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**Technology and Morality:
An Interpretation of Strategic Defenses**

by
Richard Price

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of
Master of Arts in International Affairs

The Norman Paterson School of International Affairs
Carleton University
Ottawa, Ontario
April 1989

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ISBN 0-315-51163-X

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Graduate Studies and Research acceptance of this thesis,
submitted by Richard MacKay Price, in partial fulfilment of
the requirements for the degree of Master of Arts.

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Abstract

A moral approach to strategic defenses is undertaken first from within the discourse of the moral debate over nuclear deterrence. Strategic defenses are found to have few morally redeeming features according to the dictates of justifiable self-defense. Rather, the language of morality is used as a legitimizing device for the state-supported strategy of nuclear deterrence. Moreover, that discourse itself is found insufficient to interpret the full significance of the relationship between morality and technology in the context of strategic defenses.

A more fundamental exploration of this relationship, drawing upon the insights of the philosophy of technology, reveals the nihilistic character of a faith in the redeeming power of technology. Furthermore, the logic upon which the moral argument for technology rests is found to ultimately undermine itself, thereby depriving the technological argument for "progress" of any sound rationale.

Acknowledgements

To the extent that others beside myself are at all responsible for what lies herein, they deserve mention. The ability of Professor Fen Hampson to bring a much-needed clarity of thought and presentation to this study was indispensable. I owe the sincere gratitude of a student to a teacher to Professor Tom Darby, whose depth of insight into the nature of technology in the modern world has been reflected in my own personal evolution of thought as is presented in this thesis.

I am, of course, especially fortunate to have had the accompaniment and love of my wife Lisa, who has patiently and generously followed the travails of a professional student.

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"We need wisdom most when we believe in it least."

Hans Jonas, The Imperative of
Responsibility

Introduction

To enter into a moral debate in the modern era is to willingly invite skepticism. An attempt to engage confidently in moral thinking about nuclear deterrence may seem an especially irreverent enterprise. Nevertheless, the fact that interest in and scholarship on moral issues - and in particular, those regarding nuclear deterrence - continue to proliferate is in itself a phenomenon that tells us something. It is to be expected that in an age of value relativism, wherein traditional sources of authority regarding what is good and evil, and true and false have been eroded or called into question, a vigorous debate will ensue regarding the standards by which we are to judge ourselves and our actions. Those standards, as are often reflected in the language of morality, represent conceptions of what it is that is to be valued. So it is that our modern values - today's morality - are conspicuous and distinctively human creations; so too is that phenomenon which has arisen to become valued itself: technology. If it is true that our technologies mirror conceptions of what is valued, it is equally true that technology creates new moral contexts and pushes man's moral sensibilities, leading to a questioning of the value

of our values.

Nuclear weapons are perhaps the most vivid manifestation of man's technological prowess become hubris. This study takes as its subject the technological offspring of nuclear deterrence: strategic defenses. The objective of this study is to explore the meaning of the conceivable moral positions that can be forwarded pro and con regarding strategic defenses, emphasizing the illumination and understanding of the foundations which underlie such arguments. The use of moral thought as a tool to search for the meaning of actions is particularly useful insofar as moral language more explicitly than other ways of thinking reveals its own values.

In comparison to the literature on the morality of nuclear deterrence, that on the ethical status of strategic defenses has been surprisingly muted. I say surprising because the initial and perhaps most lasting appeal of strategic defenses has been an overtly moral one. We readily recall President Reagan's plea of 1983, when he asked, "wouldn't it be better to save lives than avenge them?"¹ The compelling authority of an appeal to moral arguments has proven irresistible to those who have sought to defend strategic defenses, yet their arguments have gone little beyond a vague assumption that it is more

¹ As quoted from Steven Miller and Stephen Van Evera (eds.), The Star Wars Controversy, (Princeton: Princeton University Press, 1986), p.247.

moral to defend than to threaten retaliation. Given this paucity of substantive examination, part of the burden of this study is to anticipate unarticulated arguments on the ethical dimensions of strategic defenses.

The most obvious approach to the ethical questions raised by strategic defenses revolves around the moral issues of warfare and defense, or even more general, of politics itself. There is, however, another dimension less obvious and more speculative in nature, yet just as necessary to interpret the relationship between our moral contexts and technology: the ethics of technology. This study encompasses both sides of the moral issues in an effort to achieve a full interpretation of strategic defenses through the language of morality.

The goal here is not to stake this author's irrefutable claim to end the titanic struggle between moral thinkers and their critics by advancing my own definitive moral argument. Nevertheless, in the course of utilizing the moral method of analysis, entailing as it does a critique and justification of the ethical approach, my own judgments will naturally not remain suspended. What I do hope to demonstrate through this analysis is that a moral approach to the question of strategic defenses reveals three different ways in which strategic defenses offer an alternative to the morally uncomfortable situation of nuclear deterrence.

The first and most recognizable moral appeal of strategic defenses is that they represent a return to the moral past for which the just war tradition has provided a more or less adequate guide. That is, a recovery of the familiar world in which justifiable offense and defense pertain. Such a project stands in opposition to those who would argue that nuclear weapons are utterly 'sui generis', and that our moral past no longer serves as an adequate guideline for our entirely novel modern condition.

Secondly, strategic defenses can be seen as an attempt to re-legitimize the state in face of the apparent contradiction between Reason of State and nuclear weapons as a rational means of the state to pursue its objectives. The requirements of state interest may not always coincide with what is regarded as moral conduct. The creation of nuclear weapons, and the political doctrine of realism from which they were nurtured and are maintained as state policy, may well undercut the very moral values that the state is supposed to embody. If the inherent amorality of a stark doctrine of realism has been exposed as never before with nuclear weapons, strategic defenses are the means sought to close the gap between politics and morality.

Thirdly, strategic defenses can be interpreted as an effort to recover the beneficent nature of technology

after the regrettable creation of an ultimate means of destruction. Even more than that, the need to reassert the authority of technology after its fall from grace compels the creation of a rationale whereby it becomes necessary again, perhaps in the name of technological progress or efficiency. Here one can observe technology as a phenomenon concerned with means to the extent that it becomes an end in itself, perhaps just as adherence to absolute moral standards suggests itself as an end. Such an approach can be termed "moral" insofar as technology assumes the role of an unquestioned authority by which men act, and thus becomes a standard in itself.

This study will unfold in three major parts. The first chapter is designed to frame the ethical mode of analysis to be used throughout. This will be done through a critique of relevant aspects of the moral debate on nuclear deterrence. Following that, the ethical arguments of warfare and defense will be formulated and assessed. Finally, the technological interpretation of strategic defenses will be examined, drawing upon the insights of the philosophy of technology.

Chapter I

Shall we abandon our moral traditions because nuclear weapons now make it possible for us to bring the world to an end?

Terry Nardin, "Nuclear War and the Argument From Extremity"

Introduction - A Moral Framework of Analysis

A sound exploration of the moral significance of strategic defenses cannot begin without a sufficient appreciation of the context from which it has arisen; namely, the moral debate regarding nuclear deterrence. However, rather than undertake a detailed excursus of that debate in all its dimensions,² I will discuss four aspects of it that bear on the present study. As an introduction, I will briefly outline the relevance of a moral approach to questions of deterrence and defense. Following that, the remainder of the chapter will be devoted to introducing the way the term "moral" will be used in this study. This will be done by raising three conceptual problems with the method of moral analysis that

² As has been done elsewhere in a much more thorough fashion than can be attempted here. See especially John Finnis; Joseph Boyle; and Germain Grisez, Nuclear Deterrence, Morality and Realism (New York: Oxford University Press, 1987).

characterizes much of the deterrence ethics literature.

First in this regard is the usage of the "deontological" approach to moral thinking versus the "consequentialist." It will be contended that much of what passes for "moral" analysis in the consequentialist form differs little if at all from strategic analysis, and does not constitute a "moral" approach in a meaningful sense. Secondly, the problems of applying doctrines of individual morality to national (collective) policies will be examined in order that we are clear as to the level of analysis to be used in this study. Finally, I assert that much of deterrence ethics literature too readily presumes that just war doctrines are indubitably "moral." In using just war theory as a starting point for moral analysis, the most significant effect of technology on our moral contexts is obscured: namely, that our moral standards are dictated by the given state of technology.

I What is Morality?

In general terms, what I take to be the proper concern of moral analysis is that realm of human action whereby the agent, in discriminating for the purposes of acting between right and wrong or good and bad, must come to terms with what is to be regarded as ultimately good or right. If we reject traditional morality, it is still intelligible to speak of morality in the sense that

persons still act and are able to judge those acts. By morality is meant whatever standards by which one is able to move beyond the paralysis of inaction.

An event or possibility of action may require considerations of rules of conduct, although not all situations necessarily involve such deliberations. For example, opening a jar of jelly would not properly be termed a moral decision; such actions we would term amoral, that is, devoid of ethical significance. Such a qualification, basic as it is, is important insofar as a history of political thinkers known generically as realists have described the realm of political action as amoral. According to this position, political decisions require prudent assessments of the requirements of the political community, and the political realm of action is perceived as distinct from the moral.

In defense of the relevance of moral thought, I would argue that moral deliberations certainly do have a place in political, economic or strategic analysis. Those who would assert that political decisions in the international theatre are amoral argue that just as moral standards guide moral decisions, and economic criteria guide economic analysis, so does political prudence alone guide the politician in his deliberations. Such a neat compartmentalization is mistakenly simplistic, however, for if a political act is judged prudent, we must still

inquire as to its moral implications. Observing that "morality has no discrete sphere of its own,"¹ Marshall Cohen has argued that the realist simply assumes the preeminence of political standards of action over moral ones. The realist rejects morality because it fails to provide an infallible guide to action that serves his political needs as well as moral concerns. However, such expectations of morality to provide a single or comprehensive 'best' ground are illusory and unreasonable.⁴ If we are to do justice to moral analysis, we should acknowledge with Terry Nardin that

A morality is not a comprehensive scheme of practical guidance or judgment that tells us what to do or what is best, all things considered, but rather one kind of practice among others, a practice within which we determine what is morally right.

In approaching the question of ethics in politics, one must acknowledge the limits of moral analysis - it may not provide all the information necessary to make a decision. At the same time, however, one must affirm rather than deny the appropriateness of asking moral

³ Marshall Cohen, "Moral Skepticism and International Relations," in Kenneth Kipnis and Diana T. Meyers, (eds.) Political Realism and International Morality: Ethics in the Nuclear Age. Boulder: Westview Press, 1987, p.24.

⁴ Terry Nardin, "Nuclear War and the Argument from Extremity," in Avner Cohen and Steven Lee, (eds.) Nuclear Weapons and the Future of Humanity. Rowman and Allanheld, 1986, p.301.

⁵ Ibid.

questions across the full range of human action which carries with it ethical significance. For some issues, morality may in fact prove definitive. But if it does not, it is still appropriate to ask what it tells us.

If one therefore grants a degree of relevance for moral thought in matters of international politics such as are involved in strategic defenses, the usefulness of moral thinking in discerning the desirability of a particular policy or act must still be established. One way to approach this question is to delineate what it is that is distinctive about moral analysis. To introduce the way in which the term "moral" is to be understood throughout this analysis, I will engage in a critique of some ambiguities that have arisen in deterrence ethics literature.

II Deontology and Consequentialism

The first issue that will be addressed concerns what are generally regarded as the two basic modes of ethical analysis, deontological and consequentialist. Deontological thinking is characterized by moral rules or prohibitions which seek to guide the conduct of an agent not by considerations of consequences, but rather by the meaning of an act. While not in all cases telling us what to do in the affirmative, categorical restraints such as the biblical "thou shalt not kill" or the Kantian "never

treat men as mere means, but as ends unto themselves" tell us what we are never to do, independent of the consequences of that act. Thus, if it is wrong to threaten an innocent life, the policy of nuclear deterrence would be judged as morally wrong even if it has the result of deterring war, for there are some things which we are simply not to do.

Consequentialism, on the other hand, seeks to ground human action in utilitarian calculations of the expected outcome: the moral desirability of an act is judged according to its net effect upon bringing about the 'greater good', or in attaining Jeremy Bentham's 'greatest happiness for the greatest number of people,' to cite two common measures. In seeking the best overall state of affairs in terms of human well-being, the consequentialist admits that common morality (of the deontological sort) may have to be set aside in extreme situations as a "lesser evil" to allowing immoral consequences.

It is the contention here that much of what passes for consequentialist moral arguments concerning the ethical status of nuclear deterrence (as distinct from the use of nuclear weapons) seems curiously to differ very little from what a typical strategic or political analysis would yield. For example, it is concluded that while nuclear deterrence may not be the best of all possible situations in which we could find ourselves, adoption of

that policy is deemed "conditionally" morally acceptable⁶, is defended based on a "strictly conditional moral acceptance"⁷, or is morally justified due to the "standards of necessity" under conditions of "supreme emergency."⁸

On the other hand, there are those who have denied the moral tenability of nuclear deterrence using the same consequentialist method, asking whether the end justifies the means. These authors differ in their conclusions from those above because the risks involved in deterrence are judged to outweigh its paradoxical end.⁹ Thus, the continuation of nuclear deterrence as national policy is not judged to constitute a justifiable "lesser evil" that is required to avoid nuclear war. Rather, the risks involved in nuclear deterrence, i.e., the potential for catastrophe, are judged to be great enough that the

⁶ Joseph Nye, Nuclear Ethics. New York: Free Press, 1986, pp. xi, 98.

⁷ From The Challenge of Peace: God's Promise and Our Response, National Conference of Catholic Bishops. Quoted in Philip Murnion, (ed.) Catholics and Nuclear War, (New York: Crossroad, 1983): p.253.

⁸ Michael Walzer, Just and Unjust Wars. New York: Basic Books, 1977, p.274, 283. Others have defended the deterrent in other ways using the consequentialist approach. See for example Gregory Kavka, "Some Paradoxes of Deterrence," Journal of Philosophy 75 (1978): p.285-302.

⁹ See, for example, Robert Goodin, "Nuclear Disarmament as a Moral Certainty," Ethics 95 (April, 1985): p.641-658; and Douglas Lackey, "Missiles and Morals: A Utilitarian Look at Nuclear Deterrence," Philosophy and Public Affairs, 11 (1982): p.189-231.

intended end does not justify the means - due to the possibility of a disastrous outcome. Whether in favour of or against nuclear deterrence, many of these types of arguments seem to differ little in essence from those of a strategic nature, dealing as they all do with problems of risks and probabilities, means and ends.

The reason that such analyses tend to yield similar conclusions to those of a strategic bent is that both utilize a means-ends type of argument which assesses the moral/strategic tenability of deterrence according to what is most prudent given the desired end. In most cases, that end is the prevention of nuclear war. Even that initial presumption has proven contentious, however, as it has been interpreted differently as comprising the best interests of all persons (humanity) or as the "national interest." Whereas the implications of the latter notion shall be discussed in the next section, at this point it must be determined if the consequentialist approach offers something essentially different from the political/strategic approach.

In this regard I will attempt to defend the view of Terry Nardin that what moral thought offers as a distinctive point of view is the priority of categorical restraints over instrumental ones. Consequentialist forms of reasoning weigh probable costs and benefits and, while possibly accepting the authoritative force of categorical

restraints in most cases, ultimately deny their applicability in extreme situations due to the adverse consequences of adhering to moral law. In sum, the viability of moral restraints are judged according to their contribution to a particular end.

What the consequentialist correctly points out is that adherence to moral restraints may be rendered absurd due to the self-defeating consequences that such prohibitions may render in certain contexts. The difficulties involved in strict adherence to categorical prohibitions are not hard to imagine. For example, one would not want to adhere to the rule never to tell a lie if it meant telling a murderer where his intended victim was. Even more extreme, is one to refrain from killing a madman even if that act would prevent him from killing thousands of others? I would agree, therefore, with statements such as that by Joseph Nye which warn that strict adherence to moral rules may "become the ultimate egoism of fastidious self-righteousness in which the purity of the self is more important than the lives of countless others."¹⁵ As a result of such dangers, consequentialists claim that one cannot ignore the consequences of an action in assessing its overall moral status: to do so would be to plunge into an abyss of absurdity.

¹⁵ Nye, op.cit., p.18.

In order to protect their positions against the obvious possibility of abuse, most consequentialists offer the disclaimer that one must guard against using such reasoning to justify diabolical acts by their intended and morally good ends. Indeed, Nye requires of the consequentialist argument that it consider the effect of abrogating a moral rule upon the moral rule itself,¹¹ a similar appeal to that of Walzer, who contends that categorical rules "are still standing at the very moment they are overridden."¹²

However eminently reasonable and well-intentioned such analyses may be, they seem to lose sight of what moral analysis offers in their enthusiasm to use morality as a comprehensive way by which to either justify or deny the moral tenability of nuclear deterrence. On the basis of consequentialist forms of reasoning, the best that can be said of deterrence is that it is the right or wrong policy according to prudential calculations. However, it is certainly mistaken to term such acts "morally right" or "morally wrong", for what in fact has occurred is the supersedence of the moral standards (although they are considered until the bitter end) by considerations of prudence. In the effort of the consequentialist moralist to use his or her most cherished method of thinking as a

¹¹ Nye, op.cit., p.23.

¹² Walzer, op.cit, p.231.

comprehensive scheme for decision, the limitations of morality are overlooked. Thus, although moral restraints are subsumed to considerations of what is most expedient, prudent, effective, attractive, or efficient, the result is somehow termed "moral". Such erroneous attempts to reinterpret morality as an "instrumental practice" obfuscates the distinction between "right" and "good", for as Nardin argues

An act cannot be right if it violates the authoritative constraints of a moral practice, notwithstanding the fact that it may have good consequences, for while the consequences make the act "good," only conformity to those constraints - to what used to be called "the moral law" - can make it "right."

Thus, it is fudging the issue when the Catholic Bishops declare that nuclear deterrence is "conditionally morally acceptable", for what they are saying is that deterrence is not acceptable according to the reasonable dictates of morality, but that it is acceptable in practical political terms. That is, prudentially speaking it is "good", but it is not "right".

