this one. Much of the pigeon-holing done in this literature review commits necessary violence to the work of many of these scholars through labeling them and grouping them in ways they might resist.

[29] The "Gulf War" label can be disputed but refers to the events of late 1990 and early 1991 in the Middle East which involved Iraq, Kuwait and a coalition of forces led by the United States.

[30] Certainly other candidates exist for enrollment in nuclear criticism's postmodern school. A list of applicants might include Baudrillard (1983, 1994, 1995), Chaloupka (1992), Eco (1994) and Schwenger (1990, 1992). As this review moves from tracing these three strands of nuclear criticism it will address the contribution of others like J. F. Solomon (1988, 1990) and Taylor (1990, 1992, 1993a, 1993b, 1995) who seem to be approaching a perspective suitable to a post-Cold War era.

[31] Scholars like Baudrillard (1975, 1983, 1995) and Eco (1986) have argued that our contemporary era has become characterized not by the material mode of production that dominates the age but by the economy of symbolic exchange producing a seamless simulacra where any reference to an external reality can only be considered part of the textual engine. Reality in this hyperreality is obsolete and in its place rests its fake which is "more real, and there is more of it" (Eco, 1983, p. 18).

[32] The obvious impetus at this point in my discussion is to advocate a particular level of disarmament and create a rhetorical method and analysis to serve that end. I resist this impulse because I feel the potential for nuclear power will always be present and therefore needs sustained process of dialogic critique and management versus an absolute rhetoric of escalation or abolition. At this point, the means become more interesting to this scholar than the end.

[33] The U. S. Department of Energy is cited as DOE.

[34] For comprehensive accounts of the effects of Chernobyl see Drottz-Sjoberg and Sjoberg (1990); Earle and Cvetko (1990); Eiser, et al., (1990); Medvedev (1991, 1993); Midden and Verplanken (1990); Peters, Albrecht, Hennen and Stegelman (1990); Renn (1990); Van Der Pligt and Midden (1990) and Wynne (1989).

[35] A dominant ideology grows in an intertextual economy when certain fragments become privileged and repeated. Ideology becomes reflected in fragments "to the extent that a 'fragment,' a particular and 'isolated' form, becomes the figure of a global relation" (De Certeau, 1984, p. 52). Different ideologies may dominate different populations at different times. This project concerns nuclearism and the Western concept of scientifically-empowered progress as a dominant ideology of our nuclear age.

[36] Gramsci (1971) discusses the nature of dominant ideology and hegemony throughout his work. See Zompetti (1997) for a discussion of current uses of Gramsci's work within the Communication discipline.

[37] The Canberra Commission operates a series of websites where complete texts of its reports and statements can be found. This website is run through the Australian government and can be accessed through any world-wide web browser at http://www.dfat.gov.au/dfat/cc/cchome.html.

[38] The complete report is available in six parts on separate websites operated by the Australian government under the Canberra Commission homepage. Released August 14, 1996, this analysis refers to each part of the report separately. The page numbers provided were added when the report was printed from the websites.

[39] This Internet resource does not provide page numbers.

[40] This Internet resource does not provide page numbers.

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APPENDIX A

IMPLICATIONS FOR PUBLIC AFFAIRS:

PUBLIC AFFAIRS AS NUCLEAR CRITICISM

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In 1995 Stanley P. Rhodes and Linda G. Brown, president and vice president respectively of Scientific Certification Systems wrote:

> As the United States considers its options in setting a course toward sustainable development, it is clear that we have reached a crossroads. No one sector of society -- industry, government, educational institutions or consumers -- shoulders the blame for our environmental problems; nor can any one sector be expected to solve these problems alone. Every action we take has environmental consequences. As a result, environmental literacy is integral to a coherent national environmental strategy. (1994/1995, p. 192)

How is environmental literacy to grow? A increasing function of business and government involves those professionals in public affairs who are responsible for the communication strategies of corporations and federal agencies. While pedagogical responsibilities have often been limited to schools, public affairs professionals play an important role in cultural learning, policy formation and advocacy, and community building. The public affairs professionals become an important member of the community because they act as rhetorical critics responsible for understanding the discursive impact of policy, the necessary communicative strategy to build healthy relationships, and for identifying the needs and concerns of multiple publics. This project's post-Cold War perspective for nuclear criticism has several implicit

implications for public affairs professionals who deal with risk communication, environmental impacts and, more specifically, nuclear policy. To understand these implications, this brief speculative discussion will touch on the intertextual nature of public affairs, the challenge facing public affairs professionals today, and the advantages contemporary nuclear criticism provides.

