

Introduction

“In Byzantium the man-in-the-street was able to discuss the Mysteries and the Reincarnation, the Essential Nature of Christ and the Trinity. Theology was a common topic in the theatre and at the work bench. Street loungers might argue about a passage in the New Testament or an article of faith.”¹

If we were to substitute “missile,” “first strike,” “payload,” and “stable deterrent” for the theological terms in this quotation, it might almost pass as a description of the United States. Surely at no time has a whole nation been so wrapped up in the details of military strategy as America is at the present moment. Popular magazines run articles on it, newspapers assign reporters to cover, intellectuals publish books about it, engineers grow wealthy from it, and as the missile-gap controversy demonstrated, a man can even run for president on it.

This current fascination with the theory of weaponry cannot be explained simply by pointing to the existence of powerful potential enemies who threaten our security. Our nation has faced such threats before, but one would hardly have found a public debate a century ago over, say, the relative merits of the cavalry charge and the standard sweep. It is not the attention to things military in general, so much as the prominence of the subject of strategy in particular, which distinguishes the past several years. Recently, it has seemed that considerations of military strategy which were formerly confined to general staff meetings and West Point classrooms have now come to dominate the making of American foreign policy.

Equally striking is the background and professional orientation of the strategical experts who have gained national prominence in this new era. Contrary to what one might expect, the discussion of military strategy is, by and large, conducted by civilians in civilian circles. The professional soldiers have if anything been laggard in learning up the new terms and mastering the ebb and flow of debate. If we

¹ Rene Guerdan, *Byzantium*, p. 49.

run down a list of the leading experts on the new strategy, we encounter scientists like Leo Szilard, P.M.S. Blackett, Herman Kahn, and Edward Teller; psychologists like Charles Osgood and Richard Snyder; political scientists like Henry Kissinger, Bernard Brodie, Glenn Snyder and Morton Kaplan; and economists such as Thomas Schelling, whose contributions are perhaps the most intellectually distinguished of the lot.

We are confronted with a double puzzle: Why is the United States so intensely involved in the details of formerly obscure specialty, namely military strategy? Any why, strangest of all, should the discussion be carried on primarily by non-military intellectuals who have in the past evinced not the slightest interest in the military or its problems? The answer lies in the three-fold revolution in military technology which has taken place since the closing months of the Second World War. This revolution has completely altered the role of military matters in the formulation of our foreign policy.

This first revolution is the million-fold increase in the destructiveness of the new fusion weapons known as H-bombs. The initial stage in the development of these apocalyptic instruments of war was the fission of A-bomb. Contrary to the impression created by the attacks on Hiroshima and Nagasaki, the A-bombs did not achieve an order of magnitude of destruction different from that of the great saturation bombing raids of World War II. The 20,000 tons equivalent of T.N.T. unleashed by the Hiroshima bomb was, to be sure, the largest single explosion ever produced by man. But a comparable effect had been produced on Hamburg and Tokyo by massed fire of T.N.T. raids carried out by thousands of planes. At the end of the war, therefore, it was still possible, although terrifying, to imagine yet another war fought with Hiroshima-style bombs.

With the invention of the Hydrogen bomb, however, a genuinely new era in military affairs was begun. This weapon made use of the basic nuclear process which produced the heat and light of the sun, viz. nuclear fusion. Heavy water nuclei were fused under tremendous heat to form helium. As a byproduct of the process, atomic particles were emitted at high energies, together with immense

quantities of heat. The hydrogen bomb turned out to make possible an explosion having the force-equivalent of millions, rather than thousands, of tons of T.N.T. As a deadly bonus, it was discovered in the Eniwitok tests of 1955 that ground bursts also created huge quantities of radioactive dust which, falling again to earth in pattern formed by the prevailing winds, might scatter death as much as two-hundred miles from the site of the explosion. For the first time, man had managed to produce an artificial force which rivaled in its power with the forces of nature.

The impact upon military and foreign policy of the invention of the H-bomb was rapid and profound. In a remarkably few years, men came to realize that they had improved their weapons beyond the limits of usability. A straightforward, old-fashioned, no-holds-barred war to the finish with H-bombs would result in mutual destruction. War in its familiar form had ceased to be a rational means of achieving the goals of national policy. If, in Clausewitz's classic definition, war had been "a mere continuation of policy by other means," then a conflict fought with hydrogen bombs could not be classed a war, but rather a suicidal reciprocal annihilation.

The second revolution in military affairs is the unceasing procession of technological innovations which march from the laboratories and drawing boards onto the launching pads. As Herman Kahn points out in the last section of On Thermonuclear War, the post-war era has already seen three complete weapons revolutions, and is scheduled to experience new ones at regular intervals of four to five years. The first was the invention of the A-bomb; the second the creation of the H-bomb; the third the development of the intercontinental ballistic missile with nuclear warhead; and the fourth, just completed, is the invention of hardened or invulnerable missile landing sites, capable of surviving nuclear attack.

The technological revolution has, in its way, produced as great an upheaval as the increase in explosive force. Military men are by nature traditionalists with a deep respect for the past and habit of reliance upon the experience of their predecessors. New weapons have always been resisted by the

solider, who views with justifiable suspicion the extravagant claims of the inventor. He knows in his bones what can and cannot be done with his trusty sword, crossbow, or tank, and he is loath to forego the weapon which has saved his life for some untried contraption which promises greater firepower or better protection.

This conservatism of weaponry is reflected also in the soldier's attitude toward strategy and tactics. For millennia, men have fought hard and valiantly with the aid of a few simple precepts and trusted maxims which, summed together, passed for a science of military strategy. "Employ the element of surprise," "always hold a portion of your troops in reserve," "never waste time or space," such was the wisdom distilled from reflection upon the great campaigns of history. The remainder, on which depended victory or defeat, was the incommunicable instinct bred of long experience on the field of battle. Clausewitz, the foremost theorist of military matters, wrote that "the principles of the art of war are in themselves extremely simple and quite within the reach of sound common sense...Extensive knowledge and deep learning are by no means necessary, nor are extraordinary intellectual faculties."²

The novelty of the nuclear warheads and delivery systems has rendered obsolete the experience painfully gathered by our military men in World War II and the Korean War. No one has ever seen an intercontinental ballistic missile fired in battle conditions. No city has suffered a hit from a hydrogen bomb. There is not a single general or admiral in the world who has commanded troops in battle armed with the weapons which today constitute the core of the Soviet and American armament.

In these circumstances, the generals have no alternative but to turn for advice to the physicists, mathematicians, and engineers who created the new weapons. However much the practical many may mistrust untested theory, there is no substitute in the absence of concrete experience. So in the conference room, scattered among the grim old soldiers with ramrod posture and bemedalled chests, appear the casual tweeds of the academic scientists.

² Von Clausewitz, On War, Chapter iv.

But the new technology will not hold still. Volatile as liquid fuel, it endlessly overtakes itself and rushes on to new discoveries. There comes about, finally, the ultimate in man's control of nature: planned invention. Breakthroughs are scheduled and budgeted; miracles are performed on order. And the generals, dependent upon an ever-newer weaponry, submit themselves to the wisdom of the scientists.

As the years go by, generation succeeding generation of untested weapons, a strange race begins to develop between the Soviet Union and the United States. It is not an arms race, as that term is ordinarily used – a race to build superiority of weapons of existing types (more ships, more guns, more tanks). Rather it is a technology race, in which the aim is to gain a lead in the discovery of new types of weapons.

In this race, the scientist plays a predominating role, for he alone can assess the feasibility of suggested weapons systems and estimate the lead time needed to bring the first operations models off the production lines. The complex interconnections of warhead, delivery, communications, and control systems requires the scientist to attend in his work to the broadest problems of strategy and tactics. Slowly, scientists are transformed into strategists. And who is saying them nay? Certainly not the generals, whose minds are taxed to the limit by the effort to comprehend the bare capabilities of the new weaponry.

If it is true, as some philosophers have claimed, that the means have value only in relation to their end, then the third revolution in military strategy takes precedence in importance over the first two. For where they concern the means- the weapons- by which the military pursues its goals, it concerns those very goals themselves.

The primary goal of the military has traditionally been defense- to deny the enemy access to one's territory, wealth, and population. History is filled with images of the valiant stand at the bridge, the invaders halted and the homeland saved. The airplane was the first weapon to challenge this

conception of the function of the military. World War II demonstrated that it was possible to strike at and destroy enemy population and wealth when one's forces were hundreds or even thousands of miles away. Nevertheless, as the Battle of Britain taught, a successful defense could be mounted against bombing raids. Fighters and anti-aircraft batteries could make an air offensive too costly for the attacker. Loss rates of more than 10% or 15% were, in the long run, prohibitive. Furthermore, the bomber was merely the forward arm of a conventional ground attack. Sooner or later the foot soldiers would slog across the fields and through the villages, and the foe would throw up his lines of defense in a final effort to protect his territory.

With the invention of intercontinental ballistic missiles bearing nuclear warheads, the concept of defense became suddenly obsolete. Even when carried by manned bombers, hydrogen bombs are so destructive that a virtually perfect defense is required if the nation is to survive. An all-out attack of one thousand bombers, each armed with forty megatons of warheads, could sustain a murderous ninety percent loss from defending aircraft and AA batteries and still deliver 4000 megatons of nuclear explosive to American or Russian cities. This attack, under most circumstances, would leave either nation crippled and helpless. In the aftermath of such a catastrophe, victory and defeat would be meaningless.

The substitution of the missile for the bomber as the delivery system for nuclear warheads destroyed the last hope of developing an effective defense against a nuclear attack. Despite recent talk of anti-missile systems, there is no known or projected method for successfully defending either the United States or the Soviet Union against a full-scale missile onslaught. It follows from this fact that every nation in the world is continuously at the mercy of each of the great nuclear powers at present, the U.S. and U.S.S.R.; in the future, perhaps others as well. Should either of the great powers decide to annihilate its opposite number or some other nation, and should it actually launch an attack, there is not

a thing in the world that could be done to defend against the blow. It has always been true that each nation is at the mercy of all others, in the sense that no one can stop a sufficiently determined nation from starting a war. But with a strong army and navy, a nation or coalition of nations could halt the attacker and, with certain losses of men and material, turn him back. In the nuclear missile age, however, there is no known way to stop either the United States or the Soviet Union from obliterating any nation on earth, should it choose to do so.³

Once the awful truth of this proposition became known, it was obvious that the old goal of defense had been rendered unattainable. No legitimate meaning could be given to the claim that our bombs and missiles “defend” us against enemy attack.

However- if we are powerless to stop an enemy attack once begun, still it is open to us attempt to dissuade a potential enemy from ever launching the attack. We can, by threats or blandishments, convince him that it is in his own self-interest to leash his forces. In short, though we can no longer defend ourselves, we may possibly deter our enemy. Thus it is that by the most momentous revolution in the long history of military strategy, the goal of defense has given way to the new and unfamiliar goal of deterrence.

It is worth our while to pause a moment and examine this new concept, for it contains not only the solution to the little puzzles set forth above, but they as well to major issues of present-day national security. First of all, the concept of deterrence is, strictly speaking, a psychological rather than a physical concept. It has to do with the goals, desires, intentions, decisions, fears, and expectations of a potential enemy. His armaments, and yours, may of course be directly relevant factors, but they are not the primary focus of deterrence. Deterrence rests upon the supposition, which is generally borne out by experience, that men pursue definite goals by means military policy, and that in doing so they place discoverable and consistent values on certain outcomes or states of affairs. Put in its simplest and most

³ This statement requires qualification with regard to the Soviet Union. See below, the discussion of “counterforce.”

abstract form, deterrence is then the re-arrangement of the enemy's actual or potential environment in such a way that he ceases to find desirable the course of action from which you wish to deter him. Or, to bring it down to earth, deterrence consists in making the cost too high.

Let us note in passing that deterrence does not depend for its success on the rationality of the enemy. If that term is used in any one of its ordinary senses, then it is possible to deter irrational men as well as rational men. What is necessary, however, is that the enemy is mad, then he must at least have the consistency of madness or deterrence will be impossible.

Furthermore- and this is crucial- there must be some states of affairs, within your power to produce, which your enemy dislikes more than he likes attacking you. If there is nothing whatsoever that he cares about quite so much as he cares about annihilating you (e.g., if he is a suicidal fanatic) or if you lack the means to threaten him in a way which he find significant, then deterrence will fail. Some while ago, a high Chinese official was reported as saying the China could profitably fight a nuclear war, because even if the United States killed 300 million Chinese, there would still be (at the time) 300 million left. This statement, whether genuine or not, sent shivers through the western world, for it opened up the horrifying prospect of any enemy who could not be deterred- an enemy prepared to accept our most as a reasonable price for attacking us in turn. Should the United States even confront a China armed with nuclear weapons and possessed of so grim a value scale, it will literally be faced with annihilation or surrender. There will be no defense, and deterrence will have failed. Thus, unlike defense, deterrence depends upon the state of mind of the enemy as much as on our own military might.

With the emergence of deterrence as the new objective of military policy, a succession of paradoxes arise, rendering worse than useless the experience and habits of the military mind. When I was in the Army, I was trained in pole-climbing. As anyone who has ever used a telephone lineman's ankle gaffs knows, to keep from falling it is necessary to lean out from the pole, so that the gaffs sink

into the wood at an angle. The closer one hugs the pole, the less of an angle there is between metal and wood, and the more likely it is that the spike, or gaff, will pull out of the wood and slip. Thus when you feel yourself falling, you must act in direct contradiction to your natural instinct and push away from the pole. The general or admiral is in an analogous situation when confronted with the new concept of deterrence. His instincts pull him in one direction, when reason tells him that he must push in another. A brief catalogue of the paradoxes of deterrence will illustrate this.

First, there is the paradox of secrecy. It is an inbred conviction of the military mind that secrecy is essential to the preservation of security. As the World War II posters endlessly reminded us, "the slip of a lip may sink a ship." If the enemy is ignorant of the size and location of your forces, he cannot prepare himself for them. But if one aims at deterrence rather than defense, secrecy may be the worst possible policy. The enemy cannot be deterred from attacking unless he knows the dangers with which he is threatened. So long as we actually possess the power to inflict an unacceptable retaliation upon him, our most reasonable policy is to prove it to him, even if we must invite his military experts to inspect our bases. We gain nothing and lose everything portraying ourselves as falsely weak, for it cannot be too often repeated that once the enemy attacks, deterrence has failed and we are lost.

Then there is the paradox of mutual vulnerability. We deter, and are in turn deterred, by threats primarily against civilization population. Hence the balance of terror, as it has been called, depends upon the vulnerability of our populations. If we take steps to defend our population against nuclear attack, we thereby threaten to free ourselves from the deterrent constraint imposed by the enemy threat. Thus our apparently defensive and purely protective measure takes on a distinctly offensive significance for our enemy, and may provoke him either to equivalent countermeasures or even to a desperate pre-emptive first strike, in fear that we are preparing to begin a war.⁴

⁴ The strategic significance of civil defense is a good deal more complex than this brief discussion suggests. See below for an extended treatment.

More sophisticated paradoxes appear, such as that in a situation of mutual deterrence, a variety of weapons systems, rather than reinforcing on another and increasing our security, may actually cancel one another out, leaving the enemy with no clear idea of the nature of direction of our threat. Thus a fleet of polaris submarines, suited on for counter-city attack, is clearly the instrument of a so-called second-strike, limited deterrence policy. A large force of land-based Atlas, Titan, and Minuteman missiles is the instrument of the directly contradictory first-strike, counter-force policy. The two forces together negate one another, making it impossible for the Russians to tell which policy if either, we have adopted. This paradox, so brilliantly analyzed by Arthur Waskow in his recent book The Limits of Defense, returns to us the original point about deterrence, namely that it is fundamentally a psychological concept. This is why so many psychologists, economists, and anthropologists have entered the field of military strategy. Deterrence is a matter of bargaining, of communication, of the inducing of attitudes in others. Since military strategy has adopted deterrence as its goal, it has become a natural field of investigation for all those social sciences which touch upon the techniques and processes of bargaining, communicating, and attitude formation.

Putting together the results of these three revolutions in military technology and strategy, we have the elements of our present-day condition: a nation intensely concerned with problems of deterrence strategy, lacking any men with practical experience in the capabilities and employment of the new weapon, and forced therefore to rely heavily on the theoretical deductions of a corps of brilliant but inexperienced social scientists.

To the intellectual, who characteristically desires power but somewhat shrinks from the responsibility of its use, it has in the past been comforting to reflect on the relative unimportance of ideas in American politics.⁵ However much they may bewail their outcast state, intellectuals are secretly

⁵ Contrary to their congratulatory self-image, intellectuals tend to be authoritarian in nature. This is natural, for in the world of ideas, disputes are decided by argument and evidence, not compromise or majority rule. When the truth is at stake, it would make no sense to propose that two antagonists split the difference as if they were

pleased to find that they are not needed. Neglect frees them from the burden of caution. Suddenly, however, reports in abstruse journals have become briefing papers for policy makers. With a rapidity which puts the lie to the theory of "cultural lag," the centers of power are adopting and implementing the new ideas of the academic theorists. For example, it is only four or five years since the idea first began to circulate of a controlled nuclear war in which the antagonists deliberately restrict themselves to military targets, in order to avoid the mutually undesirable holocaust of an all-out population attack. This rather far-fetched proposal, elaborated by Morton Kaplan, Thomas Schelling and others, was a desperate attempt to preserve the possibility of using nuclear weapons as an instrument of foreign policy, in the face of the fact that a nuclear war would be manifestly contrary to any reasonable conception of the national interest. Now, half a decade since it first went the rounds of the academic community, it has become the official policy of the United States Government, proclaimed by the Defense Secretary McNamara in his speech of June 16, 1962.⁶

The theoretical tools with which the military analysts construct their theories become, therefore, a matter of practical political importance as well as intellectual interest. In the absence of experience, our policy makers rely more and more heavily on the economists and psychologists who staff RAND and the Pentagon. It is necessary to ask how they formulate the problems of military strategy, what techniques they use to arrive at their answers, whether any hidden or unrecognized presuppositions lie behind their deductions. We must ask, too, whether these are the best methods

representatives of competing interest groups. One is either right or wrong, and however humble one may be in the awareness of the possibility of error, a democratic desire to grant every side of a dispute its share is simply out of place. The authoritarian bent of the intellectual mind is revealed in the familiar fantasy, made public first by Plato, of the philosopher-king. Nowadays this takes the form among academics of a desire to be the private, unofficial presidential advisor who slips into the White House through a side door and makes or breaks a policy by a few judicious words of counsel. After a

(cont from page 12) Harvard honor graduate was elected to the presidency in 1960, the stench of the desire for power was close to overwhelming in Cambridge, Mass. Heads were turned by the thought that the colleague with whom one lunched in the Faculty Club yesterday was today in secret consultation with the president. It is unlikely that many of these sincere professors realized how deep a contempt for the democratic processes they revealed by their urgent desire to reach directly to the power at the top and gain immediate acceptance for their views.

⁶ At Ann Arbor, Michigan. For a discussion of the contents of the speech, see Chapter II, B, below.

available for the formulation of our security policy, or whether perhaps techniques can be found which hold out a greater promise of a peaceful world. In particular, we must examine rather closely one methodology which has had a pervasive influence in the thinking of the strategists, namely the concepts and models of Game Theory.

In the chapters that follow, I propose to carry out this critical examination. Some of my time will be devoted to exposition and explanation, and I will have many words of praise for the intelligence and imagination which have been displayed by the academic strategists. Nevertheless, my conclusions will be in the main negative. I will try to show that the concepts and methods of the strategists are not policy-neutral, as they assert, but in actuality constitute a concealed argument for one particular way of looking at America's security problems. I will try also to show that this way of thinking is narrow and distorted, that it leads us further down the path to nuclear war and closes off promising alternative to an existing military policy. In sum, my aim is to show that despite the undoubted brilliance and inventiveness of the new strategy, it fails in its attempt to make the United States safer and encourages us to adopt policies which seriously threaten our security.

A word of apology is due the reader for the overly abstract and technical character of some of the sections of this essay. In the past, it has by and large been possible to discuss the great issues of national policy in terms readily accessible to the intelligent layman. With the exception perhaps of economic theory, the lore of the academy was unnecessary for the citizen. In the present case a grasp of theoretical matters is essential to a genuine understanding of the issues. This fact has sent army officers and politicians back to their books, and I fear must impose the same burden on the general reader. However, the obstacles are not nearly so great as some theorists would have us believe. NO physics is involved, and only the elements of algebra. Game Theory itself is a simple, although sophisticated, branch of mathematics, and as we shall see, the actual calculations of the theory never come into play in the formulation of military strategy. Indeed, one of my principal criticisms of the new strategy will be

that although it tricks itself out in the language and style of mathematics, it is in fact nothing more than a rhetorical device for urging the adoption of certain policies.

Part I – The Concept of Deterrence

Chapter I – The Need for Theory

Two separate but related developments in military technology have created a need for new theories and methodologies, a need which the academic strategists have attempted to meet. The first of these is the continuing invention of radically new and untested weapons systems. We have now actually reached a point at which the direction and pace of technological innovation can be planned and budgeted, subject only to the economic constraints of debt limits and competing projects. This in turn has forced military planners to estimate the battleground effectiveness of complex weapons systems which have not yet been invented, let alone tested. These systems are far beyond the degree of complexity attained by the World War II bomber or aircraft carrier. A complete weapons system will include warheads, delivery vehicles (missiles or air planes or rockets), sensors such as radar, communications, and control system reaching as far up the command hierarchy as the president himself. It is not enough merely to decide whether the system will work. Estimates must also be made of its probable effectiveness against possible enemy defenses, and of its effectiveness relative in to cost to other systems also being proposed. All this must be done with an eye to four or five years in the future, for that is the lead time from drawing board to operational model. Clearly, one cannot simply ask some knowledgeable and experience line officer to make a few pencil calculations, squint along a gun barrel, and come up with an informed guess. Too many factors with varying probabilities and partially incommensurable dimensions must somehow be synthesized into a yes-or-no decision. So it is that the men responsible for making these decisions cast about for some method of integrating the manifold considerations of cost, offensive effectiveness, probable obstacles, and defensive weakness.

This desire for a methodology of weapons evaluation has also been fed by a subsidiary concern, perhaps less commendable but certainly no less strong. The proposals of the decision-makers,

once formulated, are taken to the Department of Defense and then to the Congress for approval and appropriation. Each individual weapons system, perhaps the darling of a particular service must compete for scarce funds with the systems proposed by other services, and the total military appropriations request runs up against the budget-cutting proclivities of power congressional committees. With tens of billions of dollars as the prize and military careers staked on the outcome, the competition among the several proposals loses somewhat its character of sober deliberation. A general or admiral, facing a hostile Committee of the House, needs objective support for his estimates of the value of a proposed weapon. It is rather weak merely to say, "In my judgment," for generals from other services have expressed the directly contrary judgment. But if he can say, "Our experts have calculated..." that has somewhat the ring of truth! After all, these are new and scientific weapons; it stands to reason that the techniques for evaluating them should be equally recondite and mathematical.

The need for new methodologies of decision-making, created by the endless technological innovation of the post-war period, has elicited from the academic community two associated theoretical developments. The first narrowly concerned with the performance of particular weapons in tactical situations, dates back to the Second World War. It has come to be known as Operations Research. The second, ranging more broadly over the evaluation of total systems and their integration into a coherent security policy, is called Systems Analysis. Their birthplace, if any one location can be named, is the RAND Corporation in Santa Monica, California, set up by the Air Force to conduct research and development studies on contract.

Operations Research and Systems Analysis are not strictly objects of investigation in this book, but because they are easily confused with the deterrence theory which I do wish to examine, it might be well to spend a few words explaining what they are and are not.

Herman Kahn and Irwin Mann, in a Rand Research Memorandum entitled "Techniques of Systems Analysis," have given a good brief introduction to the concept of Systems Analysis and

Operations Research. ⁷ “Systems Analysis,” they write in the Introduction “bears about the same relation to Operations Research as strategy to tactics. They both look at the same sort of question, but Systems Analysis is broader (and therefore less detailed) in both space and time.”⁸ Operations Analysis deals with such problems as the number of ships to put in a convoy, optimal bombing patterns for Air Force raids, the most effective deployment of anti-aircraft weapons, and so forth. Systems Analysis, on the other hand, lacks this definiteness of equipment and objects. Rather, say the authors, “we are trying to design a system capable of meeting contingencies which will arise five or ten, and sometimes fifteen, years in the future. We must not only design this system, we must also decide under what conditions will be used and what we shall want to do with it. The recommendations of the Systems Analyst are mainly concerned with ‘beliefs,’ research, development, and procurement, and only incidentally with operations.”⁹ Under these circumstances, unsystematic common sense or the intuitive estimate of the experience military man will be inadequate.

The second major development in military affairs which has created a demand for theory is the shift from defense to deterrence. In the Introduction, I indicated some of the confusions which have been caused by this transformation and suggested that the fundamentally psychological character of the concept of deterrence had drawn social scientists in the search for a grand deterrence strategy. In this search, which has proceeded pretty much independently of the development of Operations Research and Systems Analysis, three existing bodies of theory have been exploited. Quite naturally, some writers have drawn on the traditional theory of international relations which has its origins in the European political system of the 19th and early 20th centuries. However, for reasons which

⁷ See RM-1829, Dec. 1956. The Memorandum is part of projected book entitled Military Planning in an Uncertain World. Sections on Game Theory, War Gaming, Monte Carlo, and other aspects of the theory of military planning have appeared as RAND memoranda, but the book as such has not been published. The problems are exclusively those of the Air Force, but there is nothing in the methodology which precludes its application to the problems of the other services.

⁸ Ibid., p.2.

⁹ Ibid., p.h.

will be discussed below, this source of theoretical doctrine has proved relatively unhelpful. The psychological character of the concept of deterrence has turned others to the literature on conflict, aggression, and attitude formation in interpersonal relations. Despite some acute insights, particularly into the mechanisms of self-reinforcing aggression and the psychological processes of projection, this line of investigation has in my opinion also been barren. Nations are collections of individuals, to be sure, by they are not, contrary to Plato, men writ large. Hence the extension to politics of the discoveries of the psychology of personality requires a considerable intermediating development which, at least in this area of political theory, has not taken place. The third, and by far most promising, lode to be mined is the rich accumulation of formal theories and conceptual analyses grouped under the heading of economics. Problems of bargaining, of the commensuration of heterogeneous values, of the formulation of strategies and aggrandizement, have been given a considerable theoretical elaboration by economists for the setting of the marketplace. In particular, a branch of mathematical economics called Game Theory, invented two decades ago by John von Neumann and Oskar Morgenstern, has been virtually taken over by many strategists as the key to the solution of deterrence problems.

The reminder of this book will be devoted to a quite severe criticism of deterrence theory. I should make it clear, therefore, that I am not at all concerned with questioning the value of Operations Research and Systems Analysis. These techniques seem to me unavoidable responses to the fact of rapid technological innovation. However unsuccessful they may be as analytical tools- and my doubts about their value are reinforced rather than assuaged by the quite cautious comments of Kahn and Mann- still if one is going to schedule the future production of as yet non-existent weapons, some such method must be employed for deciding which of the innumerable proposals to adopt.

Operations Research and Systems Analysis are logically independent of deterrence theory. The former are a response to the fact of technical innovation, the latter a response to the shift from defense to deterrence. Despite the fact that these two developments have occurred simultaneously, they are

not necessarily linked. The problem of deterrence, for example, would remain even if we ceased inventing new weapons and brought the technology race to a halt. Conversely, a technology race could conceivably have developed in which defense remained a feasible military objective, while deterrence in the modern sense was lacking. Thus at least in theory, these Two methodological innovations can be put in separate compartments.

At the same time, the concrete problems of deterrence are inevitably affected by the conclusions of the Systems Analysts at RAND and elsewhere. For example, the debate over the future of the 2000 mph B-70 bomber, with Secretary McNamara insisting that it be scrapped and Congress appropriating funds for its productions was a perfect blend of arguments about Operations Research, Systems Analysis, and Deterrence Theory. The first issue was whether the B-70 could actually be built, how it would perform in battle, what its chances were of performing the mission for which it was designed. These were matters for the Operations Researcher. Beyond that, there was the question of its relation to the Polaris, Minuteman, and other weapons systems we were building at the same time. Was there an alternate system which would do the job more cheaply? Here it was Systems Analysis which was relevant. Finally, did the United States wish to adopt the "counterforce" strategy for which the B-70 system had been designed? This was an issue of deterrence theory.

In this book, I propose to single out for close examination one element in the confluence of factors determining U.S. security policy, namely the deterrence theories of the academic strategists. In doing so, I of course do not wish to deny that political, personal, and technological factors influence our policy at least as much as the theories of the strategists.

Chapter II: The Aims of Military Policy

Military policy has in the past had two principal aims, the first defensive and the second offensive. Traditionally, the defensive aim has been to deny the enemy access to one's homeland and to protect one's population and national wealth. The offensive aim of military policy can be characterized

generally as assisting in the pursuit of national objectives by the use or the threat of military force. Nations have sought to acquire new territory or to “rectify” their borders; colonies have been carved out of unclaimed continents, markets opened up and protected, alien wealth seized on land or on the high seas. In the past, nations have carried their religious beliefs to other lands at the point of a sword and lately secular ideologies have been spread by the same means. In some cases it has been necessary actually to employ force to achieve the objective, but frequently the threat of violence- “showing the flag” - has sufficed.

