

DOOMSDAY DELAYED

*USAF Strategic Weapons Doctrine and SIOP-62,
1959-1962*

Two Cautionary Tales

John H. Rubel

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To Robin


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Preface

The story I tell in these pages is based on my own experiences in the Department of Defense a half-century ago. The story is about two things: the initial launch arrangements designed into the Minuteman missile system; and the Single Integrated Operational Plan (SIOP-62), first disclosed to selected civilian defense officials, myself included, in late 1960. Both were deliberately designed to inflict hundreds of millions of deaths and uncounted casualties, mostly on innocent civilians in the USSR and China. Both deliberately removed effective operational control from the President or any other civilian or even military commander in the event of a nuclear confrontation. And the Minuteman launch system design, a "detail" not generally considered within the purview or even competence of high-level policy makers, invited the possibility of unauthorized or accidental mass launch of tens or even hundreds of nuclear-tipped missiles with little or no warning.

The materials and references recounted here began when, in early 1959, a year-and-a-half after Sputnik, I left my job at the Hughes Aircraft Co. in Los Angeles to become Assistant Director of Research and Engineering (strategic weapons) in the recently re-organized Pentagon. I remained there for more than four years. In 1960 I became a Deputy Director of Defense Research & Engineering. In 1961, I became the sole deputy and Assistant Secretary of Defense (research and engineering). In mid-1963 I returned to a post in private industry.

John H. Rubel
Santa Fe, New Mexico
October, 2007

Acknowledgements

This book was composed at the suggestion of my friend, Lindsey Grant. It is based upon two episodes recounted in a volume of my memoirs, in the hope that their lessons will be of some interest to contemporary and future students of strategic policy. Without his help this volume would never have been composed.

I am indebted, too, to Herb York, the first Director of Defense Research and Engineering in addition to many distinguished posts, who brought me to the Pentagon in 1959, both for that and for his example of leadership, effective public service, wide understanding and unflagging common sense

I thank my son, Robert, for valuable editorial assistance, and especially my wife, Robin, for her careful proof-reading, support and patience. Brittany Bauhaus rendered invaluable help with infinite patience as I struggled to master the arcane mysteries of properly formatting the text. Whatever errors remain are mine.

Introduction

The following account makes it clear that military leaderships, able to command vast technological and industrial resources for ever more high-tech military purposes, armed with thousands of atomic bombs and warheads, faced with a potential enemy or enemies known to be similarly armed, are not only capable of but actually were, in the late 1950s and early 1960s, well along in creating a military posture adapted to nuclear preemption, attacking first because the enemy might attack us first.

The authors of the SIOP-62 targeting plan predicted that nearly 500,000,000 people would die from nuclear fallout alone in the USSR and China were the go-ahead order given by the President. No accounting was presented of reciprocal effects in the United States or collateral deaths and damage in the many other places around the world—nearby countries, distant oceans, fields and farms—where global clouds of radioactive dust would eventually descend.

Moreover, these plans and postures were designed to deny any but a “go-no-go” option to civilian leadership. They offered the President the single option, as Kissinger and others put it in 1961, of *suicide or surrender, holocaust or humiliation*, under the dire circumstances of a nuclear confrontation.¹

Further, as we finally discovered, the Minuteman missile system was susceptible to a catastrophic, accidental multiple launch owing to an unanticipated potential failure mode of electro-mechanical design features that took nearly two years to ferret out in the face of persist Air Force stonewalling.

All this—the doctrines, the specific and detailed system designs, the elaborate operational targeting plans—were devised and implemented right here in the United States, not in some rogue state deemed irresponsible by our standards. Yes, there are dangers from without but, lest we forget, from within, as well, as President Eisenhower tellingly reminded the American people in his Farewell Address to the nation, an Address given well before either of the matters reported here had reached higher levels of government where something could be done about them:

[The] conjunction of an immense military establishment and a large arms industry is new in the American experience. The total influence—economic, political, even spiritual—is felt in every city, every Statehouse, every office of the Federal

government . . . in the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex . . . [and] we must also be alert to the . . . danger that public policy could itself become the captive of a scientific-technological elite. [emphasis added]

The multiple problems afflicting the launch provisions initially designed into the Minuteman missile system recounted here illustrate one example of where a “scientific-technological elite” eventually managed to correct a constellation of design features inspired and sponsored by the military, features deliberately specified, designed and implemented by uncountable heads and hands that had the effect, deliberate or not, of profoundly affecting—indeed, profoundly limiting and effectively crippling—decision-making at the highest national level in the event of a nuclear confrontation. Further, these same efforts by scientific and technological officials to fully review and understand Minuteman launch provisions led to the discovery that the Air Force and its contractors had ushered the Minuteman through design, testing and production with a potentially fatal potential to *accidentally* launch fifty missiles (per squadron), in an undeterminable number of squadrons, without the least prior notice!

Fortunately, with respect to both the technological features of Minuteman and the SIOP-62 targeting plan evolved by the three military departments under SAC supervision, critical civilian leadership seems to have been imposed under and by President Kennedy, notably during the Berlin Crisis of 1961 and soon thereafter. Eventually, the Minuteman system was critically revised. National strategic doctrine was reviewed at length and, ultimately, fundamentally changed, leading to greatly revised versions of SIOP under Defense Secretary McNamara during and after that period, as well.

As to the lessons we may learn that apply to today’s world, note that less than a decade earlier than the events recorded here, the United States was the world’s sole nuclear power. The confrontations and potential instabilities described here were bipolar, almost exclusively involving the U.S. and the Soviet Union. In staggering contrast, at this writing in 2007, there are nine nuclear states. More appear rising on the near-term horizon, most notably Iran. It needs no expert in these matters to explain that the multiplication of nuclear states substantially, perhaps exponentially, multiplies the possibilities of miscalculation, accident or deliberate preemption by an unknown assailant, or the escalation of a larval regional conflict into global catastrophe.

Nothing is more essential to maintaining what stability there is in this multiply-armed nuclear world than the security of procedures for authorizing the launch of *any* nuclear weapon by *any* military command at *any* time. One breach can trigger global catastrophe on an unimaginable scale. Nuclear-armed rogue states, or politically unstable states, are an undeniable and terrible menace. There is no argument about that. But dangers of accidental or unauthorized launch of

nuclear weapons, whatever they may be in the other eight nuclear powers around the world, have been, and may well be alive and well right here at home. That is a central message of this short book, describing follies perpetrated forty years ago.

To reinforce this point it is well to remember that follies, often innocent but dangerous, often malignant and tragic, are part of the human condition. The past is replete with them. The future will be, too. As a single, but sobering example, consider the following recent news story—a *news story*, not some episode even worse than this one buried in classified files far from public view or consciousness—from Los Alamos, New Mexico, cradle of the atomic bomb, and the leading national center for a number of matters critically related to our nuclear inventory:

In late 2006, an employee of the national weapons laboratory at Los Alamos, NM, was found to have some 200 pages of paper documents and classified information on her portable computer flash drives containing over 400 classified documents, found in her mobile home residence. She claimed to have intended to work on the materials at home, but never did, and forgot about them.

The employee had a “Sigma 15 Q” clearance, a level that would have allowed her to read classified documents that could contain information on how to bypass the so-called permissive action links that *ensure that there is only authorized use of nuclear weapons*. [emphasis added] . . . A man who was renting a room at her mobile home was jailed on drug and probation violation charges. (THE NEW MEXICAN, Deborah Baker, AP, November 3, 2006)

She was a contract employee who no longer worked in the Los Alamos laboratories when the newspaper article appeared.

Finally, a brief comment on the context in which the past events recounted here, and our current and prospective posture in the world, need to be understood. We have entered the third century of rapid technological and scientific advance that began to accelerate around the end of the 18th and the opening of the 19th centuries. The modalities of production, transport, communication, data storage and military arms have grown in complexity, reliability and global diffusion ever since. The absolute magnitude of the impact and accreting power of the long-term exponential growth of science and technology on everyday life and military destructiveness increasingly looms over the modern world. Take a banal personal example:

Airplanes were made of light wood framework covered with cloth when I was a child. I was six years old when a handful of particle physicists agreed on a standard interpretation of the Schrödinger wave equation. Leo Szilard secretly patented nuclear fission when I was 14. Lisa Meitner identified it when I was 18. I was 25 when Hiroshima and Nagasaki were wiped out. Now, in much less than

a single lifetime, a proliferating world seems well equipped for and bent on a metastasizing, multipolar "race to oblivion."² These changed and changing circumstances raise the question: *Does anybody learn anything from history? And if they do, do they learn the right, the applicable lessons?*

Surely that depends, among other factors, upon what "history" is considered to be. History here is about a few critical, but carefully planned details of missile design and their deployment, known by very few then or now, that lodged at the heart of American military posture in the early 1960s. I hope the reader will find this account compelling and thought-provoking, especially the reflection that had things gone wrong, as well they might have in connection with and even because of the events depicted here, the course of human life on earth would have been changed forever.

Do accounts of this sort help ensure that follies and dangers similar to or derivative from those recounted here will be averted in the future?

Maybe. Maybe not. If not, this small book will have served little or no useful purpose.

Chapter 1 The Setting

The Setting

From the early years of the Republic until two years after the end of WWII in 1945, the U.S. military establishment consisted of the Department of War (Army) and the Department of the Navy, each headed by a Secretary, each a member of the President's Cabinet. This changed when the National Security Act of 1947 separated the former Army Air Force from the Army and set it up as the U.S. Air Force, a third military department with its own Secretary, Chief of Staff and independent staff offices. The 1947 Act also created the post of Secretary of Defense.

Two years later, in 1959, not long after James Forrestal, the first SecDef, killed himself by jumping out of a window at the Bethesda Naval Hospital, the Secretary of Defense was equipped with a staff for the first time, creating the Office of the Secretary of Defense (OSD). Together, the 1947 and the 1949 acts accomplished the most sweeping reorganization of defense activities since the Navy Department was created in 1798.

Then, ten years later, came Sputnik 1. It took the Sputniks, starting with Sputnik 1 in October 1957, to alarm the country and galvanize Congress into passing the Defense Reorganization Act of 1958. This Act further strengthened the OSD vis-à-vis the military departments. Most conspicuously, it created the office of the Director of Defense Research and Engineering (DDR&E), armed with sweeping new powers to "supervise all research and engineering in the Department of Defense." The Act stipulated the Director's organizational rank, so important for the exercise of power, designating him the "third ranking official in the Defense Establishment," ranking after only the Secretary and Deputy Secretary of Defense, in effect an Undersecretary of Defense, but given a different title for political reasons at the time.

The first Director, Dr. Herb York, and eight or nine others whom he recruited, including me, all arrived in the Pentagon within a few weeks of one another in the spring of 1959. We were the first group of new officials to flesh out the new ODDR&E (Office of the Director of Defense Research and Engineering).

Beginning: old legacies, new realities

Thus, when I began work in the Pentagon in early 1959 the independent Air Force was twelve years old. The Navy, by contrast, was 160 years old, the Army about ten years older than that. The DoD was only ten. Neither the newly created ODDR&E (Office of the Director of Defense Research & Engineering) nor the expanded and revised JCS (Joint Chiefs of Staff) were yet fully organized.