Public affairs happens in an intertextual environment. The environment that the public affairs professional operates is often hostile and always complex. The day-to-day activities of public affairs professionals involve approximating informational needs of multiple audiences on multiple issues. It can involve approximating these needs from bits of apparently unrelated information from a great variety of sources. The public affairs industry has developed many tools to approximate public opinion and created a great variety of models for public action and motivation. The social science impulses behind these projects to predict and control human action has deservedly given the public affairs profession a seedy reputation as industrial propagandist and simply a more subtle and sophisticated advertising and marketing resource. This perception severely handicaps them from creating trust when public affairs professionals are addressing socially, politically and economically salient issues. To complicate this process, public affairs organizations often cut responsibilities either along internal and external lines, across issues or across channels of communication between media and community relations or even print and electronic media. This compartmentalization of responsibilities further fragments and limits the focus of people doing their jobs. It also

suggests within the organization the way information can become fragmented outside the organization in the informational intertextual economy of the day.

McGee (1990) explains the process of informational fragmentation. An expert may have chosen "8,000 words to express" (McGee, p. 280) his ideas and opinions. These 8,000 words are already a summary of larger discourses and a lifetime library of information. "The debater, the public speaker, the journalist, the legislator, or the essayist [I will add the publicist and the public affairs professional] will represent that discourse in 250 words, reducing and condensing" (McGee, p. 280) the opinions of the expert. McGee's process only goes through two redactive levels. The fragments of discourse which public affairs professionals deal with goes through several more levels of "truncation" (McGee, p. 280) in the media and public conversations where 250-word representations are further reduced to 8-second sound bytes with which people are intended to form opinions. First, public affairs professionals must work in both directions from the original source text to anticipate how it will be chopped and consumed by secondary and tertiary users of that information. Second, public affairs professionals also start at the level of fragments in public discourse to describe the relationships between many fragments and the competition facing their stories. McGee summarizes the integrative role of public affairs professionals when he says:

> One can get a more developed picture of a whole "text" by considering three structural relationships, between an apparently finished discourse and its sources, between an apparently finished discourse and culture, and between an apparently finished discourse and its influence. (p. 280)

Contemporary public affairs is an intertextual project in that it is necessary to survey the field of discourse within an environment to understand how intentional fragments will compete with other threads of discourse before strategies of communication are developed to create topic literacy. Topic literacy, in this case, is a degree of functional familiarity that agents within a culture gain on specific subjects which they use to form opinions and choose actions. Topic literacy involves more than technical considerations. It includes cultural and economic considerations.

As society becomes more litigious, democratic nuclear and environment communication can facilitate decision-making processes as corporations and federal agencies open themselves, often unwillingly, to public scrutiny. Barbara Price (1994/1995, vice president of Health, Environment and Safety with Philips Petroleum Company, explains "Not many years ago, the definition of excellence was determined by the company . . . While management still sets goals for corporation, there is another group of 'managers' that is evaluating our environmental performance -- the public" (p. 156). The responsibility for understanding and educating the public often falls on public affairs professionals. Expanding the tools from strictly quantitative analytical models to more inclusive discursive approaches can help public affairs professional take a leading role in facilitating the conversations necessary to build topic literacy to improve the policy-making discussions around nuclear and risk-intensive issues. The nature of public affairs requires professionals to understand their communicative environment as an discontinuous intertextual economy.

The challenges facing public affairs today involves repairing the rift between publics, industry and the government. Despite the competing interests of these groups, the problems of the nuclear age transcends interests to effect future of all these groups though the nature of that effect may differ from person to person and group to group. Charles Piller (1991) explains historically industrial communication has neglected public concerns and generalized the values of the public. This practices has created a reaction of NIMBYism or the attitude of "Not In My Back Yard" where populations oppose technological action within their community without sufficient information. The attitude becomes so pervasive it can oppose all technological action even when it means stopping environmental clean up and sustaining environmental risk. NIMBYism, according to Piller, "is the manifest rage of victims, the desperation of the powerless" and "demonstrates a gradual withdrawal of consent at the grass-roots level" (p. xi).