Where diplomats and generals lead, scholars follow, and so theories of the role of force in international relations have been evolved to explain the flow of events and guide the statesman in his choice of policy. Since we are concerned here with the new theories which have appeared in the age of deterrence, we may with profit look briefly at the theories which preceded nuclear weapons. Through an appreciation of their inadequacies for the modern era, we will come to a better understanding of our contemporary problems.

Two theories were developed by political scientists to analyze the goals of military policy in the pre-nuclear period. The first of these, generally, known as the theory of balance of power, deals essentially with the defensive aims of military policy; the second, which we may call by its American name of “Political Realism,” treats the offensive aims of military policy. Together, they comprised the core of theory available to statesmen in the formulation of security policy.¹⁰

As with most theories in the social sciences, the actual balance of power appeared in international affairs before the theoretical analysis and justification of it. Briefly, a situation emerged on the continent of Europe in which several great powers and a host of smaller ones, by a series of shifting alliances, were able to prevent any one power from acquiring dominance over all the others. The vital defensive interests of at least the great powers were protected, and to some extent the territorial

¹⁰ Strictly speaking, Political Realism should include the theory of balance of power as one of its branches. However, I have altered things slightly to bring out the logic of my discussion more clearly.

integrity of the lesser nations was guaranteed as well. The system was predicated upon the principle that realistic self-interest, rather than religion or politics or tradition should determine national policy. So it was that the catholic state of France gave aid to protestant principalities during the Thirty Years War, and later the infidel Ottoman Empire became the ally of Christian European powers because of its potential value in the valance of continental politics.

The theory of balance of power is based upon the metaphor of the balance-scale. Nations are conceived as weights whose magnitude is determined by their military power. Coalitions are adjusted until the weights on both sides of the balance are roughly equal. Any large alteration on one side must be followed quickly by a corresponding adjustment on the other or an imbalance will result, leading to war.¹¹

The system depends for its success on the validity of two basic pre-suppositions. The first presupposition concerns the relative power of the several nations. There must be no one nation so strong that it is invincible even against a coalition of all the other nations. If that should happen, then a banding together of nations in a defensive alliance would have no point. The second pre-supposition is that the nations which have formed alliances are actually willing to honor them. An alliance is, in a manner of speaking, a conglomerate of potential power. Only if that power can on occasion be actualized are we justified in looking on it as real. In other words, the nations must be willing to go to war to reestablish the balance. In the past, of course, the European states have frequently resorted to war when a nation or coalition thought it had achieved a superiority of force and sought to assert it.

A first glance, it might appear that a flaw in the balance of power system, from the modern point of view, is the second primes" because nations are no longer willing to go to war, a balance of power has ceased to be feasible. Actually I think this view is a mistake. It is really the breakdown of the

¹¹ Arthur Lee Burns, in an interesting theoretical article entitled "From Balance to Deterrence," *World Politics*, IX, 494-529, develops a simple model of a balance of power system in which the alternative metaphor of a hydraulic shifting of pressures is employed. Burns uses the model to examine the ways in which the balance of power has been obviated by the advent of nuclear weapons.

first premise that has made a balance of power obsolete. The United States and the Soviet Union now have, from a practical point of view, absolute or infinite power. A coalition of all the nations in the world, communist and non-communist, would not be sufficient to stop the United States from destroying the Soviet Union and most of the rest of the world, if it so chose. As for the Soviet Union, although it does not now have power of this magnitude, it is well within her reach if she wishes to spend the money for it. Thus power has ceased to be additive. From a military point of view, the United States plus NATO is no stronger than the United States alone. (This is the source of most of our present difficulty with NATO policy). In effect, the weights in the scales have become so great that the balance-bar has broken. No longer do the pans tilt back and forth with the addition of new weights. In the jargon of the economists, the marginal utility of further power increases is zero.

The offensive function of military policy has also been the subject of a theoretical analysis. Political Realism, as it is called, is a theory which seeks both to understand the course of international relations, particularly in its broader and longer-run configurations, and also to provide a general method by which the statesman can make policy. The theory is based essentially on a distinction between the superficial appearance of international diplomacy and the underlying power reality. Treaties, notes, conferences, and also ideologies, religions, and moral pronouncements, concerning good and evil, are merely the surface of international relations, according to the Political Realist. Beneath lie the continuing concrete interests of the nation and the power of neighbouring states determine those "concrete interests." They, in turn, shape the contours of foreign policy. However much statesmen may trick out their acts in the finery of principle, a sharp eye will discern the sinews of power.

Because the determinants of national interest change slowly, Political Realists tend to discover continuity where others have thought to find change. Thus in the kaleidoscope of twentieth century Central European politics, the analyst will see the variation on a single unchanging theme,

viz. the attempt by Germany to play off its Eastern and Western neighbours against one another to avoid a coalition between them. Similarly, the apparent about-face of Soviet policy at the time of the Molotov-Ribbentrop pact is merely a tactical shift designed to achieve for Russia the temporary security which she could not find in a pact with the western powers.

Political Realism is both a descriptive and normative doctrine. As a description of international relations, it asserts the general proposition that over the long run, the appearance of foreign policy will tend to conform to the underlying power realities, so that a change in those realities will inevitably bring with it a corresponding shift in treaties, alliance, and commitments. As a prescription, it enjoins the statesman to look behind the facade of political rhetoric in his own country and abroad and then to conform his policy goals to the limits of the power at his disposal. If the United States, by dint of its geography and economy, occupies a dominant position in Latin America, then it should now allow a moral commitment to national self-determination or scruples about intervention to restrain it from maintaining that dominance. On the other hand, if the same factors of geography and economy make the United States a relatively insignificant factor in Southeast Asia or Sub-Saharan Africa, then no ideological horror of communism or dream of democratic world should entice her into untenable military commitments and costly involvements.

The Political Realist, like the sophisticated marxist, is aware of the dangers of overly rigid theory. He does not insist that every slight alteration in power be followed by instantaneous adjustment of policy, nor does he deny some measure of efficacy to such elements of the "surface" as ideology or tradition. Nevertheless, for the theory to work, he must assume that in general, and in the long run if not immediately, a contradiction between political appearance and power reality will be corrected in favor of the latter. In effect, the theory asserts that such a rift sets up a tension or force which progressively pulls the appearance into a new shape. This dynamic relation between power relations and political forms is the central insight of the theory. The connecting link between the two, and thus

the fulcrum of the theory, is the willingness to go to war. As in the case of the balance of power, potential power must contain the threat of actualization in order to function as a significant element in the determination of policy. So long as a nation is prepared to employ its force in support of its concrete interests, pressure will be put on other nations to conform the political forms to the facts of power. But if the costs of war become so high that nations are not willing to adjust the system by force of arms, then the system collapses and the theory becomes irrelevant. This is just what happened as a result of the nuclear revolution. War between the great powers would be worse than a reversal in some contested area of the world. Whatever one may conclude from the fact for American policy, still it is a fact that the absorption of West Berlin into East Germany would be less costly to the United States than a nuclear war in which as many as one hundred million Americans might die.

The connection between form and reality has been broken. In the pre-nuclear age, when a nation greatly increased its military power a stress was placed on the existing international framework. Sooner or later, whether through negotiation or war, an adjustment would take place which realigned the pattern of domination with the pattern of power. Now, however, an increase in power may put not stress on the system at all. If the United States and the Soviet Union both have invulnerable deterrents capable of utterly destroying one another, it will not alter things for one or the other to double its number of missiles. Beyond the point at which neither side is willing to go to war, changes in relative strength are irrelevant. It is conceivable in the not-too-distant future that a second-rate power like Britain or Germany, by building an invulnerable deterrent force, could make itself the absolute equal of the much larger and more powerful Soviet Union and United States. When this becomes a possibility, the theory of Political Realism loses its significance for either the politician or the scholar.

With both the defensive and offensive objectives of military policy apparently undermined by the existence of nuclear missiles, the scholar and statesman have two alternatives. They can give up military force as a means to the preservation of national security and the advancement of national

interests, or they can look about for new theories which will in some way allow them to continue to make use of force. The first alternative has been adopted by the growing number of authors, and the unfortunately small number of statesmen who have committed themselves to some form of arms reduction and world government. Since the disputes which set nation against nation are perennial, it is not enough merely to abolish armaments. Some method must be found for resolving conflicts. Thus the recent interest in alternatives to military force is a direct consequence of the nuclear revolution.

There have always been men who deplored the use of violence and insisted, on moral or religious grounds, that war must be abandoned as an instrument of national policy. But until roughly a decade ago, their position lacked any appeal to the majority of men in the West. The reason for their failure is not hard to find. Men went to war because the through the price of the battlefield worth the prize of victory. Whatever the pacifist might feel, the fact remained that to most men the costs were worth the prize. Nations were willing to lose thousands or even tens of thousands of their young men rather than see their borders invaded or their colonies seized. Despite the unprecedented costs of the Second World War, I am sure that most Englishmen, Frenchmen, Russians, and Americans would agree that their losses were worth paying to repel naziism. But in the nuclear world, men are slowly coming to realize that in terms of their own values, and not simply in terms of the values of a few pacifists, the price of war is too great to pay.

Hans Morgenthau, the dean of Political Realists in America, recently engaged in a round table discussion of "Western Values and Total War," the text of which was later printed in COMMENTARY magazine. In the course of the discussion he had the following to say:

I want rather to discuss the fundamental philosophic question—whether it is possible to defend the values of Western civilization by nuclear war. I'm indeed inclined to answer this question in the negative, while admitting the possibility, or even perhaps the likelihood, that we will have to fight a nuclear war.

I think a revolution has occurred, perhaps in the first true revolution in foreign policy since the beginning of history, through the introduction of nuclear weapons into the arsenal warfare. For from the beginning of history to the end of the Second World War, there existed a rational relationship between violence as a means of foreign policy, and the ends of foreign policy. That

is to say, a statesman could ask himself—and always did ask himself—whether he could achieve what he sought for his nation by peaceful diplomatic means or whether he had to resort to war. The statesman in the pre-nuclear age was very much in the position of a gambler—a reasonable gambler, that is—who is willing to risk a certain fraction his material and human resources. If he wins, his risk is justified by victory; if he loses, he has not lost everything. His losses, in other words, are bearable. This rational relationship between violence as a means of foreign policy and the ends of foreign policy has been destroyed by the possibility of all-out nuclear war. The fundamental question is, in view of this disproportion between the means of violence and the ends of foreign policy, whether it is still possible today to defend the values of any civilization by resort to nuclear warfare. For is you assume—as even the most optimist analysts such as Herman Kahn have assumed—that in a third

World war fought with nuclear weapons, fifty, eighty, or a hundred million Americans would die, and nine-tenths let me say, of the economic capacity of the United States would be destroyed, you must be possessed not only by an extreme optimism but by an almost unthinking otherwise, could survive such an unprecedented catastrophe. For the fundamental error in the assumption that the moral fiber of a civilization has an unlimited capacity to recover from shock. I would rather assume from individual personal experience as well as from the experience of history that there is a breaking point for a civilization, as there is a breaking point for an individual man. For, after all, when we speak of civilization we are speaking of an abstraction' we are really speaking of man in the mass, of Americans in the mass. Would Americans in the mass be able to hold to the values of Western civilization in the face of such an unimaginable, unprecedented catastrophe?

We are of course all guessing here, but I would dare to make the guess that Western civilization would not survive such a catastrophe. If this estimate is correct, the obviously an all-out nuclear war is defense of Western civilization is a contradiction in terms, an absurdity. I must say that this absurdity may occur, but if it should occur, I would still say that it was an absurdity.¹²

For those who cling to the old way, the problem is terribly difficult. America possesses immense, unprecedented military power, but the penalties of going to war are too great to be acceptable. So the question arises. How can this power be put to use for the traditional defensive and offensive objectives of the military? If defense is impossible, how can the enemy be dissuaded from launching an attack? And if we are not prepared to fight a war to advance our national interests, then how can we bring our power to bear on international disputes? It is in response to these questions that the field of deterrence theory has sprung up. Not merely answers, but a whole methodology of answering such questions, has

¹² Commentary, Vol. 32, pp. 280-281.

come into being. With infinite skill and unflagging determination the academic strategists have striven for some way to preserve the use and threat of force as the primary instrument of foreign policy.

Chapter III: The Dilemma of Deterrence

The military and security problems of the United States, and hence also the theoretical problems of the academic strategists, are vastly complicated by the rather special character of America's national commitments. We have three basically distinct goals which we wish to advance by the use of military force. The first of these is to deter the Soviet Union from launching an attack against the American homeland. This, as I have pointed out, is the modern version of the traditional goal of defense. The second goal is back up America's diplomatic and economic moves in Asia, Africa, Latin America, and the Middle East. In these non-vital areas, it appears that conventional troops on a small scale are adequate to our purposes. The Lebanese, Viet-Nameese, Laotian, and Congo affairs are instances – some successful, some not- of this sort of local application of force. The third objective, and the one which causes all the trouble, is the defense of Western Europe against Soviet attack, either nuclear or non-nuclear.

The United States, as a consequence of its World War II alliances and the pre-war experience of the Western powers, is committed by solemn treaty to defend the soil of its NATO allies as if it were our own. Because of the apparent superiority of Soviet ground forces, and the post-war American monopoly of nuclear weaponry, the United States undertook to launch the first-strike nuclear attack against the Soviet homeland in response to Soviet aggression in Western Europe. This commitment, it was thought, would deter Russia from attempting to advance further into Europe than the cease-fire line running down the center of the continent.

With the Soviet acquisition of nuclear weapons, a genuine deterrence situation came into being. There was no questions of defending Europe- Berlin, for example, would be the first city to disappear from the face of the earth in any war fought to "defend" her. Rather, Russia was to be deterred in

Europe by the same threat of retaliation which presumably deterred her from attacking the United States itself. There was a problem however. Whereas it was quite believable that we would respond with nuclear weapons to an attack on our own soil, it was considerably less than certain, solemn commitments to the contrary notwithstanding, that we would answer a Soviet European attack with nuclear strike on the USSR, thereby leaving ourselves open to a certain return strike by Russian missiles. In the language made familiar by Herman Kahn, while our deterrent against attack on the US was “credible,” our deterrent against a European attack was not. It is out of the extraordinary complexities created by this problem that the various schools of deterrence strategy have grown.

Fundamentally, two approaches have been evolved by the academic strategists. Both are designed to preserve force as an instrument of national policy, but in quite different ways. The first alternative has been to separate the goals of defense and offense and assign different sorts of military force to each. In this approach, defense gives way to deterrence, in the form of “stable deterrence.” Offense, whether in Europe or the so-called “third areas,” is carried out by nonnuclear weapons.¹³ The second Alternative has been to lump the defensive and offensive goals together and look from some way of pursuing them all by nuclear weapons. This approach has come to be known as “counterforce.” It is associated primarily with the Air Force, and hence with RAND, just as “Stable Deterrence” is associated with the Army and Navy. The reason for this service is split, as we shall see, is simply that counterforce involves using Air Force weapons, while stable deterrence requires the weapons which have been assigned to the Army and Navy.

¹³ It may seem odd to classify the defense of Western Europe as “offensive” goal, but a little reflection will reveal this is perfectly sensible. The defense of Europe, like the preservation of trade routes, the opening of new colonies, the supporting of a friendly government etc., is a goal which goes beyond the purely defensive aim of preserving the integrity of the United States. It is just because this is so that we have trouble convincing ourselves and the Russians that we will commit national suicide in a nuclear war to avenge Germany or France. No one doubts that an attack against American cities would be answered by a missile strike against Russia. But our commitment to Europe is in the category of positive policy objectives, not the category of national survival. The necessity to convince the Russians that we will fight for Europe, and the necessity of convincing them that, on a much smaller scale, we will fight for Laos, are security problems of exactly the same type, although of course one is far more important than the other.

Counterforce is by far the more dangerous strategical doctrine. For this reason, and because it seems now to have become the official US strategy, I will devote most of my time to analyzing it. I will begin with a short discussion of stable deterrence.

A. Stable Deterrence

The principle drawback of nuclear weapons, from the point of view of strategists, is their awful destructiveness. They are too much of a military good thing. As Hans Morgenthau argues, the rational connection between means and ends has been destroyed by the multiplication of explosive power. The advocates of stable deterrence accept this fact and attempt to construct a strategy around it. The key concept in this strategy is "invulnerable second-strike capacity." A nuclear striking force may be infinitely powerful, but it is valueless as a deterrent if it can be destroyed by a surprise attack. Unhardened SAC bases, for example, might be wiped out by a missile attack before the planes were off the ground. Similarly, liquid fuel missiles requiring long fueling and countdown period before launching would be vulnerable to a sneak attack. This vulnerability, in turn, places a premium on striking first, should war actually occur. Hence both the United States, armed with vulnerable weapons, would be forced to sit with their fingers on the trigger, ready to fire instantaneously.

If the deterrence force can be protected, however, so that it is capable of riding out a first-strike and then returning the attack, the necessity for instant retaliation will be removed. Thomas Schelling, in a lecture in Boston, Mass., once defined "stability" in the following way: A deterrence situation is stable, he said, if it is not to the advantage of either side to strike first. Clearly, such a condition exists if both the United States and the Soviet Union possess invulnerable second-strike weapons. Should one side attack, it would merely exhaust its arsenal, leaving the opposing (invulnerable) force untouched. It would then be at the mercy of a counterattack.

Invulnerability can be achieved in either of two ways: hardening or mobility. By placing a missile or airbase in a concrete protecting case, it can be made invulnerable against all but direct hits by large

thermo-nuclear weapons. The Minuteman missile is not being emplaced in hardened silos around the United States. By mobility, a weapon can be kept out of the sights of an enemy attack, thereby surviving for a counterattack. The phenomenal success of the Polaris submarine with underwater missile-firing capability has given the United States a nuclear force which is, for the time being at least, virtually invulnerable. The entire country could be wiped out without touching the fleet of missile submarines cruising the oceans of the world.

The theory of stable deterrence presupposes that the retaliatory force will be aimed at population, not military installations. This follows from the fact that it is designed to be used after the enemy nuclear force has been launched. It is not, in the deterrence jargon, a "first-strike capability." Hence the missiles need not to be either precisely accurate or very large. The small (1/2 megaton), relatively inaccurate missile fired from a Polaris submarine can do quite enough civilian damage to serve as a deterrent.

Under the "deterrence umbrella" erected by the second-strike capability, offensive military objectives including the defense of Western Europe, can be achieved by conventional weapons. The threat of escalation to nuclear war is supposedly diminished by the stable deterrent, for such escalation can only bring mutual suicide. Quite obviously, stable deterrence calls for a large nuclear armed fleet which has been advanced by the Army and Navy in answer to the Air Force theory.

The theory of stable deterrence is a relatively restrained and rational strategy, as such things go. It is frequently combined, by theorists like Schelling, with a plea for some form of tacit or explicit arms control, and a cut-off of the technology race. The more moderate versions of the theory, which go by the name of "minimum deterrence," argue that once a small second-strike force has been built, production of new weapons can be ceased and the endless accumulation of weaponry halted. In deterrence, these theorists recognize, twice enough is no better than enough.

Stable deterrence obviously is not peace. With large nuclear forces in the hands of Polaris Captains or missile-silo commanders, accidents are always possible. However this is not a perfect world, and if the danger of accident were the only weakness of the stable deterrence strategy, it might well be the most acceptable alternative, including disarmament (which, as the strategists never cease to remind us, has its dangers too). But there is indeed a flaw, a fundamental flaw, in the stable deterrence theory. Unfortunately for the safety of the United States and Russia, invulnerability of any sort is relative and temporary only. The United States at this moment engaged in extensive espionage and anti-submarine warfare development design to make Russia's deterrent vulnerable. Given the dynamic of technology, it is surely only a matter of a short time before the deterrent which seems invulnerable has become vulnerable again. This danger is recognized by Thomas Schelling, who writes in the last chapter of The Strategy of Conflict:

As nature reveals her scientific and technological secrets over the coming years, we may find that each side (if it does what is ought to do and does it rapidly enough) can substantially assure the invulnerability of its own retaliatory forces irrespective of what the other side does, and assure it in a convincing way so that a powerfully stable mutual deterrence results. Alternatively, nature may have planted mischievous secrets ahead of us, so that we and the Russians continually find new ways to destroy retaliatory forces at a faster rate than we find new ways to protect them.¹⁴

Stable deterrence is thus no more than temporary way-station on the road to a permanent resolution of the cold-war impasse which keeps use continually at the edge of war. It should be remembered that a genuine acceptance of a stable deterrence strategy would entail massive changes in the present American military establishment, as well as a cessation of the development of new and different weapons. As Arthur Waskow points out in his brilliant work, The Limits of Defense, the logic of

¹⁴ Schelling, op. cit., p. 251.

stable deterrence entails the dismantling of the Air Force counterforce weaponry. Until this happens,¹⁵ we will have not stable deterrence, but a “mix” of several strategies.

B. Counterforce

The counter force strategists have mounted a frontal assault on the dilemma of deterrence- the problem, that is, of suing nuclear weapons as tools of policy without committing national suicide. Whereas most thoughtful men have agreed that a nuclear war would be a catastrophe which no threat could justify, some strategists have sought ways of actually dropping the bombs and still, in some sense, surviving. Their argument proceeds in two stages. First, it is said, nuclear war would probably not be the holocaust so confidently predicted. And second, it might be possible to fight a nuclear war in a way which would reduce civilian destruction to “acceptable” levels. If either or both of these arguments were valid, then the traditional goals of defense and offense could be reinstated and force would again become a “rational instrument of national policy.” The first stage of the argument is presented forcefully, as it ever is, by Herman Kahn in his first book, On Thermonuclear War.

1. Herman Kahn on Civil Defense.

Kahn is concerned with the feasibility of our announced policy of defending Europe against Russian attack by threat of a nuclear attack against the Soviet Union. So long as the United States is convinced that it cannot survive a nuclear war, Kahn argues, it will never use its weapons in any situation short of direct attack on America itself. Hence, its deterrent will not be credible. But if we can hope to survive Soviet attack and still rebuild our nation, then we will be willing to respond to an attack against Europe. Or at least the Soviet Union will think so. In short, we will possess a “credible first-strike proper precautions -which means civil defense- we can live through a nuclear war. The following quotation gives the core of Kahn’s claims in the first of the three “lectures” which make up the book:

¹⁵ Waskow’s discussion of the prevailing strategies and their interconnections is the clearest exposition and most devastating critique of present security practice yet to appear.

“It is the thesis of this lecture that if proper precautions have been made, it would be possible for us or the Soviets to cope with all the effects of a thermonuclear war, in the sense of saving most of the people and restoring something close to the prewar standard of living in a relatively short time. But there is no reason to believe this will be true unless both nations investigate the problem more thoroughly than has been done so far, and then take the necessary precautions.”¹⁶

The body of Kahn’s argument is to be found in Chapter II of Lecture I of his book, with additional materials lapping over into Chapter III. The order of presentation and organization of evidence are exceedingly confused, so that it is sometimes difficult to tell whether the successive sections of the chapter are intended as parts of a single discussion or treatments of quite distinct problems.

Chapter II, rather dramatically entitled, “Will the Survivors Envy the Dead”¹⁷, is an attempt to estimate the probably consequences of a nuclear attack on the United States some time in the 1960’s. The Chapter, which has six sub-sections, begins with a discussion of the “acceptability” of various degrees of tragedy, designed to get the reader out of the peace-or-apocalypse mentality which Kahn deplors. Kahn then surveys the genetic effects of radioactivity, generally deprecating the seriousness of the probably long-run consequences and again emphasizing that men can live with such tragedies as deformed babies. Having got the reader in the mood or, more accurately, out of the mood of despair which he presumably was in as he picked up the book, Kahn brings the main argument of the Chapter. In the third section, he sketches two possible attacks against the United States, a small and large, or “early” and “late” attack respectively.¹⁸ The fourth and fifth sections consider the short term radiological (“fallout”) dangers, and in the sixth section Kahn estimates the rate at which a partially destroyed and more than decimated America could rebuild her economy to pre-war levels of consumption. The

¹⁶ On Thermonuclear War, 71.

¹⁷ In On Thermonuclear War and the early RAND memoranda, Kahn exhibits an exuberant, if undisciplined, imagination. He is full of little jokes and wry comments which have, I think somewhat unjustly, given him a reputation for ghoulishness. In his latest book, perhaps as a consequence of increased association with social scientists, almost all life has gone out of his style. This is a great pity, since Kahn was one of the few giggers on the literary scene who could think up, and offer with a straight face, Swift-like “modest proposals.” Of course, Swift wasn’t serious.

¹⁸ The connection is that early in the 1960’s, the Soviet Union is presumed capable only of the smaller attack, while later in the 60’s she will have the weapons for the heavy attack.

outcome of the analysis is that with considerable precautions against radioactivity, and a certain amount of intelligent foresight in the dispersal and stockpiling of industrial and agricultural materials, the United States can survive an “early” attack and be back at the pre-war style of life within a decade. I think it is fair to say that this conclusion, if true, is quite the most remarkable fact to be turned up in a considerable period of time. Let us take a look at Kahn’s evidence and see what sort of case he has made for his claim.

The Chapter opens with a discussion of the questions, “How much tragedy is ‘acceptable’?” Kahn is not attempting really to give an answer. He is simply trying to stop people from thinking that a nuclear war would be utterly obliterating, with no distinction among the outcomes under different conditions of attack or defense. It outrages Kahn very much that so many otherwise responsible citizens should not have got it into their heads that a nuclear war would wipe out civilization. So, in attempt to get the reader to think differently about varying levels of destruction, Kahn gives some figures in a table which he labels “Acceptability of Risks.”

These figures are hypothetical. They don’t even puport to relate to anything in the real world. Their sole purpose is to make the point that there is a significant difference between pretty bad, bad, and very bad, and utterly horrible. Kahn is continually presenting the reader with very impressive-looking numerical tables which turn out, upon examination, to have been spun entirely out of his head. Thus, in Chapter 1, where he is making the same point about the significance of degrees of tragedy, he offers the following table:

Table 3
Tragic But Distinguishable Postwar States

<u>Dead</u>	<u>Economic Recuperation</u>
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2,000,000	1 year
5,000,000	2 years
10,000,000	5 years
20,000,000	10 years
40,000,000	20 years
80,000,000	50 years
160,000,000	100 years

Will the survivors envy the dead?¹⁹

The point of the table is simply that it makes a difference which of these postwar states we are left with. Bad as it is to lose 5 million Americans, it's worse to lose forty million. Kahn is of course completely correct in saying this, but his "table" is pure hokum. It clearly implies a series of correlations between numbers of deaths and extent of economic damage which are the sheerest fantasy. It is meaningless to say that the loss of 5 million people will be associated with a two year recuperative lag, while the loss of 20 million will combine with a lag of ten years. It depends on who gets killed, where, how, whether the primary killing agency is blast or radiation, what segments of the economy are destroyed, and so on. That Kahn doesn't mean anything by the figures seen in Chapter II, where he analyzes the effects of a "small" attack and claims that fifty million dead will be combined with only a ten year economic lag, rather than the 27 years or so which we get by "interpolating" in "Table 3."

Now there is nothing wrong with making up figures if your only aim is to illustrate an essentially qualitative point. If the same people who refuse to distinguish "very bad" from "horrible" are willing to grant the importance of cutting deaths of 80 million to 40 million, the numbers have served a legitimate purpose. Throughout much of Lecture I, this is precisely the use to which Kahn puts his charts. But in Chapter II, he actually makes a flat, non-hypothetical, factual claim about the level of damage from a

¹⁹ Ibid., 20.

given nuclear attack, and at that point, he must put a little backbone in his figures. Unfortunately, as we shall see, the penchant for fantasy carries over.

The second sub-section entitled "Genetics and Thermonuclear war," also has a basically rhetorical purpose, but it cites a fair variety of actual facts. Kahn is here interested in the long-term impact on making of considerably higher continuing levels of mutation-producing radiation. Once more, his point is that a little tragedy is better than a great deal, and that since we already put up with a congenital deformity rate in newborn children of 48, a rise even of one-fourth, to 5% be bearable. Although he cites some data on mutations and radiation, he has not yet made any definite assertions about the effects of a nuclear war. This appears in the next section, which sketches "Two Possible Attacks."

The early, or small, attack is of primary interest to us, since it is the one which Kahn analyzes in detail. It is a bomber attack against the American homeland in which five hundred bombs are dropped on one hundred and fifty target points, both military and civilian. The total fission yield from the bombs (all of which are assumed to have landed) is 1,500 megatons. Since a hydrogen bombs releases energy from fusion as well as fission, the total megatonage is considerably greater. Kahn does not say how much greater, but in a private conversation I asked him and he replied that he and his associates had assumed a 60-40 fission-fusion split. That would set the total megatonnage of the raid at 2,500 megatons.²⁰ The late, or heavy, attack puts 2,000 bombs on 400 target points for a total of 20,000 megatons fission yield, or 33,333 megatons total yield.