Moral thought may not provide the definitive grounds for acting in every and all situations. In a perfect world, every act would be at once morally right, politically prudent, economically sound, technologically efficient, and so on. If one judges that one cannot act according to the dictates of morality in a particular

¹³ Nardin, op.cit., p.299.

context, however, then it must simply be admitted that there are other good reasons why the moral practice should not be resolutely followed. What is of paramount importance in such situations is the significance of rejecting certain standards of good, especially in light of the effect of technology in changing the standards or values that are held, or in fact compelling that its own standards be embraced.

III Ultimate Ends: Better Deterred than Dead or Red?

One obvious difference that does occur between strategic and consequentialist analyses is the kind of language used. Whereas the strategists speak of "collateral damage," "surgical strikes," and "counter-value," the moralist is less given to such "sanitized abstractions."¹⁴ The philosophers' parlance thus includes "monstrous wrongs", "hostage-holding," "intentions to do evil," "threats to murder innocents," and "butchery of untold magnitude."

What the disparate language points to is the supposition of different categories of ends that it is deemed proper to pursue. Thus, rather than the "national interest", we have "future generations;" instead of the "state", we have "humanity;" and instead of "strategic

¹⁴ Carol Cohn, "Nuclear Language," in The Bulletin of the Atomic Scientists, (June, 1987): p.19.

stability," we have "Western values." In all cases, the ends posited are held to be ultimate values. The question to ask is whether it is intelligible to speak of some as "moral" ends, and others not. (It is to be confessed that decisions of such an ultimate nature are not often required; yet, the policies chosen in matters of such profundity as nuclear deterrence in the end reflect the priority of some ends over others.)

A difficulty with comparing much of the consequentialist literature regarding nuclear deterrence on a level field is that different ends are used as the moral referent, and it is not at all obvious which are "more moral" than others, or which is to be the highest obligation. It has become somewhat of a platitude to assert that the overarching moral imperative of our time is the prevention of nuclear war, and that we only differ in the best means to achieve this noble end. It is clear, however, that if this was indeed the irrefutable imperative of the time, there would be far less difficulty contemplating nuclear disarmament than is in fact the case. The reason, of course, is that other imperatives are reflected in national policies; namely, the protection of the state and the values that it is to provide for its people.

Some of the ends that have been proclaimed in the Western ethical literature include the following: the

defeat of the Soviets; defense against Soviet domination (national survival, defense of freedom and/or Western values); avoidance/prevention of nuclear war; and ensuring the existence of humanity and/or future generations. To state in brief what is necessarily complex, the choice of available policies requires answers to the questions such as the following: Are the survival and freedom of the state to be ensured at the risk of nuclear war, or are the survival and freedom of the state to be risked to avoid the risk of nuclear war? It is clear that for such a stark question to arise, an extreme situation of impending peril must exist. Among other conditions that must exist, those who would justify nuclear deterrence must assume that the protection of the state through deterrence is necessary and sufficient for the protection of those individual ultimate values which give the state its rationale for existence. To reformulate the above question in more moral terms, one must ask whether the state is the condition for the pursuit of our moral values, or whether the state in fact detracts from, threatens, or otherwise undermines those very values through its choice of means.

A further problem in attempting to identify what would reasonably qualify as a "moral end" is the dependence of a moral judgment on he who defines it. If it is moral for the United States to defend itself against

Soviet domination, is it plausible that the Soviets are equally morally right in pursuing their highest values? Is it coherent for one side to proclaim moral rightness over the other? If we accept as the consequentialist does the legitimacy of different ends, we are left with the problem of defining just whose moral good we are speaking of. If we define morality in such a way, it would seem difficult to affirm one's own moral rightness while not admitting that the other side logically has an equal claim.

It is in this regard that the deontological approach is far more helpful in understanding what can be claimed as "moral." Morality as defined in this study presupposes a plurality of ends being pursued, and seeks to provide a ground for decisions based on the quality of an act rather than its consequences for a particular end. Furthermore, it would seem that morality properly construed is concerned with all persons, not just a particular nationality. The distinguishing characteristics of deontology - impartiality and universality - transcend the righteous and chauvinistic moralizing inherent in sentiments such as "my state, right or wrong," a problem that most consequentialists must confront.

The usage of moral thought forwarded here makes easier the task of identifying what ultimate obligations are to be considered moral. Ensuring the existence of

future generations¹⁵ and of present humanity seem clear-cut moral imperatives, as does the avoidance of nuclear war. Much more troublesome and ambiguous is the claim that ensuring the survival of the state is the preeminent moral imperative. It is with this tension in mind that the moral status of strategic defenses will be approached, and the implications of different positions will be explored.

IV Individuals and Collectives

Such questions bear on the second conceptual problem that confronts ethical analyses of questions of deterrence and defense: the age-old and vexing riddle of politics that revolves around the tension between the private and the public, the individual versus the universal.

While an attempt is not made here to resolve that problem, it is necessary to be clear about the frame of reference used in this study. Nuclear deterrence and the question of strategic defenses both are complex acts requiring decisions at many levels. It has been argued that a shortcoming of ethical approaches to deterrence is that they focus on the individual conscience, yet nuclear strategies are national strategies. In the words of

¹⁵ For a detailed argument defending this position, see Jefferson McMahan, "Nuclear Deterrence and Future Generations," in Avner Cohen and Steven Lee, *op.cit.*, p.319-339.

Philip Chase Bobbitt,

Ethical systems that treat all nations alike and permit no political preferences ignore the very objective of strategy - namely, to preserve, protect, and often to promote certain cultural values rather than individual preferences.

If the previous argument regarding the difficulties of moral parochialism is accepted, the above quote nevertheless reveals a further problem at the level of analysis. Following the logic of the above statement, Bobbitt states that "individuals do not have nuclear strategies; nations do."¹ However, if that statement is accurate, it would seem equally correct to state that it is the individuals within a state who act. On this basis, it would be erroneous to judge the moral status of such "acts" abstracted from the individual who acts; to accept otherwise is to dissolve the moral culpability of the individual through the abstraction of the collective. Moreover, collective policies have effects on the individual, and thus are the proper concern of moral analysis.

What such criticisms point to is a weakness in much of deterrence ethics literature, for one starts to wonder (as Bobbitt above) as to precisely whom the debate is directed. In an effort to accommodate such criticisms,

¹ Philip Chase Bobbitt, "The Ethics of Nuclear Deterrence," in Kenneth Kipnis and Diana T. Meyers, op.cit., p.109.

¹ Ibid, p.113.

then, one must evaluate the policy in question from the perspective of the individual who participates in or is effected by that policy. The perspective taken in this study will be that of an agent who is in a peculiar situation regarding deterrence and strategic defenses: the scientist. In judging the desirability of strategic defenses, the scientist may have a different account of ultimate obligations, and it is these obligations which will be examined here. It is from the scientists' perspective that the technological arguments to be examined in this study take on particular relevance.

V The Just War Tradition

A final consideration of deterrence ethics is necessary to frame the analysis, that being the just war tradition. Just war doctrine has been the source of much of the moral discomfort regarding nuclear deterrence, and strategic defenses have appeared as an effort to remedy that problem. If one is to utilize just war doctrine, it is imperative to explore the assumptions, foundations and implications behind it, given its near ubiquitous use as a source of moral authority for those of the deontological bent.

Of absolute importance for this study is the under-appreciated nature of just war doctrine as a moral tradition, rather than a cogent moral theory or set of

theories. While the recent attention to this tradition has sought to revive it as a distinctly moral one, it is best understood as a "developing body of theory and practice over history," composed of an intermingling of philosophical and theological theories, juridical theory and practice, chivalric codes, and norms of the practice of warfare.¹⁶ In the face of moral skepticism, those who would defend the just war tradition have acknowledged that just war theories are subject to philosophical criticism, yet argue that the doctrines are to be evaluated according to their efficacy in practical terms. That is, to the extent that just war doctrines in fact limit the destructiveness and inhumanity of warfare, it must be acknowledged by the combatants, and therefore is proof of the existence of a universally accepted norm of practical morality. To quote from a prominent proponent of this viewpoint, just war thought

is not a moral absolute, demarcating the limits of that which is ideally, inflexibly and eternally just, but a time bound and culture bound formulation of a moral floor upon human conduct in war. It must be judged in terms of whether it was the best the civilization that produced it could do in understanding its own ideals, in comprehending the realities of its own political and military structures.

¹⁶ James Turner Johnston, Just War Tradition and the Restraint of War, Princeton: Princeton University Press, 1981: p. 122.

¹⁷ James Turner Johnston, op.cit., p.150. Michael Walzer uses a similar approach to morality as general principles we commonly acknowledge, going so far as to state that "I am by no means sure what the foundations [of

While such approaches are laudable insofar as they seek to reaffirm the relevance of a tradition of restraint in war, one must guard against the tendency to slip easily into the language of morality. Above all, the just war tradition represents attempts to reconcile the political practice of warfare with common morality, fully cognizant of the tension between political prudence and the potential irrelevance of moral thought. Our first clue that suggests just war doctrine may be more a legitimizing tool than a cogent moral theory is the recognition that it first arose in the West with Constantine, when the opposition between the Church and the world ceased to be.²⁰ As such, the exercise of armed power had to be reconciled with Christian morality. What we must ask, therefore, is whether the just war tradition serves the same purpose for the Church of modernity - the state.

Such "practical morality" projects as those of Walzer and Johnston can be placed firmly within the historical development of just war doctrine as an effort to restore the relevance of moral thought in ever changing moral contexts brought about by political and technological changes. Some, namely the pacifists, would reject such efforts as crude distortions of morality. Others would have us accept the "moral reality" of larger-

morality] are." (Walzer, *op.cit.*, p.xv).

²⁰ See Johnston, *op.cit.*, p.xxiv.

scale bombing in the era of nation states just as the knighthood had to adjust to the new reality of the crossbow in feudal times. The leap from morality to reality is taken by Walzer, who speaks of the "moral reality of war" which arises from common experience.²¹

Far from a disinterested activity, then, the transformation of just war concepts to the current moral context involves a legitimizing process upon both the new technology and that in whose name it is employed - in modern terms, the state. In effect, it is asked that we accept whatever limits we can agree upon regarding the use of new technologies, and call that result "moral." It is in this fashion that mankind's moral sensibilities are profoundly altered by the technology it creates. Such "practical moralities" amount to no less than an acquiescence of immutable human standards of the good for those dictated by the technological context.

If we are to understand such a process (if it in fact it occurs), we must subject the just war tradition to an analysis of its foundations, assumptions and implications. While a full account of just war concepts is not necessary here, an attempt will be made during the course of the analysis to explore the full meaning of the just war tradition's moral concepts where they appear applicable to strategic defenses.

²¹ Walzer, op.cit, p.15.

Conclusion

In approaching the moral issues of strategic defenses, it is imperative that some of the ambiguities in deterrence ethics literature are not perpetuated. The analysis that follows will thus be framed from the perspective of the scientist in order to be clear as to "whose" moral deliberations are being examined. In addition, it has been argued that we must pay close attention to the moral referent that is used in arguments for or against strategic defenses, in order that we do not assume too readily the legitimacy of a political order or of the technology as a moral floor from which to proceed. Finally, we must be clear as to what we mean when we say that something is morally right, in order that we may better understand the effects of politics and technology on morality. By being sensitive to these dimensions of moral thought, it may be applied to the study of strategic defenses.

Chapter II

If the MADmen are right, there is no alternative to this world of degraded dignity: we are (in Camus's phrase) both "victims and executioners." Whether they are right or not, we now live in a distorted world that makes alternatives harder to see. Fortunately, they are not right...

Gary Stahl, "Remembering the Future"

The new technologies of both human and non-human nature have been the dominant responses to the crises caused by technology itself. This illustrates how 'technology' is the pervasive mode of being in our political and social lives.

George Grant, "Thinking About Technology"

Introduction

In assessing the merits and drawbacks of strategic defenses, we must be very clear as to what exactly is meant by the term "strategic defenses." Do we mean a perfect/leak-proof defense, a near-perfect system, a less ambitious hard-point defense, or some combination thereof? Further, are our moral judgments about strategic defenses to be made on the assumption that one nation will possess them, or that both the United States and Soviet Union are to deploy systems? Finally, are such systems to be deployed in conjunction with existing offensive systems, some offensive restrictions, substantial offensive forces reductions, or perhaps even some form of disarmament? This complicated and potentially endless mix of scenarios

makes taking a moral picture exceedingly difficult, for that picture is of a static moral moment in the mind of the observer.

A moral assessment of strategic defenses is dependent upon the political and technological dynamics at a given point in time. To be clear, this is not the same as admitting that morality is context dependent in the sense that Walzer has written (recalling the "moral reality" argument). Rather, if one grants the morality of strategic defenses, for example on the basis of a justifiable self-defense, one must not end the enquiry upon a consideration of its permissibility only. What one must attempt to determine is if that permissibility translates into a moral obligation, that is, if strategic defenses are not only permissible but also desirable or even necessary. The moral necessity of strategic defenses may very well depend upon the nature of the technological and political threat (for which defenses become a moral necessity that cannot be waived in deference to other moral obligations). Thus, what may be judged to be morally necessary in one context may not accrue the approbation of exigency in another. For example, it may be deemed morally permissible to shoot an assailant if it is clear that his attack upon you threatens your life directly. However, that same act would not be judged as morally necessary if the would-be assailant was only

threatening to attack you, and was not in fact in the process of committing the attack. In the former case, the permissibility of killing may even issue from a moral obligation to defend oneself. By being sensitive to this dimension of moral analysis, the idiosyncracies of different moral positions can be accounted for at least in part.

The moral question of strategic defenses can be formulated as follows: at this point in time, what is the morally right policy for the United States to choose, if by "right" is included permissibility and obligation? The distinction is important, for it should be recognized that one may waive a "moral right" in deference to other considerations. Thus, what is deemed morally permissible is not necessarily a moral obligation that must be carried out. (The next chapter will include the moral deliberations of a technologist/scientist, which go beyond those in the question above but include it.) Having said that, it must be remembered that the genesis of the moral questions concerning strategic defenses is the assumption that there is a moral problem in deterrence for which strategic defenses may provide a solution. In helping one arrive at an acceptable point of reference, then, the moral problem(s) must be carefully defined. Without anticipating in detail the remainder of the chapter, it is apparent that there are two ways in which nuclear

deterrence may present a moral problem for the United States. First, it is morally uncomfortable for the United States to threaten to slaughter millions of Soviet citizens (among those many whom we would reasonably call innocents), as 1) the threat itself is a form of hostage holding; and 2) the risk of executing that threat is morally unacceptable. Second, what has been noted as a characteristically American desire for perfect defense of "fortress America" has been manifested in moral qualms about the inability of the United States to exercise its right, or even stronger, its moral obligation to defend itself and its people.

What one must recognize of the approach embodied in strategic defenses to resolving the moral burden of the United States is that it is above all a unilateral approach, and thus bids us to look at moral problems for the United States to be resolved by the United States. This analysis will therefore be done without directly addressing the effects of a possible deployment of a defense system by the Soviet Union. Whereas the lesson of the security dilemma under nuclear deterrence compels consideration of the moral problem as one mutually shared, the unilateralism which is the hallmark of strategic defenses belies acceptance of mutually-dependent security, and thus may serve to define its own moral questions in a peculiar and ultimately unsatisfactory way. The reason is

that strategic defenses define the moral dimension in terms of the United States rather than humanity as a whole, and thus may not adequately accommodate the novel moral context of nuclear weapons. This novel context, I would suggest, requires that the greater realm of humanity constitute the moral referent, for it is that realm that is effected by nuclear weapons.

There are two basic ways in which strategic defenses are seen as a morally advantageous response to nuclear deterrence: either to replace the deterrent system altogether, or as a way to limit a war should it occur. As a result, two possible strategic defense systems will be examined in this chapter: a perfect or "near-perfect" defense system of the "astrodome" sort; and a "less-than-perfect" system which is designed as an adjunct to the existing deterrent system. Although the attainment of a perfect defensive shield is rather universally accepted as infeasible perhaps even in the very long term, its examination is worthwhile for several reasons. First, it is evident that such a shield is the original (and for some, existing) inspiration for the resurrection of strategic defenses as conceived by President Reagan. As such, it may very well be that the only valid moral arguments for strategic defenses may reside in their abandoned formulation, which of course would be of more than passing significance. In addition, the technological

imperatives of research and development are predicated upon some notion of the possibility of progress, which in turn is averse to an assumption that such achievements are in principle technologically impossible.

I The Argument From Pure Defense

The general assumption behind the moral appeal of strategic defenses has by now become rather familiar: it would be morally preferable to protect the citizens of one's own country by shooting down the attacking missiles than by attempting to deter the attack in the first place by the threat to retaliate in kind. In the nuclear context then, defense by denial is assumed to be morally acceptable, in contradistinction to defense by deterrence (to use Glen Snyder's terms). Whereas deterrence involves a threat to prevent an attack from taking place, active defense seeks to thwart an attack by denying the adversary the possibility of any gain.

With respect to the moral assessment being formulated here, the distinction between actual use of strategic defenses and their mere deployment becomes significant, and even determinative. As mentioned before, one may recognize that the notion of self-defense by denial comprises two moral dimensions: 1) the possession of a defensive system which would deny the adversary of any hope of success, and thereby prevent an attack; and 2)

actual use of such a system should the adversary nevertheless launch an attack. President Reagan's vision of a system that would "save lives rather than avenge them" thus is also designed to prevent an attack in the first place by rendering nuclear weapons "impotent and obsolete." It is on the basis of these two purported moral advantages of a perfect or near-perfect strategic defense that the analysis will unfold.

A) Use: Towards a Formulation of Justifiable Self-Defense

The "save lives" argument of a perfect strategic defense system involves both American and Soviet lives. That is, while the operationalization of defenses against an actual attack would not only save American lives from Soviet missiles, but no Soviet lives would be lost in the process. What moral assumptions are involved in ascribing moral rightness to the use of such a system?

As deontological principles proscribe acts more than they prescribe, that is they tell us more not what to do than what to do, a moral assessment of an act or policy may proceed by asking what moral prohibitions may be in danger of transgression. One may ask, therefore, what prohibitions may be involved in the actual use of strategic defenses, and what obligations may override others? The answer to these questions will define the conception of "just defense" or more precisely,

"justifiable self-defense" by which one establishes a moral case for strategic defenses.