The successful management of our continued nuclear age necessarily entails collective action. Though the mechanics of action may be carried out by technicians and corporate representatives, the action must reflect a "democratic model of risk communication" (K. E. Rowan, 1991, p. 303) through which decisions are made. Discursive formations which prevent any action can handicap our ability to deal with our legacy. The nuclear dilemma will not disappear if global nuclear activity simply stops. The nuclear resources involve dealing with risk and handling dangerous material for a long period of time. The long radioactive life of nuclear waste and resources require an active communication-based management strategy which can be sustained indefinitely.

Five-year plans and previous concepts of long-term strategy have become obsolete in answering the challenge of public nuclear policy.

The shape of that policy-making body is changing and public affairs professionals are at the pointed-end of the spear of change. NIMBYism's "chaotic backlash" (Piller, 1991, p. 204) reflects the public's desire to be a part of the decision-making process and "to end alienation" (Piller, p. 205). As nuclear criticism seeks to open the table of discussion to the widest possible participative base, public affairs teams are those field agents responsible for actually creating the opportunities for public exchange.

As topic literacy becomes important for people to participate in the discussion over nuclear and environmental issues, public affairs professionals must embrace their role as critics and educators both of corporate agents and the public citizenry. Often critical educators will accuse the public affairs industry of serving hegemonic forces and particular interests. Serving particular interests can and should not be avoided. Paul C. Stern (1991) of the National Research Council recognizes that conflicting interests are natural in public discussion and policy formation, but embracing these differences as part of the process versus trying to quell conflict from expressing itself handicaps the conversation. Stern admits, "[t]he study of risk issues is political in its effects. That is, scientific information can affect the distribution in the society of power and material resources" (p. 101). Since the conclusion of scientific data often involves interpretation, the exchange of information seldom provides clear answers without other groups sponsoring competing studies. The competition of scientific data, values and political agendas becomes the field upon which public affairs wages its effort of consensus

building and education. Admittedly, the public affairs professional in fashioning strategies of communication become part of the cycle of fragmentation McGee (1990) noticed. Specific strategies of communication highlights information and though it clarifies parts of the discourse and conversation, it forces us to "only see part of it" (Stern, p. 107). However, the public affairs professional rarely acts alone. In conflict situation, numerous public affairs staffers may represent different interests and may compete to give their stories and claims an advantage. On one level, the competing interests become fuel for skepticism and mistrust. At another level, these competing views offer the plurality of perspectives on the problem that people need to form educated opinions and inform policy decisions. Traditionally, the communication process has flowed from expert to audience as explained throughout chapter four of this study. Public affairs acts as nuclear critic when it works to create an understanding of communication as dialogic process which moves in multiple directions and considers a multiplicity of values that are based both in textual construction and material reality. Making this change suggests the advantages that a contemporary perspective on nuclear criticism can have for public affairs.

A perspective of nuclear criticism provides advantages for practicing public affairs today. One of the premises of good public affairs around risk issues states "don't tell your public what is good for them. Educate and let them decide for themselves Respect them and they will respect you" (Julin, 1993, p. 16). At the birth of modern nuclear criticism, Richard Klein (1984b) called for critical theory to make a greater contribution to the public discussion of nuclear issues by uncovering the hidden and often

systematically ignored literary and critical assumptions that affect the shape of our nuclear conversation. Public affairs professionals must fulfill this role of the nuclear critic before they can develop strategies to improve communication of socially and politically important issues. Intertextual nuclear criticism provides public affairs people the tools for understanding the play of discourse in our nuclear age.