How much destruction would this small attack produce? It is a little hard to tell what estimate Kahn assumes for the purposes of his analysis. He makes no explicit statement at all in this subsection, but in the next chapter, in the midst of a discussion of civil defense, he estimates that an early attack

²⁰ Here as elsewhere, Kahn's estimates are bit casual. With these figures, the average bomb in the light attack works out to five megatons, and the average megatonnage per target point to roughly seventeen megatons. These are rather unlikely figures. However, it doesn't make a great deal of difference, for Kahn never reveals enough of his moth of estimation to allow the reader to check it for himself.

with no C.D. would produce 90 million casualties (deaths? deaths plus injuries?). With varying Civil Defense programs including strategic evacuation of urban areas, Kahn claims that this can be cut to as little as 5 million.²¹ Economic destruction is estimated by assuming that the attack will be launched against the 53 largest standard Metropolitan Areas. These are census areas comprising large cities together with the surrounding suburbs. For example, the New York Metropolitan Area had 12,904,000 inhabitants according to the 1950 census. When he comes to discuss economic recuperation, Kahn postulates the total destruction of everyone and everything in the 53 Standard Metropolitan Areas, even though he thinks that this is an overestimate of the probably destruction of a small attack.²² His point, presumably, is that if we can survive the greater loss, we can certainly survive the lesser.²³

In the fourth, fifth, and sixth subsections of the Chapter, Kahn presents the evidence for his claim that we can successfully live through a “small” nuclear attack. He assumes that the entire nation will sit in its shelters for three months after the attack ends. At that point we will bulldoze the dead into neat piles and begin the job of recuperation and reconstruction. Whether we can survive the first three

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²³ We can compare Kahn’s small attack with a hypothetical nuclear strike studied by the research staff of the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy, usually know as the Holifield Committee. On June 22-26, 1959, the Subcommittee heard expert testimony on the Biological and Environmental Effects of Nuclear War. For a complete report of the hearings, see the Report of the Special Subcommittee on Radiation of the Joint Committee on Atomic Energy of the Both Congress First Session, on Biological and Environmental Effects of Nuclear war. A much briefer Summary-Analysis is also available, containing all of the data which has been cited here. Herman Kahn was among the witnesses to appear at the Hearings. The Staff of the Subcommittee was posited an attack consisting of “263 nuclear weapons in 1,2,3,8 and 10 megaton sizes with total yield of 1446 megatons...detonated on 224 targets within the United States...All weapons were arbitrarily designated as having a yield of 50 percent fission and 50 percent fusion.” Summary-Analysis, p. 4. The targets included military installations, ABC installations, and seventy-one Standard Metropolitan Areas, including almost all of the first fifty-three considered by Kahn. Only 110 of the 263 weapons were directed against the population centers, for a total of 567 megatons. In other words, given the fission-fusion ratio postulated by the study, a total of only 283.5 megatons fission yield hit the seventy-one Metropolitan areas. The results estimated by the study are awesome. Of the 68 million people living in these areas according to the 1950 census, with U.S. population = 150 million, 18.6 million would have died the first day and 16.8 million shortly thereafter. Of the 33 million remaining in the cities, 11 million would have been seriously injured. In addition, some 6 million in the non-target areas would have died and another 6 million would have been injured. In all, this miniature attack which placed only 500 megatons on urban areas and another 1000 megatons on military installations would in the short run have wiped out more than a quarter of the population and left another ninth seriously injured. By present population figures this would amount to fifty million dead and twenty million injured.

months is treated briefly and inadequately in Chapter III. So that D + 3 months, we unlock our cellar doors and climb out. What sort of radiological environment do the survivors find? In the hot parts of the United States, (those near the target sites), the level of radiation is roughly 660 times that considered acceptable for genetic purposes by the National Academy of Science, according to Kahn. It is 40 times that considered safe for industrial purposes.²⁴ This, Kahn admits, is fairly hair-raising. But do not despair! “Calculations indicate” that various decontamination measures and avoidance precautions can “reduce the exposure level to about 1 per cent” of these figures, or .4 of the safe Industrial levels.²⁵ The following indicates the rigor with which Kahn handles his data.

“A reduction in the neighbourhood of 100 (of the radiation levels which he has pulled out of his hat) might be comprised of a factor for decontamination ranging from 1 to 100, a factor of about 3 to 5 for weathering, terrain, and deviation from the theoretical decay rate...and a factor of 2 to 30 to be obtained by limiting exposure to the unshielded environment.”²⁶

By my “back of the envelope calculation” (to use one of Kahn’s racy phrases), this gives a range of possible reduction factors from 6 to 15,000. I suppose one might say that is “in the neighbourhood of 100,” but then with modern jets, Tokyo is in the neighbourhood of Chicago. The various reduction factors (1 to 100, 3 to 5, 2 to 30) are of course from the same secret cache of figures in which Kahn found the original figures in which Kahn found the original radiation levels.

In case one thinks that these numbers are merely illustrative, Kahn states on the next page:

“what we have shown is that if we can get through the first three months of the war and postwar period, and if we can do the necessary decontamination and provide the necessary protection for most of the working and living hours, we can probably live with the lingering effects of radioactivity.”²⁷

²⁴ Kahn never footnotes his numerical data, and never gives the slightest indication as to how he arrives at his figures. Hence I must keep adding the repetitive phrases, “Kahn says,” or according to Kahn.” So far as I can discover, that is the sole source for most of the putative facts in the book.

²⁵ Ibid., p. 61.

²⁶ Ibid., p. 61.

²⁷ Ibid., p. 62.

Assuming that Kahn doesn't mean us to interpret the word "necessary" in such a way that the whole statement becomes a trivial tautology, it would appear that he thinks he has actually shown something significant by his hypothetical radiation levels and reduction factors. I confess myself unconvinced.

All of this, it might be well to recall, relates on to an attack which is considered "small" by Kahn. If the Soviet Union were to send more than 2500 megatons of its 20,000 megaton stockpile-or if it were to send a second attack after the first-thing might be different "by a factor in the neighbourhood of 100." Or then again, they might not.

After an extended aside on the strontium-90 and Carbon-14, in which Kahn suggests the possibility of differing grades of food, priced according to their radiation content, we come finally to the discussion of economic reconstruction.

It is assumed, for purposes of the analysis, that the 53 industrially important standard metropolitan areas are totally wiped out.²⁸ This urban area Kahn calls the A country. The predominately rural remainder is labeled the B country, and Kahn's argument consists in maintaining that this B country is wealthy enough, and sufficiently independent of the destroyed A country economically, to recoup the losses sustained in the attack within a decade. Despite some impressive-looking figures on the proportions of various industrial outputs originating in the A and B countries, and a few remarks about skilled technicians and the possibility of bottlenecks, Kahn's optimism seems to be based upon nothing more than a straight-line projection, assuming rates of growth comparable to those achieved by the United States or Russia in the post-World-War II period.

The climax of the section is a pair of technical-looking graphs, labeled Figure 1 and Figure 2, which show the Gross National Product rising from 20% of the pre-attack total in the months after the attack to 100% in 10 years, and consumption of food, durables, housing, and other commodities equaling or surpassing the pre-attack figures in the same length of time. Three is not the slightest

²⁸ Ibid., p. 75.

indication in the text of the origin of these graphs. No footnotes, no calculations allow the reader to check Kahn's "estimates" independently. Of course, there are the constant allusions to unnamed associates who, if the text is to be believed, have carried out elaborate investigations. "In our study we assumed," says Kahn,²⁹ conjuring up the image of a team of experts feeding endless streams of data into computers and applying the latest techniques of economic analysis to the outputs. The only RAND reports on the subjects which is ever cited is RAND Report R-322-RC, a Study of Non-Military Defense, July 1, 1958, by Herman Kahn and seventeen other authors. Although it is not mentioned explicitly in Chapter II³⁰, and contains even less in the way of concrete data. It is also, if anything, less adequately documented!

If we pause for a moment to take stock, we find that in support of Kahn's dramatic claim that with adequate preparation, the United States can survive a nuclear war and be back to pre-war consumption in ten years, we have a series of unsupported estimates, guesses, extrapolations, and hypotheses concerning what might happen in the aftermath of a single, "small" nuclear attack of unspecified type or distribution, and unaccompanied by any subsequent military action. This might be sufficient to raise some doubts about the success of Kahn's analysis, but in the midst of his discussion of economic recuperation, he completely destroys the credibility of his argument by the following astounding admission:

But perhaps what is most important of all, we did not look at the interaction among the effects we did study.

In spite of the many uncertainties of our study we do have a great deal of confidence in some partial conclusions- such as, that a nation like the United States, or the Soviet Union could handle each of the problems of radioactivity, physical destruction, or likely levels of casualties, if they occurred by themselves. That is, we believe if either nation were to be dusted with radioactivity in a wartime manner, and if nothing else happened, this radioactivity could, with minor preparations for a small attack and elaborate preparations for a large one, be handled. With the proper alleviatory measures the resulting environment could be made acceptable (by somewhat relaxed postwar standards, of course).

We also believe that if the destruction of the 50 or so major metropolitan areas in either country were all that happened so that the ensuing reconstruction program was not complicated by

²⁹ Ibid.

³⁰ It is footnoted on pp.22 and 297

social disorganization, loss of personnel, radioactivity, and so forth, neither the Soviet Union nor the United States would have any critical difficulty in rebuilding the equivalent of the destroyed metropolitan areas in the time we have estimated, or even less....Finally, we believe that if either nation suffered large casualties, even of the order of a quarter or a half of the population, the survivors would not just lie down and die. Nor would they necessarily suffer a disastrous social disorganization. Life would go on and the necessary readjustments would not be made.

But if all these things happened together and all the other effects were added at the same time, one cannot help but have some doubts.³¹

It takes a bit of time for the full significance of this passage to sink in. Kahn is investigating the effects of a nuclear attack. He wishes to show that with reasonable preparation, the United States can live through the sort of attack which might be launched in the early 1960's. Having distinguished the several hazards of nuclear weapons—lingering radiation, property damage, population losses, he looks at them individually and concludes (on a private evidence) that taken on at a time, they are manageable. He then does not consider what would happen if all three effects occurred simultaneously. But in a nuclear attack, they would occur simultaneously! There would be 65 to 90 million dead, the 53 largest urban areas would be obliterated, and the nation would be criss-crossed by a deadly pattern of radiation. Obviously the successful handling of the radiation problem, which depends on Kahn's magic "radiation figures," would be overwhelmingly more difficult with the population cut by a third to a half, the urban areas in ruins, fire storms raging uncontrolled, communications and transportation utterly dislocated, and the fabric of social and political organization ripped to shreds. Equally, the rosy projections of economic recuperation ignore the radiation dangers, which would impose extraordinary constraints on freedom of movement and exposure, and slow to halt many of the most vital economic activities. The loss of the city populations would deprive the nation of vast numbers of key workers, particularly at the management and technical expert levels. Contrary to Kahn's easy optimism, the experience of underdeveloped countries and even of the less well-developed sections of the United States, demonstrates that skilled personnel are the indispensable ingredient of rapid economic growth.

³¹ On Thermonuclear War, 91-2.

Somewhat later in the book, Kahn refers back to Chapter II in the following terms:

“I hope that the first lecture in an example of a reasonably good study. The finding that if a nation such as the United States or Russia makes very moderate preparations it can survive a “small” war was made quite plausible, I think.”³²

The real significance of Kahn’s study is quite otherwise, I think. It is even that when one sets out to make the most optimistic assumptions possible, to give every benefit of doubt to the positive side of the question, one is still left with the sickening conviction that even a “small” attack would be a disaster from which the nation would probably never really recover.

2. Counterforce

The backbone of the strategy of counterforce is theory that we can make the world safe for nuclear war by aiming our missiles only at other missiles. Briefly, the theory asserts that war, save for the saturation bombing and fire raids of World War II, has always been a contest between armed forces in which civilian casualties were an unfortunate by-product to be avoided is possible. A nuclear war would be too costly only if both sides deliberately sought to wipe out cities. But this would be an irrational way to fight the war. The United States can use its missiles and bombers either to destroy enemy cities or attack enemy missiles and bombers either to destroy enemy cities or to attack enemy missiles and bombers. Now it may be true that Russia would rather has us aim at missiles than cities. But it doesn’t follow that we feel the opposite way about it, for every missile which we aim at a city is one missile less which we can use to knock out Russia’s nuclear striking force. If we destroy all her major cities, she will still have missiles and plans with which to knock out ours. So it is in our own self-interest to spare Soviet cities and aim for the Soviet Forces- i.e., to adopt a counter-force strategy. The same reasoning presumably applies to the Soviets. If we both adopt counter-force policies, then it should be possible to fight a full-scale nuclear war with only minimal population losses. We might suffer as “few”

³² Ibid., 330-331.

as three million dead, a figure which compares quite favorably with the twenty million Russians who died in World War II.

A recent speech by Sec. of Defense McNamara seems to imply that a modified version of this doctrine has been adopted as the official policy of the United States government. Speaking at the University of Michigan Commencement exercises of June 16, 1962, McNamara said: "The NATO Alliance has overall nuclear strength...which makes possible a strategy designed to preserve the fabric of our societies if war should occur...the U.s. has come to the conclusion that to the extent feasible, basic military strategy is a possible general nuclear war should be approached in much the same way that more conventional military operations have been regarded in the past. That is to say, the principal military objectives, in the event of a nuclear war stemming from a major attack on the alliance, should be the destruction of the enemy's military forces, not of his civilian population.

The very strength and nature of the alliance forces make it possible for us to retain, even in the face of a massive surprise attack, sufficient reserve striking power to destroy the enemy society if driven to it. In other words, we are giving a possible opponent the strongest imaginable incentive to refrain from striking our own cities."³³

I say that this seems to imply acceptance of the counterforce theory because the context of the speech suggests another interpretation. The purpose of McNamara's remarks was to dissuade our European allies from developing their own independent deterrent forces, relying instead on our promise to come to their aid in the event of a Soviet attack against Europe. The speech is full of statements about the importance of a unified force capable of fighting a "centrally controlled campaign." As explained above, this involves convincing our allies that we will really honor our commitments. Rather than opt for civil defense and Herman Kahn does, McNamara takes over the theory of counterforce and employs it to make our deterrent threat credible. If only the Soviet Union will follow our lead in

³³ New York TIMES, June 17, 1962. For an excellent discussion of the counterforce doctrine, taking off from McNamara's speech, see Michael Brower's article entitled "Controlled Thermonuclear War," in The New Republic, July 30, 1962, pp. 9-15. Brower is exceedingly critical of the policy.

restricting nuclear attacks to military targets, then estimated casualties should shrink to an “acceptable” level. This in turn will convince the Soviets that our alliance commitments are genuine, and thereby will reassure the anxious members of NATO. It may be, therefore, that McNamara’s speech was elaborate ruse to stop President de Gaulle from building an independent French “force de frappe.”

But deterrence is a tricky business. It is all a matter of appearance. If we say we are adopting a counterforce strategy, and if we convince the Russians of this in the act of trying to convince the French, then in effect we have adopted a counterforce strategy. For in deterrence, belief is all. Hence, whether Secretary McNamara meant what he said or not, we had better take a closer look at “counterforce,” and see what we are supposed to be buying.³⁴

At some point in the war- during the first few hours, presumably- the Soviet Union and the United States would establish communication, discuss the state of destruction, make threats and counter-threats, and arrive at armistice. Depending on the size of the remaining nuclear arsenals (and the bargaining abilities of Kennedy and Krushchev), the result would either be a stand-off, or a significant shift in the world power balance in favor of one side. Whatever the outcome, however, both nations would have avoided the annihilating casualty levels of an uncontrolled counter-city war.

The appeal of this theory is obvious. It reinstates military operations as the fundamental means of pursuing national objectives, and thus restores the situation to something like the pre-deterrence era. Attractive as it is to those policy makers who shun the logical consequences of deterrence, however, it is thoroughly unsound as a strategy for the nuclear age.

First of all, the successful completion of a counterforce war requires the active cooperation of the Soviet Union. By the nature of the theory, we

³⁴ The question of the nature of our actual strategy is much more complicated than these remarks suggest. Strictly speaking, there is no such thing as the U.S. deterrence strategy. There is an Air Force strategy, an Army-Navy strategy, a confused mixture of the two which has resulted from the battles of the Pentagon, and a variety of other fragmentary views and attitudes which influence one or other of the men responsible for inventing, requisitioning, authorizing, operating,

cannot by our own actions ensure the safety of our population. Our forbearance in the matter of targeting helps the Russians, not ourselves. It is their adherence to a counterforce policy which safeguards American cities. To date, there is no sign whatsoever that Russia has been led along the same theoretical paths as RAND. Quite to the contrary, the published statements of Soviet military experts indicate that in Russia a nuclear war expected to be an all-out of extinction. We may deplore that attitude, but we cannot ignore it.

Secondly, success in a controlled nuclear war depends on a degree of integration of “command and control” which has never in the past been achieved under battle conditions. A single headquarters must be continuously and instantly appraise of the location and condition of the entire strategic nuclear force. This headquarters must be able to give orders and see them carried out without the normal battleground degradation or dilution so familiar to anyone with military experience. An accurate and rapid flow of reports must be available giving the results of the earliest strikes, estimates of probably enemy forces still in operation, and information about now-empty enemy launching sites, so that re-targeting may be performed for later missions. As Sec. McNamara said in the speech quoted above:

...We are convinced that a general nuclear war target system is indivisible, and if, despite all our efforts, nuclear war should occur, our best hope lies in conducting a centrally controlled campaign against all of the enemy’s vital nuclear capabilities, while retaining reserve forces, all centrally controlled.

All this, it must be added, in the space of a very few hours after the first massive attack is launched and returned.

Thirdly, it is vital to the success of a controlled nuclear war that attacks against military targets be clearly distinguished from attacks civilian centers. In deterrence terminology, the attacks on military sites must not carry population “bonuses” with them. Otherwise, it will be impossible to tell whether the enemy has announced deterrence policy, the Air Force persists in emplacing its missile silos and air bases close enough to population centers so that attacks against them will have unprecedentedly large civilian-death side effects. This is particularly true now that the Air Force has begun to harden its bases,

for the Soviet Union is thereby required to allot much larger megatonnage to each site if it wishes to have any hope of knocking them out. It is easy for a deterrence theorist, sitting in the quiet comfort of a secluded office, to write glibly of counterforce versus counter-city attacks. But when the bombs start falling and anywhere from 2000 to 10,000 megatons are exploded across the face of America, with the communications lines jammed, civilian panic rising, and a welter of contradictory reports piling up on the control desks in the Pentagon (assuming Washington continues to exist), the President will have only a few hours in which to decide whether we have been hit by a gentlemanly counterforce attack or a brutal, annihilating, counter-city blow. Should he misjudge the evidence, or should some major-general half way down the command chain decide to trust his own estimate rather than wait for orders from higher headquarters, the entire delicate fabric of restraint will be rent, and the suicide of a "spasm" war will result.

The fallings of a counter-force policy are neither subtle nor novel. The difficulties of maintaining command and control, the dangers of escalation into an all-out war, the obstacles to an accurate flow of information-these were obvious to the proponents of the limited-nuclear war concept almost as soon as it was first formulated. But if the problems were so great, why has the United States Government officially adopted counterforce as its policy?

One basic reason is that having committed themselves to military security, the policy makers must find a strategy which claims to hot out some hope of success, even if that hope is unreasonably slender. This point needs some emphasis, for it is obscured by the rhetoric in which the strategists cloak their arguments. The defense of counterforce, and indeed of any of the alternative deterrence strategies which have been advanced, usually begins with pious words about the virtues of peace. These are followed by the statement that disarmament is of course the goal to which all men aspire, but that unfortunately is unattainable in the foreseeable future. Several of the stock obstacles to disarmament

are rehearsed, and then the real business begins with an analysis of deterrence. The following condescending remarks from Henry Kissinger's latest book, The Necessity for Choice, are characteristic:

What could be simpler than to seek to escape the difficulty of comparing different weapons systems for purposes of arms control by abolishing weapons altogether? Since war requires arms, why is it not self-evident that total disarmament would guarantee universal peace?

The attraction of such panaceas has been considerable and it has been skillfully exploited by Soviet diplomacy....But the issue posed by total disarmament is, after all, whether striving to cut the Gordian knot with one blow helps the cause of peace or detracts from it. The implications of total disarmament are too little understood for us to announce it as an immediate end...it is clearly unattainable in the immediate future....we must seek to conduct negotiations seriously and concretely in keeping with the gravity of the situation we confront.³⁵

Kissinger's insinuation that supporters of disarmament are following the Russian line, or at least have been taken in by it, is atypical of the academic strategists. By and large, although they ritualistically impute the worst of motives to the Soviet Union, they do not indulge in this sort of slander. Quite typical, however, is the suggestion near the end of the passage that disarmament proposals are unserious, and not "in keeping with the gravity of the situation we confront," Once the "serious discussion of deterrence has begun, the inadequacies of this or that strategy are considered in an effort to choose among the alternatives. But the possibility is never examined that perhaps all of the deterrence alternatives are less plausible than disarmament. Disarmament is assumed to have been disposed of in those opening deprecatory utterances. Thus, after rejecting disarmament on the grounds that Soviet intentions are unpredictable or unalterably hostile, the strategist will propose a deterrence theory (like counterforce) which depends for its success on the most thoroughgoing cooperation between the Russia and America. The very same Soviet policy makers who, for purposes of rejecting disarmament, we suppose to be totally unreliable, are now presented as models of self-regarding rationality. Unable to see the benefits to themselves in successful disarmament, which would free immense resources for their over-taxed economy, these Russian marvels are expected to behave with infinite self-control in the midst of a nuclear attack, denying their World War II experience and traditions for the logic of RAND.

³⁵ Kissinger, pp. 231-232.

The bottomless suspicion which, we are assured, bars them from entering into genuine disarmament negotiations, will nonetheless evaporate in the face of our missiles and bombers, to be replaced by a touching faith that the American capitalists are willing to spare their cities. It is all very hard to believe.

Counterforce appeals to men who have rejected disarmament out of hand without ever seriously considering its feasibility. But the real reason for the adoption of counterforce by our government seems to be quite different, and never frankly confessed at all. To get at this reason, we must first recall to mind one of the fundamental facts of warfare in an age of hardened nuclear missiles. A missile, unlike a bomber, is capable of being launched only once, and at only one target. If that target is a large city, and if the missile has left the launching pad successfully, then the probability of its destroying the city is very high. With warheads as large as 5 megaton (on the Atlas and Titan, for example), an error of several miles over a flight of 5000 miles or more will probably make relatively little difference. But if the target is an enemy missile emplacement, and if that emplacement has been hardened to withstand all but a virtually direct hit, then the attacking missile will have to come within perhaps a mile and half or two of its target to complete its mission successfully. Under these conditions, it would be optimistic (although perhaps not unrealistic) to assume that each of our missiles fired at a Russian hardened emplacement would have $\frac{1}{2}$ or 50% chance of destroying its target. A simple arithmetical calculation reveals that to raise the probability of eliminating an enemy missile to the near-perfect level of 94%, it is necessary to aim four of our own missiles at it (i.e., a probability of missing equal to $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = 1/16$ or 6 ¼%). In other words, if Russia has 100 missiles in hardened and dispersed silos, then a flight of 400 U.S. missiles allocated four to one will have a very high probability of destroy more than 90 of those Russian weapons, and a good chance of knocking out all but one or two.³⁶

³⁶ The figure of $\frac{1}{2}$ as the probability of success of a missile flight is used by Kissinger and Kah, among others. If it can be raised as high as $\frac{3}{4}$, the ratio of attacking to defending weapons could be lowered from 4-1 to 2-1. The point of the argument remains unchanged.

Given these figures, it is clear that nation weakens itself by launching an attack against enemy missiles. Assuming that the two antagonists have equal numbers of missiles before the attack, then after the attack, even if all targets are destroyed, the attacker will have fewer missiles remaining than his opponent. This is because he has expended 4X missiles to eliminate X enemy missiles. For example, if both sides have arsenals of 1000 missiles, then the attacker's 1000 will take out, at best, 250 of the enemy's. After the attack, instead of 1000-1000 parity, the aggressor will be faced with a 750 to nothing leg. He will be at the mercy of his opponent, who will have enough missiles to wipe out any remaining bases which may contain at will.

The implication of these facts is that a counterforce deterrence strategy is rational only if one posses and overwhelming superiority in the means of delivering nuclear warheads. Quite obviously, therefore, in no possible situation would it be rational for nations simultaneously to adopt a counterforce strategy against one another! The more powerful nation might well desire to reach a tacit bargain with its opponent banning attacks on cities, but the only defense of the weaker nation would be to threaten a suicidal population attack in response to a first-strike against its missiles. In effect, the weaker state would say to the stronger state, "I cannot win against you, but at least I can guarantee that we will both lose. If you attack my deterrent force, then I will throw everything that survives against your duties in one last act of revenge." If he can make this threat believable, he has a good chance of deterring his stronger enemy from starting a "controlled" nuclear war.

Secretary McNamara as much as admitted these points in his speech, for in speaking of the possibility of fighting a counterforce war, he said"

The very strength and nature of the alliance forces make it possible for us to retain, even in the face of a massive surprise attack, sufficient reserve striking power to destroy an enemy society if driven to it. In other words, we are giving a possible opponent the strongest imaginable incentive to refrain from striking our own cities.

Counterforce is so far from being a policy which two equal powers could adopt against one another, that it is feasible for us only because of our overwhelming nuclear superiority. The actual details of the relative strengths of the United States and the Soviet Union have been admirably summarized by the British military expert, P.M.S. Blackett, in a widely-read article in Scientific American.

³⁷Blackett quotes McNamara as claiming for the United States a nuclear striking force as of November, 1961, of 1700 intercontinental bombers, several dozen operational land based ICBMS, 80 Polaris missiles on five nuclear-powered submarines, the same number of intermediate range land missiles, 300 carrier borne planes, and large numbers of nuclear armed fighters. What is more, though Blackett does not mention it, the United States plans to complete hardened Minutemen silos in 1963 at a rate of one per working day during the entire year. Semi-official estimates of Soviet strength, based upon intelligence reports in which the administration seems to place considerable confidence, credit, the U.S.S.R. with 50 ICPMs, 150 intercontinental bombers, and about 400 medium range missiles which are useless against the United States. The Soviet Union apparently also possesses some missile submarines, although not at present anything advanced as the Polaris.

It is obvious that the Soviet Union is considerably weaker than the United States in deterrence weaponry. Consequently, for the reasons outlined above, it would be utterly contrary to Russia's interests for a tacit counterforce agreement to come about between it and the United States. With so a weak force, the Soviet Union could not hope to deter the United States from a preemptive attack or first strike save by the threat of a counter-population retaliation. Needless to say, Russia is in no position at all to threaten a counterforce first strike of its own. In other words, at the present time, the United States possesses a military establishment which is designed for aggression. The Soviet Union possesses a military establishment designed at best for minimal deterrence.

³⁷ April, 1962, pp. 3-11.

What effect must Secretary McNamara's speech have had upon the Russians? They are quite as fully impressed by their nuclear disadvantage as we-more so, perhaps, because of the universal military tradition of overestimating the strength of one's enemy. The announcement of an American counterforce policy can only appear to them like an attempt at blackmail-an attempt, that is, to get them to accept the political consequences of their military inferiority. If the United States were interested solely in deterring an attack upon itself, it would have no need of counterforce. A straight second-strike threat of population retaliation would suffice. Only if the United States contemplates situation in which it might take the military initiative does a counterforce policy make sense.

Obviously Russia has only one alternative in response to such a veiled threat. She must increase her military expenditures enough to approach parity with the United States in missiles, or at the very least to cut the American lead to a point at which a U.S. counterforce policy is no longer possible. The United States will then find itself in a numerical vise, for by the logic of counterforce, it must build not merely an equal number of missiles, but a multiple number, to keep ahead of the Russians. If Russia has 100 missiles, we need at least 400. If Russia now builds a second hundred, we need not one but four hundred more to maintain a counterforce strategy. If Russia increases her missile strength to 1000, we require at least 4000 offensive missiles!

Worse still are the probably consequences of a counterforce war fought at these much inflated force levels. At the 400-100 level, a U.S. first strike against Russia probably will leave her with only a handful of missiles- four or five. But at the 4000-1000 level, a 96% kill rate still leaves Russia with a 60 missile force against our cities, would be sufficient to kill a quarter of our population. The arms spiral on which we embark by a counterforce is endless, and it carries us away from, not toward, security.

The counterforce policy announced by the United States is feasible only so long as we have in immense superiority over the Russians in delivery systems; it asserts our willingness to employ nuclear weapons first, and bus inaugurate a suicidal third world war; it is based upon a hopelessly fragile set of

assumptions about Soviet and American behaviour in the midst of a war; and its almost certain effect on Russia will be to provoke her into building missiles so fast that all hope of counterforce is destroyed. A more ineffective and self-defeating policy could not be imagined.