The strictest prohibition that would impinge upon any act of defense would be that of the absolute pacifist, who in all cases would affirm Jesus' admonition "to resist not evil; but whosoever shall smite thee on they right cheek, turn to him the other also." [Matthew 5:39] Obviously then, those who would trumpet the virtues of a policy that saves lives must try to reconcile the fact that the policy may also kill persons in the process. The history of just war thought reveals an explicit acceptance of the rightness of transgressing the moral commandment never to kill another human being in the name of a "just cause." Without pursuing the vagaries involved in the notion of "just cause" in the sense of waging war, we may nevertheless explore the necessary conditions of a coherent and justifiable self-defense which kills in the name of life.

If one adheres to the prohibition on killing, how does one reconcile a possible transgression of that obligation in the face of an impending threat to one's own life? St. Augustine interpreted Jesus' injunction against violence as having more to do with an inward disposition of not summoning the evil intention to do malice to another, as opposed to proscribing violence 'per se'. Still within the Christian tradition, Aquinas moved

towards a more explicit formulation of a justifiable self-defense by arguing that the doctrine of universal love implies self-love as well as love of one's neighbor. According to this logic, which takes St. Augustine's view a little further, one is legitimately entitled to defend oneself out of love for oneself, but not out of hatred for one's enemy.²² If one suspects that such an interpretation is little more than clever Medieval Christian sophistry, we can turn to an iconoclast's ruminations on the subject. Nietzsche, who ruthlessly denigrated Christian morality, said of self-preservation that "we act that way without any wish to do harm in return, merely in order to get away with life and limb."²³ It appears that the notion of self-defense is equally at home within Christian traditions or the formulations of those who would deny Christian tenets.

The notion of a justifiable self-defense is not confined to the Christian tradition, and indeed such a concept does not have the same problems in secular formulations as those encountered within the Christian tradition. The philosophy of Thomas Hobbes contains the simple assertion that there is nothing that prevents the

²² See Douglas Lackey, Moral Principles and Nuclear Weapons (Totowa, N.J.: Rowman and Allanheld, 1984): p.16.

²³ Friederich Nietzsche, On the Genealogy of Morals, translated by Walter Kaufmann and R.J.Hollingdale, (New York: Random House, 1967): p.180.

individual from seeking his own survival. While one could attempt to provide a comprehensive account of the nature of the concept of self-defense, such an effort is not required here. The point is merely to show that it is certainly less than controversial to accept the notion that it is coherent to speak of a legitimate recourse to self-defense, whether on the basis of secular or religious formulations.

What is of more importance here, however, is what exactly constitutes the justifiable bounds of the use of violence in self-defense. Some, such as Thomas Hobbes, would perhaps view with disdain attempts to place limits on the actions one may take in self-defense. A virtually limitless number of thinkers throughout the centuries have not accepted such a position, however, and have sought to provide some grounds to the argument that the doctrine of self-defense does not imply a limitless use of force. The very basic argument is that one is only permitted to use the means necessary to repel the attack. Thus, if a child is threatened with being shot at with a rubber band, he would not be entitled to shoot his would-be assailant with a gun; calling his father might do. Proportionality was introduced as a moral requirement in this spirit by Aquinas, who argued that "it is lawful to repel force with force, provided that one does not exceed the limits of

blameless defense."²⁴

The concept of proportionality could easily be judged to be merely a convenient instrumental restraint, and thus not of the deontological character of a 'thou shalt not kill.' In the context of the conduct of military battle, the doctrine of proportionality is probably seen rightly as an instrumental practice of prudence: use only the means necessary to achieve one's goal. However, proportionality in that sense is used to justify the waging of war, which is a very different matter from a principle of pure defense (although the latter lends itself readily to the former). As a result, an interpretation of the doctrine of proportionality, based upon its transposal to a situation of self-defense, must recognize its function as a principle intended to cope with the clash of ultimate obligations that may be involved in the exercise of self-defense - to turn the other cheek versus self-defense. Proportionality thus construed counsels not prudence in the use of force with respect to one's desired objectives, but rather takes on the form of a categorical constraint: the use of force in self-defense is morally justifiable only if it passes the test of proportionality. The moral permissibility of self-defense is conditional on its necessity - the importance of this notion will soon become clear.

²⁴ Quoted from Lackey, op.cit., p.16.

Proportionality constitutes one of the two moral restraints on the use of force as developed within the 'jus in bello' of the just war tradition. The second, discrimination, is to be understood as an attempt to protect innocents from the scourge of battle. It takes the form of a categorical restraint on the means of warfare to be paid heed regardless of the desired objective of war. In short, the principle of discrimination proscribes the intentional killing of non-combatants in the conduct of war. The word "intentional" has been subject to much abuse in the form of the doctrine of "double-effect", which states that any deaths of innocents not directly intended by the military action are morally permissible. For my purposes here, however, those problems need not be pursued. The reason is that the principle of discrimination has historically represented a moral restraint on the waging of war; what is of concern in this study is the role of such moral concepts in a notion of justifiable self-defense. Previously, the principle of discrimination would have had little relevance with respect to self-defense. Simply put, there would seem to be little reason to worry about harming innocents when one is defending against an attack, for none of those attackers who may be harmed in the act of self-defense would qualify as "innocents." In the nuclear era, however, the principle does bear examination because

the scale of technologies involved is so immense that it is conceivable that the use of one's chosen means of self-defense may jeopardize those whom we call innocents or non-combatants.

The concepts of proportionality and discrimination as outlined above are at the core of the attempts to place moral restraints on the actual conduct of warfare - the 'jus in bello' of the just war tradition. What one must ask at this point is how the actual use of strategic defenses in the face of a nuclear attack would measure up to the principles enunciated above? Strategic defenses would appear very much to conform to the restraint of proportionality that one may do no more harm than necessary to repel an attack, for they are designed to disarm the attacker's weapons rather than directly attack the aggressor. In the face of an actual attack of nuclear warheads, it would be difficult indeed to judge the use of strategic defenses as a disproportionate response. The use of strategic defenses becomes a moral necessity under the extreme conditions of nuclear attack. In addition, strategic defenses would give new meaning to the term 'discrimination', for not only would innocents (non-combatants) be spared of attack, but the actual attackers as well. The use of strategic defenses would appear to resuscitate the notion of discrimination from the ashes of Dresden, Tokyo, and Coventry, and from its outright

irrelevance with respect to the use of nuclear weapons. Furthermore, the use of strategic defenses would involve none of the difficult moralizing problems inherent in the use of aggressive warfare, as it would offer a defensive war 'par excellence.'

The operationalization of strategic defenses in time of war is not wholly without problems, however. The more ambitious plans for strategic defenses include a boost-phase system, which would attempt to destroy missiles during the launch of the missile. This component of a defensive system would require an extremely short notice to be effective, and thus impinges perilously upon requiring a preemptive attack. Preemption had accrued rather universal approval as a morally acceptable form of defense since Aquinas. However, the modern era has recognized the vagaries associated with the approval of such actions as legitimate, to the extent that the U.N. Charter disavows recourse to aggression of any sort, including preemption.²⁵ It would indeed be rather ironic if a "perfect" or "purely" defensive system required for its success a preemptive attack, for defense thereby becomes offense. While this notion will be examined further in a later section, it will suffice for the moment to assert that to the extent a defensive shield would require preemptive action, it would lose its defensive

²⁵ See James Turner Johnson, *op.cit.*, p.30.

character and thus also its moral approbation. The same could be said of a "preventative" attack (as distinct from preemptive) in which one side attempts to avoid the possibility of a future conflict by defeating a would-be enemy before it reaches the capability to wage war itself.

Furthermore, the use of a boost-phase component could very well involve the destruction of areas around the missile launch site which would involve the deaths of non-combatants. In addition to ballistic missile launch sites, potential targets of a defensive system could include launch command centres, nuclear weapons storage sites, airfields supporting nuclear-capable aircraft, and nuclear missile-firing submarine bases. In the case of the Soviet Union, this problem is very real due to the fact that many missile launch sites are located near some of the most densely populated areas of the Soviet Union.²⁶ This would present obvious difficulties for those who seek a moral seal of approval for such a system. While such damage would be deemed collateral by the strategist, it could indeed prove definitive for the moralist, depending upon the accuracy of the weapons and the destruction involved. While the moralist may approve of self-defense, he may not approve of methods which involve the deaths of innocent civilians. It would seem hard to argue that the

²⁶ See Desmond Ball, "Soviet ICBM Deployment," Survival 22:4 (July-August 1980): 167-170.

killing of innocents constitutes a legitimate form of pure defense.

It is not clear at present to what extent the boost-phase component of a defensive system would in fact involve destruction of missile sites or surrounding areas on the ground. The possibility of highly accurate directed-energy ("beam") weapons that could minimize collateral damage would therefore dangle as a moral carrot for supporters of a defensive shield. Rather than requiring the saturation of an area with enough missiles to ensure a reasonable rate of success in taking out the offensive missiles, and thereby running a high risk of killing civilians in the process, it is conceivable that increasingly precise lasers and other directed-energy weapons could in fact be employed to destroy missiles in the boost phase without involving such widespread destruction. To the extent that the main moral objection to strategic defenses is deemed to be the likely deaths of innocents around the missile sites (as is not the argument here), highly accurate directed-energy weapons capabilities could redress that moral problem and provide a moral incentive for the scientist.

Gregory Kavka has identified an additional way in which a principle of pure defense may prove defective. In his view, defending against harm may be wrong if in so doing, one deflects or redirects harm onto innocents. As

he argues,

such deflection of harm is wrong... for example, if the new victims are as innocent as those protected, if the harm they suffer is as great or greater, if their suffering this harm is probable enough, and if they are less able to defend themselves by alternative means. Thus I should not protect my yard from mudslides by building a wall that deflects them onto an impoverished orphanage. There is no simple general rule indicating precisely when redirection or deflection of harm is, and is not, permissible. But surely if an act of pure defense would deflect or redirect harm or risk onto other innocent parties, this must, to some degree, count against its permissibility.

What Kavka had in mind was the moral failing of a system which results in the nuclear adversary targeting the allies of the defended nation in order to maintain some nuclear hostages. I would reject his example as offering a moral failing of a defensive system, however. It would seem to require a feat of some imagination to suggest that it would be morally wrong for the United States to erect a defensive shield if the Soviet response was to target its nuclear missiles upon targets in countries allied to the United States. The moral failing in such a case would be that of the Soviets, perhaps, but not the United States. The United States, in such a scenario, does not force the Soviets to target other nations, and thus cannot be held responsible in any reasonable sense for the hostage-holding practices of the Soviets.

² Gregory Kavka, "A Critique of Pure Defense," The Journal of Philosophy, vol.83, no.11 (November, 1986): 629.

What I would substitute as a morally significant example of redirecting harm or risk is whether the use of defenses would involve the death or endangerment of third-country populations due to fall-out or the engagement of offensive missiles by defensive ones. For example, if an oncoming Soviet warhead was to be intercepted over Canada before it hit its target in the United States, and if that interception was likely to cause the deaths of people living in the area, then the moral permissibility of that interception could be called into question. Nevertheless, (and despite being Canadian) I would have to argue that on balance such considerations would be outweighed by the moral enormity of failing to defend at all.

In conclusion, then, it would appear that despite some reservations to the contrary, the belief that defense is moral seems on balance to be sound with respect to the actual use of a perfect or near-perfect missile defense. Not only would a defensive shield save American lives, but it would also not take Soviet lives in the process, at least not to an extent that could reasonably counsel against its use. If a perfect or near-perfect defensive shield had been put into place by the United States, it would seem that in case of an actual nuclear attack the United States would be morally permitted and obligated to use it.

B) Deployment: The Desirability and Necessity of a Perfect Defense

Having arrived at that conclusion does not complete the moral assessment of a perfect shield, however, for one must turn to a seemingly paradoxical but no less necessary question: would the possession and deployment (as opposed to use) of a perfect or near-perfect missile defense be morally right? This question is in some respects analogous to the distinction between the moral permissibility of actually using nuclear weapons as opposed to their mere possession - the threat to use them embodied in nuclear deterrence. If we have granted the permissible ways in which force may be used in order to repel a violent attack, we still must come to terms with what is permissible in a situation characterized by the risk or threat of attack.

What has been examined so far is the moral limits on the actual use of force if it is to be judged morally right. However, the restraints on the use of force in the form of 'jus ad bellum' represent a response to a different question: namely, when is it right to resort to force in the first place? Although the application of that question may seem somewhat superfluous with respect to a defensive act (i.e. strategic defenses), I hope to demonstrate that such factors in fact mitigate against the moral permissibility and necessity of strategic defenses due to the unique conditions of the nuclear age. Thus,

although transposal of the concepts of "just cause" from the 'jus ad bellum' tradition may seem somewhat awkward to a notion of defense (for self-defense seems to in all cases qualify as a just cause), I ask that the reader bear with me as I explore the utility of 'jus ad bellum' principles in determining the moral character of strategic defenses, for they too dictate moral constraints to the use of force, whether offensive or defensive in character.

When is self-defense in fact self-defense? To determine the permissible occasions for the resort to force, the familiar 'jus ad bellum' concepts of just war thought will serve as a point of reference. While those concepts - Right Authority; Necessity (Last Resort); Just Cause; and Right Intention - serve as a focal point for the moral issues involved, transposal of those concepts to strategic defenses is not without its problems. This fact in itself will prove to be of utmost importance. With respect to nuclear deterrence, Douglas Lackey has noted that

since the just war theory focuses on actual uses of force, it is not particularly suited for judging the creation of risks that are not realized as for judging the making of threats that are not carried out.

If it is the case, then, that these concepts are "not well designed for the evaluation of nuclear deterrence,"²⁸

²⁸ Lackey, op.cit., p.193.

²⁹ Ibid.

then just war thought would seem to be even less suited to strategic defenses. It is, of course, precisely the element of risks and threats that is of utmost importance to an assessment of strategic defenses. With these limitations in mind, we can proceed with the attempt to determine what moral obligations may pertain in the face of a risk of attack.

Right Authority

It has long been maintained within the just war tradition that a war may be waged only by a legitimate and competent authority. As Douglas Lackey has noted,

this rule was used to distinguish legitimate wars waged by states and empires from private wars and feuds waged by individuals, families, nomadic tribes, and gangs of bandits. Since, in the modern era, only states can afford the instruments of war [sic], the focus of discussions of competent authority has shifted to the question whether the public leader that inaugurates the fighting is duly authorized to begin the war.

Essentially, this restriction on the use of force represents an accommodation to the problem of transferring the notion of the legitimacy of a collective making the decision to exercise force on behalf of the individual. It provides an answer to observations such as that of Marshall Cohen, who notes that "it is far from obvious that because individual men have a natural right of self-

" Ibid.

preservation, states do as well."¹¹

In the case of strategic defenses, the question of competent authority leads us to consider whether the decision to deploy strategic defenses is one that can be legitimately undertaken by the state's representatives. Presumably every individual would want the ability to exercise his or her self-defense. Under conditions of nuclear deterrence, the individual obviously does not have the ability to defend against a nuclear attack. Therefore, it is the state that must exercise self-defense for the individual. While one may question the legitimacy of maintaining the policy of deterrence in the first place (which thereby creates the apparent need for strategic defenses) it nevertheless seems that few would choose to waive the ability of defending oneself in the face of an actual nuclear attack. On this basis, then, the use of strategic defenses would indeed appear to qualify as legitimate.

However, the focus on the question of deployment compels us to ask the question of whether the deployment of strategic defenses against the risk of nuclear attack is in fact an effective defense. In other words, the question of legitimacy is raised to the extent that it is found that the possession of strategic defenses in fact may increase the risk of a nuclear catastrophe. Under

¹¹ Marshall Cohen, op.cit. p.26.

conditions of nuclear deterrence, the state has assumed the position of wagering the future of all persons in order to preserve and/or enhance state interests. Should the citizens of that state (and all other citizens of all other states) regard such a risk unacceptable, the legitimacy of the state authority to act in the interests of the individuals is brought into question.

This point becomes crucial when one considers the limitations of even a perfect missile defense - such a system would likely have little or no effect on other means of delivering nuclear weapons such as flattened trajectory ballistic missiles from submarines, cruise missiles and bombers. Thus, while a defense may defend against missile attack, it is conceivable that it could increase the risk of a cruise attack. It is with this question in mind that we turn to the next category in an effort to ascertain whether strategic defenses can be considered as a moral obligation of the state to protect its citizens.

Necessity/Last Resort

A second injunction against the use of force according to the thinkers of just war is that it may only be applied as the last resort to restore peace, after all peaceful means have been exhausted. We would do well at

this point to consider that even the deployment of strategic defenses, despite its ostensible passive character, qualifies as a "use of force". Explicit recognition of this more subtle yet characteristic role of modern weapons systems is necessary if a sensitive evaluation is to be achieved. For our purposes here, then, we can ask of strategic defenses whether their deployment may, according to the dictates of last resort, be judged as a moral necessity, an obligation that must be fulfilled.

The first consideration in this regard is whether the means chosen to defend oneself is in fact effective. This may seem a curious qualification for a moral evaluation of defense, for one would not easily assume a presumption of immorality based upon the failure of one's defense to withstand attack. More to the point however, is whether the means chosen is in fact a responsible one that makes it less likely that the defender will suffer harm. Simply put, if I am morally obliged to defend myself from harm, that obligation does not include acts which may seem purely defensive to me but in fact increase the likelihood that I will suffer harm by provoking the potential attacker. But is it reasonable to say that a policy or act is morally defective if it results in preemptive action by the attacker? On the one hand, one does not force the adversary to attack; it is at all times the

attacker's choice. On the other hand, as Gregory Kavka has noted, if agents (e.g., governments) acting on behalf of other agents (e.g., citizens) choose ineffective or counterproductive means, they may be acting irresponsibly.¹² It is in this spirit that the Catholic Bishops, in an update of their position on nuclear deterrence, have argued that one must evaluate strategic defenses not merely according to their intentions and goals, but also in reference to the actual effects of pursuing them.¹³

Concerning the question of necessity, we must come to terms with how to evaluate the merits of a situation characterized not by actual attack, but rather by the risk of attack. If one is not sure if one is to be attacked, can it be coherent to morally condemn measures taken only as insurance against the possibility of attack? On the basis of these conditions of risk and possibility, Douglas Lackey has observed that strategic defenses only might save lives. Then again, they might not: strategic defenses would only become a "good moral buy" if it appeared likely that they would save lives. However, the chance of a nuclear attack on the United States without defenses but with second strike capacity is rather small.