Large corporate bodies reflect a latent awareness that the public affairs person must act as hybrid between public and corporate advocate and must be the facilitator and not the abuser of trust. In March 1995 the United States Air Force produced a white paper on public affairs entitled Revolutionary Air Force Public Affairs: Engineered for Breakthrough Performance. This paper explained:

> Public Affairs practitioners draw on many strengths. Foremost, the PA professional embodies ethical decision-making . . . Frequently, information is filtered so only partial truths are known. Public Affairs practitioners must cut through this filter, to provide commanders [policy makers] with information needed to make enlightened decisions. (p. 7)

A contemporary public affairs vision must approach discourse to integrate multiple views and fragments of materiality and textuality. Stern (1991) characterizes the type of communicative environment necessary for successful policy-making:

> A structural approach employs principles, such as checks and balances, openness, equal access to communication channels, and separation of powers, that are used in scientific communication and, more to the point, are central to democratic resolution of political disputes. (p. 113)

A public affairs professional empowered by a contemporary nuclear criticism understands the importance of creating a sustained practice of politically-empowered criticism (Williams, 1988). Public affairs professionals carrying out their responsibilities with the attitude of contemporary nuclear criticism look to how texts encourage or discourage public opinion and participation. Public affairs professionals who understand nuclear criticism can see the structural barriers and impact of policy choices on that discussion. Public affairs staffs aware of nuclear criticism are better equipped to comment on the health of public nuclear discourse. Participation comes in many forms but, on nuclear issues, must involve agenda-setting, educational campaigns and final decisions making. Florence Galliot de Galzain (1992) explains nuclear decisions demand a continuous process of public and political oversight and as such "involves the partial and permanent responsibility of each individual" (p. 51). She goes on to argue:

> In most cases indeed, the public does not fully realize the consequence of the opinion it gives. The information supplied during nuclear debates does not usually give clear enough picture of the positive and negative consequences of the decision on local life and on society as a whole, consequences which the public will have to assume subsequently. (Galliot de Galzain, p. 51)

Nuclear criticism's interests rest in articulating a "clearer picture" of how these decisions affect individuals and society. Ken Ruthven (1993) testifies to the strength of nuclear criticism to answer this challenge by saying:

> Nuclear criticism is on stronger grounds when it sets out to analyze those linguistic and rhetorical devices by means of which we have constructed discursively a nuclearism which in turn has profoundly affected our awareness of human possibilities in the nuclear age. (p. 97)

At this point, the difference between nuclear critic and public affairs professional disappears. Both work to encourage communication around nuclear and policy issues for the democratic management of policy decisions. Both seek to better understand the "intertextual interanimation" (M. Solomon, 1993, p. 62) of texts within discourse to shape attitudes and actions. Both work to ensure the discussion is as aware as possible of the undercurrents shaping its surface.

I recognize the failure of this speculative comment on the advantages of nuclear criticism's perspective for public affairs. It does not distinguished a detailed guide on how to conduct town meetings and other communicative activities to encourage more complete participation. It does not intend to offer these micro-level solutions and consciously arrests itself at a macro-level to suggest the attitude of a contemporary nuclear critic provides a useful perspective for those conducting policy-related public affairs in a post-Cold War environment. The attitude presented here serves more as a prerequisite than a program.

Critical scholars whose identities are heavily invested in opposing any institutional body will likely recoil at the co-optation of their critical project for the discourse of policy making. At that point, I feel compelled to break frame and ask what the intent of the critical project was? Was it to change the shape of public decision

making, or was it to generate a critical industry? It is possible that by working to ensure a contemporary public affairs informed by this perspective of nuclear criticism meets both goals. Though actual field practice of public affairs around nuclear and environmental-risk issues may lag, the academic discourse informing that practice seems to have been persuaded by these critical theories (Chess, Salomone, & Hance, 1995; Chess, Salomone, Hance, & Saville, 1995; Galliot de Galzain, 1992; Heath & Nathan, 1990-1991; Rimal, Fogg, & Flora, 1991; K. E. Rowan, 1991, 1995; Stern, 1991). In that sense, critical theory has changed and affected the shape and quality of public discussions. In another sense, it has created an industry for criticism within the public decision-making process because it demands the critic/public affairs professional continually analyze the discourse around policy issues to understand how assumptions, material actions and rhetorical practices exert influence on the on public discussion of policy decisions.