C. Limited Retaliation

Stable Deterrence and Counterforce are the two principal strategic doctrines which have won acceptance in some major segment of the military establishment. However, the endlessly fertile minds of the academic strategists have devised yet a third way of employing nuclear weapons, which seems to domesticate them to a point at which they can be used in the daily give and take of diplomatic bargaining. The labels attached to the theory are, variously, "controlled reprisal," "limited reprisal," or as I shall call it, limited nuclear retaliation. By this term is meant the deliberate firing of a single missile or a small number of missiles against selected targets, in an attempt to punish the enemy for some aggressive action, or dissuade him from carrying out a threat.³⁸ A large number of possible uses and contexts of limited retaliation have been conjured up by the active imaginations of the strategists. The attacks themselves can be directed either against military targets, such as radar stations, submarines, airbases, and missile emplacements, or else against centers of population. It is even possible to explode a nuclear weapon high enough over the Soviet Union so that it causes virtually no damage, while serving as an evidence of our resolve.³⁹

Just as the forms of limited retaliation are numerous, so are the provocations which may evoke it. An attempt to shift the power balance in Berlin by closing down some of the entry routes, while not an aggression of sufficient magnitude to call for an all-out nuclear attack against the Soviet Union, might be

³⁸ For discussion of the concept of limited retaliation, see, among others, Morton Kaplan, The Strategy of Limited Retaliation, Policy Memorandum 19, Center of International Studies, 1959; Herman Kahn, O.T.W., Chapter VI, esp. pp. 282ff; Thomas Schelling, The Strategy of Conflict, pp. 252-254; Glenn Snyder, Deterrence and Defense, pp. 69-74.

³⁹ It must be kept in mind throughout this discussion that deterrence is a matter of psychology. The main problem of the strategist is to devise ways of convincing the enemy that we are serious in our threats, while at the same time not getting us all blown to bits. The catch is that if you are serious, then you really may get blown to bits. The entire body of deterrence literature may be looked at as extended attempt to get around the logic of the old

answered by blowing up a Russian submarine base in the Arctic. Incursions into Turkey, instead of eliciting a conventional response with ground troops, might lead us to destroy a missile base in the Urals. Accompanying the nuclear strike would be a public assurance that we were not starting a war and a threat of further reprisals if the Soviet aggressions were not stopped immediately.

There is, of course, a possibility that the Soviet Union will respond to a limited reprisal with a similar act against one of our bases or cities. A new round of reprisals and counter-reprisals may then ensue. Each further step increases the danger of "escalation" - that is, transformation of the duel into nuclear war. Hence, pressure is put on both sides to come to terms as soon as possible.

Deterrence strategists seriously envision the possibility of a succession of city exchanges, in which first the United States "knocks out" Vladivostok; the Russia retaliates by destroying Cleveland; America ups the ante by taking out Leningrad and Kiev; Russia replies with Chicago and Boston; and finally the two powers agree on truce which settles their dispute. This stately pavanne of destruction, it is confidently asserted, can be danced without war because both powers realize how much worse such a war would be than slow-motion decimation. "The twentieth century may yet see one or two limited city exchanges," says Herman Kahn.⁴⁰

"...the very idea of limited retaliation seems bizarre, and it is. Unfortunately, it is no more so than any other possible strategy, for modern weapons developments have produced a fantastic world, that, by and large, political leaders and the public have refused to face....

It is important to recognize that the world has already changed in a way that any civilized man must deplore. If it could be changed back, any decent man would work toward that end. But some of the changes are unfortunately irreversible, and it is important to learn how to protect as many of the values of civilization as is possible.⁴¹

One's first impulse is to reject the whole idea of limited retaliation out of hand as obviously beyond the bounds of possibility in this world. The real interest of the theory is then to understand how sober and intelligent men can write about it in great detail with perfectly straight faces. However, five

⁴⁰ On Thermonuclear War, 282.

⁴¹ Kaplan, op.cit., p. 2-3.

years ago controlled nuclear war was also merely a conjecture in the minds of the academic strategists, and it is today the policy of the United States Government. It might be prudent, therefore, to rehearse the failings of limited retaliation, obvious as they may be. Along the way, we will discover some of the most characteristic faults of the strategists approach to problems of deterrence.

The first weakness of the theory of limited retaliation which shares with counterforce doctrine that the Russians view deterrence matters just as we do, and therefore will respond to a limited retaliatory blow in the "right spirit." (It would be rather unfortunate if they were so unimaginative as to view the destruction of one of their cities as an act of war.) The baroque elaborations of abstract deterrence theory are as yet, for whatever reasons, confined to certain segments of the population of the United States. Rather than basing the speculation on a factual estimate of Soviet intentions and attitudes, the strategists postulate a faceless opponent whose ratiocinative powers are unwarped by national character or ideological presupposition. Little reason as there is to suppose that the Russians will fall in with our counterforce proposals, there is far less to think that they would engage in limited retaliation and city exchanges. The theory, then, suffers from the fatal practical flaw of irrelevance.

It also ignores the simplest facts of everyday political life here in the United States. Our foreign policy, in so far as we can speak of having a policy, emerges from a complex of interplay of domestic forces, involving the White House, the State Department, the Pentagon, the Congress, and the major political parties. It is simply beyond belief that a president of the United States could acquiesce in the incineration of Chicago or New York without being impeached on the spot. It may dramatically impressive to say that domestic politics must stand aside in the presence of a threat to national security, but a glancing acquaintance with history reveals that even during wartime, America exhibits little of the stoic indomitability which the strategists take for granted. After four long and costly years of battle, the United States gave up much of its hard-won power advantage in Central Europe because of the political

pressure to “bring the boys home.” More recently, President Kennedy’s conduct during the Berlin crisis of 1961 was deeply affected by the domestic repercussions of a relatively moderate call-up of reserves.

An analogous interaction of domestic and foreign affairs seems to take place in the Soviet Union, although the secrecy with which Kremlin affairs are conducted makes certainty impossible on this question. Every indication suggests that the relative power of several Moscow factions is affected by the course of international affairs. Could Khrushchev really survive a city exchange? Surely not!

A third obstacle to limited retaliation, acknowledged by the strategists but not accorded sufficient weight by them, is the danger of escalation into an all-out war. With each successive retaliatory and counter-retaliatory round of reprisals, the level of destruction would increase. The grief of mourning would harden into angry determination. Having lost the millions of inhabitants of Washington or San Francisco, the survivors would feel themselves pledged to remain firm in their demands, and not by yielding deprive those deaths of meaning. A policy of limited retaliation would tempt the instincts of irrationality which lie so close to the surface of even the most civilized of men.

The terrible dangers of limited retaliation cannot better be expressed than by quoting the following long passage from a column by Walter Lippmann. Lippmann, writing during the height of the Berlin crisis, sought to caution both the Soviets and the American against too great a reliance on the rationality of self-interest. He said: ...though a nuclear war would be lunacy and is unlikely, it is an ever-present possibility. Why? Because, however irrational it may be to commit suicide, a nation can be provoked and exasperated to a point where its nervous system cannot endure inaction, where only violence can relieve its feelings.

This is one of the facts of life in the middle of the twentieth century. It is as much a reality as a megaton bomb, and in the nuclear age it must be given weighty consideration in the calculation of policy. There is a limit of intolerable provocation beyond which the reactions are uncontrollable. The governments must know where that line is and they must stay well back of it. Here lies the greatest danger of miscalculation, and therefore of war.

Both sides, we had better realize, are capable of miscalculating where that line is. Khrushchev, who has no sufficient experience of a state whose speech is free, is prone to think that Kennedy can and

should control an explosion of popular feeling. The fact is that there is a limit to President Kennedy's ability to lead public opinion, and he is in sight of that limit. Mr. Khrushchev must make no mistake about this.

For our part, we are prone to suppose that because speech is strictly regimented in the Soviet Union, that there are no irresistible internal pressures on Khrushchev. This can be a very dangerous illusion.

In both countries there is a line which it is not safe for the other to cross. It is the line where compromise will be regarded as humiliation or surrender. This line will have to be made precise in the negotiations. Blockade of the access routes in such a line for this country. For the Soviet Union such a line would be the giving of nuclear arms to West Germany. These are lines of provocation which cannot be crossed without provoking uncontrollable, indeed suicidal reactions.⁴²

These wise words are in the sharpest possible contrast to the irresponsible speculations of the strategists. Where they play out endless conceptual variations without the slightest concern for relevance or utility, Lippmann attends always to the actual political context, incorporating into his analysis the facts of politics and human nature, as well as the logic of deterrence. Particular attention should be paid to the actions which Lippmann considers beyond the limits of acceptability to either side. Closing off the access routes to Berlin, or the giving of nuclear weapons to West Germany, are seen as intolerable provocations. What then should we label the actual dropping of hydrogen bombs on population centers or even on inhabited military installations?

Finally, let me repeat with regard to limited retaliation what I have said about counterforce. However great the uncertainties and unforeseen liabilities of negotiated disarmament, they are far, far less than those associated with so impractical a proposal as limited city exchanges. Kaplan, Kahn, Schelling, and the others achieve a certain disembodied plausibility for their schemes only by excluding disarmament from the slightest serious consideration. In effect, they argue that disarmament and arms reduction are admirable but unachievable in the present situation; that the Soviet Union confronts us with a constant threat which can be met either by surrender or forceful resistance; that resistance by all-out war would be suicidal; and hence that the only remaining alternative, however fraught with dangers or unlikely of success, is some such device as limited retaliation. The entire argument collapses as soon

⁴² Herald Tribune, Sept. 14, 1961. Italics Lippmann's.

as one sees that the objections urged against disarmament and arms reduction are less serious than those which can be offered against limited retaliation. To be sure, disarmament is far from easy of achievement. But the alternative proposals of the strategists, so far from diminishing the attractiveness of disarmament merely demonstrate anew that is the safest way to protect our national security.

Part Two: The Logic of Strategy

Chapter Four In Pursuit of Rationality

A. Rationality and Deterrence

Two images of man compete for acceptance in the history of western thought. The first is man as contemplative, comprehending the world but not changing it. The second is man as active, involving himself in the world in attempt to alter it, bend it to his will, realize in it his hopes and desires. Around the second image of man has grown the body speculations, maxims, injunctions, and principles which, in the very broadest sense of the words, is known Moral Philosophy. In the eighteenth century, Moral Philosophy included economics and politics as well as formal ethical theory. It even encompassed the burgeoning discipline of psychology, with its observations of the sources and patterns of a man's behaviour. If we return to the original sense of the word, freeing it from its narrow moralistic overtones, we may say that Moral Philosophy deals with the question, "How ought I to act?" This question can be raised in the forum and in the marketplace, in the home and on the battlefield. Wherever men are faced with alternative courses of action leading to consequences which are desired or feared, the simple question reappears, "What ought I to do?"

It is common to suppose that the only dilemma about action is whether to do the "right" thing or the "selfish" thing; whether to obey some commandment or serve my own self-interest. But common as this view is, it is completely mistake. Whatever the merits of identifying morality with doing things I don't like, it simply isn't true that one I have opted self-interest, I have solved the problem of choice. This is probably most obvious in matters of economics. Suppose that I have decided to go into business for the purpose of making as much money as I can. I shall obey the law (in order to avoid being put in jail), but beyond that, my motto is caveat emptor. How shall I proceed? Where shall I put my capital?

How can I tell whether I am going to make a profit or suffer a loss? What rules do I follow to decide whether a dollar spent on advertising will bring more than the same dollar used to expand my plant?

In addition, I am not alone in the market. Other businessmen, equally self-interested, are competing with me for a scarce supply of consumer dollars. How can I take their trade away, beat them out for a good deal, improve my chances of surviving the competition which rages ceaselessly? In short, having chosen self-interest as the principle of my action, what is the best way of implementing in practice?

The problem is more acute still in the battlefield. There my aim is to defeat my enemy, to force him into surrender or at the very least into an armistice favorable to me. His aim is identical and human lives, not merely dollars, are at stake. Are there any rules for making the most of my position and armament? Knowing that he is planning similar attacks against me, can I find some way of forestalling them?

In the popular folk-lore of our society, it is customarily assumed that the entrepreneur and the general are coolly, unswervingly dedicated to the pursuit of their respective goals of money and victory. Actually, as even a superficial inspection of economic and military behavior reveals, these hard-eyed realists frequently base their decision on tradition, myth, or outdated experience. Lacking any conscious techniques for discovering the most advantageous course of action, they fall back on the habits of the predecessors, assuming that as they were successful, they must have known what they were doing.

The term used to describe the successful fitting of means to ends and the achievement thereby of some desired goal is instrumental rationality. Given a goal of whatever sort, the instrumentally rational way to behave is to discover the most efficient path to that goal and then take it. Habits, prejudices, traditions, taboos, are all irrational obstacles to the achievement of a goal. Instrumental rationality is generally said to be morally neutral. That is to say, there is nothing inherently good or bad about being rational in this sense. A murderer who chooses poison because it is easy to administer is

being in this sense. Hitler and the nazis in the organization of the immensely complex annihilation of the Jews were exhibiting instrumental rationality. The rightness or wrongness of the act, it is frequently held, resides in its goal, not in the efficiency or inefficiency with which is pursued.

The problem of moral philosophy, "What ought I to do?", can thus be rephrased, for purposes of economics or war, as "What is it instrumentally rational for me to do?" The central theoretical problem then becomes to discover the principles of instrumental rationality.

To the concept of instrumental rationality we may add another concept which has played an increasingly important role in the social sciences and is central to the work of the academic deterrence theorists, namely that of a strategy. In some economic and most military situations, men are locked in a competitive struggle in which the actions of each affect the outcomes for the others. Contrary to scientific exploration, where we might say that many struggles are impersonal in nature, in economic and military affairs men compete against conscious, equally self-interested opponents. The goal of one is frequently gained only at the expense of others, so that in the achievement of his objectives each man must take into account the decisions and intentions of his opponents. In these circumstances, it is sometimes possible to formulate an explicit plan of action, taking account of all the possible situations which may arise and in particular of the responses of one's opponents.

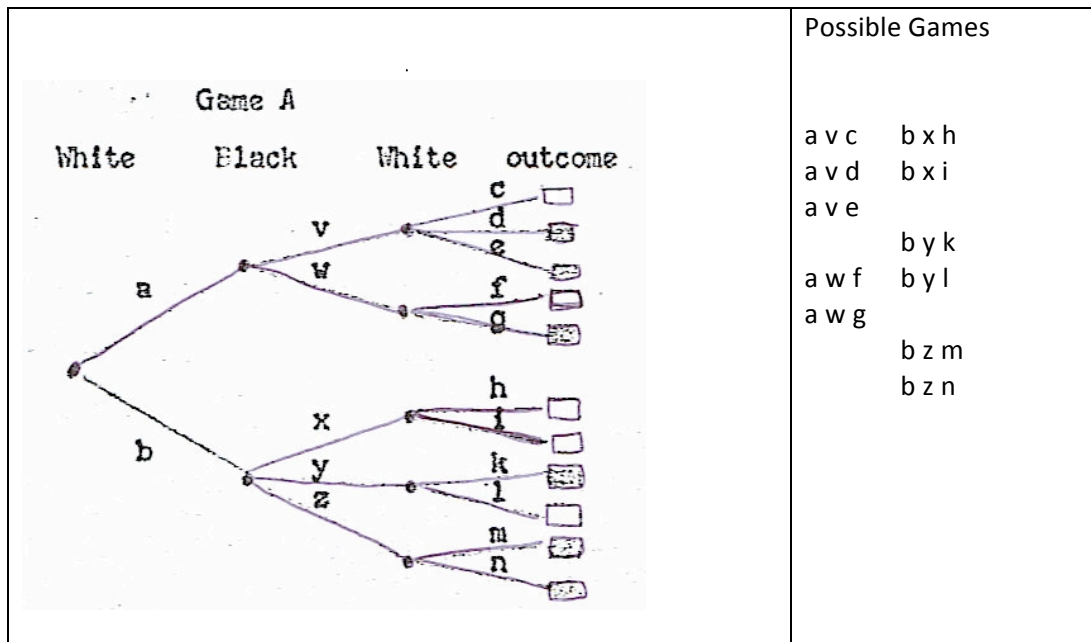
It might be well to point out here that despite the character of the subject of this book, I am not using the term "strategy" in its customary military sense. B.H. Liddell Hart, the British military expert, defines military means to fulfill the ends of policy."⁴³ It is thus, as he puts it a page later, the "art of the general." In the discussion of the academic strategists, and hence here as well, "strategy" has a special meaning derived from its use in Game Theory. A strategy is a complete plan of action or "play" which takes account of every possible future outcome.

⁴³ P.H. Liddell Hart, Strategy, 335.

A familiar example of a strategy is the plan of attack of a champion chess player. When, after starting at the board for long minutes, he finally announces “mate in four,” he is not simply expressing his intention to press the attack, or his desire to win. He is asserting that he has thought through every single possible move and countermove and has decided what he will do in each of the immense number of alternative ways in which the game can develop for the next four moves. Indeed, if his attack is perfect, he can even announce it to his opponent and invite him to resign.

There are two ways in which a strategy can be expressed. The more familiar is the branching diagram, called the extended form since it views the contest as stretching out in time. The same strategy, however, can just as well be put into non-temporal, static form by treating each complete path along the tree as a separate choice in a one-move game. This is called the “normal form,” for reasons relating to the use of that term in mathematics. The following simple example should clarify the relation between the extended and normal forms of a strategy. In Game A, represented in Figure I, White has two choices, a and b, for his first move. In response to a, Black has two choices, v and w. If White has played by, on the other hand, Black can respond with x, y, or z. Now White plays again, and he has three possible plays against Black’s v, and two each against w, x, y, or z. There are thus a total of eleven possible outcomes to this little game. But another way, there are eleven alternative paths along the branching tree of moves. They are given the table next to the diagram in Figure I. The outcome of the game is indicated by the white squares (White wins) and black squares (Black wins).

Figure I Game A in Extended Form



White, looking at the diagram of the game, sees that in five of the eleven possible cases, he wins. He says to himself: "If I play a, then if B plays v, I win with c, and if he plays with w, I win with f. But if I play b and Black plays z, I lose with either m or n. Therefore, I will play a. I can't lose." This is an example of an extended strategy. The same reasoning can be put in normal form by recognizing that White has fourteen possible strategies. These are given in Figure II.

Figure II

White's Strategies in Normal Form for Game A

- | | |
|---------------|----------------------|
| 1. avc or awf | 7. bxh or byk or bzm |
| 2. avc or awg | 8. bxh or byk or bzn |
| 3. avd or awg | 9. bxh or byk or bzm |

- | | |
|---------------|-----------------------|
| 4. avd or awg | 10. bxh or byl or bzn |
| 5. ave or awf | 11. bxi or byk or bzm |
| 6. ave or awg | 12. bxi or byk or bzn |
| | 13. bxi or byl or bzm |
| | 14. bxi or byl or bzn |

For example, Strategy #9 is to play b and then to answer x with h, y with 1, or z with m. Strategy #5 is to play a and then to answer v with e or w with f. When White looks over his possible strategies, he discovers that number 1 is a sure winner. The other thirteen, however, all give Black an opportunity to force White into a losing move. So White chooses Strategy #1, and wins no matter what Black does. White doesn't weaken himself by choosing Strategy #1 before waiting to see how Black will respond, for Strategy #1 has a consideration of Black's responses built into it. White can simply write down the number of his Strategy and go off for a cup of coffee, leaving an assistant (or machine) to play for him. Needless to say, not all games offer one or the other player a sure win. The more interesting games indeterminate. Oddly, chess is determinate, its reputation as a very difficult game. The only thing that keeps the two players glued to the board hour after hour is their inability to see far enough ahead to plan a really complete strategy for the entire game. Some day machines will be able to do this, and then people will stop playing chess. Poker, on the other hand, with its possibilities for bluffs and concealment of information, is theoretically far more complex. So the chess players who look down their noses at poker bluffs are actually all wrong so far as the intellectual content of the games in concerned.

Not every plan of action qualifies as a strategy. It is not enough merely to fix upon a goal, choose a line of action, and make some tentative decision about the way you will meet the most probably responses of your opponent. For a true strategy, in the technical sense of that term, it must be possible to give an exhaustive and precise enumeration of your possible actions, your opponent's possible replies, and the state of the world at each juncture. This does not by any means involve being able to

predict which particular course your opponent will select. A strategy is needed precisely when you can't be sure of that. But you must be able to state exactly what he may do, and what effect each possible action will have on you. And this must be done before the first move is made.

Life is in general not nearly so predictable. Hence the concept of a strategy will have application only in situations which have somehow been narrow down and specified more precisely than is usual. Games are of course the perfect examples of completely determinate situations, and it is for this reason that the theoretical investigations of strategy pay so much attention to them. But other, less artificial, examples can be found in real life. The market-place, with its clearly defined prices and wages and rates of profit, is one; the law courts are another; and under certain very special conditions, the battlefield seems to be a third.

The novelty and unfamiliarity of the new weapons has created an urgent need for new theories of military policy. For all the reasons discussed above, it is no longer possible to rely on the experience of our senior military men. The magnitude of potential destruction, furthermore, has eliminated all room for error. There will be no trial runs in the conduct of a nuclear war. Whatever Herman Kahn or Sec. McNamara may say, our first nuclear war will almost certainly be our last. But demand does not automatically create supply. Not every profession in need of a theory can count on getting one, even if it has the money to pay the intellectuals who make theories. In the case of nuclear deterrence, several significant features of the new weaponry have seemed to encourage the formulation of abstract theories and the adaptation to this new are of theories already developed in the social sciences.

The first promising fact about nuclear weapons, from the point of view of theory-builder, is the relatively high degree of predictability of their consequences. It may sound odd to say that weapons which have never been used in battle are highly predictable, but in fact we can be more sure of the consequences of exploding a hydrogen bomb of given size and type than we can of the results of a cavalry charge or tank battle. The reason is that so little of the outcome depends on human decision,

determination, and skill, and so much depends on scientifically measurable physical reactions. Having exploded the bombs under test conditions, can be fairly certain whether they will or will not accomplish a military mission such as destroying a city. After a number of firings have taken place, the probability of mishap can be calculated, so that we have a quite good idea of how many of our weapons will actually go off in battle.⁴⁴

The invention of ballistic missiles eliminated still other uncertainties from the conduct of war. The experiences of the Second World War showed that the outcome of an air battle or bombing raid is very uncertain business- the skill of the pilots may make a difference of many orders of magnitude, as in the Battle of Britain. Even though bombers armed with nuclear weapons are more predictable than those loaded with conventional bombs (because it matters less precisely how many get through), still the complexity of an air strike made it very difficult for the theoreticians at RAND and elsewhere to calculate the outcome of a hypothetical raid. With missiles, however, one can almost rely on the laws of classical physics. The accuracy and reliability of a missile can be ascertained by repeated firings. The success of recent tests has far outreached even the most optimistic predictions of a decade and a half ago. Missiles have flown to within a mile of their targets over ranges of as much as 7000 miles and more. All this makes possible for missiles the sorts of calculations which I discussed in the analysis of counterforce, and which would be impossible for bombers.

Predictability, then, of both delivery system and warhead, raises strategists' hopes that a theoretical model of nuclear conflict can be worked

⁴⁴ I am here expounding these points as they appear to the deterrence theorist. In fact, there is considerable question about the consequences of battleground nuclear explosions. For example, the massive fallout from hydrogen bombs was entirely unforeseen until the test in the South Pacific, Are there other unforeseen effects from the simultaneous explosion of many such bombs? Would firestorms in dozens of separate localities combine into a conflagration covering a several-state area? Would the ecological balance of North America be permanently affected, as was suggested to the Holifield Committee by Dr. John Wolfe of the ABC? What are the communications consequences of exploding 2000 megatons at the same time? No one can give accurate answers to these questions, and for this reason, among other, the theories of the academic strategists are of doubtful applicability to the real world.

Out which is reasonably adequate to the real world. A second factor which has in a curious way encouraged an appeal to the concept of a strategy is the swift destructiveness of nuclear weapons. A nuclear war will be over before there is much chance to pause and survey the damage. Such hope as there may be for controlling the extent of destruction or ending the war through negotiation will lie in preparations made before the first missile is launched. We simply cannot afford to “wait and see” what happens after the first exchange of thousand-megaton salvos. Consequently, we must work out ahead of time our replies to every imaginable enemy move. In other words, using the terminology described above, we need a strategy in normal form.

Finally, the subject of deterrence has attracted the interest of a group of social scientists whose academic concern is the psychology and logic of bargaining. Counterforce and limited retaliation to the contrary notwithstanding, we cannot afford to allow a nuclear war to break out. Hence our relations with the Russians take on the air, not of a pre-battle maneuvering, but rather of market-place bargaining. Threats, promises, and negotiations replace the troop movements and mobilizations of an earlier era.⁴⁵

As it happens, there lay ready to hand a body of theory which combined an analysis of the concept of strategy with a formal investigation of the logic of bargaining, threats and coalition. This was the branch of mathematical economics which its inventors, John von Neumann and Oskar Morgenstern, called Game Theory. Although it is by no means the case that all deterrence theorists employ the tools of Game Theory, nevertheless its influence has been considerable. It is not too much to say that insofar as the academic strategists have a theory at all, that theory is Game Theory.

B. Game Theory

⁴⁵ President Kennedy’s mobilization of reserve forces during the 1961 Berlin crisis, insofar as it was not a covert way of carrying out a military buildup which he desired on independent grounds, was a bargaining move designed to prove our seriousness of purposes, and not a military significant preparation for a nuclear war.

The problems of choice-making in situations offering a variety of possible outcomes of varying values have engaged the attention of economists and mathematicians for over two hundred years. Generally speaking, the difficulties of finding some common scale for rating and comparing the various possible losses and gains. These may be commodities, experience states of affairs, or a mixture of the three. A theory of choice depends upon some way of reducing them all to a homogeneous measure. A second source of difficulty is the frequent necessity of choosing among uncertain or risky alternatives. In calculating the results of our actions, we may be able, at best, only to estimate a probability with which some event will occur.⁴⁶ Finally, other persons' actions may alter the outcome of my choices (the market place is the most obvious instance of this interaction).

The problems of measurement of preference and of choice under risk have long been the subjects of intensive study in economics where they are translated into the language of demand, profit, and price. The problem of the interaction of several agents has only recently been accorded a prominent place in the literature of theoretical economics. Von Neumann and Morgenstern, in their famous work The Theory of Games and Economic Behavior,⁴⁷ undertook to develop a formal theory of rational decision-making in situations of interpersonal conflict. In the introduction to their work, the authors pointed out that previous economic theory had tended to treat exclusively the problem of man's struggle with inanimate nature. The standard model of a simple economy, from which economists proceeded to develop more complex models, was the Robinson Crusoe situation in which a lone individual made economic decisions based on his preferences and his estimates of the fruitfulness of various alternatives. But in actual economic life, each man's choices are as much determined by his

⁴⁶ Strictly speaking, uncertainty refers to our ignorance of future probabilities, as when we simply have no idea whether a piece of machinery is in good working order or not. Risk refers to known probabilities. For example, when I play an honest roulette wheel, I do not know which number will come up with next, but I do know that the probability of my winning with my number is exactly 1/38. The theoretical implications of uncertainty and risk are quite distinct, but for our purposes it is not necessary to distinguish them here.

⁴⁷ 2nd ed.; Princeton, H.J.: Princeton Univ. Press, 1947.

beliefs about the choices of other men as by his estimates of the outcome of certain natural processes.

Von Neumann and Morgenstern write:

The difference between Crusoe's perspective and that of a participant in a social economy can also be illustrated in this way: Apart from those variables which his will controls, Crusoe is given a number of data which are "dead"; they are unalterable physical background of the situation....Not a single datum with which he has to deal reflects another person's will or intention of an economic kind-based on motive of the same nature as his own. A participant in a social exchange economy, on the other hand, faces data of this last type as well" they are the product of other participant's actions and volitions (like prices). His actions will be influenced by his expectation of these, and they in turn reflect the other participants' expectation of his actions.⁴⁸

The authors conclude that an analysis of rational economic behavior must be based on a theory of the strategies which the participants in an economy employ. Finding convenient and suggestive models of such strategies in the form of certain simple games, the authors christened their mathematical system "game theory."

This is perhaps as good a place as any to clear up one of the most common misunderstandings attached to the name "Game Theory." Many well-intentioned critics of deterrence, who have with good reason been offended by the callousness displayed by authors like Herman Kahn in their discussion of "acceptable" casualty levels, have seized upon the word "games" and made the focus of their anger. Deterrence theorists who draw upon Game Theory have been accused of viewing life or war as a game, of not taking nuclear weapons seriously enough, of treating death as if it were no more than the sweeping of a chess piece from the board. There may be some measure of justice in this condemnation on other grounds, but if the critics are basing their attacks on the use of the word "game," then they have simply misunderstood the theory. Game Theory is a branch of mathematical economics, designed in the first instance to analyze the behaviour of men in economic contexts. It so happens that in the construction of models of conflict and manoeuvre, von Neumann and Morgenstern noticed that certain parlor games (primarily poker) exhibit in a simple and easily studied form some of the significant characteristics of economic competition. In particular, in poker (but not in chess) each player's actions

⁴⁸ Ibid., pp. 11-12.

(betting, raising, folding) are based as much on estimate of the probable actions of the other players as on the facts of “nature” (i.e., his cards). So, using models of simple games as the starting point of their analysis, the authors called their new theory “The Theory of Games and Economic Behaviour,” or Game Theory. It could as well have been called Bargaining Theory, Negotiating Theory, or better still, Conflict Theory, none of which have the misleading overtone of frivolousness of “Game Theory.”