¹² Gregory Kavka, op.cit., p.630.

¹³ See "Excerpts from the Bishop's Report," Arms Control Today, vol.18, no.7 (September, 1988):12-16.

Certainly, I would add, it is not so obviously greater than in a situation in which the United States had strategic defenses (indeed, it could be argued that the risk of attack would increase with strategic defenses). This argument would apply also to the case made for strategic defenses to protect against an accidental nuclear attack, or an attack launched by a third country. The upshot of the argument is that it appears that strategic defenses probably will not save any lives. As Lackey states,

If I had \$20 billion in federal funds to spend, and if my main moral imperative was to save American lives, I would choose options that surely would save lives, such as improvements in highway safety, rather than options that might save American lives but probably would not. Strategic defense is simply not a good moral buy.

Lackey can make this judgment on the basis of his recognition that the "moral obligation to save lives is not at the highest grade of moral obligation: the obligation to save lives is not nearly so powerful, for example, as the obligation not to kill people."¹⁴ This dichotomy offered by Lackey lends itself to what is for my purposes an essential observation: despite the "save lives" argument of those who support strategic defenses, it is clear that the intent of strategic defenses must

¹⁴ Douglas Lackey, "Moral Principles and Strategic Defense," The Philosophical Forum, vol.18, no.1 (Fall, 1986): p.3.

¹⁵ Ibid, p.2.

actually lie elsewhere, for the arguments do not stand up under scrutiny. To be fair, one of the motivations for strategic defenses is surely to save lives; but it cannot be the preeminent rationale, for if so, other means would accrue the moral prerogative. While all this revelation may do is state an obvious point, namely that the rationale for strategic defenses is an overtly political (and perhaps economic) one, it does serve to undermine and indeed deny the moral support for strategic defenses that derives from the "save lives" argument.

An additional weakness of the "save lives" argument is the fact that strategic defenses, however perfect, would only defend against ballistic missiles and not the other means of delivery that are presently available. Furthermore, as Charles Glaser has noted, strategic defenses would not guarantee protection against any future technological threat:

The difficulty of maintaining a perfect defense indefinitely is likely to be far greater than developing it in the first place. Consequently, so-called perfect defenses should not be envisioned as a permanent technological solution to the dangers posed by nuclear weapons. The far more likely course of events is that a world of perfect defenses would decay into a world of imperfect defenses.

As a result of these problems, strategic defenses even if perfect would not represent the necessary means

¹⁶ Charles Glaser, "Why Even Good Defenses May Be Bad," in Steven Miller and Stephen Van Evera, op.cit., p.31.

required to exercise the principle of self-defense. In fact, deployment of such a shield could conceivably increase the overall risk of nuclear attack (such an attack being delivered by other means) by creating fears of preemption. If the United States possessed a defensive shield, an unprotected Soviet Union could conceivably be provoked into a preemptive attack in a crisis situation due to its fear that the United States would disable or attempt to disable its retaliatory forces. In addition, even a situation wherein the United States and Soviet Union both had perfect defenses would be beset by risks. Indeed, Glaser has argued that the risks of a defense-dominant system would in fact be greater than the current risks embodied in nuclear deterrence by assured destruction. Glaser points out that a defensive system would be extremely sensitive to even small technological improvements which could provide one side with the significant strategic advantage of being able to penetrate the other's defenses. Such a system would be less robust, and hence, more risky, than the current situation.¹⁷

The possibility of creating additional risks to those that already exist, no matter how high or low one judges them to be, does not constitute self-defense, but rather would detract from it. The deployment of strategic defenses cannot be seen as necessary - as a moral

¹⁷ Ibid.

obligation - when other means of attack are available or are likely to become available (and it would be prudent to assume there always will be; to think otherwise is to believe in the military/technological fallacy of the "last move"). If there is a "moral imperative" or "necessary means" in the nuclear world, it would appear to lie in the political realm of action, and not in technological unilateralism. Moral approval of the use of force requires that it be under conditions of necessity, and the peace cannot be secured by any other means: strategic defenses are not able to pass this moral trial.

Just Cause

The notion of just cause represents, as James Turner Johnston has noted, an attempt to answer the original just war question within the Western (Christian) tradition: "Is it ever justifiable for Christians to participate in war?"¹⁸ Reformulated for the modern context, that question must ask: Is it justifiable for the state to engage in the risks involved in deploying strategic defenses? Whereas the locus of power in Christendom necessitated a reconciliation of Christian morality with the exercise of political power, the exercise of state power in modernity begs the question of whether a

¹⁸ James Turner Johnston, op.cit. p.xxv.

government "for the people and by the people" negates itself. What that question directs us towards is the cause for which strategic defenses are judged acceptable or perhaps necessary. In addition, it raises additional considerations that may render the principle of perfect defense morally defective. It is to the first of such provisos that we now turn.

The just war is one which protects innocents against an offense or harm against ultimate values. In that respect, offensive operations have been justified as necessary to defend one's most cherished values. Such was the moralizing inherent in the Crusades. While the justification of aggressive actions, even in the name of protecting innocents, is to say the least contentious, the moral term "innocent" bears present scrutiny. Are all persons and all communities of persons however defined to be granted the legitimacy of self-defense, or only those whom are judged as "innocents?" To put the point starkly, one could ask the awkward question of whether it would be morally right for a modern-day incarnation of the Nazis to protect themselves with a strategic defense shield, and would thereby be permitted to carry out morally offensive deeds. It is clear that additional standards of judgment are required if one is to assert that not all are equally morally entitled to self-defense. It is in this spirit that Gregory Kavka has noted that it is because the guilty

as well as the innocent can be defended that we would hesitate to call all cases of defense morally justifiable.

For his part, Kavka has posited a pure defense principle that goes as follows: "If an act, object, institution or policy is purely defensive of innocent parties, it is morally acceptable." "One party is innocent," he continues, "with respect to a harm that might be imposed by another party if and only if it would not be morally proper for the latter to impose that harm on the former."¹⁹

While the above formulation perhaps has the merit of adding precision to the necessary question, its tautologous nature may not get us much closer towards a satisfactory answer, for we are still left with the greater question of what is "morally proper."

Nevertheless, we do gain by becoming aware of the moral problems caused by protection of the guilty, and also by a second consideration noted by Kavka. Namely, the 'pure defense' principle can be rendered defective if a defensive capability is used by the defended party to wage aggression. Thus, if the United States used a defensive shield of any type after starting a war, the guilty war-starter would be protected.

In essence, what Kavka asks us to recognize is the

¹⁹ Gregory Kavka, op.cit., p.628.

total role of defenses, and not merely the defensive means as an abstraction. To use his example, the acquisition of a bullet-proof vest (a defensive tool which in and of itself cannot be used to harm someone) must be evaluated not only according to physical factors but also motivational ones. Thus, if a vest is used to commit crime, its morally innocuous character is transformed. For this reason, then, it is difficult not to conclude with Jefferson McMahan that "since even a purely defensive object may thus serve as a crucial element in a scheme of wrongdoing, the fact that an object is purely defensive will indicate little about its moral character."⁴ This point is also made by Henry Shue, who has argued that the distinction between offensive and defensive weapons in itself carries no moral weight. According to Shue, this is so because weapons do not fall neatly into either category. In addition,

even if you turn from weapons to their functions in a specific instance, the distinction between attack and defense is still not a morally decisive one by itself...A justified attack is presumably better than a defense by scoundrels.

Recognition of this important consideration precipitates the answer to one of the moral problems which

⁴ Jefferson McMahan, "A Note on 'Pure Defense,'" The Journal of Philosophy, vol.83, no.11 (November 1986): p.641.

⁵ Henry Shue, "Morality of Offense Determines Morality of Defense," Philosophical Forum, vol.18, no.1 (Fall, 1986): p.8.

strategic defenses are to address. We recall that at the outset of this chapter, it was stated that one of the moral problems of deterrence is that it removes from the United States government the ability to exercise by itself the obligation to defend its people. As Colin Gray has claimed, "the U.S. government has a moral obligation to make what provision it is able to for the saving of American lives - an absolute value."⁴² However, to so narrowly construe the meaning of "defense" as to confine it to acts which on the surface are purportedly defensive is mistaken. Preventing a nuclear war from occurring in the first place is every bit as important, and indeed more so, in "defending" the American people as is protecting them during an actual attack. As was revealed in the previous section, it would therefore be quite in error to choose to deploy strategic defenses for its ability to save lives during an attack if that deployment in fact increased the chance of an attack even occurring.

Having clarified the meaning of the term "defense", we still must attempt to determine the justice of the cause embodied in the deployment of strategic defenses. At this point, the concept of "innocence", although by no means an uncontroversial one in itself, will serve as one standard by which a moral judgment may be made. How,

⁴² Colin Gray, "Strategic Defense, Deterrence, and the Prospects for Peace," Ethics vol.95, no.3 (April 1985): p.660.

then, do these ruminations affect a moral assessment of strategic defenses?

It is in this regard that one must consider the overall role of strategic defenses in the United States' strategic posture, and the possibility that strategic defenses would be used to foster an aggressive foreign policy that would not otherwise occur. It can be said that the possession of strategic defenses in conjunction with an abandonment of all offensive nuclear forces would offer a rather straightforward and indubitable case of moral rightness. It is in this sense that President Reagan's vision of a de-nuclearized world is essentially sound, and it is also from this scenario that the proponents of strategic defenses draw their support. Strategic defenses would have succeeded in rendering nuclear weapons "impotent and obsolete" if in fact they allowed or otherwise caused the removal of all offensive nuclear forces. Much more problematic, however, is how to assess a perfect or near-perfect system that was deployed without an accompanying dismantlement of offensive nuclear forces. For strategic defenses to attain the moral quality of a "pure defense", they would have to entirely replace offensive forces. Should the United States choose to retain any level of offensive forces, it would be difficult not to conclude that "the deployment of defenses will be unlikely to make its over-all posture more

defensive in character."⁴

There are many reasons to believe that the United States would not abandon all its offensive forces (I do not intend to suggest that it should). First, it is hardly reasonable to believe that even a perfect defense would remain perfect in the face of future offensive capabilities of the Soviet Union or any other potential and future adversary. Secondly, there are other means of delivering offensive nuclear weapons available today that would be able to subvert a perfect system, which is after all only "perfect" against ballistic missiles, and not aircraft, cruise missiles, or clandestine means. A third argument offered by Steven Lee is that American leaders would never be sufficiently sure that defenses would work perfectly to trust them enough to regard the United States as truly invulnerable. I would concur with Lee that because "neither the present nor the future invulnerability of the United States could be prudently counted on," the United States could not be expected to abandon nuclear deterrence.⁵ If this is the case, it does not mean that the possession of strategic defenses with offensive weapons would be indubitably immoral, but only that those who seek moral approval could not derive

⁴ McMahan, op.cit. p.641.

⁵ Steven Lee, "Morality, the SDI, and Limited Nuclear War," Philosophy and Public Affairs, vol.17, no.1 (Winter 1988): p.22.

support from the principle of pure defense. The moral assessment of strategic defenses is thus put on significantly shakier ground unless it is pursued in conjunction with a disarmament by the United States of its offensive forces. If not, the motives of the United States in such a scenario could not help but be interpreted as less than judicious, and probably aggressive, although the possibility cannot be excluded 'a priori'.

Right Intention

To help determine under what conditions one may move towards a more precise formulation of "just cause", the just war category of Right Intention can serve a useful purpose. A "Right Intention" in just war terms is that the ultimate aim of a war be the restoration of peace. Strategic defenses do not represent an act of war, but rather an attempt to prevent war. However, the category of right intention directs one to focus on the true intent of a strategic defense. As the weaknesses of the moral justifications for strategic defenses have been examined, one may ask whether in fact the primary intent of strategic defenses is to ensure peace, or to further the political, strategic, economic and technological designs of the United States. As an enterprise within the realm of war and peace, strategic defenses are unlikely to pass

unreservedly the test of comprising the right intention of restoring peace. Rather, defensive systems entail an effort to secure the strategic, military, economic, political and technological preeminence of the United States. Accordingly, strategic defenses cannot be claimed as a morally appropriate military strategy, for there is nothing moral in striving for political or economic power.

II The Argument From Deterrence: Less-Than-Perfect Defenses

Introduction

In the face of the real-world practical problems of achieving a perfect or near-perfect missile defense, the advocates of defenses have retreated from the original moral vision of replacing nuclear deterrence to claims of the moral advantages offered by an enhanced deterrence.

I must make clear from the outset a fundamental difficulty with the premise upon which such attempts are made; namely, that a morally "better" policy or act is somehow morally right. Quite simply, if deterrence is regarded as morally untenable, and strategic defenses are seen as an enhancement of deterrence, that is, they make it more effective, it is difficult to see how the moral

status of the system is changed in any meaningful sense. On the other hand, if nuclear deterrence is regarded as a morally tolerable situation, it is equally confounding as to how and why the proponents of strategic defenses would make a case on moral grounds for the enhancement of deterrence. This quandary in itself may account for the paucity of consequentialist attempts to evaluate nuclear deterrence.

This section of the study will provide a brief summary of the consequentialist approach to strategic defenses as contained in the debate between Colin Gray and Steven Lee. That debate concerns a less-than-perfect defense. Throughout the analysis, I will subject the consequentialist approach as a whole to a critique based on the assertion that the consequentialist approach is not a moral one 'per se', but rather that it merely seeks to infuse the doctrine of Reason of State embodied in realism with the beneficent label provided by moral language.

The Colin Gray - Steven Lee Debate

There can be little doubt regarding the assertion being made here that consequentialism differs little if at all from prudent strategic analysis. Gray himself seems to bear little confusion on this alliance between the two approaches, for he states "I am a professional defense analyst and not a moral philosopher: the discussion that

follows addresses the consequentialist case for and against strategic defenses."⁵ If one can ignore that for the moment (and thus pretend, as Gray does, that the case is still somehow morally significant), and thus proceed to analyze Gray's arguments for their internal validity, we may gain some insights on the shortcomings of a consequentialist approach.

The objectives of strategic defenses as enunciated by Gray are as follows: 1) to save lives in case of war; 2) they would offer "the only promising path to nuclear disarmament on a very major scale"(p.660); 3) they would greatly reduce the risk of nuclear war occurring; and 4) they "could be the deciding factor in whether or not "nuclear winter" effects were triggered." (p.671). I think the last of these can be dismissed as rather gratuitous, and may be subsumed within the third point above.

The disarmament argument, to deal with it first, contains the implicit objective of rendering nuclear weapons "impotent and obsolete", to use Reagan's phrase. Disarmament would be made possible because nuclear weapons simply would not "work" in the face of defenses, and the risks of disarmament would thereby be removed or substantially alleviated (p.660). In the words of George Keyworth, the goal is "to reduce the military

⁵ Colin Gray, op.cit., p.661.

effectiveness of nuclear weapons so dramatically that they become unreliable for modern warfare." (p.659) What Gray asks us to believe is that the United States and Soviet Union would feel comfortable enough with strategic defenses to abandon their nuclear forces. Such a proposition seems to miss the point, however, for the building of strategic defenses is required only if in fact the possibility of their use is a very real one. One only builds a defense against something that can and may be used against oneself. The message of strategic defenses is not that nuclear weapons are impotent and obsolete, but rather that they are legitimate tools of politics. I would suggest that the way to go about making nuclear weapons obsolete is to delegitimize, and not relegitimize them. In any case, the response of the Soviet Union to SDI indicates that it seems rather probable that the effect of strategic defenses upon arms control and disarmament would be a severely detrimental one. To overcome any advantages of the United States gained by its strategic defenses, the Soviets would likely seek to circumvent the defenses by producing more offensive delivery systems that could overwhelm any defensive shield.

Gray's argument that the risk of nuclear war would be reduced in a meaningful manner depends upon the presumption that strategic defenses would increase the

uncertainties involved in a prospective attack for the attacker, and thus would mitigate even further against the decision to go to war. Based upon Gray's presentation, Steven Lee has therefore quite correctly summarized the consequentialist case for strategic defenses as requiring a weighing of the moral advantages of a damage limitation capacity in war versus an assessment of the effect of strategic defenses on the actual risk of nuclear war in the first place. Where Lee differs from Gray is on his assessment of the impact of strategic defenses on the risk of war. Lee writes that there are several very good reasons to believe that strategic defenses would in fact weaken deterrence, and thus increase the likelihood of nuclear war. Thus, "their life-losing potential would have to be morally weighed against the life-saving potential of their capacity for damage limitation." (Lee, p.26) Lee, quite correctly in my view, ascribes greater moral weight to avoiding war altogether. As a result, he concludes that "since avoiding war is a more effective way of saving lives than limiting the damage in a war, the moral disadvantage of SDI-2 defenses outweighs their moral advantage." (p.41)

However admirable a job Lee does of disarming much of the consequentialist's case for strategic defenses, he restricts his criticism to the consequentialist's own terms. In essence, Gray and Lee differ only in their

disparate assessments of the likely effects of strategic defenses on the risk of nuclear war. As a result, both of their analyses remain essentially strategic in nature, and subsume morality within the inner logic of the deterrent system. By neglecting to go beyond the terms set by the consequentialists, Lee cannot offer an alternative any more satisfying than an assessment of risk so subjective as to render the whole debate moot.

The reason, I will suggest, is that consequentialists like Gray set the moral framework within an assumption of the primacy of the state over other considerations. Strategic defenses, according to this approach, thus do not in fact provide a moral vision, but rather serve a legitimizing purpose for the state in the form of a moral palliative to soften the stark amorality of adhering resolutely to state interests. We should recall the point made earlier that for strategic defenses to be morally appealing, they must presumably have an effect on the moral problems present in the first place. Gray, however, equivocates on whether nuclear deterrence is morally problematic: "to the uncertain degree to which nuclear weapons are, or should be, judged to be uniquely morally troublesome, the SDI offers a program of action to address such concerns." (p.660) He is guilty, then, of merely seeking to infuse his strategic position with the good label of morality, and is not particularly devious in so

doing. To call such a position moral is at best misleading, and at worst cynically opportunistic.