The new organizations were designed and destined to bring new dynamics to defense management. The independence of the USAF unleashed energies and stimulated larval ambitions never fully realizable as long as the Air Force remained part of the Army. Predictably, the rapid advance of military technologies and the growing exercise of OSD powers over the military departments would inevitably conflict with traditions, ambitions and rivalries within and among the military departments that had evolved over decades and even centuries.

By war's end as many as 600,000 German civilians, according to some estimates, had perished in Allied air raids. The atomic bombs that devastated Hiroshima and Nagasaki, with their well-publicized and ghastly effects on physical structures and the bodies of human victims, *did* end the Japanese phase of the war. They proved to be a *sufficient* cause, but it remains far from clear that they were a *necessary* one. In any case, in both the public and the military mind, *strategic bombing had come to mean mass bombing of civilian targets*, and by the end of the war that included atomic bombs.

After Sputnik, even the lay public understood that atomic weapons and long-range heavy bombers and the promise of long-range missiles and missile-launching nuclear submarines—"strategic" as distinct from "tactical" weapons—were destined to become tools of global military power and policies. The Eisenhower-Dulles declaration made in 1954 announced that the U.S. would respond to military (really, Soviet) provocation anywhere, including attack with conventional weapons, *at places and with means of our own choosing*. Implicitly, this declaration warned that the U.S. would respond to any military challenge with nuclear weapons. The term "massive retaliation" stems from it.

This would have been an idle threat never ventured without such weapons in hand, a prospect not remotely comparable to the total but limited conquests of times past, of which the Athenians bullying the Melians serves as a familiar and particularly eloquent example.³ No credible threat of massive retaliatory power (or of naked aggression) had ever before been possible on the global scale enabled by modern atomic weapons and the means to deliver them half way around the world if need be.

Technology and the Air Force

Almost everyone came to believe in "air power" after the war. But it became clear with the prospect of long-range missile deployments a few years later that no Army, Navy or Air Force, nor any combination of these, could any longer defend national borders, our own included, against attack from the skies or near-

space by planes or missiles. All this was, or should have been, perfectly clear within a decade after the war's end. Hiroshima and Nagasaki had shown what could happen to the heartland of even continental nations like the U.S. and the U.S.S.R., open to utterly devastating attack against which there was no effective defense,⁴ despite the political sponsorship of "Star Wars" under President Reagan and the "Missile Shield" under George W. Bush, both egregious examples of the reification and politicization of idle hopes that a technological "shield" could and would prove to be a practicable reality.

The burgeoning of technology during the comparatively few years of WWII eclipsed that of the previous twenty years or more. High-performance planes, mass production of ships, radar detection and guidance, ballistic missiles, atomic bombs, the new field of electronics, operations analysis, tank warfare and more had, almost overnight, transformed the tactics and strategies of war. Much more was still to come. As the Air Force was the first to fully appreciate, applied science and advanced technology became central to modern military power.

Even before the USAF became independent from the Army, its chief, General "Hap" Arnold, asked Theodore von Karman, America's leading aerodynamic scientist, to spearhead a study identifying the scientific and technological research and development projects the Air Force should support for the next 10–20–30 years. That was 1944. In 1945 von Karman headed a committee charged with finding out everything it could about German aeronautical developments during WWII. In 1946 the Air Force, still under the Army, set up the RAND (Research AND Development), think-tank in Santa Monica, California, a multi-disciplinary group of engineers, scientists, economists, psychologists and others to think about war in general and new weapons in particular.

RAND quickly proposed a death-ray project, which the Air Force approved. It also proposed shooting a charge of luminous gas to the moon to learn more about the characteristics of the space between earth and the moon. Its third proposal was for a near-earth satellite to be used for communications, meteorology or navigation. The Air Force was the child, but it was also increasingly the proactive sponsor of military technologies. Would the "earth satellite" have men on board? Many an Air Force enthusiast thought it should.⁵

Chapter 2 Minuteman

The Symposium at Ft. Ritchie

A few weeks after starting at the Pentagon, I organized a symposium on strategic thinking held at Fort Ritchie, a convenient government installation an hour's drive outside of Washington. Most of the influential defense theorists of the day, many of them from the RAND Corporation, participated. They included Albert Wohlstetter, the voluble Herman Kahn and other figures, who, taken together, profoundly influenced American strategic thinking and policies for some three decades beginning in the 1950s. An intensive program of position papers and round-table discussions lasted nearly a week.

The week at Ft. Ritchie dealt in depth with the leading issues bearing on the design, configuration and deployment of strategic weapons. The possibility of what, in the atomic bomb and missile age could be a swiftly fatal *surprise attack*¹ raised many questions about *second strike* capabilities, speed of response and command and control. Not all had good answers. Surprise attack implied an assault with nuclear weapons so sudden (arriving after only minutes of warning), so overwhelming, so reliable and so accurate that many, probably most, of *our* strategic weapons and even the communication systems required for their command and control would be knocked out. Given this worst-case scenario, no adequate second strike force, a survivable force capable of deterring an enemy's first strike, would remain following such a hypothetical surprise attack.

Clearly, if such a situation were actually to exist—if our strategic forces *could* be disabled or destroyed in a massive enemy surprise attack—that circumstance could—some theoreticians seemed to believe it *would*—invite it.

All this convinced some, perhaps many, military thinkers, to believe that our possession of a first strike capability, *and the will to use it*—that is, to “launch on warning,” before any enemy missiles, thought to be on their way, would have time to land, was the only viable “defense.” Consider, however: “launch on warning” almost necessitates an *automated* response. The electronic warning signal itself, in this scenario, would trigger our first-strike missiles, many of them ready to go in a minute or so. The “will to use” this strategy would require no high-level decision-making or intervention. (This argument, a deeply held belief

among many, was never openly circulated among the defense theorists. It is further discussed below and in the next chapter.)

Most of their propositions and demonstrations had to do with *defensive* measures aimed at protecting our strategic forces. Given the enormous radius of destruction wrought by a single atomic bomb, dispersing our bombers and missiles so that very few could be knocked out by a single explosion was obviously a priority. Given the vulnerability of airplanes and missiles on the ground, easily shattered by even conventional weapons, "hardening" of their storage sites was another imperative. Submarines armed with missiles could prowl enemy perimeters safely deep beneath the sea. Unlike bombers, missiles could be launched from near-safety in concrete silos deep beneath the surface of the ground. Whatever thoughts the theorists (or military officials or officers) had about the potential inefficacy of these measures, and the concomitant imperative to launch on warning, or simply to initiate the first strike, were not aired in published documents.

Some, however, as we are about to find, were effectively embodied unnoticed for a long time in arcane details of the launch control system of the Minuteman missile, of which there would eventually be more than a thousand aimed at the USSR, and probably China as well.

Minuteman

The term *Minuteman* applies both to a particular missile, and to the aggregate of more than a thousand of them comprising a "system" of missiles and control centers spread across hundreds of miles of prairie lands in states like North Dakota, Wyoming and Montana. Individual missiles were to be, and ultimately were, buried deep in concrete silos capable of withstanding almost anything except an unlikely direct hit from an atomic warhead. In early 1959, as this account opens, Minuteman was already under development. Deployment of the first squadron was expected to, and did, begin in 1961. At least two key features of Minuteman—its wide dispersion and underground hardening of all the missiles and control centers—were a direct outcome of policies advocated by the RAND thinkers.²

The Ft. Ritchie symposium, and the many documents I read dealing with the many factors bearing on the design and deployment of strategic weapons, typically dealt with *how many, how big, how dispersed, how hardened* and the like. Equally important considerations, such as flexibility of command and control of these weapons, provisions to prevent unauthorized or accidental launch, design provisions to ensure that the malfunction or failure of a critical component would *not* result in missile launch or some comparably dreadful catastrophe, were treated little or not at all.

But while nobody at the conference discussed the great danger of *instability* that could inhere in the military posture of the U.S. on one side and the U.S.S.R. on the other, Herman Kahn did treat this matter at considerable length in extended presentations he delivered at many policy levels in the year or two after

the Ft. Ritchie conference. It is worth digressing a moment to explain.

The concept of "stability"

Instability arises most dangerously in the contemporary world when vast arsenals of horrendously destructive weapons end up ready to go in minutes. If one side *does go* for any reason, or even for none, the other is set to respond, and *must* respond. Strategic weapons, I soon realized, could often *determine* policy by their very design.

Military *instability* arises when the actions of one side will, unless countered in a timely manner, give it a decisive military advantage.³ It is worsened as the interval defining a "timely manner" shrinks to almost nothing, as it does in the missile age.

The nuclear/missile age

The missile age that dawned rapidly in the late 1950s and early 1960s, each side racing to equip itself with long-range nuclear-tipped missiles aimed at the other side, presents a vastly accelerated and amplified analogy to the circumstances that led to WWI and its sequelae. There are about fifteen minutes of radar warning time, and perhaps double that of satellite warning time, before missiles launched from nearly halfway around the globe begin landing on U.S. soil, and *vice versa*. They cannot be stopped. Such, by definition, would be a surprise attack. Such a "conflict" would not really involve uniformed combatants on either side in any conventional sense. Rather, total war, raining nuclear destruction from the skies and raining clouds of radioactive earth across the world would claim the lives and health of millions, perhaps billions, of non-combatants, within hours, with deadly effects persisting for years. What viable national policies, what effective military preparations, if any, can be made anticipating such a possibility?

When the speed with which events can occur greatly exceeds the capacity of individuals and organizations to think about and direct them, when machines and computers and communications work much faster than human brains and human organizations can respond, pressures grow to automate even the decision-making functions vested in political and military authorities. As we have already noted, there were plenty of military thinkers and military officers who deeply believed we had to launch first.

"Launch on warning" is a logically flawed and terrifying posture almost ensuring that eventually both sides *will* launch because one seemed about to do so or was thought to have done so. It is a *reductio ad absurdum* idea sponsored by those who can contemplate no alternative other than the complete automation of central thermonuclear war. Herman Kahn correctly characterized a hypothetical arrangement such as this a "doomsday machine." There was at least one such "doomsday machine" that blew up during WWI, long before the missile age. It is a further instructive example of what *instability*, as used here, can mean.⁴

Le Tonnerre

On a visit to France in 1963 I came across the remains of a WWI catastrophe near a small village along the Canal du Nord northeast of Paris. There one discovers a crater about fifty feet deep and a couple of hundred feet in diameter. Postcards on sale in the village identify it as "Le Tonnerre," a melancholy reminder of what happened to a pre-war landmark and its unfortunate human occupants.

For before WWI a small hill stood where only the crater remains. The little hill was a formidable obstacle in the path of the French on one side and the Germans on the other, each holed up in extensive trenches, unable to see the enemy on the other side of the hill and likely to get blown away if they dared peer over the top. An obvious solution occurred to each side—mine the other side and blow it up.

Each side began mining the hill. The process went on for weeks as tons of earth were excavated to form tunnels extending under the German side (dug by the French), and under the French side (dug by the Germans.) Eventually the tunnels were filled with TNT by each side under the part of the hill occupied by the other.

Then one day somebody on one side or the other—nobody will ever know which side or who it was—detonated a charge that ignited *all* the French and *all* the German explosives. Who knows?—maybe it was an accident!

Either way, accident or on purpose, the little mountain with hundreds of luckless humans in trenches on it or still tunneling beneath it, was blown to kingdom come, leaving only an impressive crater called Le Tonnerre to remind an occasional visitor forever after what *military instability* can mean.

It was not too early in 1959 to envisage a ghastly replay of this little-known drama on a global scale, however impossible to imagine its extent and consequences.