This discussion articulates some of the implications of a new perspective for nuclear criticism has on public affairs. As much as our current era is defined as the nuclear age, it also belongs to the information age. Whether the public affairs practitioners call themselves rhetorical critics or rhetorical critics recognize that their work inherently relates to the practice of public affairs, today's decision-making needs people who can work to articulate how texts relate to one another to affect how we understand complex problems. Intertextual nuclear criticism concerns this project. Nuclear critics act as public affairs advisors when a nuclear critic observes that the Department of Energy tried to encourage wider participation by producing Closing the

Circle (DOE, 1995) but faced challenges from historical practices of risk communication that damaged public-institutional relationships. Don S. Grant and Liam Downey (1995-1996) see the current system of legislation creating an environment where we "regulate through information" (p. 339). As specialists in understanding the shape and influence of information, public affairs staffs act as teams of critics. Because laws like Title III of the Superfund Amendments and Reauthorization Act specify a need for informational regulation without specifying "how proactive states must be in disseminating information" (Grant & Downey, p. 340) nor the means of that dissemination, policy makers and publics rely on public affairs staffs and their critics to seek the most effective styles and means of creating the communicative process to execute regulation through information.

For those critical skeptics who continue to doubt the intentions of institutional public affairs representatives and those scholars willingly acting in dual capacities of critic and practitioner, I ask what motivation do individuals in industries and federal agencies have for continuing policies and practices which breed distrust and alienate their potential markets and constituencies? An awareness seems to be taking hold that the continued management of our nuclear age must involve a collective action reflecting the interests of private citizens, corporate agents and political actors. Any action of public affairs professionals to betray public confidence only handicaps the policy-making process and creates greater obstacles to decision making later. Too often, public affairs people have felt public sting when placed in compromising positions between "truth" and corporate interests. Professional credibility is a premium in all public fields from

education to corporate and federal public affairs. Policies of total disclosure like the Department of Energy's openness initiative go a long way in creating the environment where critics and public affairs professionals can work with the public to improve a trust-based communication process so real action can be taken to address the problems of the nuclear age. "The relationship, or lack of relationship, that a company has with the public involved can dramatically affect the ability to communicate risk," states Jeffery Julin (1993). But, corporations do not have relationships. Instead these relationships grow between the people of the community, the staffs of their political representatives and the employees of corporations. These relations suffer when trust is exploited. Public affairs informed by contemporary nuclear criticism recognizes the value of trust and the effect of obfuscating discursive discourse practices, and it seeks to open communicative relationships.

APPENDIX B

RESOURCES FOR STARTING A NUCLEAR PROJECT

RESOURCES FOR STARTING A NUCLEAR PROJECT

The contemporary age has seen an explosion in the availability and forms of information. Often the value of a work can be told by the ability of others to use it as a reading list to direct them in further study of a particular subject. This resource guide intends to go beyond the thorough reference list provided at the end of this thesis to assist those would-be nuclear critics or those just curious about the workings of their nuclear age. It provides current addresses and website links to point people in possible directions for information concerning nuclear issues. This guide does not exhaust the resources available but includes those that I found particularly helpful and that other lists and resource guides might not point out. Though this list reflected accuracy when compiled, I ca not ensure all resources will remain available due to the dynamic nature of the Internet and nuclear resources.

This project focused on the Department of Energy and the Canberra Commission. The Department of Energy's Environmental Management Information Center provides a number of free documents on request by calling 1-800-736-3282. Texts available from the center are meant to appeal to the general public and range from the document analyzed in this project (DOE, 1995) to histories on the department and the Manhattan Project. Site specific histories are also available on most Department of Energy operated nuclear facilities. The information in these documents range in technical difficulty and specificity. The Department of Energy also operates a variety of websites as part of its openness initiative on topics from radiation testing to current environmental restoration.

The sites can be accessed from the Department of Energy's homepage at http://apollo.osti.gov/html/home.html.

The Canberra Commission documents referenced by this project have been archived by the Australian government and are available by writing the commission at:

Canberra Commission on the Elimination of Nuclear Weapons
c/o International Security Division
Department of Foreign Affairs and Trade
Canberra ACT 2600, Australia

Or, readers can access their website which contains full-text documents at http://www.dfat.gov.au/dfat/cc/cchome.html.

In the course of preparing this thesis, I used and encountered a variety of resources that extended beyond the scope of this project but may be useful for other people interested in nuclear issues. This list includes some of those resources categorized by the type of source which produced and maintains the material.