That this is in fact the agenda of the moral supporters of strategic defenses there can be little doubt. To quote from Colin Gray:

Finally, the SDI offers a possible way out of the moral dilemma that saps and threatens the very legitimacy of Western security policy. The dilemma is that the West has a moral duty to defend humane values as well as a political duty to protect its citizens and their means of livelihood, but in a nuclear-armed world that moral duty to defend humane values reposes, in extremis, on the sustaining of a credible threat to trigger a nuclear holocaust. A technologically mature SDI would enable the United States and its allies to defend their values against nuclear intimidation or even actual nuclear assault without, in the process, negating everything that they stand for.

Strategic defenses are spoken of in moral terms not because they offer a moral policy alternative, but rather because they are indicative of an attempt to close the gap between the morally legitimate conduct of state policy and the morally abhorrent maintenance of nuclear deterrence. Strategic defenses represent a response to the eroded legitimacy of the state and its representatives based upon the questioned authority to wage the enormous risks involved in maintaining a balance of nuclear terror. In such a questioning of political legitimacy as that brought about by nuclear weapons, two responses are possible. Either the technological development which precipitated the crisis must be superceded by yet another feat of

⁴ Colin Gray, op.cit., p.660-661.

technology, or else a new political framework for relations between political communities must evolve. In rejecting the latter approach (as was embodied in post-World War II calls for a "world government" and other such responses), advocates of strategic defenses are affirming the legitimacy of the state-centered realism which has been brought into question.

Strategic defenses are indicative of an attempt to redress the gap between individual morality and state interest which, after all, is essentially what the just war tradition has sought to do in the name of the Church, and later, the state. As such, the inspiration for strategic defenses is a noble one, for its advocates recognize that a world of nuclear deterred states is not the only possible future which we must encounter. Through their response, however, advocates of strategic defenses are forced into a rather self-contradictory position of acknowledging that nuclear weapons have "emergent" features which have created a political-technological crisis in need of response, while at the same time in effect denying that a nuclear revolution has occurred by their attempts to portray nuclear weapons as just another offensive weapon that, because of its potential usability, must be defended against according to the traditional

² A term used by Avner Cohen, "Reflections on Realism in the Nuclear Age," in Kipnis and Meyers, op.cit., p.220.

dictates of offense and defense, and war and security in a world of sovereign states. For my part, I would argue that strategic defenses are anachronistic before their time, as they attempt to perpetuate political conditions (war as a rational policy of the state) which have been superceded by technological developments. Those conditions are the dictates of the state-centered doctrines of realism. As Avner Cohen has argued,

deterrence is morally abhorrent because nuclear weapons undermine and threaten the very motivation that makes Hobbesian realism plausible - survival. Nuclear deterrence pushes Hobbesian realism to its ultimate limits, to the point of becoming incoherent.

This is what it means to seek a "technological fix" to a political problem, for rather than accepting the technological conditions as a given, the political conditions of realism are accepted as a given and an attempt is made to transfix the problem by a change in technology. The next chapter will hopefully reveal, however, that such attempts are indicative of an insufficient understanding of the conditions of the "technological reality" (to use George Grant's expression) which gave rise to nuclear deterrence, and thus do not in fact represent an appropriate rejection or a change of the techno-political problematic.

⁴⁸ Avner Cohen, op.cit., p.232.

Conclusion

On the basis of this analysis, I would conclude that the use of a perfect strategic defense system would constitute a morally permissible, and, perhaps even stronger, a morally obligatory response to an attack by ballistic nuclear missiles. The second and paradoxical conclusion, however, is that the deployment of such a system would constitute a morally permissible response to nuclear deterrence only if it was accompanied by nuclear disarmament by the possessor of the defensive system. In the absence of the (unlikely) abandonment of offensive weapons systems, even a perfect strategic defense would not give its possessor the moral advantage of a strategic posture that was purely (and therefore morally justifiably) defensive in character. As such, whatever moral benefits that may be derived from a "pure defense principle" would not and could not be accrued by the possessor of a perfect defensive system without the dismantling of its offensive nuclear forces.

While a perfect defensive shield can therefore in principle constitute a morally permissible response to nuclear deterrence (and thus the Reagan vision as originally conceived is sound), it cannot in any version attain the stronger character of a moral obligation. The possibility of other means of nuclear delivery would still remain, as would the spectre of ever new technologies to

subvert the new defenses and create new threats, so that even a perfect shield that was magically put in place 'ex nihilo' would not be without problems. This conclusion runs counter to a rather intuitive belief among supporters and detractors of strategic defenses alike that

if it were possible to put in place overnight a fully effective, invulnerable defense against nuclear weapons, there could hardly be serious objections to doing this.

A less-than-perfect defensive system, designed not as a replacement but as an adjunct to the present system of nuclear deterrence, would have few if any morally redeeming features. The moral appeal of such a system derives from the supposed moral superiority of "saving lives", as well as from the claim that it is a moral obligation to defend one's country. Of the former, it surely is the case that, all other things being equal, it is morally preferable to save lives than not to save them. Thus, if a nuclear attack occurred, it would surely be preferable to disarm the opponent's missiles and thereby save perhaps millions of innocent civilians. All other things may not be equal, however, for the best way to "save lives" is to prevent an attack from occurring in the first place. It is surely to misunderstand and misconstrue the notion of "self-defense" if one would choose a strategic defense system for its ability to save

⁴ As stated by the Union of Concerned Scientists, Space-Based Missile Defense (Cambridge, Mass.: Union of Concerned Scientists, 1984): p.71.

lives in case of attack if it in fact increases the chance of that attack occurring at all. It is thus that an equivocal usage of the term "defense" is responsible for much of the moral obfuscation regarding strategic defenses.

But could not such a system in fact make nuclear deterrence more stable, and thereby reduce the risk of a nuclear catastrophe? I have suggested, following the arguments of Charles Glaser, that the opposite would in fact be more likely the case. In any case, moral analysis is not particularly well equipped to render judgment on such matters. What is of utmost moral importance, however, are the following two considerations. First, a less-than-perfect defensive shield, including one designed merely to defend the U.S. against accidental or third country attacks, would do nothing to remove the moral problem for the United States, which is the murderous threat it poses for Soviet civilians (and vice versa). Rather, it was found that strategic defenses are imbued with moral language only in an effort to inject the state-maintained risk of nuclear catastrophe with morally justifiable aspects. The way in which a relegitimization of the political authority is sought is through an appeal to the traditional realm occupied by the concept of justifiable self-defense. I would argue, however, that the 'sui generis' nature of nuclear weapons has carried

with it a novel moral context that is resistant to traditional notions of the morally appropriate conduct of war and self-defense as undertaken by churchly or state authorities. Thus, whereas I have utilized in this chapter the past categories of thought by which such conduct was morally justified, namely the concepts of just war theory, those concepts have revealed themselves as insufficient to the task imposed by the nuclear age. While the use of those concepts helps to provide some precision to a moral approach to strategic defenses, they could not provide the moral bridge for the political authority as they have in the past. This is due to the novel character of "defense" in an interlocking system of mutual threat, which belies attempts to unilaterally transfix the offensive-defensive equation in one's own favour.

Second, it is not a quantitative calculation of the degree of risk that is of primary importance to the moral thinker (it is for the strategist and politician), but rather a qualitative assessment of the kinds of risk involved in matters such as strategic defenses. Thus, while outlining the possible effects the deployment of strategic defenses could have on the risks of a nuclear war occurring, I have not deemed it necessary to engage in a lengthy judgment on whether or not strategic defenses would in fact increase the risk of nuclear war, as many

are wont to do. While such factors do have an effect on a final moral judgment, moral thought is not particularly well-suited to provide unique guidance in such calculations.

How do we assess this relationship between risks and morality? We all take risks in our daily lives, for example driving on a busy highway. In one way or another, however, we deal with and accept varying amounts of risk in our actions. It is quite another matter, however, to have someone put you at risk without your approval, or even without you knowing. Such is the moral discomforture present in nuclear deterrence. However, not only are the individual citizens of the United States subjected to an uncertain amount of risk, but all of humanity.

I posed a question in the first chapter to which it is now appropriate to return: are the survival and freedom of the state to be ensured at the risk of nuclear war, or are the survival and freedom of the state to be risked to avoid nuclear war? It is clear how strategic defenses answer the question. If we understand morality as a hierarchy of worth, that is, what it is that is to be most highly valued, it is apparent that a policy choice of strategic defenses reflects a preference of national priorities over those of humanity as a whole. The risks to humanity are judged to be worth taking in the name of preserving and affirming existing political conditions.

Even if the risks involved are confidently judged as "manageable", those risks are taken. For some, this taking of risk represents the potential for infinite loss, and is unacceptable no matter how low the probability of nuclear catastrophe is judged to be. In any case, strategic defenses represent primarily an affirmation of the authority of the state, with secondary consideration to the interests of humanity. It is in this sense that strategic defenses fail to provide a morally acceptable response to nuclear deterrence.

* The theme of risks and morality will be pursued in detail in the next chapter in the context of the scientist's / technologist's moral deliberations regarding his or her role in the technological process.

Chapter III

If only the earth lasts for us; and if it does not last, it is no matter.

Friederich Nietzsche, On the Uses and Disadvantages of History

The worst thing we can do is to try to make our saving practices explicit in our attempt to preserve them. To strengthen what remains of our heritage we must resist the Platonic temptation to come here and make a list of our values, since that would just turn whatever still has a grip on us into more meaningless objects.

Hubert Dreyfus, "Knowledge and Human Values: A Genealogy of Nihilism"

Introduction

I have suggested in the preceding chapters that a moral analysis of strategic defenses, circumscribed within the parameters drawn by the traditional moral considerations given over to war, defence, and politics, is by itself insufficient as a method of interpreting the moral significance and meaning of the technological phenomenon in question. Part of the key to understanding why this is so lies within the moral vision of President Reagan himself. No longer is the enemy of the United States (and indeed of all people) solely defined as the political/military threat of the Soviet Union, but rather

in terms of the threat of nuclear war in general, and ballistic nuclear missiles in particular. We thus have the earnest plea by Reagan: "Isn't it worth every investment necessary to free the world from the threat of nuclear war?" And further:

I am directing a comprehensive and intensive effort to define a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles.

This dichotomization between the political and technological threats is by no means incidental. What it tells us is that technology itself has come to be seen as the threat that must be addressed. As such, the moral debate over strategic defenses becomes a technological one. The moral appeal of strategic defenses is not merely that such a technological system is "defensive" in character, but that it seeks to reassert the legitimacy of technology as a beneficent enterprise, to rescue technology from the bad name given it by nuclear weapons. As Reagan enjoined his people, "let us turn to the very strengths in technology that spawned our great industrial base and that have given us the quality of life we enjoy today."⁵¹ It is in view of this response to technology

⁵¹ From Reagan's March 23, 1983 speech. Quoted in Steven Miller, *op.cit.*, p.257-258.

⁵² Ibid, p.257. I owe the insight for this argument to Jeff Smith, "Reagan, Star Wars, and American Culture," Bulletin of the Atomic Scientists, 43:1 (January/February 1987):19-25.

that I hope to argue that the enemy of technology has become technology itself.

It is not surprising, then, that we find the moral deliberations of the scientist⁵³ are not restricted to questions of national interest and self-defense, but rather involve the moral appeal of the technological enterprise in itself. The scientist, like any other individual in society, likely ascribes to himself feelings of obligation at different levels: individual conscience, professional commitments, national duty, and the greater lot of humanity as a whole. These obligations may or may not at all times be compatible with one other. When they conflict - for example, when professional duties involve complicity in broader social acts with which one does not agree - one must attempt to arrive at a decision based upon those commitments that are most valued. In the case of strategic defenses, the scientist involved in research of relevant technologies may or may not agree that strategic defenses are in fact in the nation's best interests. If it is judged that they are in fact the proper response to defend the national interest, the scientist's research will involve little personal dilemmas. If, however, it is judged that strategic defenses are not in fact desirable, the scientist is put in a somewhat more awkward position,

⁵³ Although I will use the term "scientist" herein, it will become evident that "technologist" would be the more appropriate appellation.

for he may nevertheless feel compelled to continue research in the name of technological progress. (Or, he may draw guidance from a conviction that the moral appeal of a perfect defensive shield, as detailed in the previous chapter, constitutes a worthy motivation to pursue even the highly unlikely technological feat of a perfect ballistic missile defense.) What I want to explore in this chapter is the meaning of the implicit commitment to technological progress as an authoritative practice that for the most part goes unquestioned. It is in the spirit of this unquestioned commitment that we have the frequently sounded contention that

Critics and supporters alike now recognize that the central question concerns the kind of research and development program we should be conducting. Virtually no one on either side of the issue, here or among our allies, contests the need for research on technologies that might contribute to a defense against ballistic missiles.

In this chapter, I will elucidate the moral argument of technology, in general and as it appears in the context of strategic defenses. I will then proceed with an exegesis of the meaning and implications of the "need for research" arguments in an attempt to elucidate the relationship between technology and morality.

⁴ Fred Hoffman, "The SDI in U.S. Nuclear Strategy," in Stephen Miller and Steven Van Evera, op.cit., p.3.

I The Moral Appeal of Technology: Strategic Defenses Considered

The moral argument for technology begins with the claim that the scientific enterprise is simply the honest quest and dissemination of disinterested truth. This "Sapere aude!"⁵⁵ tradition received its initial and lasting articulation with the Galilean imperative of the Enlightenment, which claimed the right to challenge dogma and seek the truth about nature and the universe. Seen as an unfettered intellectual activity, this ideal of science bade all to

explore every domain, unravel every mystery, penetrate every unknown, explain every process. Consider not the cost, abide no interference, in the holy pursuit of truth.

Implicit in such claims is a belief in the absolute utility of knowledge as a force for human progress, the betterment of the human condition. Thus conceived as a "vital, intrinsic spiritual value"⁵⁶ unto itself, science

⁵⁵ Or "Dare to know!" as Kant characterized the spirit of the Enlightenment. See Carl Mitcham, "Responsibility and Technology: The Expanding Relationship," in Paul Durbin, (ed.) Technology and Responsibility, (D.Reidel: 1987): p.9. See also Dominique Dubarle, "On the Relations Between Science and the State," in Morton Grodzins and Eugene Rabinowitch, (eds.), The Atomic Age: Scientists in National and World Affairs (Basic Books, 1963).

⁵⁶ See Robert Sinsheimer, "The Galilean Imperative," in John Richards, (ed.) Recombinant DNA: Science, Ethics, and Politics (New York: Academic Press, 1978): p.30.

⁵⁷ Dubarle, op.cit., p.390.

demands the primary loyalty of the scientist to the pursuit of truth uncorrupted by the dictates of religions or political ideologies. Concomitant with this belief was a determination that it was not up to the scientist to decide what to do with the practical results of his inquiry, but that such decisions lay within the realm of the political leaders of society.

In the aftermath of World War II, and following the creation of nuclear weapons, a second tradition has developed which holds that the scientist's responsibilities as a member of society must take precedence over his obligations to the scientific enterprise. As recorded in fora such as the Bulletin of the Atomic Scientists and the Pugwash Movement, the representatives of this new tradition have attempted to retrieve the legitimacy of the scientific enterprise from the realization that unbridled scientific and technological inquiry is not necessarily a positive force in human affairs.⁵⁸ That debate - between the freedom of unfettered scientific inquiry and the control implied by social responsibility - has by no means been settled, and

⁵⁸ For articulations of both points of view during the atomic debate, see Herbert York, The Advisors: Oppenheimer, Teller, and the Superbomb (W.H. Freeman: 1976); Robert Gilpin, American Scientists and Nuclear Weapons Policy (Princeton: Princeton University Press, 1962); Morton Grodzins and Eugene Rabinowitch, op.cit.; and Heinar Kippar dt, In the Matter of J. Robert Oppenheimer (Hill and Wang, 1964).

has taken a very familiar shape during the course of the life of strategic defenses.

Echoing the statement by Hoffman above, but in terms which more explicitly reveal their intellectual debt, we find the position that research on strategic defenses must proceed because "we would be unfaithful to the tradition of Western civilization if we shied away from exploring what man can accomplish, if we failed to increase man's control over nature."⁵⁹ Continuing the logic of technology, it is claimed that

When a scientist has learned what he can learn and built what he can build, his work is not yet done. He must also explain in clear and simple terms what he has found and what he has constructed. And there his responsibility as a scientist ends. The decision on how to use the results of his science is not his. The right and duty to make such decisions belong to the people.

I will not pursue to any length the political question of a scientist's role in the decisions regarding what to do with the results of his inquiry. I will state, however, that the above appeals have lost all credibility due to the exaggerated claims of their author regarding his explanations of what has been found and constructed with respect to strategic defense technologies.⁶¹ While

⁵⁹ Edward Teller, Better a Shield Than a Sword (New York: Free Press, 1987): p.84.

⁶⁰ Ibid, p.234.

⁶¹ See Deborah Blum, "Weird Science: Livermore's X-Ray Laser Flap," Bulletin of the Atomic Scientists, vol.44, no.6 (July/August 1988): pp.7-13.

those questions are undeniably important, what is of more concern for the purposes of this study are the implications of the first sentence in the above quotation.

II Knowledge and Technology

To begin, it is imperative that one is clear on what is meant by the terms "science" and "technology", for it is equivocal usage of these terms that contributes to much obfuscation. Despite claims to the contrary, it would be a mistake to presume unquestioningly that what is being exalted by the advocates of "pure science" is merely the innocuous data of pure knowledge. What is in fact the object of such espousal is better understood as technology. Much of "pure" or "theoretical" science as it is done today is made possible only with technological instruments that facilitate experimentation, and thus confer the ability to confirm theory. The knowledge that is sought becomes indelibly bound to what can be done technologically. Our "scientific knowledge" of sub-atomic particles or the planets, for example, is only accessible through the grace of technology.