In the next few pages, I will try to summarize a few of the central concepts of Game Theory and indicate some recent developments which have proved of particular interest to the strategists. Needless to say, it will be impossible even to begin to tap the rich literature on this subject, and the reader is therefore urged to look at one of the several excellent introductions which have published. Perhaps the clearest non-technical exposition is that of Anatol Rapoport in his interesting book, Fights, Games, and Debates.

The central problem of Game Theory is to discover the principles which should govern rational choice in situations of uncertainty involving risk. In the simplest of such situations, only one person or “player” is involved, and the problem is to decide how to evaluate a course of action whose possible outcomes have varying values and varying probabilities. The solution to this problem, first proposed several centuries ago, is to choose the course of action which has the greatest “mathematical expectation” or “expected value.” This notion will be explored in some depth in the next chapter, and in order to avoid complicating matters unduly I will pass over it here.

When more than one player enters the game, the task of discovering a rational strategy becomes immensely more difficult. The choices of the other player will affect my outcome, or “payoff,” and my choices will in turn affect him. It becomes necessary to ask what he is likely to do, and to take into account the fact that he is asking the same question in turn. Possibilities open up of bluffs, second-guessing, and all the other strategical tricks which enliven a game or complicate a war.

The general aim of Game Theory is to discover the rationally best strategy in any given game situation, in the sense of instrumental rationality described above. However, in order to facilitate the development of the theory, certain very stringent limitations are placed upon the behavior of the players. In particular, all the players are assumed to be rational. This means that each of the players, in calculating his strategy, must assume that all the other players are performing analogous calculations perfectly. It might appear that this is not much of a limitation, but in practice it eliminates many sorts of strategic tricks which actual players frequently employ. For example, a good poker player will observe his opponent and note any revealing habits they may have, such as a penchant for bluffing or an aversion to inside straights. He will use this information about strategic preferences in future hands to improve his odds. Perfectly rational players, however, do not have such quirks, and a strategy which is rational in the game theoretic sense will take no account of them.⁴⁹ The problem of Game Theory, then, in more precise terms, is to ascertain whether there is any set of rules for choosing a strategy in situations assuming perfect rationality for all players.

The simplest species of game studied by von Neumann and Morgenstern is what they called a zero-sum two-person game. This is a game with two players in which the winner wins exactly as much the loser loses (i.e., the sum of their payoffs is zero). The game theorist is not interested in the superficial trappings of the game. He is concerned only with the pattern of payoffs- that is to say, the sums won or lost by the players in each the possible outcomes. These payoffs can be represented graphically in a square array, known as a "payoff matrix." For example, consider the simple game called "choosing" (at least that is what it was called in New York when I was a boy). At the count of "three," both players put out fingers, either one or two. Now in the original game, one called either "odds" or either one or two. Now in the original game, one called either "odds" or "evens," but we can make the

⁴⁹ In an extension of Game Theory known as Bargaining Theory, these and other extra-rational considerations are introduced into the calculations of the players. The results, while less amenable to strict mathematical analysis, are far more interesting as models of real life situations. See below.

game, and the payoff, just a bit more complicated. Suppose that the following rules are adopted: if both A and B put out one finger, A gets 2 cents; if both put out two fingers, B gets 2 cents; if A puts out one finger and B puts out two, then A gets 4 cents; finally, if A puts out two fingers and B puts out 1, then A gets 1 center. (This is not a very good game for B to play, as we will see). This complicated set of rules can be very neatly summarized in a two-by-two matrix, as in Figure I. Figure I.

		B	
		One	Two
A	One	2	4
	Two	1	-2

The figures in the boxes are A's payoffs in the four possible cases. Since this is a "zero-sum" game, B's payoff are simply the negatives of A's. Thus B loses in three cases and wins only if both put out two fingers.

What strategies should A and B adopt? Let us look first into A's mind. He studies the game and says to himself: "If I put out one finger, then no matter what B does, I come off better than I would with two fingers: if he puts out one, I win 2 cents instead of only 2 cent, and if he puts out two fingers, I win 4 cents instead of losing 2. So it looks as if one is my best play under any circumstances." At the same time, B is also studying the game, and his reasoning goes something like this:⁵⁰ "The only way I can actually win anything is if we both put out two fingers. But looking at things from A's point of view, it is obvious that one finger is the best strategy for him. In that case, I lose 4 cents if I play two. Since A is rational, he is aware of perferability of one for him, so I can assume he will put out only one finger. That being the case, I had better put out one also and resign myself to a 2 cent loss."

⁵⁰ We can tell what is going on in B's mind because, by hypothesis, he is perfectly rational. Without that assumption, all the complicated reasoning of Game Theory would be impossible.

The outcome “one-one” can also be arrived at by another line of reasoning which embodies an analogous version of rationality. Player A can look for the strategy which maximizes his minimum gain; at the same time, Player B can look for the strategy which minimizes his maximum loss. The intersection of these two chains of reasoning, in our game of choosing, is again “one-one.” (Briefly, A discovers that the minimum gain in row 1 is 2, while the minimum gain in row 2 is actually -2, a loss. B finds that the maximum loss in column 1 is -2, while the maximum loss in column 2 is -4. Hence A chooses row 1 and B chooses column 1, with “one-one” as the result). The box thus singled out in the payoff matrix has still another property which distinguishes it mathematically: it is the smallest number in its row and largest number in its column. Because of the shape of the three-dimensional graph of such a situation, it is called a “saddle-point.”

Not all games are of this simple variety, needless to say. Even if we limit things to two players, considerable complexity can be introduced by lifting the restriction that the sum of the payoffs be zero. If we do not even require that the sum be the same in all outcomes, we have what is called the “two-person variable sum game.” This class of games, it turns out, has been the primary object of study in recent literature on game theory and it is also the focus of attention of the strategists.

The most frequently cited instance of a two-person variable-sum game is the curious conundrum known as the Prisoner’s Dilemma. Two criminals are caught and accused of a very serious crime, carrying with it a penalty of life imprisonment. Unfortunately for the policy, there is a shortage of evidence against the two, and so the District Attorney tires a trick to break them down. He puts them in separate rooms, and to each in turn makes the following statement: “If you turn state’s evidence, and your buddy doesn’t, you will go free and he will get life. If you both confess, we will reduce your sentences to fifteen year each. If neither of you confesses, we still have enough evidence to send you away for a short term on a minor offense. Now doesn’t imagine your pal is going to keep his mouth shut, for he knows that if he does and you sing, he is sunk. So you might as well confess too and at least get

the sentence cut down from life to fifteen years.” The situation is represented by the payoff matrix in Figure II below. Because B’s payoffs are not the simple negatives of A’s, two numbers must appear in each box, the first for the payoff to A and the second for the payoff to B. We can give numbers to the various outcomes, suggesting their relative values. Let us say that -30 is that value of life imprisonment, +30 is the value of freedom, -15 is the value of the 15 of the 15 year sentence, and -3 is the value of the minor sentence. Then the set of alternatives for each criminal looks like this:

Figure II

		B	
		Don’t Squeal	Squeal
A	Don’t Squeal	-3, -3	-30, +30
	Squeal	+30, -30	-15, -15

There are four possible outcomes. If neither one squeals, both get minor sentences, represented by the pair of payoffs -3,-3. If A squeals and B keeps quiet, the A goes free (+30) and B goes to jail for life (-30). The reverse is true of B squeals and A keeps quiet. Finally, when both confess, their payoffs equal -15 apiece.⁵¹

The dilemma faced by the two prisoners in our little example is simply this: If A follows what looks like a rational policy, he will squeal, for he says to himself: “If I squeal, then no matter what B does, I come out better that I would have by keeping quiet. If he doesn’t squeal, I get off free instead of a minor rap, and if he squeals too, I get fifteen years instead of life.” B also figures the same way, of course, for we are assuming that they are equally rational. So both squeal, and as the diagram shows, they both get fifteen-

⁵¹ The reader may wonder where we got the numbers from. This turns out to be a very significant question indeed, as I shall show in my analysis of the unacknowledged presuppositions of the strategists. The answer is that like all the numbers used in Game Theory examples, they were plucked arbitrarily out the air.

year sentences. But a look at the matrix reveals that if they had both kept quiet, they could have gotten off with minor terms in jail. In other words, apparently rational course of behavior does not maximize value, even though that is supposed to be the definition of rationality. The trouble is that each criminal has to be able to trust the other not to pull a double-cross and get off scot-free by confessing. That they are better off trusting one another is clear, but what is not so clear is that it is rational to trust.

Variable-sum games do not have strict “solutions,” in the mathematical sense defined by von Neumann and Morgenstern. Hence formal Game Theory stops with the two-person zero-sum game. However, in a broader sense, it is precisely here that the really interesting development of Game Theory begins. The axioms of rationality laid down by the originators of the theory are too stringent to allow of solutions for any but the simplest games. This does not mean that we cannot search for richer conceptions of rationality which will lead to analyses of complicated games, like those with variable sums.

The first complicating factor introduced in the study of variable-sum games is communication. How does a situation alter when the players can communicate with one another? In our Prisoner’s Dilemma, a host of possibilities are opened up to the two prisoners by communication, although their problem is by no means solved by it. It is still open to either of them to try to double-cross the other. But now one of the two may make threats or promises to avoid the mutually disadvantageous double-squeal. Thomas Schelling has done some beautiful work in the dynamics of such communications-problems in his book The Strategy of Conflict. He points out that in some cases, it may be to the advantage of one party to make it impossible to hear the other. For instance, suppose that two men are attempting to strike a bargain on the sale of a house, and for some reason the deal must be closed by noon at the latest. The last man to make an offer before twelve will presumably have it accepted, since both parties prefer to complete the deal rather than see it fall through. This being the case, if the buyer

makes a bid favorable to himself and then hides, or hangs up the phone (or pretends that he can speak but not hear over it), the seller may be forced, in his own interest, to accept.

Schelling and other has coined the term “bargaining games” to characterize these partly cooperative, partly competitive situations. As Schelling points out, unless one intends to fight a war to the death in which extermination of the enemy is more important than self-survival, then even war itself is a bargaining game. We and the Soviet Union, while prepared to launch nuclear weapons at one another over Berlin, still have a common interest in avoiding accidental wars, and in keeping the destruction of a war to a minimum should it occur.

The logic of threats and promises is explored in great detail by Schelling. A threat, as he realizes, is a quite complex bargaining move in which problems of credibility and commitment are involved. There are threats which hurt oneself as much as one’s opponent, threat to do something and threats not to stop doing something, threats to attack and threats merely to raise the probability of attacking. All these, Schelling claims, affect the payoff matrices and value scales of the players, and hence put pressure on them to alter the strategies. Deterrence itself is seen as a complex matter of adjusting the enemy’s payoff matrix, but suitable threats, etc., until it becomes rational for him to do what you want him to do.

As developed by Schelling, Bargaining Theory is not strictly a theory. It has not axioms, proves no theorems, provides no “solutions” to various bargaining games. The reason for this, as I have pointed out, is that beyond the simplest of games, no mathematically defined solutions are possible. Consequently, we must view the work of Schelling and others in the field as having the aim of evolving a vocabulary of strategy. By means of the games and matrices, they seek to develop a series of models and a repertory of concepts with which we can think about problems of a nuclear deterrence.⁵²

⁵² In Schelling’s case, I think it is fair to say that his work has a wider significance than this. It is really a vocabulary for speaking about all forms of conflict and the attendant strategies.

The question which faces us, then is not whether the theorems of Game Theory are valid; not whether the conclusions of Schelling, Kaplan, and Snyder are formally entailed by their premises. Our problem, rather, is to evaluate this new vocabulary in order to decide whether it is useful, whether it clarifies the practical problems confronting us, provides guidelines for our thought. We must ask whether this vocabulary has built into it hidden presuppositions which beg the questions we wish to answer. Does it assume anything about Russia, America, our national goals, our value scale, which might wish to bring out into the open debate? In short, do the models of the Game Theorists constitute a vocabulary or a rhetoric of deterrence?

Chapter V- The Failings of Game Theory

Game theory and its extension, Bargaining Theory, are fascinating abstract disciplines, embodying some of the most imaginative theoretical work in the social sciences. But we must still consider whether the insights of von Neumann, Morgenstern, Schelling, and the other have a practical application in the field of Deterrence Theory. The use of the concepts and terminology of Game Theory in the literature of deterrence suggests that the strategists themselves find great significance in payoff matrices, utility calculations, and the models of threats and promises. Thomas Schelling is admirably cautious in the opening pages of his book, The Strategy of Conflict. After describing briefly the general area of conflict theory, he explains why he limits himself to the strategy of conflict:

“We can be interested in the strategy of conflict for at least three reasons. We may be involved in a conflict ourselves; we all are, in fact, participants in international conflict, and we want to “win” in some proper sense. We may wish to understand how participants actually do conduct themselves in conflict situations; and understanding of “correct” play may give us a benchmark for the study of actual behavior. We may wish to control or influence the behavior of others in conflicts, and we want, therefore, to know how to the variable that are subject to our control can affect their behavior.

If we confine our study to the theory of strategy, we seriously restrict ourselves by the assumption of rational behavior motivated not just of intelligent behavior, but of behavior motivated by a conscious calculation of advantages, a calculation that in turn is based on an explicit and internally consistent value system. We thus limit the applicability of any results we reach. If our interest in the study of actual behavior, the results we reach under this constrain

may prove to be either a good approximation of reality or a caricature. Any abstraction runs a risk of this sort, and we have to be prepared to use judgment with any results we reach.”⁵³

We can distinguish three views of the relation of game theoretic models of rational behavior to the actual happenings of international conflict. The simplest view, of course, would be that Game Theory offers an accurate description of international conflict. On this view, nations are not merely analogous to players in a game, they are players, and the statements made about rational game strategists apply to them unequivocally. Stated in this way, such an interpretation is obviously false. Schelling is quite clear that he does not intend his work to be so understood, and although other theorists are less explicit about their methodological assumptions, it is fair to say that they would follow his lead.

The second view is that the models of Game Theory simplified pictures which emphasize the basic determining factors in conflict situations and work out the mathematical and casual relationships between them. Such a theory serves as a tool for predicting the interactions of variable quantities and the probably responses of the enemy to our moves. As Schelling says in the passage just quoted, “we want to know how the variables that are subject to our control can affect our opponents’ behavior.” An example of such a model from the physical sciences would be the “ideal gas” of Boyle’s Law. There is no real gas which exactly conforms to the conditions of Boyle’s model. Nevertheless, by using the model one can deduce relationships between pressure, temperature, and volume which, within certain relatively narrow limits of error, are accurate predictions of the behavior of hydrogen or oxygen.

The third possible interpretation is that Game Theory presents a value-free formal model of perfectly rational behavior. According to this view, Game Theory isolates (Schelling says “abstracts”) the factors which constitute perfect rationality, and constructs a picture of conflict situation in which the participants guide their actions by the canons of rationality alone. No assumptions concerning the

⁵³ Schelling, op. cit., pp. 3-4.

nature of the values of the actors are built into the model, except the methodological assumption of internal consistency. None of the non-rational distinguishing characteristics of Russians or Americans, generals or politicians, are included. The result is of course not a picture of reality. It is a technical device which can be used to explore the relationships between different concepts (of threat and bargain, for example) and provide insight into the way that men would act if they were perfectly rational. In this way, it can also service as an ideal of rationality- a model of how we ought to act, insofar as we seek to pursue our chose goals in a rational, rather than traditional or emotional or bureaucratic matter.

The remarks of Schelling and the other strategists suggest that in their application of Game Theory to the problems of deterrence, they interpret rationality as a simplified picture of the fundamental casual factors in the decision-making aspects of conflict situations. In the following two sections, I will consider these interpretations and try to assess their legitimacy. My conclusions, to anticipate a bit, will be that game theoretic models are irrelevant s casual models of decision making, and inadequate as analyses of perfect rationality.

A. The Predictive Value of Game Theory

How useful is Game Theory in helping us to predict the way in which our potential enemies will behave? Can the abstract models of conflict actually give us some clues as the probably reactions of the Russians to our threats? At first one might have rather high hopes, for Game Theory is an outgrowth of the social science which has had the greatest success in predicting detailed changes in quantitative variables, namely Economics. Upon closer consideration, however, I think it will be clear that the strategical applications of Game Theory have no the slightest predictive value in the present state of their development and cannot be expected to acquire a much greater value in the future.

In order to understand why the impressive models of the strategists are so unhelpful in discovering actual casual relationships, we may turn our attention briefly to the models of economic theory which have had such success. The original model of an economic system was the classical laissez

faire model developed by Ricardo and Adam Smith. It postulated a large (effectively unlimited) number of entrepreneurs and consumers, producing and buying a diversity of goods. These players, or “economic men” as they were called, were motivated solely by the desire of increased profit or a better bargain. They were presumed not to be hampered in their economic activity by ignorance, prejudice, habit, or even sheer laziness. It was also assumed that men were willing and able to shift their capital investment quickly and fluidly from a less profitable to a more profitable enterprise, guiding themselves again purely by the profit motive.

Although competition may be the sole determining force in the theory of laissez faire, John Stuart Mill, when he came to write his Principles of Political Economy, recognized that the case was rather different in practice. In the chapter “Of Competition, and Custom,” he said:

So far as rents, profits, wages, prices, are determined by competition, laws may be assigned for them. Assume competition to be their exclusive regulator, and principles of broad generality and scientific precision may be laid down, according to which they will be regulated. The political economist justly deems this his proper business: and as an abstract or hypothetical science, political economy cannot do, anything more. But it would be a great misconception of the actual course of human affairs to suppose that competition exercises in fact this unlimited sway. I am not speaking of monopolies, either natural or artificial, or any interferences of authority with the liberty of production or exchange. Such disturbing causes have always been allowed for by political economists. I speak of cases in which there is nothing to restrain competition; no hindrance to it either in the nature of the case or in artificial obstacles; yet in which the result is not determined by competition, but by custom or usage; competition either not taking place at all, or producing its effect in quite a different manner from that which is ordinarily assumed to be natural to it.⁵⁴

Thus two factors, competition and custom, determine wage levels, prices, profits, and rents. Now Mill begins the chapter by saying that one must “ascertain the amount of influence which belongs to each of these causes.” It sounds, therefore, as if he thought there some theoretical method for deducing laws or principles of custom, just as Smith had deduced laws of competition. Unfortunately, this is not at all the case, Law of competition can be deduced because, under the postulate of perfect competition, there is one and only one thing which any economic man will do in a given situation : viz.,

⁵⁴ Mill, Principles of Political Economy, Book II, Chapter IV.

whatever maximizes his wealth. But “custom” is all a catch-all term from grouping together all the uncountably many ways in which men may deviate from perfect economic rationality. It is like the terms “hit” and “miss” in an archery shoot. If I am told that the last shot was a perfect hit, I know exactly where to look for the arrow- right in the center of the bullseye. But if I am merely told that it was a miss, the arrow may be virtually anywhere! Granted that rents are distorted from their competitive norm by custom, are they lower than pure laissez faire would make them? How much higher or lower? Mill gives no answer, for of course there can be no answer purely on the basis of abstract theory.

Economists have developed techniques to handle this problem. What they do, simply, is to gather data of actual rents, prices, interest rates, or wages, and attempt by induction, not deduction, to discover patterns which can be expressed in the form of general laws. The typical instrument of this empirical exercise is what is known as a “time series.” This is a record of the fluctuations of a given quantity over a period of months or years. For example, the year by year record of the Gross National Product of the United States is a time series, as are the monthly unemployment figures, the yearly auto sales, and the population increases each tenth year.

With these data in hand, the economists then constructs an abstract model into which he builds a custom or irrationality factor in the form of a set of variables. Merely on the basis of the theory he does not know what values to assign to these variables, but by inspecting his empirical data and employing a variety of high-powered mathematical tools for handling such data, he can estimate the proper values. He then feeds these into the model, makes predictions, and goes back to the data once more to see whether the predictions are correct. Without the model, of course, the economist would have very little ability to foresee the behavior of the key economic indices. But without the data, he is simply a useless model-builder.

The situation in deterrence theory is precisely analogous to that in economics. The game theorists begins by postulating two antagonists whose actions are assumed to be the products of

rational choice and calculation. Then various possible threats or attacks are fed into the model, and deductions are made as to what responses would follow. For example, Thomas Schelling examines in great detail the different effects which can be produced by deliberately introducing an element of uncertainty or randomness into one's strategy. He ascertains the precise mathematical relationship between payoffs and probabilities, and by means of familiar techniques is able to say just how much uncertainty, or dissuade him from some course of action. In order to apply these formulae to real deterrence problems you need to only know your own utility scale, your opponent's utility scale, and the probabilities of the various outcomes. The rest is simple calculation.

Or rather, it would be simple calculation, if only men in the real world would adhere faithfully to the simple canons of rationality laid down in the theory. But alas, they do not. Pride, patriotism, tradition, ambition, ideology, even more scruple, intervene to warp men's picture of the world and seduce them from the calculus of expected value. In order for the game theorist to apply his formulae to the world, he, like the economist, must know just how much these "irrational" factors will influence the players. Granted that the game theoretic model is at least a partial distortion of real action, what quantitative allowances should he make in his calculations?

The only possible source of this information for the game theorist, as for the economist, is experience. The economist has his time series; so too, the game theorist needs data on the way in which men and nations perform their deterrence manoeuvres. He must have examples of threats which have succeeded and threats which have failed; he must be able to discover what Walter Lippmann, in the passage quoted above, calls the "limits of intolerable provocation, beyond which the reactions of Russia and the United States are uncontrollable."

But here we encounter an insurmountable obstacle in the path of the game theorist. Unlike the economist, he has no data actual performances and he cannot afford to wait for it. The economy is a continuing enterprise in which endless transactions take place each year. The economist can observe a

business cycle or inflationary trend in an attempt to discover causes and cures. The game theorist, however, unless he is insanely reckless, will not dare take the chance of plunging America into a nuclear war, merely to ascertain that “limit of intolerable provocation.” Are threats of nuclear retaliation effective? Perhaps, but can we experiment with them for the sake of filling the payoff matrices of the game theorist?

Quite obviously not. At the present time, we have none of the evidence necessary for actually applying Game Theory to nuclear deterrence, and the risks of acquiring such evidence are impossibly high. For example, Morton Kaplan and other recommend the use of a “limited reprisal” strategy. The theory behind this strategy is simple: even after a single nuclear weapon has actually been dropped on the United States or Soviet Union, it is still in the interest of the injured nation to settle the dispute rather than plunge into a suicidal war. Hence, by taking out a city or a base, we can put pressure on the Russians for a settlement without at the same time starting a war. Kaplan, of course, recognizes the possibility that the Russians might react “irrationally,” and in self-destructive anger strike back with a full-scale nuclear onslaught. But he faces the same problem which Mill faced with regard to custom. Kaplan knows *that* irrational factors may sway the Russians (and ourselves), but he doesn’t know how much. And the only way in the world to find out is to try! We can drop a few bombs and carefully observe the pattern of Soviet responses. Then, after World War VIII or IX, we may have a sufficient time series to formulate some general propositions. With any luck, our mutated descendants, deprived of the mixed blessings of modern civilization, may retain as their sole legacy from our present era a thoroughly proof-tested theory of nuclear deterrence.

We must guard against the danger of talking ourselves into false beliefs. As more and more high-ranking officers and policy makers become enamored of the game theoretic language, they tend to react on one another, reinforcing their conviction that the proposals are rational and feasible. We have already adopted the game theoretic policy of counterforce without the slightest reason to suppose that

Russian will reciprocate. The more we absorb ourselves in the abstractions of the strategists, the less we base our policies on factual estimate of Russian intentions. Ironically, we thus ignore the first lesson of Game Theory, namely to incorporate into one's own plans the probably responses of the enemy.

B. Game Theory as an Analysis of Rationality

The most significant claim for Game Theory is that it enables us to work out in considerable detail the implications for decision-making of the postulate of rationality. Needless to say, men do not often approximate to perfectly rational behavior, but it is nevertheless quite useful to know exactly what such behavior would be. By rationality is meant, of course, "instrumental rationality." Schelling's definition is clear and precise: "behavior motivated by a conscious calculation of advantages, a calculation that in turn is based on an explicit and internally consistent value system."

Although Game Theory makes the assumption of consistency in values and rationality in choice, it purports to be perfectly neutral with regard to what particular values they players wish to maximize and how they rank the various outcomes in relative order of value. Thus, one man may prefer leisure to money, a second money to fame, and a third fame to either leisure or money. Game Theory can be used equally by all three in the pursuit of their private goals. Obviously therefore, Game Theory makes no moral judgments about the rightness or wrongs of the value system of a player. So long as the player is consistent with himself and calculates his gains and losses in the mathematically appropriate manner, he is being "rational." In effect, the game theorist says to the politician: "You choose your 'national goals' and decide upon their relative value to yourself and your citizens. Then I will tell you how to do the best possible job of achieving them." Game Theory, as a formal system, is neutral as between Communism and Democracy (although, of course, the game theorists themselves may not be.) Presumably, the same calculations which they propose can be made by the Russians, and Game Theory assumes that they will be.

Thus Game Theory is ostensibly “value-neutral.” In fact, however, I will show that it is very far indeed from value-neutrality. As developed by von Neumann and Morgenstern, it places stringent restrictions on the sorts of values which can be pursued by the “players” and as applied to deterrence problems by Schelling, Snyder, Kaplan, and others, it makes powerful presuppositions about the actual order of values of the United States and the Soviet Union. Once the dubiousness of those value assumptions is exposed, Game Theory is seen to be thoroughly illegitimate as a methodology of decision-making in a deterrence context. As theory should precede application, let us begin with the presuppositions built into Game Theory itself. Game Theory and Nature of Value

The central concept of Game Theory is “value.” In game situations, players are presumed to be engaged in the maximization of utility or value, and the fundamental postulate of rationality employed by game theorists is that one always seeks the strategy which promises the greatest “expected utility.”⁵⁵ Utility was introduced into the vocabulary of the social scientist more than two hundred years ago by Daniel Bernoulli.⁵⁶ Bernoulli was faced with a paradoxical gambling problem which seemed to contradict the customary assumption that men aimed at the maximization of their monetary wealth. He concluded that in fact it must be not wealth itself but some subjective quality or experience which men sought to maximize when they gambled or engaged in activities. This subjective quality (pleasure, enjoyment, satisfaction, or “utility”) might bear only an indirect relation to objective wealth. For example, a poor man in desperate need of money would place a far higher value on one hundred dollars than a wealthy man would had no ungratified desires. A gambler who loved the game might prefer to lose a bit rather than wipe out his opponents and see the game come to an end. In general, the utility which men attach to objects, experiences, and states of affairs cannot be assumed to be directly and simply determined by

⁵⁵ The notion of “expected utility,” as opposed simply to utility, is a bit complicated and will be discussed separately in the next section. For the time being it is only necessary to understand the concept of utility itself.

⁵⁶ Cf. Daniel Bernoulli, “Exposition of a New Theory of Measurement of Risk,” *Econometrica*, XXI, 23-26.

their monetary value. So in any truly adequate theory of choice under risk, such as Game Theory, we must assume the actors to be engaged in the maximization of utility, not of wealth.

Bernoulli seems to have supposed that there actually existed a perceptible quality called utility, but this rather dubious assumption is not at all necessary to the development of what is now known as “utility theory.” Although it may appear to lead us far afield from deterrence, it will be worth our while to look a bit more closely at the manner in which the concept of utility is developed in modern theory.

We begin with the undoubted fact that men are capable of expressing preferences among various states of affairs or experiences. Given any pair, such as going to a baseball game or eating a steak, listening to Verdi or watching a movie, kissing a pretty girl or winning a thousand dollars, a “player can state which he prefers (or perhaps that is indifferent between them.) Naturally, different players may have different preferences. Hence each individual player will have his own “utility scale.” Once a player has expressed a series of such preference, we can order them all in order of desirability for him. The only assumption we must make is that the player is consistent with himself. That is to say, if he says he likes the baseball game better than the steak, and the steak better than listening to Verdi, then he had better prefer the baseball game to Verdi. In fact, this premise, which is called “transitivity of preference,” is taken by some utility theorists as part of the definition of rationality.

Thus far we have an “ordinal ordering” of the possible states, or “outcomes.” We have the individual’s listing of the best, second best, third best, fourth best, and so on, strictly from his own point of view.⁵⁷ Although this is sufficient for some purposes of economic theory, it is not for Game Theory. What is needed is rather a cardinal measure of utility. Some means must be found of attaching numbers to the various outcomes which can then be added, subtracted, multiplied, and divided. For this purpose, the player must be able to express his preferences among a variety of combinations of outcomes having different probabilities. He must be able to say,

⁵⁷ Called an ordinal ordering because “first,” “second,” “third,” etc. are ordinal numbers. By contrast, 1,2,3,4 etc are cardinal numbers.

for example, whether he would rather go to a ball game or have 1/3 chance of eating a steak and 2/3 chance of kissing a pretty girl. If he can perform this and many other similar acts of choice, then the game theorist can define his “utility function” as a cardinal measure of utility. To put the whole complicated matter in a nutshell, we can then attach a number to any possible state of affairs and say, “That is how much it means to him.”