Minuteman launch provisions

Soon after my appointment to the ODDR&E, I visited a number of companies and organizations involved with strategic weapons. These visits included a few to STL (Space Technology Laboratories), a division of TRW (Thompson-Ramo-Wooldridge), then responsible for System Engineering and Technical Direction (SETD)⁵ oversight of all Air Force large missile projects.

There I was briefed by Bob Bennett, the Minuteman project manager. I had known him at Hughes when we both worked there a few years before. Perhaps I expected a level of rapport between us because of that, but his briefings were unclear or guarded or even deliberately incomplete whenever they touched on launch provisions for the Minuteman missile system.

The PSAC (President's Science Advisory Committee) had set up the Strategic Weapons panel, headed by Dr. Franklin Long of Cornell, charged with stay-

ing current on strategic weapons developments. Soon after coming to the Pentagon, I was invited to accompany the panel when it met, as it did several times a year, to review the features and progress of strategic system developments and deployments. The panel included a number of eminent scientists, some of them members of the earlier von Neumann Committee.⁶ Harold Brown, Herb York's successor as Director of the atomic bomb development laboratory at Livermore, was a member. Brown would later succeed Herb York as the second DDR&E.

In the spring of 1959 I attended panel meetings in the Los Angeles area lasting several days, reviewing major missile projects, including Minuteman. It was the latest and by far the most advanced Air Force ICBM project, incorporating many features long advocated by RAND and other strategic analysts. Basically, Minuteman was said to be a "second-strike" weapon, as distinct from the earlier ATLAS and TITAN missiles, both of which used liquid fuels that could not be kept inside the missile for very long and took a comparatively long time to be readied for launch⁷, rendering them highly vulnerable to an enemy's first strike.

Minuteman, by contrast, was to be powered by a three-stage rocket, each stage a solid propellant, launchable in less than a minute, safe in deep underground concrete silos until moments before launch.⁸ Its guidance system included gyroscopes of special design, each of them rotating on frictionless gas bearings normally running all the time. The guidance system in each missile was set for a pre-selected target somewhere across the world.

Like the propulsion system, the guidance systems, once set in motion, required no further setup time prior to launch. We should note right here that these features—almost instantaneous launch, no pre-launch setup time, all operational missiles ready to GO—are *not required for a second-strike capability*. They are, however, nice to have in a first-strike system, since the first strike could be launched without the least prior detectable external physical evidence—evidence that might alert an enemy that a strike was likely—that preparations to strike were under way.

Minuteman, STL and the Long committee: A critical meeting

By June 1959, when the PSAC committee visited STL for a periodic updating, I had developed a feeling, based on several earlier meetings with him, that Bob Bennett was holding out on me. He was deliberately vague about specific questions I was probing. I wanted to know how the Minuteman system got launched. How do the commands come in? How do you respond to those commands? How does the system function just prior to and during launch? What happens when the operators push the launch button, if there is such a thing? I had some intimations of how it worked, but I lacked critical details.⁹

Bennett gave the Minuteman presentation to the PSAC panel. He outlined the chief distinguishing features of the system: there would be fifty missiles in a squadron, divided into five groups of ten missiles each. Missiles would be buried in concrete silos in open fields separated from each other by three miles or so in a large circle several miles across, each circle of ten missiles separated from the

others by fifteen or twenty miles. Every silo would be a separate target. Only an inconspicuous concrete and steel structure a few feet across and almost flush with the ground would reveal a silo's location, a miniscule target for an enemy missile launched from the other side of the North Pole even if the enemy (meaning the U.S.S.R.) had somehow (however improbably) discovered the exact coordinates of each silo. Eventually there would be more than 20 Minuteman squadrons and over 1,000 missiles deployed. If an enemy struck first, thousands of missiles, or, in later versions, thousands of independently targetable warheads, would have to be launched to ensure any acceptable probability of destroying the Minuteman system when fully deployed.

So, Bennett explained. special gyroscopes in the guidance system of each missile would spin continually and every missile's guidance system would be pre-targeted. It would take less than a minute to fire a missile once the order to launch was received. Widely dispersed across a nearly featureless landscape protected against overpressures of up to 100 pounds per square inch in their underground silos until almost the very instant of launch, the entire system would be able to ride out a Soviet first strike, and then strike back in retaliation. Such, at least, was official doctrine.

At last Bennett came to the launch system. There would be five launch control centers, one for each group of ten missiles. All the launch equipment would be housed in concrete silos underground, these hardened to withstand not just 100, but 300 pounds of overpressure. Each launch control center would be manned by two airmen, said to be Air Force captains, each seated at a control console separated from the other by bulletproof glass.¹⁰ Each airman would have a key that could be used to turn a switch when inserted into a matching lock. Upon receiving an authorization to launch, details of which were rather vague,¹¹ the two men would insert their keys into the lock in front of him controlling a switch. If the two men in a silo turned their keys within two seconds of one another, their launch control center would be electronically deemed to have "voted" to launch. If two or more centers "voted" within a comparably short interval, then *all fifty missiles in the squadron would be launched.*

Questions

I was curious about procedures for launching: how are the decisions to be made, and what happens when the launch commands are given. What if you decide you really didn't want to launch the rest after you've already launched some? Can you launch missiles one at a time, selectively? What if some operators decide to launch without authority? Here I cite from a transcript of my discussion of this matter for the John F. Kennedy Library:

A moment arrived in this briefing in June of 1959 when I could ask the question I wanted to ask, one I had asked Bennett in private before, but without getting a satisfactory response. I had the feeling that if I asked the question, surrounded as I was by members of the President's Science Advisory Committee panel, that I might elicit a better answer.

So I said something like, "Bob, can you describe how the missiles are launched?" Now I began to think that he was made uncomfortable by the question. He seemed reluctant to grasp its simple meaning.

I asked him to describe the pre-launch sequence. "Let's say that a launch message reaches a launch control center. Now what happens?" He began to describe how a launch control center was laid out: it's under the ground; it's hardened to three hundred PSI; it's a small room with control panels and switches and dials and things like that; there are two men down there. Each of these men has a key that fits into a key-operated switch. Between these two men is a sheet of bulletproof glass. If each man is standing close enough to his panel to actuate his switch, he is separated by that bulletproof glass from the other man so that he couldn't intimidate the other man, at that moment at least, by threatening to shoot him. If each of these two men inserts his key on command into the key-operated switch and turns the switch within two seconds of the other one, then the launch control center will be deemed to have "voted" to launch. If at least two out of the five launch control centers have voted to launch within some short period of time, then the missiles will be launched. That's the kind of explanation he gave.

"Well," I said, "when you say the missiles will be launched, do you mean all fifty missiles will be launched?"

"Well," he said, "that depends."

I said, "Depends on what?"

"Well, it depends on whether all the missiles are ready, and so forth, to be fired."

"Yes," I said, "but assume that the missile silo doors are not locked shut, and assume that all the missiles are ready to launch, then if two or more launch centers vote to launch will all fifty missiles be launched?"

"Well," he said, "Yes."

"Now," he said, "You have to understand"—and I think at this point he sensed a certain ripple of disquiet that swept the audience, the small audience that he had—"you have to understand that there are two modes."

We asked him to describe the two modes. It turned out that one mode was what he called "salvo" and the other was what he called "ripple launch." In the ripple launch mode you could preset a time interval between the missiles, while in salvo mode they all left their silos as simultaneously as the accuracy of switches and related equipment permits. It turned out, in pursuing the matter further, that if you had preset the system for ripple launch, there was no way to interrupt it after the launch command was transmitted to the silos. If the first missile went, and then six seconds later, let us say, the second, and after another six seconds, the third, and if after the twentieth missile you decided that was really enough missiles, you couldn't stop the system from launching the remaining thirty, according to what Bennett told us at that time.¹²

Well, the committee was pretty shook [sic] by this revelation. I don't think anybody had ever realized before that there would be four men buried in the ground somewhere in northern North Dakota who might someday stick their keys into four little slots, turn them and irrevocably launch fifty Minuteman missiles.¹³

It seemed to me that the system Bennett had described to the panel, quite apart from its susceptibility to accidental or unauthorized launch, was *designed*

to foreclose any decision to fire Minuteman missiles short of firing all fifty in each squadron. By *design*, the president could *not* decide to launch one missile, or two, or a few against specific targets.

There would have to be—so we all assumed at the time—a *command* to launch the missiles that was authoritative and verifiable, though exactly how *that* was supposed to work was anything but clear to me. It remained that, in any case, the president or some designated military authority issuing that command, would have one and only one choice, a narrowly restricted choice deliberately designed into the arcane details of the system: *order an apocalyptic nuclear bombardment or do nothing at all*. As Henry Kissinger was to say a couple of years later: “Either holocaust or humiliation.”

Command and Control

I stress again: there was no possibility of meaningful *control*. The most unimaginable mass military catastrophe in history—launching a *minimum* of fifty missiles in each squadron carrying vastly more equivalent explosive power than all the bombs dropped in all of WWII or, for that matter, in all the wars since time began—could hang on a single command and the obedience of no more than four young Air Force airmen in underground silos somewhere out in the plains of North Dakota. And Air Force “requirements” called for more than twenty squadrons—General Power, SAC commander for several years, wanted *two hundred* squadrons, ten-thousand missiles—all configured the same way!

I was exposed to this situation within a few weeks of starting in my Pentagon job. In the months following this introduction I discovered that the Minuteman launch system was far more complex and dangerous than I at first realized. The underlying policy matter of *command and control* of strategic weapons became one of my chief concerns for the next several years.

A couple of years later, when command and control had become a major concern from the White House on down, I had occasion to discuss the subject with General LeMay, by then the Air Force chief of staff. When I brought the matter up, LeMay expostulated contemptuously: “Command and control! Command and control! What’s that? It’s telling the fighting man what to do, that’s what it is. And that’s a job for the professional soldier. They talk about the president exercising command and control. What is the president?” He spit out the “p” in president. “A politician.” He spit out the “p” in “politician.” “What does a politician know about war?” He dwelled on w-a-a-h-r. “Who needs the president if there’s a w-a-a-h-r? Nobody! All we need HIM for is to tell us that there IS a war. We are professional soldiers. We’ll take care of the rest.”

Who was responsible? Was it on purpose? Why?

Questions crowd in on every side of the known facts: How did the Minuteman launch system come into being in the first place? Who was responsible? How come, once I brought its obvious dangers and deficiencies to light, it took

years and multiple efforts against palpable resistance to get anything done about it? Most of all: WHY? Why was this done in the first place, and why the long and almost-successful resistance to correcting it?

Remember: virtually every detail of Minuteman and every other military weapon system is carefully specified in advance of its actual creation. The launch and control system did not spring in to being *ex nihilo* by accident. It was not the bizarre offspring of the unauthorized whim of some eccentric designer in the bowels of an electronics laboratory.

Quite the contrary. The complex details of the original launch and control system, like every other significant aspect of every complex missile system, had to be carefully specified in advance of design. The system was meticulously designed to meet those specifications. Nor did the launch provisions just happen to pass unnoticed during the years it took to test and manufacture the system—to ensure, in short, that it *did* meet the design requirements. Like everything else about Minuteman, down to the metal alloys of its screws and frame, the insulation on wires, the plugs and sockets connecting electronic elements to each other—indeed, the very name of the system itself, *Minuteman*—you can be sure that the particulars of the launch system were specified from the start in minute detail.