See Tom Darby, "Reflections on Technology: An Excursus as Introduction," in Darby, (ed.) Sojourns in the New World (Ottawa: Carleton University Press, 1986): 18-19; and Hans Jonas, "Straddling the Boundaries of Theory and Practice," in John Richards, (ed.) Recombinant DNA:

As such, the act of knowing is also an act of making and doing, of creatively acting. In the words of George Grant,

our activities of knowing and making have been brought together in a way which does not allow the once-clear distinguishing of them. In fact, the coining of the word 'technology' catches the novelty of that co-penetration of knowing and making. It also implies that we have brought the sciences and the arts into a new unity in our will to be masters of the earth and beyond.

The modern merging of theory and practice, the development of the cognitive operation as an originaive making,⁶⁴ collapses the kind of radical freedom of inquiry claimed by the "disinterested" scientist, for that inquiry is no longer clearly divorced from action. It is clear that what is being extolled in statements such as those by Teller and others is not merely science as an end unto itself, but technology. It is in this respect that the modern scientist is more appropriately called a technologist, for he is no longer merely a man of contemplation, but has become a man of action.

Thus, what is implied in the pursuit of unlimited technological progress is a claim for the goodness of technology as an end itself (and not simply theoretical science). This claim subverts the traditional

Science, Ethics, and Politics (New York: Academic Press, 1978): 253-271.

⁶³ George Grant, "Thinking About Technology," in Technology and Justice (Toronto: Anansi, 1986): p.12.

⁶⁴ Jonas, op.cit., p.269.

understanding of technology as a mere instrument to an end. This reversal of the means-ends relationship as it traditionally has been understood reveals the truth of the observation that modern technology may in fact not be "aimed at searching for means to concretely wanted ends, but for means that can be used for any end whatsoever."⁶⁵ This is indeed what is implied in the attitude of those who would assert the "need" to continue research in a project that is deemed undesirable for the political end for which it was originally devised. As such, technology itself is appealed to, and assumes a moral quality as it becomes the authoritative practice that is judged more worthy as a standard of action than the distracting subjectivisms of politics, religion, philosophy, and the like. If we probe more deeply along these lines, we can discern even more about our present condition and the role of strategic defenses in coping with that condition.

III Control and Risk: The Past and Action

At the core of the technological ethos is the quest for mastery over human and non-human nature, the desire to conquer chance, to control and even eliminate the contingent in human affairs. The phenomenon of strategic

⁶⁵ T.Maarten T.Coolen, "Philosophical Anthropology and the Problem of Responsibility in Technology," in Durbin, op.cit., p.47.

defenses is a paragon of this impulse, and an understanding of this helps to clarify for us where strategic defenses have come from, and where they are likely to lead.

As we have seen in the preceding chapter, strategic defenses represent a response to a crisis brought about by the creation of nuclear weapons. Simply put, the advocates of strategic defenses do not resign to the fate of having to live with nuclear weapons. What is unacceptable with nuclear weapons is the lack of control which their existence has wrought. It has become a familiar argument that nuclear weapons have helped to "keep the peace" since the Second World War. Implied in that argument is a satisfaction that nuclear weapons are "good" in that they have actually served to constrain the Hobbesian proclivity of man to war: that they have in fact controlled a contingency of human affairs which man can no longer afford. Contrary to such a belief, however, is the perception that such constraining of human behaviour is not enough; that there is not an adequate guarantee that sufficient control can be maintained over nuclear weapons into the indefinite future. The genesis of such worries is the tremendous uncertainty embodied in nuclear weapons: a risk of destruction so great that it belies our best efforts to put on a face of nominal control.

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It has been argued that is it precisely this tremendous unpredictability embodied in nuclear weapons that is the "emergent" feature of the nuclear era.⁶⁵ The Clausewitzian notion of the "fog of war" has been brought to a novel level with the uncertainties involved in crossing the nuclear threshold. Strategic defenses are preeminently technological in the sense that they seek to retrieve for international politics an element of control that has been lost. It is of more than passing interest to observe that the chief means by which strategic defenses are purported to do this is to actually increase the uncertainties involved in the strategic equation. The most persistent of the arguments in favour of strategic defenses is that the addition of an unknown factor - the effectiveness of a missile defense system - would further mitigate against the possibility of a nuclear attack by increasing the uncertainties of the attacker that the intended objectives of the attack could be reasonably calculated and achieved. That is, we should overcome the unbearable burden of chance by injecting even further uncertainties into the deterrent formula.

The impulse to be able to calculate and predict is thereby manifested in an effort to deny such calculability. What is forgotten in this impulse to

⁶⁵ See Avner Cohen, "Reflections on Realism in the Nuclear Age," op.cit., p.228.

control, however, are the concomitant dangers and risks that arise with the desire to control and the tremendous power employed in its service. While it is an open question whether more control would in fact be achieved, I would argue that the risks involved with nuclear weapons would in any case not be reduced in any meaningful sense. The reason is simply that risk is not merely a function of probabilities, but also of harm. If it is judged that risking a nuclear exchange of any degree would put into jeopardy the existence of mankind (and it cannot be denied outright that any exchange would not), and that such a possibility represents the potential for an infinite loss, then any probability or possibility of an exchange, no matter how small, is unacceptable.

To forge ahead in the face of such unknown effects is to place a greater faith in man's ability to control, a faith with which we arrived at our current condition, than in a fear of danger. This is what it means to be a technological creature.

It would be appropriate at this point to be explicit as to what "risks" may be involved in forging ahead with the mere research (and not deployment) of strategic defense technologies. Firstly, any significant and rapid breakthroughs could create new and profound pressures on the current deterrent situation, which would carry with it new dangers of nuclear catastrophe. These arguments have

been examined in greater detail in the previous chapter.

Secondly, advocates of research overlook the tremendous self-sustaining inertia generated by a technological innovation, both in terms of the human lobby that may accompany it, and also in terms of other technologies used to support that innovation or that are in turn spawned from it. With military technologies, it has become an all-too familiar scenario that systems designated as research programs, possibly to be used merely as bargaining chips in arms negotiations, engender a bureaucratic and industrial constituency which entrenches the system as a permanent technological fixture (at least until its obsolescence).

Thirdly, and at a more fundamental level, the push for research opens a wide door for new possibilities of choice which will accompany any new technological system, and indeed which will grow out of the synergy of independent systems. If such innovation has created novel moral contexts in the past and present, the dilemmas of which we have by no means resolved, we can only expect (although not predict) more moral choices to arise in the future.

IV Technology and Nihilism: The Morality of Efficiency

Proponents of uninhibited technological progress

invariably claim that theirs is a "value-free" or "value-neutral" activity. In this section, I hope to demonstrate that such claims are inherent in the nature of technology, yet for the most part are misconceived. The argument that technology is "value-free" essentially posits that technologies are mere instruments to be applied to ends that are determined external to that means itself. As a practical application of this view,

Acting responsibly with respect to technology then consists in engaging in a normative evaluation of the ends to the realization of which the means are applied, and subsequently, in utilizing these means for no other ends than those we take to be ethically justified.

There are several difficulties with the view that the value of the means derives solely from the value of its ostensible end. The author of the above statement has criticized such a stance as ignoring the occurrence of unintended consequences, that a technical means can be a means not only to its intended end, but also to unforeseen consequences. For Coolen, the ethical neutrality arguments dissolve with this recognition.⁶⁸

More fundamentally, however, it is clear that a commitment to technological progress is in itself a valuation of worth, a "value." That commitment is to the technological paradigm of knowledge, which has been called

⁶⁷ T.Maarten T.Coolen, op.cit., p.43.

⁶⁸ Ibid.

by Grant our "civilisational destiny."⁶⁹ As such, that commitment will itself determine what it is that is judged to be worthy of studying, of pursuing, of making. The very questions that we ask are the result of a commitment to a certain way of knowing and doing. Thus, the origins of various technologies themselves are not value-neutral, but rather are precipitated within the conditions of this "destiny."

Moreover, the effect of the development of a particular technology is far from benign. I would argue that the activity of choosing to present ourselves with the new choices offered by technology is anything but a disinterested and value-free activity. That choice in itself bespeaks of a commitment to unlimited technological "progress" as the overriding authority by which one decides to act. Nevertheless, it is this very "value-ladenness" of a commitment to the technological process which does in fact accrue a sense of "value-neutrality" (although different from the sense it is habitually understood), for such a commitment is utterly alien to what we understand as morality.⁷⁰ Technology so proclaimed becomes its own standard, and thus its own morality. What

⁶⁹ Grant, op.cit., p.21-22.

⁷⁰ On the utter difference between morality and technology, see Peter Emberely, op.cit., and also in "Technology, Values and Nihilism," Science, Technology and Politics, vol.3, no.1 (1988): pp.41-58.

is of fundamental importance, however, is an understanding that a technological commitment is not like other contemporary commitments to "values", for such commitments are presaged by technology and cannot stand up to its logic. In destroying the tenability of all other "value" commitments, technology leaves only itself in its place. It is in this sense that technology is utterly nihilistic.

The emergence of technological "progress" as the authoritative standard which produces commitment is inherent in the 'logos' of modern technology itself, and is manifested in the sole standard to which technology is subject (or better, perhaps, by which technology measures itself): efficiency. Technology is by its nature a self-referring process whose worth is judged according to the relationship of its means to ostensible ends: efficiency. As we have encountered in the claims for technological progress for its own sake, that means-ends relationship becomes blurred. Under the relentless logic of utilitarian reasoning, wherein everything is evaluated according to its use, every attained end simply and immediately becomes another means to yet another end. In this way, technology justifies itself through the innovations understood as "progress", for the

continual readjustment of means provides for the 'telos', the purpose or end of technology. Thus not only are means self-adjusted but ends are also self-adjusted to

become more identical with means."¹

It is this self-referring, self-adjusting process which we understand as innovation. Indeed, what in fact occurs with the commitment to innovation is that the most efficient arrangement conceivable is attained, for the most direct means-ends relationship (that is, the most efficient) is one in which there is the least difference in the causal relationship between means and ends. That is, the means becomes the most efficient means because it becomes the end itself. This coalescence of means and ends is pure efficiency, and thus the internal standard of technology becomes realized under the aegis of "progress". Having become an end unto itself, the 'logos' of technology is in full command. The logic of efficiency admits of no external standards - no limits - but the limitlessness offered by continual innovation: the realm of utter possibility. The very nature of modern technology therefore is nihilistic. Furthermore, the argument for "progress" itself is revealed as nothing less than an efficient way to justify the technological enterprise.

Of what importance is this for our understanding of strategic defenses? The commitment to "progress" - which has been shown to be an argument for efficiency - denies the restrictions imposed by external limits to

¹ Tom Darby, op.cit., p.7

technological innovation. And limitlessness implies nihilism. Nihilism is the loss of any commitment to authority (standards, ends or limits) which imparts meaning to the world, and thereby governs our conduct. Technology, the harbinger of nihilism in the modern world, allows a rueful transformation of the nihilistic dictum that "everything is permitted" into a praxis of "everything therefore will and must be done." This is so because technology presents us with the ultimate means by which we can bore our way through the realm of the possible that has been opened up by the questioning of what were previously authoritative ends. It is thus that we have imperative statements that research on strategic defenses is a "need", that it "must" be done, and there is little questioning of whether it should and will be done. As Caspar Weinberger has noted, "the debate in Congress is not whether the United States should work on strategic defense technologies, but how vigorously."¹² Furthermore, we are led to ask who are the greatest beneficiaries of the fulfillment of this "need". Perhaps it is those who have invested the most in this activity.

The active nihilist is one who lives by his actions; he is one who acts and is conscious of his acting. To act is to unleash a process, the ultimate results of which

¹² Caspar Weinberger, "Why Offense Needs Defense," in Douglas Lackey, Ethics and Strategic Defense (Belmont, CA: Wadsworth, 1989): 58.

cannot possibly be foretold. In acting we wage and encounter risk. This is why, especially in our age of high stakes, the active nihilist, fully conscious of the meaning of his actions, is likely to be moderate. The technologist, then, if he is fully aware of the nature of his activity, is reckless and foolish if he is willing to wage the risk that the effects of strategic defenses may not be beneficial. Rather than deny ourselves the possibility of future choices, he deems it courageous to face the possible. From this one must conclude that if the technologist assumes that technology can be 'applied' to 'values' external to technology itself, then he is simply ignorant of the nature and meaning of what he applies. If, however, he should understand the meaning of his 'tool' and is still willing to take the risk, then he is gambling with the highest of stakes.

It is light of these reflections that the statement quoted earlier, "when a scientist has learned what he can learn and built what he can build" takes on particular significance. The unquestioned and continued pursuit of technological research is not "pure research" as previously understood, but is indeed a nihilistic form of action. Claiming that we can think everything is not the same as asserting that we can do everything. And it is certainly not the same as declaring that we must do everything. To not understand this is indeed to live

dangerously.

V The Ontology of Technology: The Future and Choice

It is on this note that we can uncover the significance of strategic defenses as an example of technological optimism. An inquiry into the optimism and pessimism of the technological process reveals much about what we think about ourselves and technology. The last section intimated that the choice of unbridled technological progress is an inherently future-oriented activity. To be brief, it implies a confidence in mankind's ability to cope with any possible future choices that he is presented with as they arise out of ever new technological possibilities. I will return to this theme of the future at a later point. For the moment, however, we shall look at the role of the past and the present.

The impulse to technologically supercede nuclear deterrence by strategic defenses is grounded in part within the dissatisfaction of the long-term reliability of the present situation of nuclear deterrence. If there was absolutely no reason to doubt that the presence of nuclear weapons will forever prevent their use, there would be none of the feeling of helplessness or at least indeterminacy that gives rise to the technological attempt to escape deterrence. Whether due to fears of human

fallibility (as I would suspect is the case) or technical malfunction, strategic defenses are born of a lack of adequate certainty in the ability of man to control his own creations. In this regard, strategic defenses originate in a certain pessimism regarding mankind's ability to adapt adequately to his novel technological environment. With this observation, one may readily perceive how inappropriate a response strategic defenses are to the problem of nuclear weapons, and how they betray their own rationale. Simply put, if the problem is one of pessimism regarding mankind's ability to control the power of his making, it is difficult indeed to see how the addition of yet more power addresses the problem at all.

At the same time, one can also see how strategic defenses are the expected response: in the face of uncertainty and lack of control, the only response that the technological animal can countenance is to seek to attain that very control which eludes him. The full significance of this is that while the supporter of research in strategic defenses believes he is rejecting the principles which led to and sustain the existence of nuclear deterrence, he is in fact embracing them, unwittingly but wholeheartedly. To explain, there is in one sense a refusal to accept the givenness of the past into the present; that is, living with nuclear weapons is not affirmed as a situation to which we are to resign

ourselves. To do so would be to affirm the principles upon whose unfolding we arrived where we are in the present. On the other hand, we all know too well that we cannot change the past, a realization made all-too familiar with the dictum that we cannot disinvent nuclear weapons. What, then, does it mean to deny the past?

In reflecting upon the significance of the fact that "the meaning of the past is not completed until the present,"³ Gary Stahl has grasped the meaning of nuclear weapons in shaping the moral world in which we live. He states:

The present policy of nuclear deterrence is taken as a particular act, the proposal of a rule of action that is the principled denial of the possibility of a moral world: our acts of beginning omnicide thus - as exemplar - invite other actions to follow a principle that contradicts the possibility of sustaining and advancing that world of moral space and time without which man as agent cannot exist. Thus omnicide is not only the threat of future disaster, but the presence of a distortion already begun: as we "remember" that possible future, we degrade this actual present.

Thus, to not reject the present situation of nuclear deterrence (strategic defense advocates do reject it) becomes an insidious acquiescence to technology. As he continues, we see that acceptance of the past in our present is fraught with more meaning than we might suppose:

³ Gary Stahl, "Remembering the Future," in Avner Cohen and Steven Lee, (eds.) Nuclear Weapons and the Future of Humanity (Crowman and Allanheld, 1986): p.105.

⁴ Ibid, p.106.

This is the sense in which the beginning act of omnicide is poisonous. As an act at the shifting point of the present, it is the power to accept or reject the invitation of the past, and to offer itself as an exemplar to the future. As such, it rejects those acts of the past that affirmed the dignity of man; it invites us to organize the future on a principle that holds the existence of man hostage to the sovereign interests of nation states, and ultimately rejects the dignity of human existence as a matter of principle.

In not accepting that the current situation with nuclear weapons is the best world that we could be in, advocates of further research in strategic defenses are not submitting to the "naked worship of the actual," to use Nietzsche's phrase. More profoundly, however, such technologists do not go far enough in their rejection of the principles which have led to the modern condition, because the underlying principle is the will-to-technology itself. It is in this spirit, I believe, that it has been observed that

It may be too much to claim (as it would be too much for any historical phenomenon) that genocide and omnicide are inevitable outcomes or accompaniments of the technological ideal. But they are unquestionably consistent with that ideal; in the ways I have suggested, they epitomize it.

As with nuclear weapons, so it is with strategic defenses that the technological ideal is epitomized and perpetuated.

It may seem to make little sense to critically

⁵ Ibid, p.109.

⁶ Berel Lang, "Genocide and Omnicide: Technology at the Limits," in Avner Cohen and Steven Lee, op.cit., p.127.

isolate the technological impulse on the one hand, while on the other describing it as a "destiny." It would seem that there would be little scope left for alternative action if this is indeed the case. The argument, however, is not that the technological ideal is the only possible way by which men act and think. The danger is that it will accrue a certain and increasing normalcy which enlarges "into a rejection of the concept of purpose or value altogether."⁷⁷ If it goes unquestioned, such unthinking perpetuation condemns mankind to the vagaries of a future conditioned by the unlimited possibilities of technological "progress."

What such a commitment to unlimited "progress" in technology in turn presupposes is indeed a certain kind of optimism; namely, that technology is a force for human progress insofar as it forces mankind to come to terms with new situations, and thereby to grow as a being in the process of maturation to ever new contexts. In this sense, I suppose that even nuclear weapons would be judged as a "progressive" development in that they have provided the needed impetus to force mankind to come to terms with his historical proclivity to war.⁷⁸ How indeed would one answer the awkward (and perhaps impossible) question: do

⁷⁷ Ibid, p.127.

⁷⁸ For a revealing expression of such a view, see Edward Teller's views as adapted by Heinar Kipphardt, op.cit., p.95.

we regret the bringing of nuclear weapons into our world?