RESOURCES FROM THE UNITED STATES GOVERNMENT

The Department of Defense archives speeches by key leaders on a variety of topics through its DefenseLink websites. DefenseLink is the official U.S. Department of Defense world-wide web information service includes up-to-date Department of Defense news releases, contract awards, briefing transcripts and related information. A searchable database provides access to defense information sources, and the site is linked to all the armed services and defense-related agencies. The sites can be accessed at http://www.dtic.dla.mil/defenselink.

The U.S. Arms Control and Disarmament Agency operates websites with current international disarmament information at http://www.acda.gov. Full texts of all major Arms Control Treaties are also provided by the Arms Control and Disarmament Agency and are available at http://www.acda.gov/treatie2.htm.

The Environmental Health Center, a division of the National Safety Council, provides information on a range of safety issues including those regarding the nuclear industry. Information is available by writing:

Environmental Health Center

A Division of The National Safety Council

1019 19th St NW, Ste 401

Washington DC 20036

INTERNATIONAL RESOURCES

The Canadian Forces College Peace and Security world-wide web server provides a comprehensive listing of international defense, disarmament, military and historical resources catalogued in both French and English and information about the Canadian Forces College. Access this site at http://www.cfcss.dnd.ca.

The Conflict Studies Research Center, at the Royal Military Academy, Sandhurst, operates a gopher site with international nuclear-related resource information at (Gopher Site) gopher://gopher.nato.int/11/secdef/csnc.

The Disarmament Times webpages at http://www.igc.apc.org/disarm/dt.html are operated by the NGO Committee on Disarmament which can be reached by writing:

NGO Committee on Disarmament

777 United Nations Plaza #3B

New York NY 10017

The International Relations and Security Network is an initiative by the Center for Security Studies and Conflict Research in Zurich. This site contains a large list of on-line resources in the field of defense and security policy with literally hundreds of links to government and institutional sites worldwide. Links are categorized by region and by subject. Access this site at http://www.isn.ethz.ch.

The United Kingdom's Defense Evaluation and Research Agency homepage with a variety of security information can be reached at http://www.dra.hmg.org. The United Kingdom also has its Government Information System which contains information from and links to the main United Kingdom government departments. Access this site at http://www.open.gov.uk.

The United Nations has a comprehensive world-wide website with links to several other of its sub-organizations at http://www.undcp.org/unlinks.html.

PROFESSIONAL ORGANIZATION RESOURCES

The Federation of Atomic Scientists operates a series of websites on a variety of social issues including the effects of nuclear technology and radiation. Its websites include information on various projects such as arms sales monitoring, biological weapons, cyberstrategy, intelligence reform, military analysis, monitoring emerging diseases, nuclear weapons, secrecy and government and space policy. The huge Federation of Atomic Scientist repository of primary-source documents makes this a

particularly useful research resource. This site can be accessed at http://www.fas.org/index.html.

The International Physicians for the Prevention of Nuclear War has existed discontinuously since the early 1960s and campaigns for increased awareness of the effects of nuclear technology on health. It operates websites at http://www.healthnet.org/IPPNW/IPPNW.html.

UNIVERSITY-ALIGNED RESOURCES

The Center for Defense and International Security Studies is an inter-disciplinary research center based in the Department of Politics and International Relations at Lancaster University in the United Kingdom. The center exists to research, raise awareness and stimulate debate on a wide range of defense and security issues relevant to both the international community. It operates websites at http://www.cdiss.org/hometemp.htm.

The Center for International Security and Arms Control is operated by Stanford University. Information about the center, its research programs and publications can be accessed at http://www-leland.stanford.edu/group/cisac.

The Defense Arms Control Studies Program at the Massachusetts Institute of Technology operates a homepage with various information on weapons issues at http://cis-server.mit.edu/DACS/index.html.

The Global Security Program at Cambridge University also offers information on nuclear issues and can be reached at http://www.gsp.com/ac.uk.

The Harvard Sussex Program is an international collaborative program of research and communication to promote the global elimination of chemical and biological weapons and to strengthen the constraints against hostile uses of biomedical technologies. It can be reached at http://ccfas-www.harvard.edu/~hsp.

IANWeb is a collaborative project involving the University of Pittsburgh's Graduate School of Public and International Affairs and its International Management Development Institute. It is designed to enhance the institutional capacity of schools of international affairs in East and Central Europe. It contains several pages of useful links to institutions worldwide. Access this site at http://www.pittt.ed/~ian/index.html.