The same bureaucratic system of “requirements” that contrived the bullet-proof glass pane between the two operators in each launch control center, and, no doubt, the caliber of the pistols the operators were assumed to carry, generated specifications that likewise carefully described the details of the electronic pulse generators, the electronic gates that would sort out those pulses, the notching motors that would advance one notch at a time as each pulse reached it after passing through a gate (described below)—and all the rest. Launching all 50 missiles at once, whether in an instant or in a ripple series, was a thoughtfully deliberate, carefully specified feature of the Minuteman system. Somebody—indeed, a number of military and contractor figures, including many near the top of the hierarchy—made the embracing decisions and oversaw the specific details that embodied those decisions, resulting in the all-or-nothing design with which Minuteman was initially deployed in 1961. That much is certain.

But exactly who did it, which policy-level officers okayed it, how the management of Space Technology Laboratories, which included Simon Ramo, Deane Wooldridge and Ruben Mettler, all of them first-tier technical men directly responsible for overall technical supervision of Minuteman and every other ICBM (Intercontinental Ballistic Missile) design and development program in America, were involved in such decisions and development actions, and, most important of all, WHY it happened, must remain shrouded in the murky corners and corridors of Air Force policy and technological undertakings of that time.

But happen it did. Nor is this the end of the story.

A revelation

The SACBM (the Scientific Advisory Committee for Ballistic Missiles),

headed by Clark Milliken from Caltech, customarily met in the fall in September or October. It was up to me to suggest a topic for consideration by the Committee. I suggested that Dr. Milliken and the Committee address the current status of command and control of strategic weapons. He agreed. To introduce the subject to the Committee, I sent all its members a copy of RED ALERT, a fictional account of how a demented Air Force colonel in charge of a SAC base tries to start WWII on his own by ordering B-52s to attack the USSR. A popular film, *Dr. Strangelove*, which reached theaters a couple of years later, was a basically believable enactment of this grim story made palatable by outlandish and comical characterizations that the public found very amusing.

The day came for the briefings to be presented to the SACBM. They lasted the better part of a day. We heard about the Atlas and Titan intercontinental missiles, the B-52s, the Polaris and finally, in the afternoon, an Air Force colonel described Minuteman.

He repeated the familiar litany of general system features—fifty missiles in a squadron arranged in groups of ten, each group associated with a launch control center, missiles and launch control centers (LCCs) deep underground in concrete silos widely dispersed across prairie lands in northwestern states. He explained how at least two of the LCCs had to “vote” in order to launch the fifty missiles in a squadron. He described how a “vote” only counted if the two men in an LCC, separated from each other by a bullet-proof glass panel (so neither could force the other at gunpoint to cooperate in an unauthorized launch), were to turn their keys within two seconds of one another. I have described this above, and I suspect that most of the Committee members had at least a passing knowledge of most of these features.

Then the colonel described the “clock,” a feature I have not mentioned before. Again, from the Kennedy Library transcript:

[T]here was a circumstance under which [only] one launch control center could launch the missiles. One supposed an attack that wiped out all but one LCC and all the power lines. There was an emergency power system good for six hours. If only one launch control center survived and if the two men in that launch control center voted to launch, there was supposed to be a clock-operated switch that was initiated by signals involved in these sequences. This clock could be set to anywhere from fifty-eight minutes to six hours. When it reached its preset time, it voted as if it were a second LCC. Thus, for example, suppose the clock was set to fifty-eight minutes. Suppose that a pair of men in an LCC had voted, but that nobody else had [presumably because only one LCC had survived a Soviet attack]. Fifty-eight minutes later the clock would vote, and the entire squadron would be launched automatically.

The minimum setting of the clock [viz: 58 minutes] prevented only two men from launching the squadron without warning, and gave enough time for someone to disable the system had the two men voted without authority. This they could do anytime of any day or night, of course.¹⁴

One may suppose an even worse case: all the launch control centers have been knocked out, nobody has “voted” to launch, but the clocks of last resort

would replace the missing men and vote, instead of them. Again, the minimum time to which the clock or clocks could be set was clearly a supremely critical point.

I had always been told that the minimum setting was fifty-eight minutes, set by the requirement to allow enough time to stop the otherwise automatic launch of the entire squadron, if need be. The maximum setting was six hours, after which there would be no more auxiliary power. The colonel explained some of this, except that he did not mention these options for setting the clock. I interrupted to ask: what was the minimum setting? To my astonishment he said Zero! Zero? Really, zero? Yes, he was sure, zero.

I do not know to this day if he knew what he was talking about or not. But the very fact that an Air Force colonel charged with explaining this complex system to the eminent scientists on the Scientific Advisory Committee for Ballistic Missiles could even imagine that zero was an OK number was and is appalling. Zero could mean that only two men—or, perhaps, none at all—could set off the unstoppable firing of fifty Minuteman missiles (in each squadron so affected) by accident or, effectively, by designing the system in this way, in the event of a series of power interruptions, if the clock were set to zero.¹⁵

None of these portentous implications of *zero* seemed to occur to the colonel, but they sent me into orbit.

From 1959 on I had had many conversations about Minuteman, but never before had I heard about this supposed zero setting of the critical clock. The launch-control problems and dangers had seemed serious enough to me to demand action even without this new revelation. I had spoken several times with General Schriever, head of all Air Force missile development. He wasn't interested. In fact, he was conspicuously disinterested in discussing the subject.

One day in the summer or early fall of 1960 I had lunch with Jim Douglas, the Deputy SecDef, expressly to air my concerns about Minuteman. Sitting in a small, private dining room on the Pentagon's “E” ring, the seat of the most powerful military establishment in the world, I asked him if he would feel safer knowing that the USSR had a Minuteman system in place.

Like ours, it would have gyros spinning, solid rockets in groups of fifty ready to fire in a minute or less (hence, “Minuteman”). The ultimate system would include hundreds, perhaps more than a thousand missiles aimed at all sorts of key targets in America.¹⁶ There would be no way of selecting among them or of stopping them once launched, all this under the control of a few Soviet airmen bored to tears in underground silos somewhere in Siberia?

He thought I had a point there. My concerns dropped again into another organizational black hole.

When Marvin Stern took over the Strategic Warfare office from me in early 1960, I told him that his top priority was to get the Minuteman launch control system changed.

Marvin Stern knew General Schriever and many other Air Force people. I said,

"You will not get this done without getting a directive that orders the Air Force to do something about it." "Oh, no, John, that's not the way to operate in the Pentagon," he said. So he tried personal persuasion and reason to get something done about this essentially political issue.¹⁷

After much prodding, he presented me (nine months later, in November 1960) with a memorandum for the Assistant Secretary of the Air Force (research and development) that had already been discussed with the recipient, asking for studies that

should establish specific changes which result from the introduction of increased flexibility, the effect of these changes on the over-all program and the dates by which these changes can be introduced into the system...

The requested investigations were to be submitted by November 30. I have found no record of a reply in the files, and I remember none.¹⁸

About December 1960 or January 1961, Marvin Stern bet me a Martini that he was going to get a directive out of General Schriever that would correct these design problems in the Minuteman system. When he finally put the bee on General Schriever, he realized that [Schriever] had been lying to him all along. I say lying. And he [Stern] never got the promised changes. At that point he became convinced that he'd better get a directive.¹⁹

The subject remained alive for a long time. On July 14, 1961 the deputy Secretary of Defense, Roswell Gilpatric, signing for McNamara, sent a memorandum I wrote to the Secretary of the Air Force on the subject of Minuteman Flexibility and Safety. He referenced a memo for the DDR&E entitled Flexibility in Minuteman dated January 25, 1961. By mid-1961 matters of this sort were the subject of white papers, and one had been submitted to McNamara by the Air Force dated July 6. The SecDef memorandum of July 14 states:

I am concerned about the time schedules you have stated in the White Paper on selective launch and dual targeting capability for the Minuteman system. Generals Schriever and Ritland estimated that at least the capability for selective launch could be incorporated in the second wing [squadron] at the same time as the incorporation of the radio launch control system.

In view of the discrepancies between earlier estimates and current ones, I would like you to appoint an independent group of experts to assist in improving our grasp on both the flexibility and the safety problems associated with the Minuteman system.²⁰

Air Force inaction remained the order of the day.

Chapter 3 The Fletcher Committee

Transition, the Fletcher Committee

Starting in late November or early December 1960, the Eisenhower Administration took steps to facilitate the transition to the Kennedy Administration that would take office in January 1961. In an extraordinary and well-planned effort, many of the key officials already designated by the new Administration were given access to the government offices they would soon occupy. Robert McNamara, the SecDef designate, was furnished with an office in the Pentagon not far from Secretary Gates's office. Jerry Wiesner, to be the new science advisor to the president and head of PSAC, came over often in December and early January. I told him all about my Minuteman concerns, which he shared without question.

Soon after McNamara took over, either York or I managed to get a \$35 million supplemental budgetary request added to the list of items to be submitted to Congress by the SecDef a few weeks later. The funds were intended to do something about the Minuteman launch control problem.

But I discovered in April that the \$35 million was no longer in the budget package. I was told that Joe Charyk, Under Secretary of the Air Force (formerly Assistant Secretary of the Air Force for R&D), had collared Charlie Hitch, the new comptroller, and told him the money wasn't needed, whereupon Hitch dutifully took it out. I ran into Wiesner soon after making this discovery. He told me I'd better tell McNamara right away.

So I did. I filled him in on nearly two years of my so-far futile efforts to do something about Minuteman. He struck the table with his fist and assured me he would take care of it. By this time, Harold Brown had been named York's successor as the DDR&E. Asked by McNamara to deal with the matter, Brown asked Jim Fletcher to head a committee to study the problem and make recommendations.

Fletcher and I had lived only a block apart in West Los Angeles. We both worked at the Hughes Aircraft Co. and for years drove to work together nearly

every day. Later he became the head of his own company. Still later he became the president of the University of Utah and twice the Administrator of NASA. Several times since coming to the Pentagon I had asked Fletcher to head scientific committees looking into projects with which I was concerned. When I heard one day that he was in the building getting briefed by the Air Force about Minuteman in preparation for his latest assignment, I sent for him to find out what he thought his committee's job was supposed to be.

He came to my office from the Air Force on the fifth floor of the Pentagon where various officials had been carefully avoiding the critical issue while giving him all sorts of totally unrelated and useless instructions that would have led him and his committee absolutely nowhere.

So I filled him in on the long Minuteman launch system history, starting in early 1959 when I tried to figure out what Bob Bennett was not telling me, and ending with the Air Force colonel confidently assuring the SACBM that the overriding emergency "clock" could be set to zero. Fletcher took it all in very quickly. I knew he would do an excellent job.

Notching motors

The Fletcher Committee submitted its report a couple of months later. With his customary thoroughness and keen mind, Fletcher dug deep and discovered that things were far worse than I had realized. For one thing, it turned out that when the keys were inserted in the switches at the Launch Control Centers (LCCs) they did not just make a simple and direct electrical connection to the missile firing system. Rather, they activated an electronic circuit that put out a train of electrical pulses generated by circuits on a plug-in electronic "board" that could be changed from time to time for security reasons. The time interval from one pulse to the next varied, depending on how the particular circuits were set up, a coding system intended to make the launch system more secure. At the missile end of the line, matching circuits would let these pulses through ONLY if the intervals, or "gates," matched up with the spacing of pulses sent out when the keys were turned.