In the eyes of such optimists, those who regret and resent the creation of nuclear weapons will be judged in the future as primitive, or perhaps as mere cowards. To illustrate this point, we can turn to the myth of Prometheus, who was condemned to crucifixion in posterity because of the fears aroused in some by the new power of fire:

In their eyes, the destructive threat of fire outweighed all the blessings of controllable heat; and all the good that Prometheus had thought to bring the human race was apparently canceled out by the risks to which his discovery had exposed them... What brought the technology of fire under human control was a legal invention: the concept of "arson." The use of fire was safely naturalized into human life through the development of new institutions and public attitudes, by which the misuse of fire was stigmatized as antihuman and punished as a crime. And, if effective ways of controlling nuclear power have so far eluded us, that represents a failure of our institutional imaginations.

There is thus an implicit confidence in the ability of man to cope with his creations,

a faith in the resilience of our social institutions - in their capacity to contain the stress of change, and to adapt the knowledge gained by science - and the power inherent in that knowledge - to the benefit of man and society more than the detriment.

The gamble, therefore, is one of having the courage to meet unknown possibilities in the effort to secure technological benefits for mankind, or shrinking from the

³ Stephen Toulmin, "The Limits of Allegiance in a Nuclear Age," in Avner Cohen and Steven Lee, op.cit., p.365.

⁴ Robert Sinsheimer, op.cit., p.24.

challenge. The crucial question thus becomes: to what are we expected to get used to? Keeping foremost in our minds the fact that ever higher accretions of power accompany increases in technological capability, the motto for such optimists in the nuclear age might well be "adjust or dust."

Is such optimism really optimism at all? Is it a confidence in the ability of man to adjust in the future, or merely an endless affirmation of technology based upon an eternal dissatisfaction with the present? Countering the reproach of pessimism for those who counsel caution in such matters, Hans Jonas has offered the rebuttal that

the greater pessimism is on the side of those who consider the given (our humanity) to be so bad or worthless that every gamble for its possible improvement is defensible."

Dissatisfaction with our givenness in the world is coupled with an eschatological element to technology, an exaltation of the possible over the actual.⁶² But it is also an eternal eschatology, for it consists of the endless affirmation of technology. The power of possibility, driven by the logic of efficiency, thereby becomes the only standard -its own morality if you will- upon which action is based. Too irresistible to refuse,

⁶¹ Hans Jonas, The Imperative of Responsibility: In Search of an Ethics for the Technological Age (University of Chicago Press, 1984): p.34.

⁶² See George Grant, "Thinking About Technology," *op.cit.*, p.34.

mankind is driven to find out for himself the limits of his possibilities and capabilities. In that, he has no limits.

I would argue that the affirmation of progress unlimited contradicts what has been identified as a possible motive for strategic defenders: namely, that not enough certainty exists that man will in fact adjust adequately to nuclear weapons. If mankind is judged able to adjust to his technologies, there would seem little urgency in seeking a way to remove nuclear weapons from the hands of men. As such, the eternal affirmation of technology, personified by the drive for continued research in strategic defense technologies, represents not an optimism regarding mankind's abilities, but rather an unthinking embrace of a metaphysical and eschatological hope. By continuing the technological enterprise, it is hoped that the virginal legitimacy of technology lost with the creation and use of nuclear weapons can be regained, and that posterity will again be able to confirm the prescient wisdom of the contemporary dictum that technology on the whole is a progressive force for mankind.

Can one attempt to conclusively refute such a view? Such a position is tantamount to an embrace of faith. Yet, it is more. In its extreme, yet common forms, it is but a technological mysticism that preaches that man

cannot outdo himself. Considering the past record of human events, it would seem that caution tempered by pessimism is in order. Nevertheless, the record also shows that it is difficult to persuade the technological optimist (and especially the mystic) of the dangers shrouded in their visions of possibility. It may take nothing less than a catastrophe itself for them to see their wrongheadedness. Unfortunately, should their tardy enlightenment ever occur, no one may be around to celebrate.

Conclusion: Of Morality and Technology

Within this analysis, I have attempted to interpret the meaning of strategic defenses and the various arguments used to justify continued research in its technologies. In doing so, it has become apparent that the defining characteristics of nihilism as embodied in technology can be identified with the commitment to the innovative technological enterprise of strategic defenses. The legitimacy of the moral argument for technology has been shown to be predicated upon a dichotomy between thought and action which is alien to the contemporary technological process. Furthermore, a commitment to technology connotes the impossibility of morality, unless

that commitment itself is termed a "morality" in the sense that "progress" is deemed the most worthy standard of action. This "morality" has been disclosed to be nothing other than efficiency.

The "technological optimism" that serves as the genesis for such a commitment has been found to contradict the very rationale for strategic defenses; namely, a pessimism regarding mankind's ability to adequately control his own creations - nuclear weapons. Strategic defenses nevertheless are offered as a solution to the problem of technology- the technological fix - for they arise out of a dissatisfaction with the uncontrollable contingencies embodied in nuclear weapons, a novel level of uncertainty inimical to the technological desire to assert mastery and control over human affairs. The practical effect of the continual pursuit of control, and a faith in the beneficence of technology in providing for the means of its deliverance, is a concomitant rise of ever higher levels of power and risk.

Nevertheless, whereas I have sought in this chapter to elucidate the relationship between technology and morality, the moral dilemmas of the scientist have not been completely assuaged, for the possibility of a technological breakthrough cannot be dismissed as morally irrelevant. As a variant of the 'technology for its own sake' argument, we encounter the position that the pursuit

of technological research is worthy in view of the potential and unforeseen benefits that arise from technology. In the instance of strategic defenses, this usually takes the form of the possibility of industrial, commercial or perhaps even medical spin-offs that may be discovered through the research process. Furthermore, the moral desirability of a perfect defensive shield has not been dispensed with and remains a moral possibility.

The source of these moral dilemmas is the unpredictability inherent in the technological process. Indeed it is difficult to arrive at a complete moral judgment of an act when the ultimate consequences of that act remain unknown. The dilemma becomes acute in the realm of modern technologies, for they may be of such a large scale and have such profound effects. What moral principles, if any, can be of use in such a situation? The next and final chapter of this study will present the thoughts of two authors who have sought, in different ways, to accommodate some of these moral problems inherent in the technological process.

Chapter IV

The history of ethical values, it should come as no surprise, is closely related to the history of the possibility of action.

Berel Lang, "Genocide and Omnicide:
Technology at the Limits"

Introduction

To my knowledge, the speculative attempt to formulate an ethic unique to strategic defenses has not previously been forwarded. To move towards this task, the ideas of two authors will be presented. The first, Robert Goodin, has attempted to provide a decision making rule to accommodate the moral uncertainties of nuclear deterrence. The second, Hans Jonas, has sought to provide an ethical prescription for the technological age in a broader context. These two authors have been chosen because their ethical prescriptions correspond to the nature of the problem as defined herein. That is, they address the practical problem of how to act when faced with the possibility of unforeseeable and potentially disastrous consequences resulting from the technological process. They both differ significantly from the numerous utilitarian attempts to resolve the nuclear dilemma, all of which merely perpetuate the very problem which they need to address; namely, the inability to adequately deal

with the probability of differing outcomes when no rigorous estimates can be maintained.⁸³ After presenting the thoughts of these two authors, I will assess their appropriateness for the question of strategic defenses.

I Robert Goodin and Moral Certitude

In approaching nuclear deterrence from the standpoint of morality, Robert Goodin has argued that the probabilistic logic by which deterrence operates is entirely inappropriate for the circumstances. In his view, it is "sheer folly for us to predicate any profoundly important policy choices on such fallible subjective probability estimates"⁸⁴ as are involved in nuclear deterrence. The chief "probability estimate" of nuclear deterrence is the belief that by emphasizing the risks of nuclear war, the chances of it occurring are probably made less. That is, we take a "small risk of nuclear war" in hopes of "preventing an even larger risk

⁸³ See, for example, Gregory Kavka's "Disaster Avoidance Principle", in "Some Paradoxes of Deterrence," Journal of Philosophy 75:6 (1978): 285-302; and Douglas Lackey's "Minimax" strategy, in "Missiles and Morals: A Utilitarian Look at Nuclear Deterrence," Philosophy and Public Affairs 11 (1982): 189-231.

⁸⁴ Robert Goodin, "Disarmament as a Moral Certainty," Ethics 95:3 (April 1985): 644.

of nuclear war".⁸⁵ The problem for Goodin is that we have no idea what those risks are. Lacking objective statistics or well-validated scientific theories

where probabilities of nuclear war are concerned, we just do not know enough about the shape of the underlying distribution to justify employing any of the standard techniques for estimating probabilities. That we can have no reliable probability estimates is in itself quite enough to render probabilistic reasoning about such affairs wildly inappropriate.

In short, Goodin's argument against nuclear deterrence is that "it amounts to playing the odds without knowing the odds," which in his view "constitutes recklessness par excellence."⁸⁶

While Goodin recognizes the error of seeking certainties where none are available, he nevertheless argues that the limited quest for certainties with regard to ensuring against nuclear catastrophe are "eminently defensible."⁸⁷ Explaining why the search for such certainty is warranted, he states:

Where there is any risk of something infinitely awful happening, then probabilities simply do not matter. Just so long as that outcome is possible - so long as there is some nonzero probability of its happening - we must do whatever we can to avoid it. Infinite costs, discounted

⁸⁵ As he quotes the Harvard Nuclear Study Group in Living With Nuclear Weapons (Cambridge, Mass.: Harvard University Press, 1983): 15.

⁸⁶ Goodin, op.cit., p.643.

⁸⁷ Ibid.

⁸⁸ Ibid, p.642.

by any probability larger than zero, are still infinite."⁸⁹ The possibility of a nuclear war occurring, as you might expect, constitutes for Goodin a morally heinous event that warrants the quest for attempting to make it not merely improbable, but impossible.

Goodin thus introduces a method by which we should seek "changes in the possibility of nuclear war occurring rather than merely changes in its probability."⁹⁰ At the core of his method, which he calls "possibilistic" reasoning, is the conviction that what is important in "great matters" is not whether the moral outcome is made probable, but whether it is made possible, certain or impossible. Thus, there are four ways of changing possibilities:

- a) something previously impossible can be made possible;
- b) something previously merely possible can be made certain;
- c) something previously certain can be made merely possible; or
- d) something previously possible can be made impossible.

With respect to nuclear war, then, we should be concerned not with steps that may change the probability of it occurring, but rather with actions that make it

⁸⁹ Ibid, p.648.

⁹⁰ Ibid, p.656.

possible, impossible or certain. At this point in time, nuclear war has been made possible. For the present, then, we must be concerned with steps that may make sure it never becomes inevitable. Similarly, whoever might be presented with an opportunity to make nuclear war impossible should seize it.³¹

On the basis of this possibilistic reasoning, Goodin makes a case for the merits of nuclear disarmament in rendering all-out nuclear war impossible. While we need not pursue those arguments in detail here, the thrust of Goodin's analysis clearly has implications for strategic defenses. Do strategic defenses in fact represent an act designed to preclude the possibility of nuclear war? Or do they in fact represent a step in making nuclear war inevitable? If we can answer either question in the affirmative, the implications for the decision of individual agents become clear:

Just as the first is blamed for making the harmful outcome possible and the last for allowing it to become inevitable, intermediate agents are blamed for failing to take opportunities when they had them to make the harmful outcome impossible.

This means then, that

a moral agent should make morally desirable outcomes possible or certain (and morally undesirable ones impossible or uncertain) wherever he can; that a moral agent should open up as many possible paths to good outcomes (and close off as many possible paths to bad

³¹ Ibid, p.652.

³² Ibid, p.647.

ones) as he can.⁹¹

In analyzing Goodin's ethical prescription, it becomes apparent that it does not discriminate between positive and negative obligations: that is, it seems that an agent has an equal responsibility to open up possible paths to good outcomes as to close off paths to bad outcomes. So formulated, Goodin's rule therefore does not get us any further in discerning the merits of pursuing technological research in the hopes of securing material benefits for mankind. The committed technologist could draw support from Goodin's ethic in the belief that by facilitating technological progress, he will open as many possible paths to good outcomes as he can.

Goodin's formulation does, however, lend us some insight in rendering impotent the second type of technological argument; namely, that further research in strategic defense technologies is justified in the quest to attain the morally desirable perfect defensive system that would render nuclear war impossible. In analyzing this position, it becomes clear that if the moral imperative is to render an all-out nuclear war impossible, strategic defenses in and of themselves would prove inadequate to the task. As detailed in the previous chapters, strategic defenses are designed solely as a defense against certain forms of nuclear weapons, namely

⁹¹ Ibid, p.649.

ballistic missiles, and would have little effect on other means of delivering nuclear warheads. Should strategic defenses be accompanied by nuclear disarmament, however, the argument might very well hold. Nevertheless, the decisive act in such a scenario would be disarmament, not the deployment of strategic defenses. As a result, and according to the ethical rule of Goodin, the technologist involved in strategic defenses cannot draw support for his activities from the purported goal of strategic defenses of making nuclear war impossible. It is in this sense that Reagan's plea to "render nuclear weapons impotent and obsolete" is especially misleading, for the objective of strategic defenses is to nullify ballistic nuclear missiles, and not nuclear weapons as a whole.

Would strategic defenses have the opposite effect, that is, making nuclear war inevitable as opposed to merely possible? It is conceivable to imagine that the inventing, building and deploying of strategic defenses could in the hindsight of an imaginable future constitute steps that in fact made a nuclear war inevitable. However much elaboration and hypothesizing could be made on this point, I think the fact of the matter is that such designations of causal responsibility cannot be made at this point in time (if ever they are legitimately made), and thus it cannot be said on the basis of possibilistic reasoning whether the participation of a scientist today

in strategic defense research would in fact represent a morally intolerable act.

II Hans Jonas and the Heuristic of Fear

A different approach from the possibilistic consequentialism encountered in Robert Goodin is the deontological approach taken by Hans Jonas in attempting to accommodate the viscidities of the technological practice. The problem with modern technology, as Jonas sees it, is that the "qualitatively novel nature of certain of our actions has opened up a whole new dimension of ethical relevance for which there is no precedent in the standards and canons of traditional ethics."⁹⁴ The predictive knowledge of the consequences of technology "falls behind the technical knowledge that nourishes our power to act."⁹⁵ Not only is the gap between our power to act and our ability to foretell a novel moral problem, but the unprecedented nature of objects, the sheer magnitude, and the cumulative effects of the technological practice make the situation even more complex. As he states, the cumulative effects of cause-effect trains

keep adding themselves to one another, with the result that the situation for later subjects and their choices of action will be progressively different from

⁹⁴ Hans Jonas, The Imperative of Responsibility: In Search of an Ethics for the Technological Age. Chicago: University of Chicago Press, 1984): 1.

⁹⁵ Ibid, p.8.

that of the initial agent and ever more the fated product of what was done before.

In essence, then, Jonas recognizes the problems of ascribing moral responsibility to the technological practice when the ultimate consequences of one's actions cannot possibly be foretold. But it is precisely this ignorance that must become the basis of moral deliberation; to act otherwise is to commit oneself to the vagaries of an unending technological process. Thus, in matters which impinge upon the very nature and existence of mankind, Jonas accords the prevalence of the bad over the good prognosis, a prophecy of doom over that of hope. In the hit and miss of unknown experiments, we cannot afford a miss in great matters. Thus, Jonas posits the "heuristic of fear" which is based upon a knowledge of the possible: in his words, we must allow "more weight to threat than to promise and to avoid apocalyptic prospects even at the price of thereby perhaps missing eschatological fulfillments."⁹

On this point, Jonas and Goodin converge, for they both recognize the moral importance of avoiding the possible - the unknown - where it may be deleterious. Where they differ, however, is that Jonas takes the further deontological step necessary to deal head-on with

⁸⁶ Ibid, p.7.

⁹ Ibid, p.32.

the problem of unknown consequences. On this point Goodin must remain silent, however innovative his "possibilistic consequentialism" may be. His position is embedded with the utilitarian handicap of means-ends reasoning - a reasoning, or better yet, a calculation of the possibilities of the ultimate consequences of relationships of means with respect to various ends. It is upon this 'reasoning' that the utilitarian project rests. Goodin asks us to consider the best use of an action for an end - an argument for efficiency. He cannot answer, then, the ultimate question with which he must reckon: what is the use of use? Jonas, on the other hand, avoids the ultimate meaninglessness of the utilitarian and bids us to act according to the meaning of an action.

Jonas thus posits an ethical axiom which validates this rule of the bad prognosis over the good, and which goes as follows: "Never must the existence or essence of man as a whole be made a stake in the hazards of action."⁹⁸ Or, worded differently, "do not compromise the conditions for an indefinite continuation of humanity on earth."⁹⁹

What has emerged, then, is the deontological prohibition against risking mankind in the political or

⁹⁸ Ibid, p.37.

⁹⁹ Ibid, p.11.

technological realm of action. It is the thesis of this study that the moral rule never to put the fate of mankind as a whole at risk is an inevitable correlate of the scope and power of our capabilities of action. Moral thought in general arises out of our possibilities to act. We have the categorical "thou shalt not kill" as a moral prohibition because we have the ability to kill. One may argue whether it is to be resolutely followed in all contexts, and at all times, but one cannot argue the existence of the rule as a correlate of the possibility of action. Thus, if it is indeed all of humanity that has been brought under the scope of action with our modern technology, then it is not surprising that the accompanying ethical rule will have as its axiom the protection of mankind.

While this moral axiom, serving as it has as the presumption of this moral analysis, may seem intuitively valid, it has been by no means universally accepted as the definitive standard of moral action. Whereas Jefferson McMahan has arrived at a similar formulation in the context of nuclear deterrence, "that it is of utmost moral importance to ensure the existence of future generations,"¹⁰⁰ others have concluded differently. Joseph Nye, for example, has argued that

¹⁰⁰ Jefferson McMahan, *op.cit.*, p.331.

It does not follow from the fact that extinction is an unlimited consequence that even a tiny probability is intolerable and that our generation has no right to take risks.