From the summary which I have just given it would appear that no restrictions are placed by the theory on what can be valued by the players. They must be self-consistent, to be sure, but beyond that any tastes and preferences, no matter how idiosyncratic or perverse, can be accommodated by the theory of utility. Or so it seems. In fact, however, a very stringent limit is placed upon the states of affairs which can be valued by the players- a limit which thus gets built into the theory and may never be noticed by the academic strategists who apply it to deterrence.

Strictly speaking, Game Theory does not limit the players with regard to what states of affairs they may value. Rather, it restricts them from valuing the manner in which the states are realized. Or, to put the point more precisely, it restricts the players from placing any value on the kinds of strategies which they employ. Now, as I shall show in what follows, there is a certain class of exceedingly important values, which we can call “Social values,” whose character is inseparable from the manner in which they are brought about. Hence Game Theory, by barring the players from valuing any particular strategy over any other, in effect bars them from including these social values in their value scales. To anticipate just a bit, it will turn out that such values as democracy and free speech fall into the category of “social values.”

To begin with, let us look more closely at what are called “cooperative games.” These are games in which the payoff matrix makes the players win and lose together. For example, consider the following game:⁵⁸ A and B are given an opportunity to divide one hundred dollars between them. Each

⁵⁸ The example is taken from Schelling.

is told to write on piece of paper the division which he proposes. There must be no communication. If the two proposals precisely match, then A and B get the sums which they have proposed, but if the proposals are different, neither one gets anything. In this game, there is no percentage at all in trying to outwit the other player. Only cooperation pays off. (Schelling reports that when this game is tried on people, most of them fall very easily into the most “natural” solution, which is 50-50.) If A tries to get an edge, by writing for example that he should get all the money, he will only hurt himself, for B is sure not to have written the same thing. In so-called mixed games, having elements of both cooperation pays off, and other situations in which one player can increase his winnings by switching to a competitive strategy.

In either mixed games or pure cooperation games, the choice of strategy is determined solely by the payoff prospects. The players are assumed not to have any particular preference for cooperative strategies as such. (It is a commonplace of such tournament games as chess or bridge that the real expert will not exhibit a consistent preference for a particular line of play or plan of attack. To do so would give his opponent a fatal edge). This means that the states of affairs which the players are striving for are valued by them quite independently of how they are realized. For example, the business man seeks a profit. He will use a cooperative strategy if that promises the greatest gain, and competitive strategy if that looks best, but his desire is for the profit, not the strategy. If he is so soft-hearted as to prefer strategies of cooperation, even at the cost of a lower profit, he will by game theoretic standards be irrational (although not therefore unlovable.)

I hope I have indicated that Game Theory normally makes no allowance for a strategy preference. But it is not yet clear whether that constitutes a limitation on the players. What possible objects of states of affairs might they desire for which the method of realization was not irrelevant? As a first example, I will cite the thoroughly non-political experience of love.

There are some cynics who maintain that love is a zero-sum game-one lover's gain is inevitably the other's loss. Rather more romantic souls insist that it is really a variable-sum game in which both cooperation and competition enter. The idealists among us might wish to hold out for love as a game of pure cooperation, with both partners winning or losing together. But if I may be permitted the most romantic view of all, I would say that not even the concept of a cooperative game successfully captures the essence of love (and, as we shall see, of some more politically relevant experiences). The true lover does not cooperate with his loved one because, by some accident of the moment, his happiness can only be brought about in conjunction with hers. Rather, what he seeks to achieve is the simultaneous happiness of both. What is more, he seeks to achieve it through a reciprocal relationship which, in the language of Game Theory, is "cooperative."

We may attach the label "egotistic values" to those valued states of affairs or experiences whose enjoyment by some individual is independent of the manner in which they are brought about. And we may use the term "social values" to refer to those states of affairs or experiences whose value to some individual is inseparably related to a cooperative means of realizing them. In this language, then, love would be a social value.

A rather more important example for our purposes is that political right of free speech. Strictly speaking, every man is free at any time to say whatever he wishes, whether he is in a totalitarian or democratic society. What he is not always free to do is say it to someone else. In short, he is not free to communicate. Freedom of speech really is freedom of communication. It is not a private right unrelated to the rights of others, but a relation between men in which the listener is fully as significant as the speaker. Indeed, we may go one step further. Freedom of speech, to be genuine, must be reciprocal- the listener must be free in turn to become the speaker. In other words, when we speak about the right of free speech, we are really talking about the right of free men to enter into the cooperative relationship of communication. It follows from this that men can only bring about freedom of speech cooperatively.

It is contrary to the very concept of free speech to speak of forcing or tricking a man into it. Thus freedom of speech is what I have called a social value. It is a state of affairs whose value to us is dependent upon the manner in which it is brought about. For this reason, Game Theory is inadequate to express a preference for freedom of speech. Needless to say, we can in game theoretic terms express a preference for the set of legal statutes which formally “guarantee” free speech; but the actual human relationship between conscious agents is itself inseparable from the “strategy” of cooperation by which it is brought about, and hence falls outside the limits of Game Theory.

It follows from the above that the old phrase, “free marketplace of ideas,” is quite inadequate description of the political forum in a democracy. The image of a marketplace of ideas derived, of course, from the classical economic concept of a free economic marketplace, in which goods compete for the money of the consumers. By analogy, the political forum is viewed as a market in which ideas are put for for sale, and compete for the assent of the citizens. In the forum, the ideas put forward may in some sense be viewed as “competitors” for our assent. But the proponents of the ideas ought not to consider themselves as competing producers, on the analogy of economics. If they are genuinely devoted to the pursuit of truth, they will adopt an attitude quite different from that of a manufacturer seeking profits. The manufacturer is not expected by classical economics to exercise a personal censorship of his product, withdrawing it from the market as soon as he sees that superior brand has appeared. The consumers can perform that function by ceasing to buy from him. In the political forum, on the other hand, the speaker genuinely devoted to the truth will withdraw his ideas as soon as he has been convinced of their falsehood. It is just this willingness to abide by the objective and universal criterion of truth that distinguishes genuine democratic debate from mere propaganda battles. However, debased on may think the political debates have become in this country, still it would take a thorough cynic to see in them nothing more than advertising battles among competing brands. Contrary

to what many men have thought, a thorough-going market mentality would be the death of democratic discourse in this or any other society.⁵⁹

Political democracy, like freedom of speech, is a social value. Democracy is not merely, or indeed not even, a set of voting procedures and bicameral legislature. It is a system of political organization in which a group of men joining together to act in the common good, each man to count for one and no more than one in the formulation and execution of the will of the community. Democracy is thus not a particular state of affairs, but rather a procedure for achieving whatever states of affairs are jointly decided upon. Here again, it makes no sense to adopt a “competitive” strategy for achieving democracy, for it is by its nature cooperative. Hence, to the extent that men value democracy for itself, and not simply as a momentarily efficient means to some other end, they are valuing a certain way of achieving values-which is to say, a certain kind of strategy.

Perhaps it would be well to step back a moment from this close look at competitive or cooperative strategies and ask what the underlying disagreement is between myself and the game theorists. Basically, I think what is at stake here is a conception of the nature of man and his function as political animal. One tradition, going back to the classical liberalism of the 18th century and embodied in the economic theory of Adam Smith, holds that man is a self-sufficient and egoistic being whose actions are based on a calculus of personal interest. For reasons of efficiency, he comes together with others of his kind to form a social compact and live as a community. He remains faithful to the compact because he foresightedly recognizes that he benefits through the arrangement, gaining the profits of division of labor and related economics of cooperation. He is engaged, to use game theoretic terminology, in a lifelong bargaining game of partial cooperation.

⁵⁹ Needless to say, in the past several decades so many elements of hucksterism have crept into our politics that it is now possible to package and sell a candidate like a detergent. Happily, voters seem to have gained the ability from their long hours in front of the television screen to distinguish the commercial from the show with great ease. It is as hard to get a voter to buy a synthetic candidate as it is to get him to switch his brand of cigarettes, even though also, when he does do either, it appears to be for rough-

But however well this portrait may have corresponded to the shopkeeper of Adam Smith's day, as a universal picture of man it is woefully inadequate. In reality, as any sociologist or anthropologist or psychologist knows, man is first and last a social being. His more, language, habits, expectations, even the innermost structure of his personality, are shaped by his culture. He set goals, and fulfills himself most successfully, only in a social context. Men do not form political communities merely because, by some accident of nature, they lack the abilities to fulfill their goals individually. They do so because, as Aristotle long ago asserted, their highest potentialities are political in nature. Men only realize themselves fully through participation in the political life of the community. Such participation, in a state formed on democratic principles aims at the achievement of social values. Hence, Game Theory, by sharpening and reinforcing the image of man as a maximizer of egoistic value, badly distorts the nature of our society.

When we turn to the problems of formulating foreign policy, we can see how Game Theory, by its limited view of the nature of value, prejudices the statesman in the formulation of policy. To the extent that he employs the concept of Game Theory, he is led away from the possibility of increasing the rule of law in international affairs. Principles of democracy and justice are necessarily ignored, for they do not fit into the game theoretic model. The statesman is encouraged to expect that the nations of the world will behave like 19th century shopkeepers, and he is assured by the strategist that the determination of policy by such calculations is rational.

Show deterrence strategists will object that even if my criticisms have some merit in theory, they are beside the point in practice. After all, it is quite unlikely that Russia, which shows no concern for the democratic values internally, will join with us in realizing them internationally. Social values are all very well in domestic affairs, but the world isn't ready for them a global scale. Hence Game Theory reminds useful in the present world context, however much it may be inadequate to some future utopia.

Two answers can be given to this criticism. First, I stated at the beginning of the section that I was going to deal here with the failings of game theory as a theory. Practical inadequacies will be treated in the next section. Now, I think that it is a very serious weakness indeed of Game Theory that it builds into its very concepts and methods a narrow and distorted view of the nature of value. Clearly, the game theorists are wrong when they assert that their model gives as an analysis of what it is to be rational. In fact, their model gives us an analysis of what it is to be a classical economic man. We can leave aside the question whether any such model was ever relevant even to economic choice; the important point for us is that it is of very dubious relevance to the making of political choices in a deterrence age.

Second, while the world may not at the moment offer great promise of a growth of the rule of law, still it is vitally important that we hold open that possibility in our minds. We need not be foolishly optimistic, or shut our eyes to the obstacles which Russia (and the United States) have thus far placed in the way of such a development: but to rule out of the very logic of decision-making, so that we cannot even consistently raise it as a possibility, is a dangerously narrow course to take. Game Theory's inability to make a place in its calculations for a dedication to justice or law or democracy is, in my opinion, a fatal weakness in its claims as a "logic of rational decision-making."

1. Expected Utility as a Criterion of Rational Choice

In the last section, I showed how Game Theory places serious limitations on the sorts of things which the "players" are permitted to value. The result of this restriction proved to be that no room could be made in Game Theory for a desire for freedom of speech or democratic process. To the

game theorists, political forms must be viewed as mere means to the achievement of some end, and not as ends in themselves. In this section, I would like to explore another group of limitations built into Game Theory, this time having to do with the principle which is supposed to guide one's choices among the various values. Game Theory purports to be an analysis of what it means to be rational in choice-making situations. In the next few pages, I will try to demonstrate that in fact the fundamental axiom of Game Theory leads to irrational choice when applied to the area of nuclear deterrence. The very mathematics of Game Theory encourages-indeed forces- the players to adopt a reckless attitude toward the possibility of war. Under cover of pure theory, the deterrence strategists who employs game theoretic concepts commits himself to a dangerous deterrence policy. The claims of "neutrality" and "impartiality", it will appear, are thoroughly false.

The central concept of the analysis of rational choice expected utility. This is an extension of a very old notion called mathematical expectation. It was developed by probability theorists as a measure of the value of a gamble or risky venture in which the various possible outcomes have differing probabilities and differing values. For example, consider the following game. The first player cuts a deck of cards. If a black face card comes up, he wins \$10; If a red eight comes up, he loses \$40; If a red queen comes up, he wins \$30; and if an ace comes up, he loses \$25. For any other card, he neither wins nor loses. Should he play this game? What is the game "worth" to him? Well he obviously can't decide merely by adding up the amounts he can lose (i.e., \$40 + \$25, or \$65), and then comparing that with the total of the amounts he may win (\$10 + \$30, or \$40). The probabilities of the various payoffs are different, so there must be some sort of weighting factor involved. Somehow, he must combine the value of the payoff (i.e., how much it wins or loses for him) with the probability of the payoff (i.e., how likely it is to happen).

The solution proposed by mathematicians several centuries ago, and used since by probability theorists, is Mathematical Expectation. This a weighted sum of the payoffs multiplied by their probabilities. The formal mathematical expression is:

$$\text{Mathematical Expectation} = \sum_{i=1}^n p_i v_i,$$

where v_i is the value of the i 'th, p_i is the probability of the i 'th payoff, and there are n possible outcomes.

Let us apply this to the example just cited. The first possibility is that a black face card will come up. The probability of this is $6/52$ (since there are six black face cards, not counting the aces, and 52 cards in all), or $3/26$. The value to me of the outcome is \$10. Therefore, multiplying the two together, the value of that outcome is $\$30/26$, or \$1.15. Next, the probability of a red eight is $2/52$, or $1/26$. The value is minus \$40 (you pay him.) Multiplying, the value of the outcome is worth $-\$1.92$. All the other outcomes (which have a combined probability of $38/52$) have a zero value to both players. We can now tabulate the results of our calculations and see what the total value of the game is. Thus:

Table I

Expected Value of Gamble to First Player

<u>Outcome</u>	<u>Value</u>	<u>Probability</u>	<u>Expected Value</u>
1. black face card	\$10	6/52	\$1.15
2. red eight	-\$40	2/52	-\$1.54
3. red queen	\$30	4/52	\$1.92
4. ace	-\$25	4/52	0

According to our calculations, the value of the game to the first player is minus \$1.16. It is therefore a very bad game for him to play (and a very good game for his opponent to play). But what does it mean to say that the “value of the game” is \$1.16? Why should we adopt this method of mathematical weighting as the correct way of evaluating such a complex risk? The answer, without going into the matter too deeply, is that if you play this game again and again, your average winnings (or losses) per hand will tend to approximate to -\$1.16.

Now Game Theory lays it down as an axiom of rationality that in any risk situation, one should always choose the strategy with the greatest expected utility. In other words, maximization of expected utility is a criterion of rationality in game theoretic contexts. This means that in our example, the wise thing for the first player to do is to choose the null strategy-don't play. It has a value of zero (no wins, no losses), which is better than losing more than a dollar a hand.

There are two ways in which we may interpret the use of this axiom by the strategists who adopt it from Game Theory. First, we may view them as laying down a formal axiom and simply drawing out its logical consequences in theorems. In other words, Schelling, Snyder, et al. may simply be exploring the implications of an arbitrarily chosen definition of rationality. Or, Second, we may view them as attempting to codify and express precisely some pre-systematic insight into the nature of the rational behavior of real men. Fairly clearly, the second is the more interesting interpretation, for if they are doing no more than setting up arbitrary definitions, their work cannot possibly have any important consequences for the policy maker. A man may use words any way he wishes, after all.

The procedure actually being employed by the strategists is rather special, for their problem is an unusual one. The economist or utility theorist has the task of formulating the canons of rationality which out to govern men's behavior in familiar contexts, i.e., those of the marketplace. But the deterrence strategist has the far more difficult problem of formulating the canons of rationality which out to govern the choices of the statesman in the entire unfamiliar context of nuclear deterrence. What

is more, he must do this with regard to weapons which have never been used, and with the threat of magnitude of destruction which has never before been experience by men.

In this situation, the strategist- or indeed any of us- can only do one thing: study behavior which in the past has been viewed as rational, try to elicit from it some rules or criteria of rationality, and then attempt to extend them to the new situations of deterrence. The methodology of the strategists is not in any sense a deduction or calculation from some self-evident premises. Rather, it is as set of proposals for future decision-making.

In other words, the extension of the method of expected-value maximization to deterrence is recommendation and not a demonstration. Snyder and Schelling are offering a suggestion as to how we out to make decisions in this new area of human choice. They base their proposal upon analogies between the bargaining and other economic situations to which utility theory has been applied in the past, and the military situations for which a method of decision-making is sought. The sophistication and elegance of the mathematics must not divert us from the central question, which is whether the proposed extension is wise and useful.

Such a question cannot be settled decisively by argument. The most that the supporters of utility-maximization can do is to exhibit the method in its original economic context, and the point to the similarities with strategic problems. Those like myself who are skeptical of the fruitfulness of the proposed application can only present evidence of dissimilarities, and try to show why these cast doubt upon the adequacy of utility-maximization as a measure of rationality in deterrence contexts.

I am not here attempting to question the formal adequacy of Game Theory, nor am I concerned with its applicability to the domain of economic choice. My aim is to call question the fruitfulness and wisdom of extending the game-theoretic criteria of rationality to situation of grand deterrence strategy.

I shall present four argument against the use of expected-value maximization as a criterion of rationality in military strategy. In each case I will point to some feature of strategic decisions which

makes them unlike ordinary economic decisions, and I will then suggest that this difference is critical for the methodology in question.

The first limitation on the use of expected-value maximization is its assumption that the reserves of the player in a game situation are sufficient to avoid the risk of exhaustion in the short run. If some one outcome or not unlikely series of outcomes of as strategy will bankrupt the player, then it may be a poor strategy for him to adopt, even though its expected value is quite high .For example, suppose a gambling game offers the opportunity to be a dollar, with a ten percent probability of winning \$20 and a ninety percent probability of losing the dollar. The expected value of the game (or of the strategy of playing the game, as opposed to not playing it) is, according to the formula, $(1/10 \times 20) - (9/10 \times 1)$, or \$1.10. Over the long run, this is obviously a very good game to play, as it promises better than 100% return on the investment. What if you only have a five dollar stake, however? Should you play? The danger is that five straight losses may occur before one of the big \$20 payoffs. Since we are interested in a five-play run, we can transform this iterated game into a new one-shot game with six possible outcomes. The bet is now five dollars, and the payoffs are total loss (equal to five straight losses of the old game), \$16 (or one win) \$37 (or two wins) \$58 (or three wins,) and so forth. The schedule of probabilities and payoffs, together with the expected values, is given in Table II.

Table II

<u>Outcomes</u>	<u>Payoff (in \$)</u>	<u>Probability</u>	<u>Expected Value (in \$)</u>
1. no wins	-5	.59	-2.95
2. one win, four losses	15	.328	5.25
3. two wins, three losses	37	.0729	2.70
4. three wins, two losses	58	.0081	.46
5. four wins, one loss	79	.000045	.04
6. five wins	100	.00001	----

.99946~1.0

\$5.50

The expected value of the new game is \$5.50, (5×1.10), for it is formally equivalent to five rounds of the one-play game. But the telescoped form reveals that there is almost a 60% chance of being wiped out before at least one win comes along to swell the stake. Hence this a much less attractive game to a man with limited funds than might at first appear. If second game presents itself with a less spectacular expected value but negligible probability of total loss, it would surely be rational to play it instead.

The relevance of this limitation to national policy is clear. If we believe that nuclear war will mean the destruction of the United States as a world power, or even its demise a organized society, then even the temptation of considerable gain (such as the permanent defeat of the Soviet Union) may be insufficient to lure us into a strategy which threatens war. Limited actions, like limited losses in gambling, are of an entirely different order than total war, for there is always the possibility of recouping losses in a later limited action. Total war, on the other hand, closes off all future "plays." It is like going bankrupt. Hence we must be exceedingly wary of policies which are urged on the grounds that they offer a high expected value, but which also threaten too high a probability account is clearly inadequate.

A second restriction, related to that of limited resources, is the assumption that the values of the several outcomes are of roughly comparable orders of magnitude. This is necessary in order that no single outcome dominate every expected value of which it a component. For example, consider a situation in which there are five possible outcomes, rated as follows: A=10, B=15, C=20, D=50, and E=-100,100. It is obvious that any strategy which offers the slightest meaningful probability of outcome E will have a lower expected value than any other strategy which omits E entirely from among its possible outcomes. For example, if strategy S has a 1/10 of 1% chance of yielding E, and 99 and 9/10% chance of D, then its expected value will be $(.001 \times -100,000)$ plus $(.999 \times 50)$, or -50.05. This more than two and

one-half times as bad as the worst possible strategy which does not threaten E at all (i.e., the strategy, if it exists, which ensures C). Thus the overriding consideration in the situation will be to avoid E. Any alternative will be preferable to even a minute chance of E. The method of expected value maximization will simply be irrelevant to decision making in such a situation (or rather, it will be limited by the condition that prior to expected value calculations, all strategies be eliminated from consideration which threaten E with any probability whatsoever).

Many of the debates over American foreign policy can be looked at as if they were attempts to support the claims of varying payoff figures in a deterrence game. One group of authors emphasizes the absolute horrors of a nuclear holocaust and argues that the result of a war would be the cessation of American society as we know it. They are in effect proposing that we assign to nuclear war a negative value so great that it dominates every expected value calculation and makes even a small chance of total war sufficient to condemn strategy.

In opposition to this view of nuclear war, there are several possible lines of argument, each of which attempt in a different way to demonstrate the commensurability of nuclear war with other outcomes. The most direct is simply to deny that nuclear war would be so overwhelmingly destructive, or at least that its destructive effects could be cut to acceptable limits by appropriate measures of passive defense. This, as we have seen, is what Herman Kahn tried to do in the first part of his book, On Thermonuclear War.

A second possibility is to insist on the even greater negative value of some other outcome, thereby once again giving point to the technique of expected value calculation. We are familiar with this line of counter-argument in the form of the slogan, "Better dead than Red!"

Alternatively, one can reintroduce the calculation of expected value by insisting on the extremely large positive value of some outcome, whose possibility balances the possibility of nuclear war. In a sense, this is the logic behind the argument that the opportunity of destroying Russia or

inflicting defeats upon her is worth the risk of being destroyed ourselves. Unfortunately, the proponents of this view have failed to comprehend the revolution in military relations. Today, the choice is not between obliterating Russia or being obliterated; it is between mutual destruction and mutual survival. Hence this response, although formerly it would have served to defend the methodology of expected value calculation, is now irrelevant to the problem of deterrence.

There is still another response to the argument that a nuclear would be obliterating and must be avoided at all costs. This is that no course of action- not even uniltarel disarmament-can safeguard us against a nuclear attack, and that our wisest course if there to face the possibility of war, include it in our calculations, and work always to diminish the possibility without sacrificing our fundamental values or national interest. This, I take it, is the position of the present administration, and of a considerable number of foreign policy experts. I am not concerned here with its soundness or rationality; I only wish to point out that, in common with the apocalyptic view described above, it has no use for expected-value calculation. If I understand Mr. Kennedy's foreign policy correctly, he does not believe that the prospect of greater gains justifies a large risk of nuclear war. He has laid down certain minimal national interests for which he is willing to risk total national destruction. Within the context of these primary interests, he strive to minimize the threat of war, while pursuing our secondary interests by non-nuclear means. While the technique of expected value calculation might conceivably be relevant to choices among secondary goals, it has no role to play in the formulation of deterrence policy. To propose it as a methodology of decision-making is actually to make a substantive recommendation of far-reaching, and in my opinion dangerous, implications. Such a method presupposes a willingness to run greater risks of war in order to achieve more valuable foreign policy victories. Hence it is by no means a neutral methodology, as its proponents claim.

We have come upon a third objection to the methodology of utility theory, namely its failure to take account of aversion to risk .We can give this point a mathematical expression by means of a brief

hypothetical example. Let us suppose, contrary to what has been urged above, that the negative value of a nuclear war is sufficiently comparable to other possible outcomes to allow of meaningful expected value calculations. Let us further suppose that when faced with a choice between two strategies, both of which threaten a measurable probability of nuclear war, we are willing to base our decision upon a consideration of expected values. Our attitude is that if we must run some risk of war, and if the two probabilities are not too dissimilar, we are prepared to take a slightly greater risk for a chance at a greater gain. Stated symbolically, if a and b are possible outcomes of considerable positive value, with $a > b$, and if d is nuclear war, then:

$$(1) ra + (1-r)d > rb + (1-r)d$$

and furthermore, there is some $E > 0$ such that

$$(2) (r-E)a + (1-r+E)d > rb + (1-r)d$$

However, assume that we are extremely anxious to eliminate any risk of nuclear war, and therefore place an especially high value on no-risk strategies. This is the converse of what is called a "love of danger" or "love of gambling." There will now be outcomes which are worth less than either a or b , but which are preferred to any probability combination of a or b with d because they exclude the threat of war. This is to say: given c , $a > c > d$,

$$(3) c > ra + (1-r)d \quad \text{for any } r < 1 \quad \text{But this contradicts the postulates of the}$$

axiomatic theory of utility, as stated for example by Marschak. According to Marschak's Postulate II,⁶⁰

$a > c > d$ implied

$$(4) c = ra + (1-r)d \text{ for some } r, 0 < r < 1.$$

This contradicts (3).

The "aversion to risk", as we may label this phenomenon, seems to me an eminently reasonable attitude for a policy planner to adopt. A private individual who places his life in jeopardy in order to

⁶⁰ Cf. J. Marschak, "Rational Behavior, Uncertain Prospects, and Measurable Utility," *Econometrica*, XVIII, 111-141.

increase his gain may not be irrational. Man's time is short, and death comes soon enough, no matter how cautiously one lives. But for a statesman to adopt a similar viewpoint toward the life of his nation would be grossly irresponsible and unreasonable. Consequently, in planning the deterrence policy of nation, it is wise to avoid the implications of the methodology of expected value calculation.

My last argument concerns a rather different problem. As I have already indicated, utility theory is explicitly designed to take account of the divergence between objective payoffs and our subjective preferences for them. A given sum of money may be worth more to me under some conditions than under others. Furthermore, I may place value upon subjective elements which have no objective monetary equivalents. In a friendly poker game, for example, the pleasure of the evening may lead me to play in a less than ruthless style, in order not to clean out a novice who has agreed to sit in. Such behavior, while economically irrational in a narrow sense, is nonetheless an attempt to maximize overall subjective utility, and hence can be viewed perfectly rational. In the more formal presentations of utility theory, it is assumed that a set of outcomes, p_1, p_2, \dots, p_i , can be ordered according to preferability. No limits are placed upon what may be treated as an outcome, and of course I am permitted to arrange the outcomes in any way which strikes my fancy, subject only to certain consistency conditions of well-ordering.

In order to see the complications which this produces, let us revert to the case of the gamble discussed above. The bet, it will be recalled, was one dollar, with 10% chance of a \$20 win, and a 90% chance of loss. The problem, as we saw, was that with a limited stake of \$5, the probability was too high of being cleaning out before a win. In order to make the case more personal, let me suppose that I am on my way to the store to buy my wife a birthday present. The use of a subjective utility measure is designed precisely to register my particular concern over losing the money for the present. I can express this concern by assigning the loss of the entire five dollars a negative value more than five times as great as that of the loss of one dollar. If my aversion to losing all my money is great enough, and if the

temptation of possible gain is not disproportionately seductive, then from the expected value of the strategy will be negative, and I will choose not to play. Specifically, suppose that the various outcomes of the five-shot game are assigned the value listed in Table III, as measured in some arbitrarily chosen unit subjective utility:

Table III

Outcome	Subjective Utility	Probability	Expected Value
1. no wins	15 [N.B.]	.59	-8.85
2. One win, four losses	16	.328	5.25
3. Two wins, three losses	37	.0729	2.70
4. Three wins, two losses	58	.0081	.45
5. Four wins, one loss	79	.00045	.04
6. Five wins	100	.00001	----
		<u>.99946</u> ~1.0	<u>-.40</u>

In this revised calculation, the expected value of the game is less than the value of not playing at all so I decide not to play. There is nothing mysterious about this new calculation. It is merely a mathematical expression of the fact that in the stated circumstances, five dollars has a greater value than usual to me.

Now, however, suppose that the gambler offers me a chance to play the game one step at a time, instead of in its five-shot portmanteau form. He knows that I have a strong gambling streak and hopes to woo me away from my husbandly resolve. At this point, I figure that four dollars will still buy a nice present, so I take the plunge, setting loss of one dollar equal to precisely minus one utile. I lose, and consider whether to play again. The game is looking slightly less attractive, for I have only four dollars and I have begun to worry about that present. At the same time, my gambling spirit is aroused. I am hooked, as gamblers say, and so I put down my money. I lose again in a desperate attempt to recoup

slap down another dollar and lose again. Now I have only two dollars left. This is too little to buy any sort of respectable present, so I play twice more and lose everything.

We can assume that my utility function changes from play to play, as the conditions of my pocketbook and of my frame of mind alter. But we have no reason at all to suppose that this change, summed over the five plays, exactly equals the subjective utility of the five-shot game. For me, the prospect of losing five dollars all at once may seem better or worse than the sum of the prospects of the gains and losses at each stage of the iterated series of one shot games. Of course it is possible that the two will be equal, but it is certainly not necessary.