Suppose they *did* line up. Then each pulse coming through an electronic "gate" would energize a little electric motor known as a "notching motor." A regular electric motor rotates without stopping as long as power is applied to it. A notching motor only rotates one "notch" whenever an electrical pulse hits it, much like the second hand on a clock that moves one second at a time upon receiving a timed impulse.

So a series of pulses makes the motor rotate one notch for each pulse in the series. When all the pulses initiated by the two LCC switches have come through the electronic gates the motor will have rotated exactly enough to mechanically turn an electrical switch to ON. This switch *launches all the missiles* that are ready to go, assuming that at least one other LCC has also "voted" to launch.

But just suppose that the electricity coming in from power lines to a Min-

uteman squadron occasionally goes off and then back on again in a few seconds or even in a fraction of a second. Will that sort of power blip be interpreted as a "pulse" that will advance notching motors all across the Minuteman squadron of fifty missiles? The Fletcher Committee thought it *very well might do just that*. If it did, then, given enough time, a succession of power hiccups hardly worth noticing *might* finally turn some or all of the notching motors to the ON position. To the amazement of the brave captains down in the LCCs studying calculus for their engineering courses, fifty missiles from each squadron so affected would one day roar into the wild blue yonder on their way to the Soviet Union. Soon thereafter, the doomsday machine would be fully activated as enemy nuclear warheads and bombs rained down on the U.S.

At last: ACTION!

The Fletcher Committee recommended that the first squadron of Minuteman missiles, scheduled for deployment in early fall, 1961, be retrofitted so that the position of notching motors corresponding to each LCC would be permanently displayed in the launch centers. Many other design changes were also required and all subsequent production models were to be modified to incorporate them.

Eventually the all-or-nothing features were removed from the system so that missiles aimed at predetermined targets could be selectively launched upon orders from highest authority. \$130 million was appropriated just to implement the retrofit of the first squadron and begin changing the systems to be produced after it. The final bill, adjusted to more recent values, was almost ten times larger.¹ My battle had taken more than two years. In the end, I probably won. The worst destabilizing and dangerous features of the Minuteman system were widely understood, acknowledged and being changed by the fall of 1961.

Why? A circumstantial—and obvious—explanation

Readers can judge for themselves the obvious circumstantial answer to *why?*—why *would* the Air Force, as a bureaucratic, policy-making, policy-following organization, first decide, then specify, then supervise the development of and finally contrive to conceal and then to preserve the all-or-nothing launch feature of the Minuteman system? As for me, the circumstantial evidence in response is more than ample.

General LeMay's comments about command and control, *what is the president?* and all we need him for is to tell us *there is* a war pretty much summarizes a way of looking at these things that certainly was not limited to Gen. LeMay alone. I cite a conversation that Herb York once had with another Air Force general:

General Kuter told me that we had to complete the BMEWS (Ballistic Missile Early Warning System) as soon as possible, and he urged that we ex-

pand it in order to create a highly redundant capability at each site: We must have an absolutely reliable early warning of a missile attack. Basically, I agreed.

All would have been well if he had stopped there, but he didn't. In words I can't precisely recall, he went on to say that we had to have this redundancy and the resulting high level of reliability so that, when we finally connected the warning system directly to the launch button of our own ICBMs, there would be no false alarms.

I was astonished. I told him flatly that we would not automate our response, that we would not connect the warning system directly to the launch button. We would not, in sum, go to a "launch on warning" strategy. We would, especially, not go to one that did not have the president in the decision-making loop.

Kuter coldly replied, In that case, we might as well surrender now. (York (1987, pp. 183-184)

Unquestionably, the ultimate result of an arms race between the U.S. and the USSR in which *both sides* equipped themselves with Minuteman systems, pre-targeted, ready to go in seconds, set to fire all at once, effectively triggered by *warning* of an impending attack, would be a Doomsday Machine à la Herman Kahn, Le Tonnerre on a global scale, and the end of modern civilization as we have known it. That said, the Minuteman system as initially configured was set up *as if* that were, indeed, its intended role.

As for more substantive evidence that these provisions were deliberate and reflected high-level Air Force policy aimed not only at creating them, but resisting any changes or even any clear understanding of what the design details were for two years, I suggest the following:

- Bennett's obvious obfuscations, maintained unrelentingly. He never came forth with a complete explanation to me or to the PSAC panel during the months over which I had many conversations and contacts with him;
- General Schriever's comparable stonewalling when both I and Marvin Stern tried to secure his cooperation in correcting the situation;
- The action of Joseph Charyk, Under Secretary of the Air Force and formerly Assistant Sec. USAF (R&D) in, as I was told, causing Charles Hitch, the DoD Comptroller (formerly of Rand) to reverse the \$35 million added to the early 1961 Supplementary Budget request by either Herb York or me specifically intended to begin addressing Minuteman launch system deficiencies;
- The disinformation, and lack of correct information, given to Dr. James Fletcher by Dr. Brockway MacMillan, Asst. Sec. USAF (R&D) in the spring of 1961 as Fletcher was about to begin investigating the Minuteman launch system in detail pursuant to a directive initially issued by Robert McNamara, SecDef.
- The 1-year interval during which Dr. Marvin Stern tried repeatedly, but failed, to secure ANY Air Force response to his attempts to get action

regarding the launch system problem. Ultimately, in the fall of 1961, by threatening to stop, and perhaps by actually suspending funding, Stern finally managed to get the Air Force's attention. All this was *after* the Fletcher committee had revealed previously unsuspected and highly dangerous features of the launch control system that cried out for immediate remediation.

And lastly, an additional factor, namely, the thinking embedded in many military circles at the time, which may have gone something like this: *Why would anyone on our side dare risk firing no more than one or only a handful of nuclear-tipped missiles, telegraphing our hostile intentions, and inviting the enemy to respond with every weapon he could command? It would be far better, such thinking went, to disarm the enemy by destroying his strategic weapons before he has a chance to use them. Let that be the sole option. We will design Minuteman to force that outcome.*

Technical audit

Nearly ten years later, in about 1970, I visited Herb York in his splendid home overlooking the Pacific Ocean in La Jolla. We walked along the beach, talking about old times. I wondered if the Air Force had actually done all the things they were supposed to do to make Minuteman less of a danger to the world. How would we know it if, in fact, an airman with a screwdriver could set the critical clocks to zero after all? We agreed that the military departments require an official they do not have who would be the technical equivalent of the Inspector General. The IG inspects the books of every military base and probably every PX in the world where U.S. forces are stationed. You can be pretty sure there are not many shoplifted candy bars disappearing from PX inventories without the IG finding out about it.

But what about *technical* auditing? Short of another Fletcher Committee, how would you ever discover the technical status of launch controls for Minuteman or any other sensitive strategic weapon system? So far as Herb and I knew at that time more than thirty years ago, there was no regular procedural way to ensure that some faceless engineers and disciplined military personnel had not contrived to evade requirements imposed long before, or to create new systems with technical features designed to impose or to subvert U.S. military, strategic and diplomatic policies.

Chapter 4

Siop-62

Single Integrated Operating Plan (SIOP)

In the late spring of 1960, President Eisenhower, at the urging of the Secretary of Defense Tom Gates, issued an order requiring the three military departments to formulate a Single Integrated Operational Plan (SIOP)¹ to govern targeting of nuclear weapons by all three military departments. The order was issued in an attempt to move toward a "rational" targeting plan (an oxymoron if there ever was one!) and away from the current state of affairs in which the Army, Navy and Air Force each had its own targeting plan essentially unrelated to the plans of the other two Services.

I do not remember the exact wording of Eisenhower's charge to the military, a charge undoubtedly approved by the Joint Chiefs before the president signed it. It included words close to these:

...prepare a Single Integrated Operational Plan for the targeting and deployment of nuclear weapons in the event of a nuclear confrontation with the Sino-Soviet bloc that will destroy at least 90% of the military-industrial power of that bloc with at least 95% confidence.

The critically operative words in that charge were "at least." They led directly to a SIOP "plan" that was nothing less than a *capabilities* plan calling for dropping every bomb and launching every missile in our possession at the "Sino-Soviet bloc." The "plan," by its very nature, reflected the conviction (usually unacknowledged) that by wiping out most of China and the Soviet Union, especially the Russian part, America would, to cite the Air Force mantra, "prevail." Needless to say, the SIOP only described how the USSR and China would be targeted, not how the U.S. would be struck in return.

The meeting took place near mid-December 1960 at Strategic Air Command (SAC) headquarters at Offutt Air Base near Omaha, Nebraska, attended by Secretary Gates, Deputy Secretary Jim Douglas, myself, the Joint Chiefs of Staff, and a multitude of general officers representing every Unified and Specified com-

mand² from all over the world.

The setting

The SIOP briefing was held on the floor of the command center at SAC headquarters. The viewers faced a high wall along which enormous panels bearing maps and charts ran on tracks the entire length of the room, perhaps a hundred feet or so. Behind and overhead one floor up was a glass-enclosed balcony. The generals would run SAC's part of the war from up there behind a long line of desks, glued to telephones, peering through the enclosing glass at the maps depicting the scene of wartime activity somewhere—indeed, anywhere and perhaps almost everywhere—in the world.

Today the balcony was dark. Only one panel of maps was spotlighted. Folding chairs of the old-fashioned kind made with wooden slats had been set up on the floor of this cavernous space facing the maps. In the front row sat General Thomas Power, the SAC commander and the senior officer overseeing the creation of the SIOP, flanked by the SecDef on one side and the Deputy SecDef on the other. I sat behind him in the second row with a number of four-star generals. Behind me were many rows all filled with generals of diminishing rank, the one-star fellows invisible in the gloom far in the rear.

The briefing begins

At a signal from General Power the briefer stepped on stage as it were, directly facing his audience, about fifteen or twenty feet in front of the first row. An aide appeared carrying an easel which he meticulously placed exactly parallel to the front row and next to the briefer. Another aide took a stand on the left side of the easel. His job was to flip the large charts over the top of the easel when the briefer, standing on the right side and armed with a long pointer, had finished with the previous one. The first briefer was to describe the attack on the Soviet Union.

After presenting a few charts he came to one defining the first wave of attacks to reach the Soviet Union. As I recall, these came from carrier-based fighter-bombers stationed near Okinawa. Having made this disclosure, he stepped aside.

Thereupon two airmen appeared, one from each side of the long wall lined with maps, each carrying a tall stepladder. Each airman stopped at the edge of the large map which, we now observed, showed China and the Soviet Union and probably some other nearby features on a heroic scale. Each man climbed his tall ladder at the same brisk rate, reaching the top at the same instant as his counterpart. Each reached up toward a red ribbon which, we now noticed, encircled a large roll of clear plastic. With a single motion, each untied the bowknot securing the ribbon at his end of the roll, whereupon the plastic sheet unrolled with a *whoosh!*, flapped a bit and then dangled limply in front of the map. A bunch of

little marks appeared, most of them over Moscow, representing nuclear explosions. The men descended the ladders, folded them, carried them off, and disappeared.

Wave after wave

The briefer repeated this performance several times as successive waves from B-52s already aloft on *Headstart** missions and fighter-bombers from carriers in the Mediterranean and from U.S. bases in Germany and others from carriers and bases around Japan and B-47s and B-52s launched from bases in the U.S. and some from bases in Europe and a few ballistic missiles (many more would become part of the plan during the next few years) dropped their lethal loads over the USSR.