Continuing his argument, Nye states that ascribing an absolute value to survival would constitute the "dictatorship of future generations" in the name of mere biological procreation. As Nye would justify the pursuit of other values such as freedom, he believes we could infer that future generations "might wish us to take some risks of species extinction in order to provide equal access" to values that give meaning to life.¹²²

I will not engage here in a lengthy defense of why I think the imperative of mankind's survival should prove definitive in a moral judgment, but rather present that moral maxim as one which the technologist must give some weight. What is of immediate importance, then, is the relationship of that ethic to strategic defenses. While Jonas himself indicates that this ethical principle is not designed primarily with nuclear weapons in mind (but rather technologies such as genetic manipulation, lifespan extension and so on), I think that it certainly has relevance with respect to strategic defenses and the moral deliberations of the scientist.

The immediate problem with applying this axiom to

¹²¹ Joseph Nye, *op.cit.*, p.64.

¹²² *Ibid*, p.65.

strategic defenses is that it is already somewhat anachronistic to state that those responsible for policy and technological choices in matters of nuclear deterrence should not wager the existence of mankind, for that threshold has already been crossed. To transpose Jonas' ethic to strategic defenses, then, would it be consistent with his thought to add the proviso that never must the existence or nature of mankind be further wagered as a hazard of action? That is, should we not engage in attempting to escape or fine-tune the current condition of nuclear deterrence, for we might very well be increasing the risk to mankind? To counter, however, it could be equally said that the decision to 'let things take care of themselves' is also an act that involves the risk of humanity.

Jonas' ethic was formulated to counsel against the view that the prospect of benefits to humanity from technology justifies the taking of risks: as he warns, "no gain is worth the price, no hope of gain justifies this risk [to humanity]." ¹⁰³ Thus, Jonas provides an effective counter to the argument that the possibility of technological benefits justifies continued research on strategic defense technologies. In Jonas' words, seeking to improve the givenness of our present in the name of progress stands "under the aegis of arrogance, rather than

¹⁰³ Ibid, p.33.

of necessity."¹⁰⁴ Technological projects that would involve risks to humanity could only be considered (and therefore, possibly justified) if they were undertaken in order to avoid an "ultimate evil", and not if they were done in the name of pursuing an "ultimate good". Nevertheless, strategic defenses do indeed present a curious twist to this warning of Jonas, for does not the attempt to escape the risks posed to mankind by nuclear weapons indeed represent the avoidance of an "ultimate evil" (nuclear catastrophe), rather than the pursuit of an "ultimate good", a mere hope of material gain?

Jonas' answer to such a question would likely be that to build upon the possibility of a technological breakthrough that would render strategic defenses workable is simply and utterly irresponsible.¹⁰⁵ In this sense, and if we adhere to the axiom that there be a mankind into the future, the ethical prescriptions of Jonas would seem to counsel against the pursuit of a technological answer to the moral problem of nuclear deterrence.

To return to a theme of the previous chapter, a danger of choosing the technological response to the problem of risk is that the taking of such technological risks would accrue a normalcy that denies legitimacy to the moral realm. Rather than rejecting the legitimacy of

¹⁰⁴ Ibid, p.36.

¹⁰⁵ Ibid, see p.121.

such risks, the technological response accepts the legitimacy of the past from which it arose and affirms itself into the future at the expense of morality.

Conclusion

In this chapter I have attempted to present the moral arguments for strategic defenses encountered in the indeterminacy of the technological process. The deontological prescription offered by Hans Jonas was found to provide a more satisfying and appropriate response to the moral dilemmas of the technologist. In general, it is for the same reasons that deontological reasoning is more appropriate as an approach to moral dilemmas. Deontological reasoning takes as its presumption the inability to adequately calculate and assess the ultimate consequences of a particular course of action, and the difficulties in ascribing moral responsibility under such conditions of uncertainty. A categorical moral prohibition of the deontological sort thus is an attempt to ground the standards of action in the meaning of an act, rather than in the consequences of the act itself. Indeed, this is the uniqueness of moral thought. It is what makes a thought moral. As stated at the outset of this study, it may be judged that the moral law may have to be violated in certain contexts according to the dictates of prudence. The point, however, is to be able

to recognize the full meaning of such derogations from morality. Moreover, it is to be able to tell if 'morality' is merely evoked as a justification while remaining embedded within the impulse toward usefulness. In both instances one may ask for whom an act is deemed useful.

In exploring the relationship between technology and morality in the context of strategic defenses, I have sought to make explicit the assumptions, beliefs, and commitments that must accompany such a project. It has been said that such a method, in itself, is nihilistic; that by making explicit whatever authorities man may entertain in the modern world, those authorities are revealed as just another set of 'values' to which man commits himself.¹⁰⁶

This is so because any 'value' may be chosen by anyone who so chooses to deem whatever 'value' useful, but no one can say for everyone which 'values' are of the most use to us all. Because of this, we are tempted to turn to the only authority available to us, the logic of efficiency, the best tool for rendering the greatest benefits for the most people. But even if we turn to the logic of efficiency as our only effective and authoritative standard, this standard, if the logic of

¹⁰⁶ See Hubert Dreyfus, "Knowledge and Human Values: A Genealogy of Nihilism," Teacher's College Record. 82:3 (Spring 1981): 507-520.

efficiency prevails, will in turn undermine itself. Since the logic of efficiency ultimately rests on the relation between means and ends, and the optimal efficiency is equivalent to ultimate usefulness, then the end of the logic of efficiency is utility - use. It is in this sense that technology, identified in the form of nuclear weapons as the "enemy" from which we are to be rescued, has become its own enemy.

Bibliography

- Ackland, Len and McGuire, Steven (eds.). Assessing the Nuclear Age. Educational Foundation for Nuclear Science, 1986.
- Bernardin, Joseph Cardinal. "Morality, Deterrence, and SDI: The Bishop's Challenge." Arms Control Today. 18:7 (September 1988): 12-16.
- Bethe, Hans. "The Ethical Responsibilities of Scientists." The Center Magazine. 16:5 (September/October 1983): 2-11.
- Blum, Deborah. "Weird Science: Livermore's X-Ray Laser Flap." Bulletin of the Atomic Scientists. 44:6 (July/August 1988): 7-13.
- Bobbitt, Philip Chase. "The Ethic of Nuclear Deterrence." In Kenneth Kipnis and Diana T. Meyers (eds.), Political Realism and International Morality: Ethics in the Nuclear Age: 109-121.
- Bridgman, P.W. "Scientists and Social Responsibility." Bulletin of the Atomic Scientists. 4:3 (March 1948): 69-72.
- Broad, William. Star Warriors. Simon and Schuster, 1985.
- Callahan, Daniel. "Ethical Prerequisites for Examining Biological Research: The Case of Recombinant DNA." In John Richards (ed.), Recombinant DNA: Science, Ethics, and Politics: 135-147.
- Carter, Ashton B. Directed Energy Missile Defense in Space. Washington, D.C.: U.S. Congress, Office of Technology Assessment, OTA-BP-26, April 1984.
- Childress, James F. "Just-War Theories: The Bases, Interrelations, Priorities, and Functions of Their Criteria." Theological Studies. 39:3 (September 1978): 427- 445.
- Cohen, Avner. "Reflections on Realism in the Nuclear Age." In Kenneth Kipnis and Diana T. Meyers (eds.), Political Realism and International Morality: Ethics in the Nuclear Age: 220- 238.

- Cohen, Avner, and Lee, Steven. Nuclear Weapons and the Future of Humanity: The Fundamental Questions. Rowman and Allanheld, 1986.
- Cohen, Marshall. "Moral Skepticism and International Relations." in Kenneth Kipnis and Diana T. Meyers (eds.), Political Realism and International Morality: Ethics in the Nuclear Age: 15-34.
- Cohn, Carol. "Nuclear Language and How We Learned to Pat the Bomb." Bulletin of the Atomic Scientists. 43:5 (June 1987): 17-24.
- Coolen, T.Maarten T. "Philosophical Anthropology and the Problem of Responsibility in Technology." In Paul Durbin, Technology and Responsibility: 41-65.
- Darby, Tom (ed.). Sojourns in the New World. Ottawa: Carleton University Press, 1986.
- Dreyfus, Hubert. "Knowledge and Human Values: A Genealogy of Nihilism." Teacher's College Record. 82:3 (Spring 1981): 507-520.
- Durbin, Paul (ed.). Technology and Responsibility. Dordrecht: D.Reidel, 1987.
- Dworkin, Gerald. "Nuclear Intentions." Ethics. Vol.95, no.3 (April 1985): 445-460.
- Elshtain, Jean Bethke. "Critical Reflections on Realism, Just Wars, and Feminism in a Nuclear Age." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 255-272.
- Emberley, Peter. "Technology, Values and Nihilism." Science, Technology and Politics. Vol.3, no.1 (1988): 41-58.
- Emberley, Peter. "Values and Technology: George Grant and our Present Possibilities." Canadian Journal of Political Science. Vol.21, no.3 (September 1988): 465-494.
- Finnis, John; Boyle, Joseph M. Jr.; and Grisez, Germain. Nuclear Deterrence, Morality and Realism. New York: Oxford University Press, 1987.
- Franck, James. "The Social Task of the Scientist." Bulletin of the Atomic Scientists. Vol.3, no.3 (March 1947): 70.

- Gilpin, Robert. American Scientists and Nuclear Weapons Policy. Princeton: Princeton University Press, 1962.
- Glaser, Charles. "Do We Want the Missile Defenses We Can Build?" International Security 10:1 (1985).
- Glaser, Charles. "Why Even Good Defenses May Be Bad." International Security 9:12 (Fall 1984).
- Goodin, Robert. "Nuclear Disarmament as a Moral Certainty." Ethics. Vol.95, no.3 (April 1985): 641-658.
- Grant, George. Technology and Empire. Toronto: Anansi: 1969.
- Grant, George. Technology and Justice. Toronto: Anansi, 1986.
- Gray, Colin. "Strategic Defense, Deterrence, and the Prospects for Peace." Ethics. 95:3 (April 1985): 659-672.
- Grodzins, Morton and Rabinowitch, Eugene (eds.). The Atomic Age: Scientists in National and World Affairs. New York: Basic Books, 1963.
- Hardin, Russell. "Deterrence and Moral Theory." In Kenneth Kipnis and Diana T. Meyers (eds.), Political Realism and International Morality: Ethics in the Nuclear Age: 35-60.
- Hardin, Russell. "Risking Armageddon." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 201-223.
- Hardin, Russell, and Mearsheimer, John. "Introduction." Ethics. 95:3 (April 1985): 411-423.
- Heidegger, Martin. "The Question Concerning Technology." Trans. William Lovitt, in The Question Concerning Technology. Harper & Row, 1977.
- Hoffman, Fred. "The SDI in U.S. Nuclear Strategy." In Steven Miller and Stephen Van Evera (eds.), The Star Wars Controversy: 3-14.
- Hottois, Gilbert. "Technoscience: Nihilistic Power Versus a New Ethical Consciousness." In Paul Durbin (ed.), Technology and Responsibility: 69-84.

- Jalbert, John. "Phenomenology and the Autonomy of Technology." In Paul Durbin (ed.), Technology and Responsibility: 85-98.
- Johnson, James Turner. Just War Tradition and the Restraint of War. Princeton: Princeton University Press, 1981.
- Jonas, Hans. "Straddling the Boundaries of Theory and Practice: Recombinant DNA Research as a Case of Action in the Process of Inquiry." In John Richards (ed.), Recombinant DNA: Science, Ethics, and Politics: 253-271.
- Jonas, Hans. "Technology and Responsibility: Reflections on the New Tasks of Ethics." Social Research. 40:1 (Spring 1973): 31-54.
- Jonas, Hans. The Imperative of Responsibility: In Search of an Ethics for the Technological Age. Chicago: University of Chicago Press, 1984.
- Jones, John, and Griesbach, Marc (eds.). Just War Theory in the Nuclear Age. Lanham, Md.: University Press of America, 1985.
- Kavka, Gregory. "A Critique of Pure Defense." Journal of Philosophy. 83:11 (November 1986): 625-633.
- Kavka, Gregory. "Morality and Nuclear Politics: Lessons of the Missile Crisis." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 233-254.
- Kavka, Gregory. "Some Paradoxes of Deterrence." Journal of Philosophy. 75:6 (June 1978): 285-302.
- Kavka, Gregory. "Space War Ethics." Ethics. 95:3 (April 1985): 673-691.
- Kipnis, Kenneth, and Myers, Diana T. Political Realism and International Morality: Ethics in the Nuclear Age. Boulder: Westview Press, 1987.
- Kipphardt, Heinar. In the Matter of J. Robert Oppenheimer. Hill & Wang, 1964.
- Lackey, Douglas. Ethics and Strategic Defense. Belmont, CA: Wadsworth, 1989.

- Lackey, Douglas. "Missiles and Morals: A Utilitarian Look at Nuclear Deterrence." Philosophy and Public Affairs 11 (1982): 189-231.
- Lackey, Douglas. Moral Principles and Nuclear Weapons. Totowa, N.J.: Rowman and Allanheld, 1984.
- Lackey, Douglas. "Moral Principles and Strategic Defense." The Philosophical Forum. 18:1 (Fall 1986): 1-7.
- Lackey, Douglas. "Taking Risk Seriously." Journal of Philosophy. 83:11 (November 1986): 633-640.
- Lackey, Douglas. "The Intentions of Deterrence." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 307-318.
- Lang, Berel. "Genocide and Omnicide: Technology at the Limits." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 115-130.
- Lapp, Ralph. The Weapons Culture. New York: W.W.Norton, 1968.
- Lautenschlager, Karl. "Controlling Military Technology." Ethics. 95:3 (April 1985): 692-711.
- Lee, Steven. "The Moral Vision of Strategic Defense." The Philosophical Forum. 18:1 (Fall 1986): 15-20.
- Lee, Steven. "Morality, the SDI, and Limited Nuclear War." Philosophy and Public Affairs. 17:1 (Winter 1988): 15-43.
- Margolis, Joseph. "The Peculiarities of Nuclear Thinking." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 153-168.
- McMahan, Jefferson. "A Note on 'Pure Defense.'" Journal of Philosophy. 83:11 (November 1986): 640-641.
- McMahan, Jefferson. "Nuclear Deterrence and Future Generations." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 319-329.
- Mitcham, Carl. "Responsibility and Technology: The Expanding Relationship." In Paul Durbin (ed.), Responsibility and Technology: 3-39.
- Moss, Norman. Men Who Play God: The Story of the H-Bomb and How the World Came to Live With It. Harper & Row, 1968.

- Nardin, Terry. "Commentary." In John Jones and Marc Griesbach (eds.), Just War Theory in the Nuclear Age: 128-132.
- Nardin, Terry. "Nuclear War and the Argument from Extremity." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 289-305.
- National Conference of Catholic Bishops. "The Challenge of Peace: God's Promise and Our Response." In Philip J. Murnion (ed.), Catholics and Nuclear War. New York: Crossroad: 1983, pp.245-338.
- Nye, Joseph. Nuclear Ethics. New York: Free Press, 1986.
- Pellegrino, Edmund D. "The Physician, Nuclear Warfare, and the Ethics of Medicine." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 341-358.
- Pitt, Joseph. "The Autonomy of Technology." In Paul Durbin (ed.), Technology and Responsibility: 99-114.
- Richards, John (ed.). Recombinant DNA: Science, Ethics, and Politics. New York: Academic Press, 1978.
- Richards, John. "The Limitations of Broad Moral Policies." In John Richards (ed.), Recombinant DNA: Science, Ethics, and Politics: 157-176.
- Shue, Henry. "Morality of Offense Determines Morality of Defense." The Philosophical Forum. 18:1 (Fall, 1986): 8-14.
- Sinsheimer, Robert. "The Galilean Imperative." In John Richards (ed.), Recombinant DNA: Science, Ethics, and Politics: 17-32.
- Smith, Jeff. "Reagan, Star Wars, and American Culture." Bulletin of the Atomic Scientists. 43:1 (January/February 1987): 19-25.
- Smith, Wilfred Cantwell. "Responsibility." In Eugene Combs (ed.), Modernity and Responsibility: Essays for George Grant. Toronto: University of Toronto Press, 1983: pp.74-84.
- Stahl, Gary. "Remembering the Future." In Avner Cohen and Steven Lee, Nuclear Weapons and the Future of Humanity, p.105-114.

- Teller, Edward. Better a Shield Than a Sword. New York: Free Press, 1987.
- Teller, Edward. "The Two Responsibilities of Scientists." in Ackland, Len and McGuire, Steven (eds.), Assessing the Nuclear Age: 121-124.
- Thompson, Kenneth W. "The Nuclear Problem: Response to the Bishop's Letter." In Kenneth W. Thompson (ed.), Ethics and International Relations. New York: Transaction, 1985: pp.59-73.
- Toulmin, Stephen. "The Limits of Allegiance in a Nuclear Age." In Avner Cohen and Steven Lee (eds.), Nuclear Weapons and the Future of Humanity: 359-372.
- Vanderburg, Willem. "Technique and Responsibility: Think Globally, Act Locally, According to Jacques Ellul." In Paul Durbin (ed.), Technology and Responsibility: 115-132.
- Walzer, Michael. Just and Unjust Wars. New York: Basic Books, 1977.
- Wasserstrom, Richard. "War, Nuclear War, and Nuclear Deterrence: Some Conceptual and Moral Issues." Ethics. 95:3 (April 1985): 424-444.
- Weiss, Paul. "The Message of Science." in Ackland, Len and McGuire, Steven (eds.), Assessing the Nuclear Age: 584-589.
- Werner, Richard. "The Immorality of Nuclear Deterrence." In Kenneth Kipnis and Diana T. Meyers (eds.), Political Realism and International Morality: Ethics in the Nuclear Age: 158-178.
- Wessen, Anthony, and Brown, Ronald. "Religion, Technology and Human Autonomy." In Paul Durbin (ed.), Technology and Responsibility: 243-257.
- Winner, Langdon. Autonomous Technology: Technics Out-of-Control as a Theme in Political Thought. Cambridge, Mass.: MIT Press, 1977.
- York, Herbert. The Advisors: Oppenheimer, Teller, and the Superbomb. W.H. Freeman & Co., 1976.
- Zuckerman, Lord. Star Wars in a Nuclear World. London: William Kimber, 1986.

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