The dilemma can be heightened by the addition of a few more fanciful psychological details. Suppose that I have been through such temptations before and know how I tend to react to them. I very much want to reform and hence, when presented with the five-shot game, place a high negative value on total loss, making the expected value of it negative. However, I also know that my feelings will chance in the heat of the game, and that if I play the game one shot at a time, losing as I go, the overall sum of expected values will be positive. What is it rational for me to do?

The source of the trouble is the obscurity surrounding the original expressions of preference on which the definition of subjective utility was based. When I try to decide whether I would rather lose five dollars all at once or one at a time, am I supposed to imagine myself in the midst of play or in a pre-game condition? If there a contradiction between the two methods of estimating, which should I adopt as more rational? Should I strive to adjust my mid-game attitudes to the calmly considered preferences of the pre-game period, or should I ignore my pre-game sobriety as unrepresentative of my true gambling spirit? Obviously, utility theory can give no answer. The dilemma sounds somewhat like a debate between a puritan and a romantic. It is a very important matter, but one which falls under the heading of substantive policy, not procedure or methodology.

Very striking and significant analogies to this curious dilemma can be found in the game theoretic approach to nuclear strategy. Glenn Snyder seems particularly prone to confusion of this sort. Near the beginning of his book, he defines “rationality” as:

....choosing to act in the manner which gives best promise of maximizing one’s value position, on the basis of a sober calculation of potential gains and losses, and probabilities of enemy actions. “This definition,” he goes on, “is broad enough to allow the inclusion of such ‘emotional’ values as honor, prestige, and revenge as legitimate ends of policy. It may be perfectly rational, in other words, to be willing to accept some costs, solely to satisfy such emotions, but of course if the emotions inhibit a clear-eyed view of the consequences of an act, they may lead to irrational behavior.”⁶¹

Suppose that in conformity with this definition of rationality, our policy-makers in the present (pre-war) state perform the following expected value calculation. Taking into account objective factors like loss of life and property, change in power balance, etc., and also such emotional factors as outrage over these losses, they conclude that massive retaliation with the remnants of a nuclear striking force would be irrational if there were no chance of counter-force effects, and if the enemy could respond by totally wiping out the remaining parts of the United States. In other words, all things considered, they conclude that should the Russians succeed in getting in a crippling first-strike, the only rational response would be surrender. Now suppose that the attack actually occurs, and that by some miracle these policy planners are still alive. They feel an overwhelming anger and desire revenge even at the cost of self-annihilation. Their world has crumbled around them; they are willing to see it disappear completely if only they can inflict some terrible blow on the enemy. According to Snyder, it is now perfectly rational for them to unleash their remaining nuclear striking force, for their subjective value structure has changed enough to make the expected value of this suicidal retaliation positive rather than negative. Not that is not their calculation of value, but their values themselves which have changed, just as in the

⁶¹ Snyder, *op. cit.*, 25.

gambling example above I imagined my feelings to change from play to play, and hence also my utility estimates.

If Snyder's definition is taken literally, virtually any series of contradictory decisions is rational, so long as each in turn accords with one's feelings of the moment. It becomes impossible to distinguish between rational and irrational policies: should we act on the basis of pre-attack or post-attack utility estimates? In the pre-attack situation, should we plan on the basis of the way we feel then, or the way we expect to feel after the attack?

There are two alternatives: Either we interpret the methodology as neutrally as possible, in which case it seems to reduce to an unhelpful tautology which fails to sort strategies into the categories of rational and irrational; or else we can adopt some meaningful interpretation, in which case we build very powerful policy assumptions into our methodology, and thereby conceal them from the scrutiny to which they should increasingly be subjected.

This, in fact, is the lesson we are taught by all four of the cases which I have analyzed. Expected value maximization is urged as a substantively neutral method which makes no presuppositions about what is preferable but merely tells us how best to achieve whatever it is that we in fact desire. Upon examination, we discover that when the method is extended to the realm of military strategy, it carries with it very powerful and questionable value-assumptions. Four of these assumptions which I have attempted to bring to light are:

1. That nuclear war will not bankrupt us, or remove us altogether from the game of deterrence.
2. That the consequences of nuclear war are of roughly the same magnitude of value as other possible outcomes of deterrence strategies.
3. That no allowance in our calculations should be made for our aversion to the risk of nuclear war, over and above our negative evaluation of its consequences.

4. That here is some one frame of mind or condition in which value estimating of future events should be made, and that all variant value estimates resulting from the changed objective or subjective conditions should be ignored.

Since the application of utility maximization to military strategy involves these four presuppositions, it is clearly not a value-neutral methodology as its proponents claim. I have tried to suggest my reasons for believe these presuppositions to be false. If I am correct, then the methodology, although useful in economic contexts, is inappropriate to the analysis of decision making in military strategy and foreign policy.

C. Conclusion

Let me try to draw together the results of my critique of Game Theory in its application to problems of deterrence and security policy. Game Theory was originally developed as an analysis of the principles of rationality in choice-making situations involving risk and uncertainty. It puts itself forward primarily as a formal methodology of strategy formation-that is, a systematic account of how men ought to make choices if they wish to be prudently rational. The matrices, formulae, and technical vocabulary are all designed to clarify our thinking about tricky and complicated problems. Like economics, Game Theory does not seek to tell anyone what he ought to desire, but only how best to get whatever it is that he wants.

When the academic strategist takes over the vocabulary of Game Theory and applies it to problems of national security, the results are extraordinarily attractive to anyone engaged in the difficult and frustrating business of making policy decisions. The general or statesman is hounded by special interest groups, pressured by members of Congress, harassed by the endless quantity of decisions which he must make, and- if he is at all conscientious- haunted by the fear that he is making a mistake which will cost his country its life. There is not a man alive who would not be humbled by the burden of such responsibilities, and so it is natural that statesmen are drawn to the work of the strategists. These latter

are by and large, disinterested academics with no special branch of the military or home-state industry to sell. In place of the slogans for the service academies or the platitudes of the Congressional Record, they offer a technical apparatus which apparently has all the impartiality and precision of the physical sciences. The models of the strategists, furthermore, are not briefs for this or that policy. They are perfectly neutral tools to be used by anyone concerned to formulate a policy with a minimum of irrationality.

But alas, not all that speaks with the voice of mathematics is objective! The game theoretic tools of the academic strategists contain a host of powerful policy presuppositions which, taken all together, constitute an implicit argument for one special point of view on America's security problems. First of all, Game Theory itself is unable to express a preference for social values- freedom of speech, democratic process, and the other political forms which are inherently cooperative. As applied to U.S. foreign policy, Game Theory thus commits the statesman to a nation-state oriented policy, with no place left open for even the possibility of the growth of world law, or democratic institutions at the international level. There is no way in which, using the models of Game Theory, the statesman can include in his payoff matrix a number which represents his preference for social values.

Secondly, and more serious for the immediate future, the use of the game theoretic principle of expected utility maximization carries with it an unnoticed commitment to a belligerent and aggressive security policy. In subscribing to the apparently neutral principle of rational choice, the policy-maker is actually committing himself to the view that nuclear war will not be a total catastrophe, but rather, somewhat in the view of Herman Kahn, can be "lived through." He is also committing himself to the extraordinarily foolhardy view that we should not make a place in our calculations for an aversion to risk-that we ought, in other words, be willing to take big chances of a nuclear war in order to have a stab at large gains in the field of foreign policy. It would follow from this, for example, that we ought to risk a war over Berlin if we have a chance of pushing the Russians out of East Germany; or again, that when

Chiang's chances of returning to the mainland become good enough, we ought to be willing to risk a nuclear war to help him. Now there is no doubt that many Americans hold these and similar values (I personally do not). And there is no reason in the world why they shouldn't be freely and openly expressed and defended in the political forum. BUT THEY SHOULD NOT BE SO EMBEDDED IN THE VERY METHODOLOGY OF DECISION-MAKING THAT OUR STATESMEN ARE UNABLE TO EVEN QUESTION, LET ALONE REJECT, THEM.

Chapter VI

The Pitfalls of Abstract Theory

In the preceding chapter, I analysed in some detail the hidden presuppositions and internal contradictions of Game Theory, especially as it is applied to deterrence contexts. In this chapter I will explore some of the pitfalls of theory into which the academic strategists have stumbled. The mistakes discussed here are not peculiar to Game Theory or its adherents. They recur whenever men seek to develop theory beyond the limits of usefulness. The successes of abstract theory in the physical sciences have encouraged social scientists to attempt analogous abstractions in the study of society, but thus far I think it is fair to say that only in economics have the results been at all promising.

A. The Danger of Over-abstraction

All theory, indeed all generalization, requires abstraction. The simple observation that oaks grow from acorns involves an abstraction from the particular nature of this or that oak, this or that acorn. In formulating that generalization, I concentrate my attention on what is common to all oaks and all acorns and then discover a constant relation between them. A similar process takes place when the physicist formulates general laws about the behavior of all falling bodies, or all atoms of hydrogen, or all gasses. Abstraction is fruitful when it puts to one side irrelevant differences and brings into focus significant similarities among many objects or events. But there is a danger of over-abstraction which must always be guarded against. I may abstract from so many of the characteristics of my examples that

I am left with nothing of significance at all. For example, suppose that instead of grouping all oaks and all acorns together I abstract to the point of talking about all trees and all nuts. Now it isn't true that all trees grow from nuts, so by carrying the process of abstraction this far, I have missed what may be called the level of significant generality.

Or consider a familiar example from the discipline of History, namely the attempt to find laws of revolutions in general. The Glorious Revolution of 1688 in England, the American Revolution, the French Revolution, and the Russian Revolution are grouped together in once category, their differences abstracted from, and then some common pattern in them all is sought. What the historian finds, of course, is that only by the grace of a linguistic accident are these four widely differing events to be classes as "revolutions." The first was apolitical regularization, the second a colonial revolt, the third and aristocratic reaction which grew into a middle-class fight for limited monarchy, and the fourth a coup d'etat supported by elements of a small working class. I am by no means arguing, as have some students of history, that historical events by their nature are unsuited for generalization. Quite to the contrary. But a desire for abstraction, if not held in check, can only produce empty and unfruitful generalizations.

The academic strategists, in their quest for theory, have fallen into the error of over-abstraction. To begin with, they abstract from the particular identity of the countries which are locked in cold war struggle. It is not the Soviet Union and the United States, but country A and country B, which jockey for position in their models. Now a moment's reflection will reveal that by putting to one side the distinguishing characteristics of Russia and the United States, the strategists have robbed their analyses of any significance for contemporary policy-making. For the United States is not merely some country "A" faced in an indeterminate situation by some other nameless country "B." If that were a fruitful way of looking at our security problems, then there would be in principle no difference between our problems vis-à-vis Russia, Israel's problems vis-à-vis Egypt, Indonesia's problems vis-à-vis the Netherlands, or even our problems vis-à-vis Great Britain! All can equally well fit into the abstract mold

of country "A" and country "B". The strategists act as though it were a matter of no significance that it is Russia, and not Germany or China, which possesses nuclear weapons. They abstract from the identity of our supposed enemy just as the botanist abstracts from the peculiarities of this or that oak tree. They even abstract from the form of internal government of "A" and "B," as if it were all the same to deterrence policy whether it was democratically or autocratically determined. To the strategists, it is a happy and symbolic accident that US read backwards is SU! They say, in effect, "We wish to discover those rules of deterrence policy which are equally and indifferently valid of Russia, America, China, France, Germany, or any other nation-state which might exist, regardless of internal politics, national goals, traditions, or ideology." The result is over-abstraction, leading to a series of formally consistent but practically valueless propositions which no statesman could ever actually apply to a concrete security problem.

Let me pursue this point a bit further, for it is the key to much of the curious irrelevance of the new deterrence literature. The theorist by nature abhors the accidental, the particular, the mere fact. He dislikes propositions which are true simply because something happens to be the case. He desires rather the necessary truth which must be so because of the very nature of things. It is for the historian to concern himself with the accident that the founding fathers were wise men rather than fools, or that America was blessed with a great president during her crisis of civil war, and not cursed with nonentity of who followed him. The strategist wishes to find universal principles which transcend the accidents of circumstance. It seems almost demeaning to him to acknowledge that America faces a real antagonist rather than simply an embodiment of the pure concept of antagonism. If I may be somewhat factious (but not, I think, wholly inaccurate), the strategist seems to feel that it would be cheating a bit to use what he knows of Khrushchev's character, or Russia's geography, or the history of Bolshevik foreign affairs.

I sympathise with the turn of mind. As one who was trained originally in Philosophy, I am always ready to view things, in Plato's phrase, "under the aspect of eternity." But when it comes to the survival of the United States and the prevention of a nuclear war, a predilection for abstraction must give way to more urgent needs. It may just be the case that America will survive rather than perish because it is Khrushchev, and not Hitler or Mao, whom we face at this point in history. The particularities from which the strategists abstract their theoretical treatises may contain a clue to the working out of an honorable and lasting settlement with our enemies. Perhaps it is true, as so many of the deterrence theorists insist, that disarmament between nuclear rivals cannot be achieved in general, BUT FOR US THE QUESTION IS WHETHER IT CAN BE ACHIEVED THIS ONCE IN PARTICULAR. The answer to that question depends at least in part upon the identity of the rulers in the two nations, the skill of the negotiators, the temper of domestic politics, and even the accidents of tension and relaxation in the cold war. By hiding all these vital details behind their A's and B's and matrices, the strategists try to lure us into holding out for a general solution; if we are seduced by their rhetoric, we may pass up our last chance for a stable peace and instead continue the unchecked rush toward war.

The passion for abstraction has actually carried the strategists beyond the level of nameless countries and unmarked globe. Strictly speaking, theorists like Schelling do not even acknowledge the fact that they are talking about nation-states, rather than feudal baronies, Greek cities, baseball teams, corporations, or individuals. The academic strategist, no matter what their character. The rhetorical effects of this abstraction are rather sinister, as we shall see in the next chapter. Here I wish only to explore some of the consequences for the theory as such.

The most striking effect of this lumping together of all possible antagonists is that the strategists tend to treat them all as if they were individual men. The "A"s and "B"s give way to "he" and "him." The following passage from Herman Kahn illustrates perfectly the kind of argumentation which turns up in

the abstract analyses of the strategists. Kahn is running over some of the desirable characteristics of a deterrent force:

We must not look too dangerous to the enemy. This does not mean that we cannot do anything that threatens him. After all, our mere possession of a Type I Deterrence capability implies that we can harm him if we desire. But it does mean to the extent that is consistent with our other objectives, we should not make him so unhappy and distraught that he will be tempted to end his anxieties by the use of drastic alternatives. We do not wish him to conclude, "better a fearful end than endless fear." We must not appear to be excessively aggressive, irresponsible, trigger-happy, or accident prone, today or in the future.⁶²

The enemy is viewed as having feelings, fears, expectations. Now it should be obvious that nation-state does not have fears, or feel "unhappy and distraught," in any sense familiar to us from our talk about individual men. Nor does a nation "make decisions" in the same sense that individuals do. A man reflects, deliberates, weighs alternatives, and chooses. The result, we may suppose, is some action attributable to him: he speaks, walks, attacks, fires a weapon, etc. But unless one holds a rather mystical nineteenth century Hegelian notion of nationhood, it is nonsense to say that a nation reflects, deliberates, and decides. What happens is that men in the nation do these things, and the outcome is some sort of interaction of their individual processes. In the rare case of an absolute, unlimited dictator, of the sort that Stalin may have been but Hitler never was, we may be justified in treating the man and the nation as interchangeable. But surely no such identification fits the facts of decision-making in either contemporary Russia or in the United States.

What is more, it does not strictly make sense to speak of a nation "acting," on the analogy of an individual. When Admiral Burke makes a belligerent speech, is it America which has acted? What the CIA encourages the Loatian faction which the State Department is attempting to depose, when the President proposes and a Congressional committee disposes, when the Air Force fights the Army for control of missile development, what is the "the action" of the country? A nation is an organized

⁶² Herman Kahn, On Thermonuclear War, 157.

conglomerate of men; its actions, if we must speak thus, are the sum total of the actions of all those men who act, or claim to act, in its name.

To illustrate this point, let us return to the matter of counterforce, which Sec. McNamara apparently announced as official U.S. policy in the speech quoted above. It may be I have no idea- that when Sec. McNamara sat in his office reflecting on the merits of various strategies, he went through a process something like that described by Schelling. He may have weighed up the probabilities, assessed the value (or utility) of the various outcomes, performed a rough expected value calculation, worked out some "systems analysis" problems, and made up his mind. At this point, then, a decision had been made. Not by the United States, notice, but by an individual who happens to hold one of many powerful positions in the United States. This decision was part of an extremely complex on-going process, which involves innumerable considerations other than those which we assume were weighed by Sec. McNamara.

The chiefs of staff of the several services are engaged in a battle for the interest of their segment of the military complex; the implications for procurement contracts are studied by the Congressmen who have identified themselves with the missile's industry; the effects on the budget and on future elections are considered by the other cabinet members; the Secretary of State is concerned over the consequences of counterforce for the NATO alliance. Personal factors, such as Mr. McNamara's brilliance as an administrator, affect the interplay of offices and officials. And all of this, of course, had been going on for a decade or more. McNamara's calculations were merely one (although an important one) of a never-ending succession of decisions and actions by Government officials and private citizens in the area of defense.

What then, does it mean to say that the United States had "decided" upon a counterforce strategy? It certainly does not mean that some man has "changed his mind." Rather, the statement that America has chosen a policy is simply a short-hand way of describing a complex shift in emphasis and

complexion of the myriad of actions which make up "America's actions." Officers who have supported counterforce are promoted to positions of influence, and others not so fortunate are set aside. The budget allotment for counterforce weapons is increased, and perhaps certain other budget items are cut to make room. Speeches are made, by McNamara and others, in an attempt to convey the change to the Russians. But these speeches are also moves in the battle to change our strategy, so their significance is ambiguous. Perhaps targeting plans for SAC are altered, but no Polaris submarines are dismantled, and the foot soldiers are not sent home.

Little or none of this, obviously, can be captured by the simple model of the strategist. Here again, over-abstraction has robbed the analysis of any meaningful content. What chance is there that we will discover some rule or law of choice which applies indifferently to Sec. McNamara and the whole American government? The models of the strategists are not merely "inaccurate" or "approximate" or "abstract." They are not properly models of governmental decision-making processes at all.

One final point concerning the dangers of over-abstraction: By treating nations as individuals, the strategists tend to ignore a critical element in the international picture, namely the subtle interplay of domestic and foreign politics in both the United States and the Soviet Union. Even if we accept the identification of America with Kennedy and Russia with Khrushchev, we must still recognize that both men act in their cold war capacities not as private individuals but as political leaders. We may speak figuratively of "Khrushchev's rockets" or Kennedy's Polaris submarines," but in fact their control over these weapons is dependent upon that power in the thrust and parry of the cold war involves attending simultaneously to the effect on the enemy and the effect on their internal political support. An individual engaged in a game theoretic struggle does not have to ask what a certain strategy will cost in control over himself (unless, of course, he has fears of incipient madness), but a political leader, even in a dictatorship, must always be alert to a domestic threat from the ambitious men who inevitably appear to challenge his hegemony.

The interplay of domestic and foreign affairs procedures a deadly dialectic in a cold war negotiations which in the Berlin crises of 1961, for example, severely hampered Kenney and Khrushchev in their search for mutual accommodation. In both countries there appear to be "hard" factions which deprecate the possibility or usefulness of negotiation, warn endlessly against the untrustworthiness of the enemy, and insist that standing firm is the only policy with any chance of success. The result is a succession of events something like this: Kennedy makes a conciliatory move toward Khrushchev in an attempt to relax tension and advance toward a settlement. He is warned by his domestic hard-line critics that the conciliation will be taken by the Russians as weakness and will be answered with increased demands. Khrushchev, perhaps, wishes to respond with a concession of his own, but our gesture has frightened the hard-line party in the Soviet Union, which cries "Don't trust them, it is only a ruse, they are trying to trick us into lowering our guard." This prevents Khrushchev from answering our move, and so our own right wing triumphantly says, "You see, we told you it wouldn't work; you have simply capitulated to them." To protect his domestic position, and because the Russians have not responded to his gesture, Kennedy now makes a strong move to reassert our previous demands. And now Khrushchev's "right" (or, if you wish, "left") wing has all the proof it needs. "So Nikita Sergeivich," says Molotov, "I told you the Americans do were not serious, and you see now that I was right. In the future do not imagine that you can deal with them as if they were trustworthy socialists." At about the same time, Everett Dirksen is making a speech in the Senate, condemning the Democratic "giveaway" and hinting at twenty months of treason.

The frustrating dilemma outlined here is of course perfectly familiar to President Kennedy and his close advisors. What I wish to emphasize is that the academic strategists, by using an over-simple model of the international scene are unable in their analyses to take into account of the relation of internal to foreign policy-making. In the game theoretic models of Schelling, for example, such a vital complication could be represented only as a genera distorting influence on the value scale of the

players. Now it would presumably be possible to construct a more complicated model with at least for our even more “players” which would allow for the representation of some of these subtleties, but such models have yet to appear. The reason is that the present state of the analytical art of the strategists does not admit of so advanced a development. Rather than practice a modest restraint, they have eagerly offered policy advice based on their model-T analytical devices. The result is such absurd and irrelevant proposals as limited city exchanges.

B. Puzzles and Problems

In addition to the fallacy of over-abstraction, the academic strategists are prone to another pitfall of theory-building. This is the temptation to reduce all of the problems of policy-making or choice to one very special kind, which we may call “puzzles.” Game Theory in particular lends itself to this error because of its tendency to ignore the political complexities of international affairs.

Statesman face many different sorts of problems in the making of choices. Sometimes, a physical or technical obstacle stands in the way of achieving a desired end. For example, we may wish to raise the standard of living of our allies but simply not have the necessary capital to do the job, or we may lack the technical knowledge to develop the resources of some under-developed country. A second sort of problem is the situation in which several values conflict, forcing us to adjudicate between them and effect some sort of compromise. The complicated tangle of NATO is the most pressing instance of such a value-conflict. The British ties to the Commonwealth countries, the French desire for a preeminent position on the continent, the German longing for reunification, our wish to keep possession of our nuclear weapons but also to see our allies play a larger part in the military defense of Europe—all these make impossible a single policy which will satisfy every legitimate claim of all the parties involved. So the statesman must somehow give a little here, take a bit there, always protect the vital interests of his government, and yet come out with an answer. Strictly speaking, such problems are never “solved;” rather, we might say that they are sometimes “resolved.”

A puzzle is one special kind of problem in which the clarity and precision of the outcomes and the definiteness of the effects of various moves make possible a “right” solution whose correctness can be checked in some explicitly defined way. Chess problems (“White to play and mate in three”) are puzzles, for example, White is not supposed to achieve an accommodation with Black. He is supposed to mate him, and anyone who knows the rules of chess can tell with absolute certainty whether a proposed solution is right or wrong. Many, though not all, of the most familiar examples of puzzles come from games or game-like situations. This is no accident, as we shall see, but results from the peculiarly artificial nature of puzzles.

The contrast between puzzles and other sorts of problems can be made clearer by two examples. Consider first the old puzzle (it appears in many forms) about the African explorer who is marooned with his wife on an island in the midst of the Congo river. With them are a pigmy carrying his poison dart blowgun and a hungry cannibal. The explorer is armed and has a small raft which will carry only two persons at a time. So long as the explorer is present with his gun, peace reigns, but if the cannibal is left alone with the wife, he will eat her. He will not eat the pigmy however (a matter of tribal taboos). The pigmy in turn, if given a chance, will kill his mortal enemy the cannibal, but he has no animosity toward the explorer’s wife. The puzzle is to find a way of transporting the quartet to the river bank opposite without letting anyone get killed. The solution, as the reader can check easily enough, is for the explorer first to take the cannibal across, return alone to the island, take his wife across, return once more with the cannibal to the island, take the pigmy across, return alone for the last time, and bring the cannibal to shore. The trick is never to leave either the pigmy and cannibal or the cannibal and wife alone.

Compare this puzzle with a possible real-life situation of a roughly similar nature. A group of travelers on a small island in the Congo river during a storm. They have only a small, flimsy raft and the rising water makes it imperative that they get to shore as quickly as possible. A number of trips will be

required, and it is clear that first to go will have the best chance of survival. The problem is to decide in what order to Gerry the travelers to safety. There are any number of alternative principles which may be invoked to arrived at a decision: women and children first, old and injured first, drawing lots, or every man for himself. Some of the party may try to make another raft, or they may put more men on the raft and hope it will float, and some may even decide to ride out the storm on the island. Whatever is finally done, no one can say with the confidence of a puzzle-solver that the “correct solution” was arrived at. There is no such thing as “the correct solution” although one can certainly maintain that this or that solution is preferable.

In the case of the puzzle, a host of extraneous factors have been eliminated arbitrarily from consideration. We are not allowed, for example, to challenge the assumption that the pigmy will always kill the cannibal as soon as he gets the chance. It isn't playing the game to suggest that perhaps the explorer chance intimidate the cannibal by threats into refraining from eating the wife. The puzzle works only if we accept without question as absolutely true the statements made about eh conditions and actors. In real life problem of the traveler, on the other hand we are always free to register our beliefs about the objective conditions and also our values and objectives. Perhaps when confronted with the necessity of leaving some one behind, we will realize that we don't believe in women and children first; or perhaps, to give ourselves more credit, we will sacrifice ourselves for the good of others.

To put the point another way, puzzles are problems in which certain variables have been artificially held constant and others have been given precisely defined ranges of values. The result, to revert our previous terminology, is not a picture of real life but a model of it. A chess problem, for example, makes sense if we rigorously define the rules of the game and then arbitrarily rule out extraneous considerations. When announcing “mate in three,” we don't feel it necessary to add “unless someone knocks over the board or the rules are changed or White loses interest.

The intellectual tends to naturally look for ways of reducing problems to puzzles. Puzzles are intellectually satisfying- the solutions click into place like the door of a fine foreign car. A puzzle, is finished, solved, over with when the right answer has been found. There are none of the lingering doubts and uneasy qualms which come from compromising dearly-held values in an uncertain world. Problems are frustrating. One never has a solution; no matter what one does, the outcome will be unsatisfying in some way to someone. Statesmen like problems; intellectuals generally dislike them.

The models of the academic strategists are actually devices for transforming national security problems into decision-making puzzles. By abstracting from complicating particulars, and arbitrarily limiting the possible outcomes and rules of decisions, the strategist attempts to treat the choosing of a strategy or the response to a threat as a puzzle having a right answer or solution. For example, suppose that the Soviet Union threatens to cut off the supply routes to Berlin. For the statesman, this is a problem to which some response must be found. He must weigh the dangers of using force, the possible effects of yielding to the threat, the probable reactions of the Russians to various kind of counter-threats, and also the simultaneous reactions of our allies. It makes no sense to speak of a “right answer,” as if the problem were on a chess board. There are too many uncertainties, too many conflicting beliefs about values and goals, too subtle an interplay of factual and evaluative questions. For a more long-term problem, like the future development of NATO, this non-puzzle character in terms of a payoff matrix with varying payoffs in the different boxes, manages to convey the impression that the statesman is maximizing some quantity, and hence can be said to have solved the problem or not according as he finds the strategy with the maximum expected value.

If we recall the definition of a “strategy” given in the last chapter, it should be clear that only puzzles allow of strategies in the strict sense. A strategy, remember, is a complete plan of play taking account of all possible outcomes and responses by the other players. In order to formulate a strategy, a player must first have a consistent and explicit value scale, then be able to enumerate all the possible

future moves and countermoves of his opponent, and finally be able to attach probabilities to them. But as our examples of the explorer and the marooned travelers illustrate, this is possible only in the artificial case of a puzzle.

The unfortunate effects of “puzzle-thinking” can be seen throughout the literature on deterrence and foreign policy, and as it happens they are not confined to those who favor deterrence on security policy. Frequently, for example, one will see mention of the “n-th country problem, i.e., the problem created by the spread of nuclear weaponry to third, fourth, fifth, or any number (n) of countries. Both deterrence experts and disarmament proponents look for a “solution to the n-th power problem,” as though it were some sort of global chess puzzle. In fact, however, there is no such thing as a solution to this problem. What we must seek is ways of diminishing the dangers created by the spread of nuclear weapons. Test ban treaties, bilateral agreements on the control of nuclear weapons, arms control, all these and other avenues are possible ways of handling the problem. But there can never be a “solution,” in the sense that scientists might “solve” the problem of controlled thermonuclear reactions.

Similarly, discussions of arms control and disarmament frequently center on finding a solution to the “inspection problem!” Here again, inspection poses problems, but not puzzles. There is no one right arrangement of inspection stations, neutral observers, and verification teams which will solve the problem of mistrust, possible cheating, rearmament threats, and so forth. We can simply search for an accommodation with the Russians which will adequately protect the security of each, while going a long way toward reducing the danger of a nuclear war. This is, needless to say, a very large order. It is not made easier by the confusion of problems with game-like puzzles. The problems we face as a nation must be lived with, got round, reduced, deactivated, dampened. “Solutions” occur only in the world of abstract models and parlor games.