Each time the briefer described an attack wave the ballet of the ladder masters would be re-enacted. They would untie another pair of red ribbons, a plastic roll would come whooshing down and Moscow would be even further obliterated beneath the little marks on those layers of plastic sheets. There were little marks in other places, too, but somebody noted that a third of Soviet industrial-military strength was concentrated in the greater Moscow area, hence the concentration of bombs dropped on that region.

I recall that the plan called for a total of forty megatons—*megatons*—on Moscow, about four thousand times more than the bomb over Hiroshima and perhaps twenty to thirty times more than all the non-nuclear bombs dropped by the Allies in both theaters during more than four years of WWII.

Writing in retrospect, considering that SIOP called for dropping 7,847 megatons on the Sino-Soviet bloc and some eastern European targets, I question my memory—forty megatons seems like far too small a number for such a coveted "target." But then, it really doesn't matter. Even if the SIOP masters *had* programmed four-hundred, or four-thousand, forty megatons would have been enough.

At the point in the briefing where some bombers were described flying northeast from the Mediterranean on their way to Moscow, General Power waved at the speaker, saying: "Just a minute. Just a minute." He then turned in his front row chair to stare into the obscurity of uniforms and dusk stretching behind me and said, "I just hope none of you have any relatives in Albania, be-

* *Headstart* called for B-52 bombers to circulate in flight from bases in the northwest, such as Montana and North Dakota, across the northern U.S. over Minneapolis, thence to Labrador for refueling, then further north before turning westward and returning to base after a mission lasting nearly twenty-four hours. Each bomber carried two 5-megaton nuclear bombs. Mock bombing exercises and other mission-related tasks kept the crew busy much of the time. Team ratings were posted regularly, maintaining a vivid competitive atmosphere among them. Backup bombers stood on "alert" around the clock, ready to follow the *Headstart* planes into attack mode if war started. I flew on one of these missions in 1959.

cause they have a radar station there that is right on our flight path, and we take it out." With that, to which the response was utter silence, Power turned to the speaker and with another wave of the hand, told him to "Go ahead."

Constraints

The briefer told us that these attacks were subject to constraints. For example, given average winds aloft at the time an attack was launched, no more than 100 rem of fallout radiation must blow into the atmosphere over Helsinki and no more than 200 rem over Seoul. "Rem" stood for "roentgen equivalent—man."³ Any such calculation of "average winds aloft" would most likely be way off from the actual winds blowing on the day and hour of a real attack. The effects of 200 rem on the population of Seoul could be very serious and might well include many deaths.

Having described these "constraints," strangely skewed in favor of Helsinki over Seoul, he next showed a chart that displayed deaths on the vertical axis and time in hours, extending out to weeks, along the horizontal axis. He announced that there were about 175 million people in the USSR. This chart depicted the deaths from fallout alone—not from the direct effects of blast or radiation from a bomb going off, just from fallout subsequent to the attacks when radioactive dust propelled to high altitudes by the initial blast begins to fall back to earth. The curve of deaths, rising as time went by, leveled off at about 100 million, showing that more than half the population of the Soviet Union would be killed from radioactive fallout alone.

As the briefer concluded this explanation and was about to go to another chart, General Power again interrupted. "Just a minute. Just a minute," he declared. Then, again turning in his front row chair and staring into the obscurity of unmoving uniforms in the dusk of the furthest rows in the rear, he said: "I just want to say that this assumes that Ivan just stands there in the open and stares up at the fallout. It assumes Ivan doesn't even try to take cover. He just stands there letting the fallout come down without taking cover. I just want to make that clear."

May I ask a question?

The briefing was soon concluded, to be followed by an identical one covering the attack on China given by a different speaker. Eventually, he too arrived at a chart showing deaths from fallout alone. "There are about 600 million Chinese in China," he said. His chart went up to half that number, 300 million, on the vertical axis. It showed that deaths from fallout as time passed after the attack leveled out at that number, 300 million, half the population of China.

A voice out of the gloom from somewhere behind me interrupted, saying: "May I ask a question?" General Power turned again in his front-row seat, stared into the darkness and said, "Yeah, what is it?" in a tone not likely to encourage

the timid. "What if this isn't China's war?" the voice asked. "What if this is just a war with the Soviets? Can you change the plan?"

"Well, yeah," said General Power resignedly, "we can, but I hope nobody thinks of it, because it would really screw up the plan."

That exchange did it. Already oppressed by the briefings up to that point, I shrank within, horrified. I thought of the Wansee Conference in January 1942, when an assemblage of German bureaucrats swiftly agreed on a program to exterminate every last Jew they could find anywhere in Europe, using methods of mass extermination more technologically efficient than the vans filled with exhaust gases, the mass shootings, or incineration in barns and synagogues used until then. I felt as if I were witnessing a comparable descent into the deep heart of darkness, a twilight underworld governed by disciplined, meticulous and energetically mindless groupthink aimed at wiping out half the people living on nearly one third of the earth's surface. Those feelings have not entirely abated, even though more than forty years have passed since that dark moment.

Chapter 5 SIOP Post Mortem

Post mortem—the American Way

Tom Gates called a meeting the next morning to discuss the proceedings of the previous evening. The Chiefs were there, I was there, and the Secretaries of the Army, Navy and Air Force joined the group.¹ Gates began with Lyman Lemnitzer, Chairman of the Joint Chiefs. Lemnitzer said the men had done a very fine job, a very difficult job, and that they should be commended for their work. The Army Chief said much the same thing. The Navy CNO, Arleigh Burke, who, Tom Gates later told me, had personally called on the president to object to the SIOP project,² took his customary pipe out of his jaw and repeated the same message—hard job, well done, should be commended. The last to speak, General White of the Air Force, ground out a comparable stream of the platitudes favored that morning in his gravely voice always filled with a certain air of authority.

The last to speak was General Shoup, Commandant of the Marine Corps. Shoup was a short man with rimless glasses who could have passed for a school-teacher from a rural mid-American community. But he wasn't. He was a Marine. "All I can say is," he said in a level voice, "any plan that murders three hundred million Chinese when it might not even be their war is not a good plan. That is not the American way."³

End of the SIOP briefing

Nobody moved a muscle. I was utterly taken aback by the entire episode. Gates, thank Heaven, never turned to me. I had no idea what I would say if he did. I should have, but fear I would not have had the courage to say that this was the most barbaric, unthinkable, crazy so-called "plan" I had ever heard and could never have imagined. *Maybe* I would have said that I was not a military man and really didn't feel entitled to an opinion on a subject for which I had no training or experience, but I wasn't asked, and I would probably never have thought of it if I had been.⁴

Herb York and I shared our memories of SIOP presentations, especially after he accompanied McNamara to a second SIOP briefing in February 1961 after returning from his convalescence. He recalls that

John Rubel and I talked it over...on other occasions thereafter. That casual but absurd remark [about victims who would simply stare up at fallout instead of taking cover] is, I came to think, an accurate measure of the whole idea. And yet, as long as we depend primarily on the threat of mutual assured destruction for maintaining the peace, how else could it be?"⁵

Herb, too, recalls his reactions to SIOP as one of his most vivid memories from his Pentagon years, the oppressive memory of the essential absurdity of trying to ensure peace by the threat of mutual destruction. But to be struck by this absurdity, unfortunately, gave no clue to any way to get out of the grim dilemma of those days and times, a dilemma that has not entirely vanished more than forty years later,⁶ and which is rapidly diminishing in importance compared with the far less manageable, far more unstable contemporary and future world where many more nations, and even non-national entities, will possess nuclear weapons and the means to deliver them.

Chapter 6 The 1961 Berlin Crisis

The 1961 Berlin crisis

After the end of WWII in Europe the Allied powers divided Germany into four zones, occupied respectively by the U.S., England, France and the USSR. Berlin, the former capital of pre-war Germany, was likewise divided into four sectors, each administered by one of these four powers. Tensions rose as Soviet-Western relations deteriorated. Germany was eventually divided into two nations, the eastern under Communist rule and the western created by a merger of the U.S., British and French zones. Berlin lay deep within the eastern part of Germany under Soviet domination.

In 1948 the Soviets blocked all roads, railroads and waterways leading from the western half of the country into and out of Berlin. The U.S. began a massive airlift to bring supplies to the beleaguered city. After less than a year of non-stop operations that amply supplied Berlin, the Soviets ended the blockade.

In 1955, western Germany, by now the Federal Republic of Germany, was admitted to NATO (North Atlantic Treaty Organization). In response, the Soviets formed the Warsaw Pact, a similar combination of national forces facing west. As the U.S. deployed IRBMs (Intermediate Range Ballistic Missiles capable of reaching the Soviet heartland) and other strike weapons in Germany, East Germans continued to stream to the west. By 1958 some two million refugees from the East, many of them technically trained and educated young people, had emigrated. The outflow was continuing at the rate of some 10,000 per day.

Pressured by these developments, Khrushchev, the Soviet premier, threatened another Berlin crisis in 1958-1959, and announced that he would declare the post-WWII borders permanent and sign a peace treaty with East Germany. Eventually, this crisis was resolved without any serious incidents.

Then on January 6, 1961, only a couple of weeks before Kennedy was inaugurated, only a couple of months after SIOP-62 had first been presented to Secretary Gates and others for the first time, Khrushchev opened another Berlin crisis that was to beset the Kennedy administration for much of that year. In a speech to leading USSR ideological institutes, he laid out an aggressive policy of

Communist ideological struggle and announced that the current occupation of Berlin would have to end, raising again the threat of making a separate peace with East Germany.

Kennedy saw this speech as an outline of Khrushchev's strategy for Communist expansion and subversion around the world. Berlin was to become a critical symbol for both sides. To lose it to Soviet bombast and threats would fatally weaken America's role as leader of the free world. To resist Soviet threats could lead to war.

Kennedy and Khrushchev

Kennedy had identified Berlin as a coming test of American "nerve and will" while running for President in 1960. In late April 1961, he asked McNamara for a report on military planning for a possible Berlin crisis. McNamara replied that NATO could not defend West Berlin with conventional weapons alone. "Even an airlift 'would not succeed in reopening and maintaining air access in the face of determined Soviet opposition.'"¹

Kennedy met Khrushchev in Vienna a month after receiving this information. He had hoped to calm tensions. He left, grumbling, "It will be a cold winter."

Around the same time, Dean Acheson, who had helped to create the NATO military alliance while he was Secretary of State under Harry Truman, wrote Kennedy a long memo on Berlin, which the President circulated widely. Acheson endorsed McNamara's plan to upgrade conventional forces, but warned that *it would do no good unless the Soviets were convinced that any move against Berlin would trigger all-out war between the United States and the USSR—which, by definition in those days, meant nuclear war.* [emphasis added] *

Graduated response

Henry Kissinger, then a Harvard professor and part-time consultant to the National Security Council (and later Secretary of State under Nixon), wrote a memo to McGeorge Bundy, Kennedy's national security adviser, on the growing Berlin issue. He warned that before risking nuclear war over Berlin the president must understand what is meant by "nuclear war," and must define "the nature of our nuclear options." However,

U.S. military policy at the time called for "massive retaliation" in the event of general war—shooting off all our nuclear weapons against every target in the

*Unless otherwise noted, subsequent citations in this section dealing with the 1961 Berlin crisis are from Kaplan (2001)

Soviet Union, China and parts of Eastern Europe no matter how limited the cause of the war might be...[with the SIOP in effect] it would be impossible to launch a smaller-scale nuclear attack even if the president wanted to do so...Many feared that a president in crisis would face the choice of "suicide or surrender," "holocaust or humiliation."