Todd's Atomic Homepage is the most comprehensive collection of Internet resources on technical aspects of nuclear science. Run under the auspices of the University of California at Berkeley, this site includes links to every academic atomic physics department, nuclear reference resources, nuclear reactor-specific sites, and detailed list of historically-inclined sites. This site can independently serve as a primer for critics interested in nuclear issues and can be accessed at http://neutrino.nuc.berkeley.edu/neutronics/todd/tah.html.

INDEPENDENT ORGANIZATION RESOURCES

Started in the 1970s, the Campaign for Nuclear Disarmament is still active and can be reached at http://www.mcb.net/cnd/welcome. It continues to provide publications and to organize activities committed to opposing nuclear technology.

The Center for Defense Information is a Washington DC-based think-tank which believes "that strong social, economic, political, and military components and a healthy

environment contribute equally to the nation's security." It operates websites at http://www.cdi.org.

The Electronics Headquarters for the Acquisition of War Knowledge is a comprehensive set of military Internet resources, including links to the United States Department of Defense and NATO sites, military graphics sites and veterans resources. Access this site at http://www.olcommerce.com/cadre/index.html.

For Mother Earth is an international anti-nuclear citizens network with groups in Belarus, Belgium, Germany, the Netherlands, Slovakia and the United States. More information is available at:

For Mother Earth International

att: Pol D'huyvetter & Krista van Velzen

Gewad 15

9000 Gent, Belgium

Readers can e-mail the organization at abolition@motherearth.knooppunt.be.

The George C. Marshall Institute holds forums and sponsors scholarship on socially-relevant topics including nuclear strategy. Its sites can be reached at http://www.marshall.org/index.html.

The Henry L. Stimson Center sponsors the Project on Elimination Weapons of Mass Destruction. The Stimson Center operates a particularly comprehensive set of resources, including the Chemical Weapons Convention Implementation Project and the site for the Coalition to Reduce Nuclear Dangers. More information is available at its website at http://www.stimson.org. The Stimson Center also operates The Internet Guide

to Elimination Research (TIGER) which aims to provide anyone doing research on eliminating weapons of mass destruction with both an introduction to key issues and a comprehensive listing of Internet documents and sites on eliminating weapons of mass destruction. It can be reached at http://www.stimson.org/pub/stimson/zeronuke/tiger/index.html.

High Frontier is a Washington DC-based organization working to promote active missile defenses and operates informative websites at http://www.erols.com/hifront/index.html.

Jane's Information Group which brings us Jane's Defense Weekly, Jane's Intelligence Review and a host of other publications operates websites at http://www.janes.com/janes.html.

MILNET or the Open Source Military Information Database is currently under major reconstruction but describes itself as a "comprehensive authorial database of open source information on the world's military and intelligence apparatus." It can be reached at http://www.onestep.com/milnet.

The Monterey Institute of International Studies works to provide critical academic insight into proliferation. Its sites include the pages for the Center for Non-Proliferation Studies with databases of nuclear and missile proliferation information and can be reached at http://cns.miis.edu.

For several decades the RAND corporation has provided research-based analysis for the improvement of national security policies. Its websites provide comprehensive information on RAND and its activities. They can be reached at http://www.rand.org.

The State of the World Forum holds periodic seminars for world leaders on critical issues ranging from human rights to nuclear policy. For more information on the State of the World Forum, readers can write:

The State of the World Forum

The Presidio

P.O. Box29434

San Francisco CA 94129

Or access its website at http://www.worldforum.org.

HELPFUL PERIODICALS

The following list provides a number of periodicals dedicated to nuclear issues which can help people stay current on nuclear policy discussions and environmental issues:

- Bulletin of Atomic Scientists -- Published monthly by the Education Foundation for Nuclear Science.
- Defense Cleanup -- Published weekly by Pasha Publications.
- Energy Daily -- Published daily by King Publishing Group.
- Inside Energy -- Published Weekly by McGraw-Hill.
- Nuclear Waste News -- Published weekly by Business Publishers.
- The Radioactive Exchange -- Published 23 times a year by Exchange Publications.
- Weapons Complex Monitor: Waste Management and Cleanup -- Published biweekly by Exchange Publications.