Part Three The Rhetoric of Deterrence

Chapter VII: The Military Definition of Reality

Throughout Parts I and II of this book, I have repeatedly asserted that the methodologies of the academic strategists constitute a rhetoric whose purpose is to advance one special point of view with regard to the problem of deterrence. I have presented some arguments against major deterrence theories now current, and I have also analyzed the theoretical techniques of the strategists, in an attempt to show that they are not objective conceptual tools, as claimed. It is time now to demonstrate more directly the rhetorical character of the language of the strategists.

A. The Rhetoric in Action

All thought proceeds in terms of language, whether silent or spoke. Whatever may be the case for young children, it is certain that by the time we have become adult members of a culture and society, our thinking is entirely carried on in terms of the language we have learned. Language is so natural to use that we usually do not even notice its presence. We think through words, not about them, for the most part. Only when struggling to express ourselves in an unfamiliar tongue do we become sensitive to the fact that words and phrases are the medium of our expression. The transparent character of language has its consequence a natural tendency to ignore the influence of the language in shaping and leading our thought. To the native speaker, it seems that language places no constraints whatsoever on his ability to express himself. The linguist has a rather different view of the role of language. For him, it is clear that language actively mold thought. Language provides a ready-made set of categories, distinctions, ways of connecting concepts and dividing up experiences. It guides the speaker in singling out the entire perceptual environment that small number of discrete characteristics which are to be noticed and given by the famous linguist Edward Sapir in his excellent introduction to the subject, Language. Sapir discusses the various aspects of a situation which a language might choose to emphasize by means of grammatical devices. For example, many languages, by means of the device

of verb tense, make it grammatically unavoidable that the speaker indicates whether the event being described takes place in the past, present, or future. A language can also indicate the gender of the speaker or the persons and objects spoken about. It may include a grammatical component which defines the number of the things mentioned, and this in turn may be done either by a simple singular-plural distinction, or by a more complicated system, such as one-two-many. The point which Sapir stresses is that in a language which, for example, expresses number (such as English), it is not possible to speak grammatically without taking notice of the facts of number in the situation. You cannot formulate the English sentence "The horse (?) jump(?) the fence (?)" without deciding whether it is one or many horses, which jump or jumps, the fence or fences.

Number and tense are familiar to speakers of English, and anyone who has studied German or Romance language will have encountered gender. But Sapir offers examples of languages which have incorporated into their grammar aspects of situation which would not by the farthest stretch of the imagination be viewed as "grammatical" by an American. The Kwakiutl Indian, for instance, cannot formulate a sentence describing an action by some person on some object, without stating the spatial relationships of the several entities to one another and the listener. The Kwakiutl doesn't merely say "The farmer kills the duck." He says, "The farmer (invisible to us but standing behind a door not far away from me, you being seated yonder well out of reach) kills that duckling (which belongs to you)."⁶³

At a fundamental level, grammar shapes perception. At a rather higher level, thought is channeled by the metaphors and conceptual framework with which we operate. This channeling is unavoidable, for out of the infinite variety of qualities and relationships in any situation we must select a small number to notice, define, and give expression to. The power of words lies precisely in their ability to pre-determine what we will attend to and even, as we shall see, the attitude we take toward it. The familiar political metaphor of the right-left spectrum is a case in point. For some time now

⁶³ Sapir, Language, 92-3.

commentators have been aware of the utter inadequacy of this simple model to express the complex relationships among the several major political attitudes in this country. In what sense is a man like Rockefeller “a little to the left of Nixon but to the right of Kennedy”? Why should a willingness to employ the power of the Federal Government be grouped with a concern for the liberty of the individuals “left wing;” and a sympathy with business be associated with a lack of concern for due process as “right wing?” The categories are inadequate- but they are used, and consequently our thought is guided in the direction of finding facts which support the “left-right” distinction. The terms “left” and “right” have varying value-connotations to those who use them, but some of the terms we use in political discussion are so loaded with positive or negative value-connotations-“Christmas cheer,” as one philosopher has called it-that they function as rhetorical devices for persuading the listener rather than as analytical tools for clarifying a situation. For instance, consider the term “free world,” generally used in the United States to refer to every piece of land lying outside the borders of Russia, China, and the allies. We employ the term “free world,” so often that we begin to ignore the vast areas of unfreedom outside the Soviet sphere- as well as the pockets of relative freedom within it. A man who sought freedom would probably be better off in Poland than in Spain, not to speak of Korea, Portugal, or Mississippi. But the phrase shapes our thinking, so that although we know about the unfreedom of the “free world” countries, we tend to class them as “exceptions.”

As I have said, all language selects and focuses; hence no language is neutral, if by that we mean equally amenable to the expression of all possible points of view. But some language is limited in a special and dangerous way. Under the pretence of objectivity and impartiality, it covertly biases the listener (and the speaker) in favor of one particular point of view or evaluative attitude to the exclusion of others which ostensibly are being considered as well. It is this kind of language- or this way of using language- which I am calling “rhetorical.” And what I now wish to show is that the terminology and methods of analysis of the academic strategists are rhetorical in precisely this sense. Purporting to offer

use a vocabulary which is impartial as among the various possible security policies for the United States, the strategists in fact have elaborated a rhetoric into which is built a military definition of reality. This special point of view is nowhere acknowledged or defended by the strategists. Rather, the effect of their language is to make it seem as if no other point of View were even possible. A rhetoric is totally successful when speaker and listener do not realize that it exists, when the biased, one-sided representative of reality appears to be simple reality itself. This is the danger we must guard ourselves against.

I have chosen the phrase “military definition of reality” to describe the exclusively security-oriented policy of the strategists. Before trying to lay it bare for examination, I will take up a number of particular examples of the strategists’ rhetoric in action. My meaning will be clearer after we have looked at some actual cases.

B. Case Studies of Deterrence Rhetoric

1. The Language of Toughness

In their writings, the strategists characteristically adopt a tone of tough, no-nonsense practicality which they contrast with the supposed impracticality of disarmament supporters. In the context of American political debate, this pose is frequently effective, for we in this country have a traditional suspicion of “do-gooders,” “sob sisters,” and even the perfectly honest expression of moral concern. The political Realist school of international relations exhibits this hard-boiled front, as in the following passage by Henry Kissinger:

As in the case of surprise attack, it is important to guard against simplified answers to the problem of local aggression. What could be simpler than to seek to escape the difficulty of comparing different weapons systems by abolishing weapons all together? Since war requires arms, why is it not self-evident that total disarmament would guarantee universal peace?... But the issue posed by total disarmament is, after all, whether striving to cut the Gordian knot with one blow helps the cause of peace or detracts from it. The implications of total disarmament are

far too little understood for us to announce it as immediate end. The prospects of arms control can be endangered as much-and more lastingly- by the proclamation of vague goals as by the rigid insistence on achieving security entirely by through military means. Mr. Krushchev's proposal may be a subtle maneuver to prevent the adoption of any meaningful control scheme or at least to turn negotiations into a propaganda duel. By stating a sweeping goal which is clearly unattainable in the immediate future attention can be diverted from the more complicated measures required to discipline the arms race now.⁶⁴

The use of loaded terms like "simplified," "escape the difficulty," "universal peace," "vague," "sweeping goal," conveys the impression that disarmament proponents are soft-minded and impractical. Note that at one point Kissinger gets his metaphors mixed, for "cut the Gordian knot" is usually taken as a image of practical ruthlessness and not uncautious haste. By contrast, in the next paragraph we are enjoined to "conduct negotiations seriously and concretely in keeping with gravity of the situation." The implication clearly is that disarmament is unserious and abstract proposal and that its supporters have treated the world situation with levity. Kissinger offers no evidence to support this series of charges, and when one considers the work of such members of the disarmament camp as Louis Sohn and Charles Osgood, it seems likely that he would have great difficulty in doing so.

Herman Kahn also has a variety of rhetorical devices designed to create an image of tough expertness. He uses the word "sober" several times to characterize proposals or people of whom he approves. Thus an unnamed study which says that the destructiveness of wars depend on how they are fought is called "sober." (p.10) Strategists who ask for more weapons than the theory of minimum deterrence requires are "sober advocates of Finite Deterrence." (p. 14) "Sober studies" (as usual, unnamed) indicate that a sane decision maker might "rationally decide that he is better off going to war than not going to war." (p. 230) Finally, the last chapter of the book is entitled "The Problem Must be Taken Seriously," and the second section of this admonitory conclusion as its subtitle "We Must Be More Sober About Deterrence."

⁶⁴ The Necessity for Choice, 213-2.

Kahn writes a great deal of the time in a sort of tenseless present which makes him sound continually on top of the problem. This gives an air of super-modernity which seems to fit well with the technological aura of the new military. He almost seems to say, "If I talk in this day-after-tomorrow fashion, I must be the man to tell you about these day-after-tomorrow weapons." Kahn also uses adjective designed to convey a clinical, value-neutral impression. He characterizes a policy proposal or new strategic concept as "interesting" (p. 191) or "exciting" (p.264), rather in the way that a doctor might speak of a high mortality rate from cancer of the liver as "interesting."

When I say that the language of toughness is rhetorical, I mean that Kissinger, Kahn, and the others use it to create an impression which is never substantiated by quotations from the writings of the disarmament school. By the same token, the writing of the strategists themselves fail to provide evidence of the seriousness, concreteness, and realistic hard-mindedness which they purport to value. So far as seriousness is concerned, it is difficult to imagine a more unserious proposal than limited city exchanges. The lack of factual details has already been point out in Kahn's work. And with regard to the study of disarmament, no published work by the strategists displays anything like the wealth of information which has been gathered and analyzed in thee says edited by Seymore Melman under the title, Inspection for Disarmament.

To the extent that the strategists are successful in their rhetorical toughness, the reader tends to reject disarmament out of hand as "unrealistic" or "unserious." It then becomes possible for the strategists to explore the alternative deterrence policies without the necessity of showing, at every step of the way, that their proposals are more feasible, less open to the dangers of failure, than disarmament.

2. Aggression and the Abstract Enemy

A second rhetorical device of the strategists is the practice of abstracting from the identity of the nations discussed, so that the enemy becomes a mere X or "Nation A" in a model of conflict. In itself

there is nothing wrong with such abstraction, although as I tried to show in Chapter VI it is carried too far in the formal models of the strategists. But this abstraction can also serve a rhetorical purpose by illicitly importing into the analysis certain assumptions about the enemy which one either cannot or does not wish to state and defend openly. One of these assumptions concerns the motives and policy goals of the Soviet Union. Presumably, in any objective analytical model of international conflict it ought to be an open question precisely how aggressive or expansionist the enemy is. That is an empirical fact which would be “plugged into” the model when it was applied to a particular case. But Game Theory, in common with the classic economic theory out of which it grows, tends to prejudge this question in one direction. It has the effect of presupposing that the enemy (in this cause Russia) is limitlessly aggressive and expansionist. This assumption is introduced by the way of the apparently harmless hypothesis that every “player” seeks to maximize value. Now, this assumption does not, in a strict technical sense, say anything about whether the player is aggressive or not. A non-aggressive player would simply place little or no value on additional increments of territory or power. Hence, although he would, like all the players, be maximizing value as he conceives it, he would not necessarily be attempting to expand his borders or defeat his neighbors.

But when the language of Game Theory is used informally, this technical point tends to be forgotten. When we say that a nation is maximizing value, we automatically think of it as expanding its frontiers and power until it encounters opposition from others nations. In short, we are unconsciously led to suppose that a Kennan-like containment image of Soviet expansionism is the only plausible view. No place seems to be made in the model for the possibility that the Soviet Russia might not wish to expand into southeast Asia or Africa, or even into western Europe.

The strategists’ habits of treating the enemy as an unnamed and unspecified “X” reinforces the already existing American tendency to see Russia as the embodiment of abstract evil, rather than as an

actual, historically specific nation-state. It feeds the unfortunate penchant for abstract labels, such as “communism” or “atheism” or “fascism,” with which Americans like to identify their enemies.

The abstract mode of speaking about security problems also strengthens the American tendency to view foreign policy in military terms. When an enemy is identified as X and is described solely in terms of his missile strength, it comes very easy to suppose that military victory is the only objective he might ever formulate. The historical goals of Russian policy in Eastern Europe or Manchuria are ignored, and instead of the Soviet Union is assumed to have no other aim but the destruction of the United States. Indeed, it is not all fanciful to say that as classical economists postulated economic man, whose goal was infinite wealth, so modern strategists postulate thermonuclear war, whose aim is “world domination.” In both cases, by treating the objects of study in an abstract manner, the theorist is led to the quite unwarranted assumption of insatiable and unlimited expansionist tendencies.

3. The Seductiveness of the Subjective

In Chapter IV, I pointed out that Game Theory as a formal mathematical discipline with proofs and theorems stops short at the theory of the two-person constant-sum game. Beyond this point von Neumann and Morgenstern were unable to discover solutions to many-person or variable-sum games. The extension of Game Theory called “Bargaining Theory” is thus not in the same sense a mathematical theory. Rather, it is a systematic elaboration of a set of key concepts in the form of models of game-like situations. The aim is not to prove anything, but only to define more precisely the significant quantities and identify the variables which seem likely to have an influence on the outcome of the game.

Even if one limits oneself to the two-person zero-sum game, application is forbiddingly difficult. The problem is that the utility function of each player, as defined by von Neumann and Morgenstern, is extraordinarily complicated to work out. The player must be asked a series of questions concerning relative preferences for probability combinations of possible outcomes, and he must answer these consistently in order for his utility function to be constructed. Only then can numerical values be

attached to the outcomes and a strategy plotted. For more complicated games, and for situations involving anything more varied as payoffs than sums of money, it is virtually impossible to actually apply the theory in the way which one applies Mechanics or Geometry to physical problems.

The strategists do not pretend to provide solutions of deterrence problems. They are quite well aware of the limits of the theory. Their sole claim is to illuminate complex security problems by means of the concepts and models of Game Theory. Thus, Schelling never says that the mathematical calculations in his book constitute a proof of the virtues of stable deterrence or limited city exchange. Rather, he suggests that light may be thrown on the new and obscure context of deterrence if we look at it as if it were a bargaining game.

Since it is illumination and not demonstration which is ought, the strategists deal in possibilities rather than probabilities. They do not attempt to estimate the probability of a Soviet response to American threat. They merely explore the different possible responses, and then look in turn at the possible counter-responses which we could make to each Soviet move. The result is a branching tree which represents the future “games” which might be “played.” It is up to the statesman, then, to judge at each for in the diagram which path the Soviets are most likely to take.

In the estimation of probabilities, evidence is the basis of judgment. But in the calculation of possibilities, the law of contradiction is the sole limit to imagination. Anything which is consistent is possible, and hence may be given a place in the explorations of the strategists.

It seems to follow from this that the strategists will be neutral about the prediction of future probabilities. They make no claims, and hence no need evidence. But when one reads a book by Schelling or Kaplan or Snyder or Kahn, one comes away with the very definite impression that certain possibilities have been ruled out, and others have been elevated to the status of probabilities. How is this done? By what trick of language is a factual conclusion drawn out of an apparently fact-free exposition? A clue can be gained by inspecting some passages from Strategy and Arms Control, a recent

work by Thomas Schelling and Morton H alperin. Schelling and Helperin are concerned with the interrelations between possible arm control measures and our deterrence strategy. Ostensibly, they seek merely to explore in a general and non-committal way the possible connections, so that policy-makers will know what sorts of things to keep an eye out for. Nevertheless, the authors have a point of view which comes through in every part of the book. It is that the United States should seek only limited arms control agreements which make the deterrence climate safer, and not attempt general and complete disarmament of the sort which would radically alter the security situation and require a wholly different approach to world affairs. The following one page excerpt from Part II of the book illustrates the manner in which the authors convey their policy convictions while making no straightforward assertions which would require factual backing.

Agreements are likely to have long-range political consequences as well as more immediate effects. These merge in the possibility that an arms agreement will lead to further arms negotiations and agreements between two sides. In evaluating any particular proposal, it has to be considered whether, if this agreement fails, future arms control will be impossible or unlikely. Successful working of a particular agreement can increase the likelihood of further, more far-reaching, arms control; poor agreements may discredit and retard arms regulation.

A particular arms agreement may be desired because it paves the way for further arms control. A limited agreement may help to test the efficiency of various inspection techniques and to discover ways of improving them. It may help to try international control machinery, to discover kinks in recruiting or communications, or to test how a voting mechanism works and whether the international machinery can accomplish what it is supposed to accomplish.

Each country may, furthermore, want to check the effect of any agreement on its internal administration and morale, particularly in its military services. Legal problems may be more easily handled initially for a limited agreement. A limited agreement might be valuable for discovering public attitudes towards inspectorates, and how they are affected by the role the inspectorate performs. Finally, each side may want to gauge the effect any agreement has on the international political environment, and on its ability to pursue its goals by other methods. In these various ways, limited measures of arms control may be useful preliminaries to more ambitious arrangements.

It may also be the case that some first steps at arms control would alter the political climate, externally or internally, in a way that would make possible (or impossible) more comprehensive schemes. In any event, whatever the initial motives and occurrences that bring particular measures of arms control into prominence, the measures may acquire a symbolic value, as a "test case," and

become at least as important for their implications for subsequent negotiations as for their intrinsic merits. This seems to have been true of the nuclear-test discussions.⁶⁵

There are sixteen sentences in all this passage. Of these sixteen, the first is a rather obvious statement which serves merely to introduce the section, the third raises the issue of the section without attempting to answer it, and the last asserts that the test-ban negotiations have acquired a symbolic significance. All thirteen remaining sentences have as their operative verb “may” or “may be” or some synonym. In short, with the exception of the concluding sentence, there isn’t a flat assertion in the entire passage. It is purely a catalogue of this which might happen-i.e., are logically possible. Now there is no arguing with such a catalogue. Of course these things might happen - and so might any other assortment of things one would care to mention. But notice that from the infinite number of possibilities, Schelling and Halperin have managed to choose thirteen or so which, if true, would clearly imply the superiority of limited arms control over systematic and comprehensive disarmament. They do not at all commit themselves to the truth of the thirteen hypothetical propositions they present, and in the absence of any factual support this caution is fully justified. But language is a strange thing: merely by singling these possibilities out for explicit acknowledgement, the impression is conveyed that they are somehow more likely than mere possibilities. The unspoken assertion behind the catalogue is, “We would not have wasted your time and our limited space to state these possibilities if we did not have reason to suppose that they are the likely, the probable, turns of future events.”

This technique, which might be called argument by subjunctive, is a common device of the strategists. Edward Teller, for example, employs it in the following passage from his essay, “The Feasibility of Arms Control,” in the special issue of DAEDALUS devoted to that subject.⁶⁶

“There is no doubt in my mind that human contacts between all people will promote the cause of peace. This is particularly true if these human contacts lead to positive and valuable accomplishments. Joint work on

⁶⁵ Schelling and Halperin, Strategy and Arms Control, 47-9.

⁶⁶ Arms Control, DAEDALUS, Fall, 1960, 781-799.

medical problems or on the exploration of our globe and the oceans of air and water are cases in point.

On the other hand, it is undeniable that disarmament may lead to frustration, friction, and failure. Therefore, there is at least some doubt whether or not arms control is the proper first step in creating a peaceful atmosphere.”

In the first paragraph, Teller makes assertions concerning the beneficial effects of human contacts. In the second paragraph, however, he merely asserts a possible or hypothetical connection between arms control and certain undesirable outcomes. Strictly speaking, Teller’s statements in the latter paragraph are absolutely undeniable. It is possible that disarmament may lead to frustration, etc. It is also possible that disarmament may lead to anything else one wishes to name. All things are possible. It is also true that in this world, there is always some doubt about the best way to handle a problem. So of course there is some doubt whether arms control is the “proper first step.” But it is also undeniable that disarmament may lead to vastly reduced international tensions, a lowering of the danger of war, and a wholly new form of international conflict in which we are not threatened at every turn by the immanence of nuclear war. Teller has said nothing to suggest that this possibility is less probable than the one which he chooses to mention. Here again, however, simply by mentioning it, he manages to convey the quite false impression that he has reason for believing it to be probable.

4. The Significance of Numbers

As I pointed out in Chapter V, the technique of expected value maximization is used in Game Theory can be usefully applied only to contexts in which the various possible outcomes are of roughly comparable value. For example, if a situation offers four outcomes, three of which are assigned utilities of a situation between 20 and 40 unites, and one of which is rated at 50,000 unites, the obviously the strategies which offer even a very slight probability of that fourth outcome will mathematically dominate the others. Expected value maximization will not be invalid in this case; it will merely be irrelevant. So if we are to make use of this method in choosing a deterrence strategy, we must

assume that the negative value of a nuclear war is not vastly out of proportion to the positive and negative values of such other outcomes as the loss of Berlin, a victory in Viet Nam, or the liberation of Poland. Should we take the view that nuclear war is simply incommensurable with these and the other non-annihilating possibilities in the international sphere, then we will have no use for payoff matrices and Game Theory.

In view of this simple arithmetical truth, it is significant that when students of military strategy employ the concepts of game theory for analytical purposes, they usually fill their matrices with "orienting numbers" which are in fact of comparable orders of magnitude. For instance, Glenn Snyder offers a mathematical example to illustrate certain principles of deterrence. He considers the consequences of an all-out Soviet nuclear attack on the U.S. or alternatively of a Soviet ground attack on Western Europe, to both of which the U.S. can make either no response or a massive retaliatory response or 0 in the case of the ground attack - a ground force response. The pay-off matrix which he presents for the United States looks like this:⁶⁷

Table I

United States	Soviet Union		
	No attack	Nuclear Attack on U.S.	Ground attack on Western Europe
No response	0	-500	-100
Massive response	0	-400	-400
Ground force response	0	0	-150

The nuclear attack on the United States is less costly in the case of massive retaliation because of the assumption that certain Soviet weapons are thereby destroyed which were not used in the first strike.

⁶⁷ Snyder, *op. cit.*, 270.

(Presumably, Snyder has made an error in setting the cost of the ground force response to nuclear attack equal to 0. Since in that case a ground force response is impossible, it would come under the heading of “no response” and hence cost -500.)

What these figures state is that the difference to the United States between an obliterating nuclear exchange and the uncontested loss of Europe is three times as serious as the difference between a nuclear exchange and an un-answered knock-out blow from the Soviet Union (i.e., $(400-100)/(500-400)$ or $3/1$.) Also, since the status quo ante is set equal to zero, the figures tell us that the difference between the unanswered nuclear strike and the uncontested loss of Europe is four times as great as the difference between the loss of Europe and the status quo. Whether Americans really evaluate these various possibilities in this manner is, of course, left open by Snyder. He specifically disavows any significance for his numbers. However, by choosing commensurable quantities he conveys the impression that his calculations of expected values represent a believable and usable model of decision-making. Because of the comparability of the values assigned to the various outcomes, he can realistically discuss the changes in probability of outcomes which must be effected in order to change the relative desirability of various strategies. Had he assigned a value of -5,000 or -50,000 to the knock-out nuclear attack, he would have so over-balanced his calculations that no realistic alternative defense postures would alter them significantly.

Here, as when cataloguing a variety of hypothetical possibilities, the strategist manages to convey a particular point of view without ever actually stating or defending it. Snyder is not prepared to argue that an obliterating nuclear war would be of the same order of magnitude in value as the loss of Europe or a conventional war. Neither is Morton Kaplan⁶⁸ or Thomas Schelling⁶⁹. But by their choice of illustrative numbers, all three authors implicitly assert precisely that dubious proposition. Anyone who

⁶⁸ Cf. Morton Kaplan, “The Calculus of Nuclear Deterrence,” *World Politics*, XI, (October, 1958), 20-43. esp. 29.

⁶⁹ Cf. Strategy of Conflict, passim, where Schelling gives sample figures for payoff matrices.

adopts their methodology is automatically led into a similar value attitude, without ever confronting it openly as an important and debatable policy commitment.

5. Strategy and Democracy

I have already pointed out that the theoretical confusions which are produced by treating nations as though they were decision-making individuals. There is also a practical consequence particularly distressing in a political society which, like ours, is on the way to becoming a garrison state. The policy-maker who conforms his thinking to the game theoretic mold is unknowingly led to an authoritarian attitude toward political decision-making.

As individual is, in a manner of speaking, a perfectly unified point source of authority and decision. Leaving aside certain psychological theories about the structure of the self, we may say that the individual there is no multiplicity of personalities, wills, or intelligences. Normally, after the process of deliberation has been carried out, a decision is taken and action follows. The individual will always be hemmed in by the independent constraints of the world around him (including other men), and he may be harassed by indeciveness, uncertainty, or that inability to act which the ancient Greeks called "weakness of will." But he will not be faced internally with the necessity of accommodating his will to other wills.

When the individual goes into the political arena, it is of course completely otherwise. There he is continually involved in a struggle against other will. The whole of politics is really nothing more than the process of transforming a variety of individual wills into social (or, if one wishes to be more precise, political) action. The problem of concerting individual wills is as central to monarchy or dictatorship as to democracy. The king's commands can be carried out only by means of the obedience of his subjects and the loyalty of his army. The dictator, by the same token, is totally dependent upon the subservience of the nation. His power as an individual extends no farther than his right arm or the gun he carries. All the rest depends on his authority, which is to say the willingness of other men to do so as he commands.

In all political situations, even those most thoroughly autocratic, we can find accommodation, bargaining, and coercion- which is to say, the aggregating of individual wills into social action. The dictator, if he is to be successful, must never forget that his power rests on the willingness of the people to follow him, or – what is not quite the same thing – on their unwillingness to rise up against him. He will also quite probably find it necessary to maintain some sort of mutual understanding with the church, the army, and the economic powers of the nation. Franco in Spain, for example, despite his economic position, is endlessly engaged in playing off against one another the church, the old Falangists, the Monarchists, and the industrialists.

The purpose of this brief discourse on political power is to make the point that no political organization, whether dictatorial or not, can legitimately be treated as if it were a decision-making individual. Even the most absolute of tyrants such as Stalin can never in a literal sense claim that his will is the will of the nation. He may for the moment be capable of employing the power of the state to translate his personal decisions into actions, but the preservation of that capability will depend upon the continuing loyalty or subservience of the other members of the state. The necessity of maintaining that loyalty introduces a factor into his calculations which will sharply distinguish them from the calculations of a private individual.

All political decision-making involves the accommodation of separate wills, but we may draw a distinction between two quite different forms of political organization. In the first type, accommodation is accidental; in the second, it is essential. A dictator, for example is forced by his lack of perfectly absolute power to adjust himself in various ways to the wills of others (if only to make himself so awe-inspiring to them that he can bend them to his will). Autocracy would remain in the absence of accommodation or compromise; indeed, autocracy is only imperfectly realized to the extent that the dictator must adjust himself to the wills of his subjects. In a democracy, on the other hand, accommodation is essential. That is to say, it is not merely an (imperfect) means to an end, but the very

essence of democratic decision-making. The process by which wills are concerted and translated into political action is the defining characteristic of democracy- we call a society democratic precisely because it embodies, in one form or another, a certain principle of social decision-making.

What has all of this to do with the logic of strategy? The answer is that the language and methodology of the strategists covertly inclines us toward the first sort of political society, in which accommodation is accidental, rather than toward the second, in which it is essential. To put the point more simply and strongly, the language of the strategists has an authoritarian or anti-democratic bias. This bias is built into the habit of treating the units of decision-making as individuals rather than as nations or governments. So long as the player in a model of decision-making is viewed as an individual, we are encouraged to look on the processes of democratic accommodation as nuisances, interferences with the operations of reason. The necessity in the United States of winning assent for a strategic proposal from a variety of semi-independent officials is seen as a kind of organizational or political friction. Like the friction in a machine, it slows things down and makes impossible the applications of pure theory. Just as the engineer strives for a frictionless machine, so the strategists is ineluctably inclined to strive for a frictionless government. This, of course, means a government in which the decisions of the chief are automatically the decisions of the nation at large.

Thus the academic strategists, already biased in an anti-democratic way by their intellectual training and habits of mind, are led to view Congressional committees, Joint Chiefs of Staff, State Department officials, and even subordinate members of the president's own staff, as obstacles to the proper functioning of the decision-making apparatus. The dispersal of political power, which is an essential safeguard of democratic political organization, becomes in the models of the strategists merely one more irrational factor distorting the process of decision.

There are at all times men who cannot abide the complexity and diversity of democratic politics, who long for the simplicity of autocracy and dream of the day when all power will be vested in one man,

whose ear they will (benevolently) bend. In times like the present, the real or supposed threat of enemy attack is used as a weapon to frighten defenders of democracy into giving up their safeguards. In the name of national security and unity, all power is to be vested in the leader. The anti-democrats have used the cold war as an excuse to extend the tentacles of national security to education, religion, industry, and even into sports and arts. Congress no longer passes a National Education Act; it passed a National Defense Education Act. Capitalists are enjoined to forego profits and workers the right of the strike for the good of the state. High jumpers no longer jump for mother or school; they jump for democracy and the American way of life. Even God is enlisted in the cause of security as Americans are exhorted to the counter creep of materialism by attending church.

Needless to say, the esoteric theories of a handful of strategists play only a minor role in the assault on democracy, but their influence is felt where the dance is greatest, within the walls of the Federal Government. By providing an apparent theoretical justification for the already powerful suspicion of democratic decision-making procedures, the academic strategists amplify the problem of maintain our political ideals together with our national security.