Kissinger discussed the desirability of asking the Pentagon to submit a plan for graduated nuclear response with both Harry Rowen and Carl Kaysen.² During the summer, William Kaufmann, the RAND strategist who had long advocated a counterforce plan aimed at substantially disarming Soviet nuclear forces while keeping many "counter-value" weapons in reserve,³ thus holding Soviet civilian targets hostage to Soviet responses, noted that the "missile gap" that Kennedy had made a centerpiece during his campaign for the White House was in reality a gap greatly in favor of the U.S.

The Soviets had no more than eight intercontinental ballistic missiles...Their bombers sat out on open runways. Their air-defense batteries were virtually worthless...Maybe the United States could knock out the whole Soviet nuclear arsenal in a very small sneak attack.

Bundy passed all this on to Kennedy along with Kissinger's message, saying that he, Kissinger and Kaysen all agreed that current war plans and posture were dangerously rigid.

Six days later Kennedy held an NSC meeting on Berlin. Among the items on the agenda was: "steps to prepare war plans which would permit the discriminating use of nuclear weapons in Central Europe and . . . against the USSR."

These deliberations continued during the month of July. Near the end of the month Kennedy spoke to the nation, airing his concerns about a probable crisis over Berlin and announcing increases in the defense budget. On August 13,⁴ only three weeks later, East German soldiers arrived with construction materials, equipment and crews and began erecting the Berlin Wall. At first Kennedy and others thought this marked the end of the crisis. But it didn't.

Why not a first strike?

In early September, Kaysen and Rowen finished their first-strike study.

On September 5 Kaysen, who had taken over the drafting of the plan, sent General Taylor the resulting thirty-three page memo,⁵ titled "Strategic Air Planning and Berlin." It included a very detailed description of . . . SIOP-62, [which] called for sending in the full arsenal of the Strategic Air Command—2,258 missiles and bombers carrying 3,423 nuclear weapons—against 1,077 "military and urban-industrial targets" throughout the "Sino-Soviet Bloc." Kaysen reported that if the SIOP were executed, the attack would kill 54 percent of the USSR's

population and destroy 82 percent of its buildings.

Whether these figures are exactly correct—whether some other source may claim there were fewer of this or more of that—is immaterial. There were more than enough weapons programmed to put Kaysen's conclusions right in the ballpark.

He went on, however, to propose that the U.S. should be prepared to initiate general war by our own first strike in a manner designed for this particular confrontation. He argued further that we should target Soviet forces, avoid civilian casualties and damage as much as possible, and withhold large forces to dissuade the USSR from "the irrational urge for revenge." In short: he proposed a RAND war-fighting (not nuclear deterrence) approach "straight out of *Dr. Strangelove*," (except that Stanley Kubrick didn't make that dark satire for another two years).

Kaysen went on to detail the types and numbers of targets to be destroyed in the first wave, the number of our bombers needed to hit the USSR, and the key assumptions on which the plan was based. He thought the assumptions were pretty good, and estimated that somewhere between "only" 500,000 and 1,000,000 Soviet civilians would be killed. U.S. casualties in case of a Soviet response would range from a "negligible" number to as much as 75 percent of the U.S. population in the worst case!

Thinking

Kennedy apparently took much of this in. He asked Gen. Taylor to submit a list of questions to Gen. Lyman Lemnitzer, Chairman of the Joint Chiefs of Staff, and General Power, commander of SAC. A meeting was scheduled for the following day when Kennedy, Taylor, Power and Lemnitzer were to discuss the questions. They included this:

Is it possible to get some alternatives into the [SIOP] plan? . . . Is it now possible to exclude urban areas or governmental controls, or both, from attack? . . . How would you plan an attack that would use a minimum-sized force against Soviet long-range striking power only?

There were other questions. Was the very idea of a counterforce first strike feasible? And the very basic question:

I am concerned over my ability to control our military effort once a war begins. If the first weapon succeeds, can you prevent additional weapons from inflicting redundant destruction?

At the next day's meeting nobody addressed these questions. According to the minutes, General Power spent most of the time claiming that the Soviets had hidden away "many times more" missiles than the CIA's spy photos had indicated—a point that Lemnitzer and Taylor disputed.⁶

More discussions and detailed analyses ensued. Paul Nitze, (Assistant Sec-

retary of Defense for International Security Affairs, the Pentagon liaison with State), probably more deeply involved for many years in strategic thinking than any of the other civilians involved, thought that Kennedy should "consider most seriously the option of an initial strategic strike of our own." McNamara disagreed. He argued that neither side could be sure of "winning," both risked devastating damage, and both had a great interest in avoiding a nuclear exchange of any sort.

The last act

The first-strike talk wound down. Kennedy decided to send a warning to Khrushchev. On October 21, on orders from Kennedy, Roswell Gilpatric, Deputy Secretary of Defense,

gave a speech in Hot Springs, Virginia, that let everyone know for the first time—and let Khrushchev know we knew—that there was no missile gap [in favor of the USSR]. He revealed how many nuclear weapons we had, emphasized that the arsenal would be second to none even after a Soviet attack, and said, "The Iron Curtain is not so impenetrable as to force us to accept at face value the Kremlin's boasts."

Khrushchev got the message. He proceeded with plans to detonate a thirty-megaton bomb, by far the largest tested up to that time. Near the end of October thirty tanks from each side faced each other at close range for some sixteen hours on each side of an east-west line in Germany, but after some back-channel diplomacy between Kennedy and Khrushchev, *that* crisis ended.

Nightmare reality

This brief outline of a profoundly wrenching confrontation conveys little or nothing of the conflicts, drama and emotion that churned through the studies, meetings, conversations and heated exchanges that led to its final resolution. To cite only one example:

Ted Sorensen, the chief White House counsel and speech writer who had been with Kennedy since his earliest Senate days, was outraged when Kaysen told him about the [early September first-strike] study, shouting, "You're crazy! We shouldn't let guys like you around here." Even more appalled was a friend of Kaysen's on the NSC staff named Marcus Raskin. Raskin had served as foreign policy adviser to a few liberal Democratic Senators and had been hired by Bundy as a token leftist. Raskin was horrified by the very existence of such a study. "How does this make us any better than those who measured the gas ovens or the engineers who built the tracks for the death trains in Nazi Germany?" he hollered at one point. Raskin never spoke to Kaysen again.⁷

On balance, Khrushchev had lost. He needed to win one. The Cuban missile crisis followed a year later and led to still another downer for Khrushchev that ended his political career in the Soviet Union.⁸

Military advice

Both the Berlin and the subsequent Cuban crisis illuminated the critical role of the president and the often Neanderthal role of high-level military officers:

Kennedy's resistance [to pressure from the military] reached a climax during the Cuban Missile Crisis. . . . The blockade or quarantine of Cuba that he imposed to force the removal of nuclear weapons did not satisfy the Joint Chiefs. When Kennedy first proposed it, General LeMay said he saw direct military intervention as a necessity. "This blockade and the political action I see leading into war," he told Kennedy in a conversation captured on tape by a White House recording device. "I don't see any other solution. It will lead right into war. This is almost as bad as the appeasement at Munich."

LeMay indirectly threatened to make his dissent public. "I think that a blockade, and the political talk, would be considered by a lot of our friends and neutrals as being a pretty weak response to this. And I'm sure a lot of our own citizens would feel that way too. In other words, you're in a pretty bad fix at the present time."

LeMay's words angered Kennedy, who asked, "What did you say?" LeMay repeated: "You're in a pretty bad fix." Kenneth O'Donnell recalled in his memoirs that after the meeting, Kennedy asked him, "Can you imagine LeMay saying a thing like that? These brass hats have one great advantage in their favor. If we listen to them, and do what they want us to do, none of us will be alive later to tell them that they were wrong."

Meetings with Curtis LeMay—the Air Force chief of staff—drove Kennedy into a "sort of fit." (Kaplan op cit)

Movement

A fallout from the 1961 Berlin crisis was a series of major changes in U.S. nuclear war planning. McNamara ordered a new version of the SIOP, this one SIOP-63, giving future presidents at least the appearance of some "flexible options"—including varieties of first-strike plans.

Little noted, the MINUTEMAN launch control system was changed to correct the egregious weaknesses brought to light by the Fletcher committee. The Air Force was required to redesign the system to provide for multiple options. These included the option of allowing individual missiles to be selected for launch at a specified target, and eliminating exclusive reliance on the existing launch mode that called for firing all fifty missiles in every squadron deployed, or none at all, that had so disturbed me more than two and a half years before.

According to Kaplan (1983), the Air Force wanted nothing to do with changes leading to "controlled response," a conclusion clear to me more than twenty years before his book came out. He reports that

The Air Force . . . simply refused to spend money on it, arguing that it was infeasible. [Marvin] Stern approached McNamara's general counsel, Cyrus Vance, and asked what could legally be done to prod the Air Force into action.

"Anything you can get away with," Vance replied.

Against all regulations and laws [sic], Stern canceled MINUTEMAN funding for one month, pending a commitment by the Air Force to improve command-control and develop a rapid retargeting program for the missile. They gave in, changed the command-control electronics and added "selective-launch" and eight "target-selection" features to each MINUTEMAN, at a total cost, eventually, of \$840 million.⁹

The account of these events, written nearly twenty years before the memo to General Taylor was unearthed, (Kaplan (1983)), recounts in more detail the conflicts of views and personalities and the enormous gap that swiftly opened between strategic analyses and the real world of the 1961 Berlin crisis. To cite a single paragraph:

At the RAND Corporation, the attack plan [of September 1961] would have been heralded as a monumental success. Not just Herman Kahn but virtually the entire strategic community would have considered two, three, or even ten million fatalities, in the abstract, "acceptable," or anyway certainly not "unacceptable," losses under the circumstances. But now, in the real world, in the context of a real crisis with real political decision-makers, the reaction was much different. Nearly everyone was aghast.

There was, in the end, a signal lesson to be derived from the 1961 Berlin crisis. Again, Kaplan:

If ever in the history of the nuclear arms race, before or since, one side had unquestionable superiority over the other, one side truly had the ability to devastate the other side's strategic forces, one side could execute the RAND counterforce/no-cities option with fairly high confidence, the autumn of 1961 was that time. Yet approaching the height of the gravest crisis that had faced the West since the onset of the Cold War, everyone said, "No."¹⁰

Chapter 7 In Retrospect

In Retrospect

Only a couple of years after Herb wrote about his reactions to SIOP-62, the Soviet Union collapsed. The infamous Berlin Wall came down. The outrageously, obscenely swollen stockpiles of nuclear weapons, relentlessly orchestrated by the mentality that had cheered and run the nuclear and missile arms race continued, however, to expand. SIOP-62, on our side, and a corresponding posture on the USSR side, had emerged in response to a cosmically ironic principle of escalating reciprocity. It was, indeed, MAD.

Everyone alive on the planet today can be thankful that, despite the enormous risks that were run as stockpiles and weapons and arsenals swelled, the worst did not happen. The Berlin and subsequent crises taught top policy figures the gross inadequacies of the SIOP-62 posture. Before long, it was changed, and changed again. The all-or-nothing, holocaust or humiliation option offered up by the dominant military establishment was rejected and replaced.

Minuteman did not go off unexpectedly. The egregious design flaws and years of stonewalling that could have led to the most appalling catastrophe in human history were brought to light. Minuteman launch provisions, carefully specified, dutifully designed and diligently guarded *soto voce* for years, were pried from military obscurity, and, eventually, corrected. *Probably.*

The hyper-alertness characterized by the *Headstart* patrols continued for years. The grim scenario of the novel, *Red Alert*, which led to the bowdlerized motion picture *Dr. Strangelove*, and to the revelatory séance of the Scientific Advisory Committee for Ballistic Missiles at which the Air Force briefer announced that the automatic launch feature could be inaugurated with the governing “clock” set to *zero*, never happened. One five-megaton bomb was accidentally dropped into the Bay of Biscay off the shores of Spain by an Air Force B-52. What could have been a turning point in the history of Western Europe was, instead, a few days of headlines and some little-noticed stories about recovering the device from the ocean bottom—an embarrassing episode, not the tragic detonation it might have been.

Remnants and vestiges

It is useful to remind ourselves of this obvious banality: today's realities, and the futures we face, are rooted in and outgrowths of yesterdays we fail to consider at our peril. The Industrial Revolution is not much more than two centuries old, and technology, often led by military weapons developments, accelerates and spreads around the world as never before.

The Great War, as WWI was called in its day, may well have killed off more people, mostly but not all of them combatants, than all the conflicts before then put together. Its sequel, WWII, saw total war waged on a scale that is still hard to grasp, in the course of which tens of millions of civilians died from deliberate military attacks, inevitable "collateral effects" of war, millions were murdered in the Holocaust and in German policies of deliberate starvation followed by post-war expulsions, murder, exposure and disease all across re-conquered territories. Nothing comparable to this nightmare of deaths, murders, casualties and destruction had ever been dreamed before.

Then ensued the Cold War, not nearly as cold as the term suggests. Vietnam and Korea are among its bitter memories. Vietnam remains synonymous with nightmare memories of a tragic, costly, futile and divisive struggle never to be repeated. North Korea, much of it laid waste by years of ravaging war, is a far greater threat to the Korean peninsula and even to world peace than it was nearly sixty years ago when the non-war "Korean War" began (a "conflict," but not a declared war. In fact, no "war" has been declared by the U.S. since WWII). The United Nations, founded in the aftermath of WWII, bulges with more than double the number of nations it started with, and has proved itself utterly incapable of preventing dozens of wars, genocides, ethnic cleansings or the violation of the most basic human rights by many if not most of its member states.

Still, tangible vestiges of the SIOP era remain. Hundreds of Minuteman missiles stand on the *qui vive* across miles of northwestern America, gyros spinning, ready to go. No longer armed with single warheads, each missile boosts a number of independently targetable warheads, dispersed after launch high above the earth toward a multitude of targets. Immensely expensive Missile Shield experiments consume billions every year in aerospace laboratories and the northern reaches of the continent where an occasional staged intercept experiment makes front page news. The project's very name is an oxymoron, often justified as "protection" against "rogue" missiles, hopefully obliging enough to contain only a single warhead, hopefully launched in numbers small enough so that the ultimate Shield will, maybe, be able to shoot at least some of them down.

The giant antennas of the Ballistic Missile Early Warning System (BMEWS), upgraded, after staring northward during decades of constant vigilance, with ever-more effective radar technologies, still scan the skies north of Thule in the warming ice fields of Greenland, waiting day and night for feeble signals that might—*might*—presage the start of a surprise attack from somewhere roughly over the North Pole. Just how an American military hierarchy

would or will react to what may seem to be a BMEWS or satellite warning signal, or how Russian counterparts would or will react to a corresponding alarm on their side of the world, remains to be discovered.

So the mind-set that spawned the original Minuteman system and produced SIOP-62 has not quite disappeared. Santayana famously said that "those who cannot learn from history are doomed to repeat it." By now it should be fairly clear that history, most decidedly in these times, does not repeat itself. History that is inapplicable to contemporary confrontations may be worse than none at all.

They still write and talk at the highest levels of our government as if atomic weapons can, and probably should be used to "fight" wars, or what are the equivalents of older-style wars that have emerged in recent times. Politicians competing for national office sometimes sound as if they think that suggesting their hypothetical willingness to "nuke" a putative enemy will win voters who approve being "tough on terrorism." The growing dangers of a fatal nuclear exchange by electronic accident or human error or the dynamics of a Domsday Machine are still far below the radar for much of the public, bombarded with intransigent problems of war, immigration, health care, education and jobs that also proliferate in the contemporary world, the product of humanity itself, seemingly almost beyond human control.

Legacies

Sixty years ago the U.S. was the only nuclear power in the world. Now there are nine, and Iran will make ten. During these last six decades, nuclear know-how, equipment and fissile materials percolated through many border porosities. Now, in addition to the relatively much more powerful big-five countries—Britain, France, Russia and China that acquired bombs fairly soon after the U.S. did—India, Pakistan, Israel, North Korea and, it seems likely in a fairly short time, Iran, will be amply supplied with enough nuclear weaponry to bring any great nation in the world to its knees. So the number of nuclear countries is now almost ten times greater than when America dropped one each on Hiroshima and Nagasaki in August, 1945. We can hope that all of the big-five will remain on our side for the indefinite future. Even if they do, the spread of nuclear arms to Pakistan, India, North Korea and, ally or not, to Israel, and probably, soon, to Iran, creates a wholly new and potentially profoundly unstable circumstance. And there is more:

There is enough fissile material in the world today for 300,000 bombs . . . "shared in weapons usable form by some fifty countries." More than thirty states now have at least one metric ton of this material. Forty states, according to the IAEA (International Atomic Energy Agency) can now build a nuclear weapon while eight or nine nuclear states themselves still possess 27,000 bombs, nearly all held by the U.S. and Russia, each bomb capable of destroying a city, and generating a vast cloud of nuclear

poison.¹

It is obvious that however unstable and ultimately dangerously insecure MAD turned out to be in the bipolar world of the Cold War, mutual deterrence among nine or ten nuclear powers, with more to come, and not only nations, but, in the long term, gangs of crazies around the world, cannot endure. That way—and that is the way the world is going—that way madness lies. Contemporary U.S. nuclear posture and policies in view of these and related realities would appear to be far from reassuring.²

Fundamentals have changed—radically

We have seen that it was far from safe to entrust the security of the civilized world to the designs and practices of the American military establishment or to rely on the dynamics of military and diplomatic interaction between the U.S. and the USSR, even though, after a number of years, the White House and the Kremlin were equipped with the Red Telephone, so at least, as even *Strangelove* was able to portray for laughs, the White House and the Kremlin could talk any time, day or night.

Implicit in that arrangement was the realization on the part of both sides, the U.S. and the USSR, that MAD assumed that the leaders of both sides were, in some essential respects at least, “rational,” that they wanted to live, not to die, to save their people, not to sacrifice them.

And there were only two antagonists involved, we and them, the U.S. and the USSR. Indeed, the *de facto* relationships among the U.S., UK and France, the mutual suspicions between China and Russia (the “Sino-Soviet Bloc” notwithstanding), and the *de jure* relationships governed by NATO, gave the U.S. added clout. Given these circumstances and more or less reasonable assumptions, SIOP made a kind of bizarre, nightmare sense in a bipolar world of nuclear giants.

Yes, the definition of what was *adequate* “assured destruction” became increasingly absurd. Eventually, huge defense budgets and hydrogen bombs and ridiculous stockpiles armed the world with explosive power enough for 10 tons of TNT to blow up every man, woman and child in it. But it turned out, when crises arose and the chips were down, that in the highest councils of our government, more sober thoughts and reasonable judgments prevailed. Khrushchev backed down over Berlin in 1961 and over Cuba in 1962. The U.S. took intermediate range ballistic missiles out of Italy and Turkey.

Best of all, perhaps: the Doomsday Machine that was set to go off by accident or design—Minuteman, *Headstart*, hundreds of bombers ready to go, thousands of warheads, more thousands of atomic shells and bombs, and tons of fissile material—didn’t. The bipolar world survived its nightmare follies. Its swollen nuclear stockpiles and missile inventories are somewhat less malignantly swollen. But they have metastasized. That bipolar world that did not self-destruct is gone. Forever. Now we face an increasingly multipolar nuclear-armed world.

Now

What, then, have we learned? The reader can pretty well judge that. Certainly, “we,” meaning anyone who knows a little about all this and has given it even passing thought, knows that the world passed through an incredibly crazy and dangerous time and escaped, scarred but not fatally damaged. In retrospect it seems bizarre, almost unreal, almost dreamlike, to realize that SIOP-62 was actually created once upon a time not so long ago, that the Joint Chiefs of Staff could and did sit around a table and solemnly commend its authors for their “hard work,” that General Power, who hosted the SIOP team for months and presided over its presentations, volunteered that “I just hope none of you have any relatives in Albania, because they have a radar station there that is right on our flight path, and we take it out,” and protested that yes, the plan *could* be changed to spare 300 million Chinese if it turned out not to be their war, “but I hope nobody thinks about it, because it would really screw up the Plan.”

And “we” have learned that nobody—NOBODY—has anything close to a workable plan to stop proliferation, to end the international anarchy that allows and even encourages the world to drift inexorably toward suicide.

Resignation and advocacy

During my years in the Pentagon I was treated to a short lecture by multi-starred generals on several occasions. It went something like this:

Look, people have been fighting wars from the beginning of time. They started with rocks and clubs. Then spears and arrows. Then guns and cannons and gunpowder. Now we have atom bombs. So what? There has always been offense and then defense and then more of both. Next time a lot more people will die. But it won’t be the end of the world.

Here, a sophomoric hypothesis about the role of biological necessity in the history of human violence is advanced to support unwise and even irrational military and political policies. History recounts examples of its practical application. For example, the Sioux Indians hunted buffalo by stampeding a few herd leaders over a steep cliff, predictably followed by hundreds more.

Still, we know that this mentality, given half a chance, will surface in military and government councils. We know from recent history that a compliant bureaucracy, military and civilian, will murder six million people in cold blood or plan, buy, design, build and deploy the means to murder half the people on earth, probably including themselves. How come? Is all this built into the human genome, a melancholy procession from stones to atoms, a predestined progress toward the End Times, the inevitable rise of malign leaders over compliant masses?

Leadership?

We have certainly observed the disasters visited upon vast populations by incompetent, blind, evil leadership. Herman Goering was vile, but he was not stupid, and he learned something useful about such things from first hand experience. At Nuremberg he said:

Of course the people don't want war. But after all, it's the leaders of the country who determine the policy, and it's always a simple matter to drag the people along whether it's a democracy, a fascist dictatorship, or a parliament, or a communist dictatorship. Voice or no voice, the people can always be brought to the bidding of the leaders. That is easy. All you have to do is tell them they are being attacked, and denounce the pacifists for lack of patriotism, and exposing the country to greater danger. It works the same in any country.³

What the world seems incapable of learning, is how to deal with the legacies of superstitions, shibboleths and fears that endure for millennia, and the metastasizing proliferation and anarchy deeply rooted in the madnnesses of the Cold War. Nor has the climate for leadership developed even in advanced representative democracies such as our own that will reliably elect men and women with the intellect, vision and will to lead the masses—ours and everybody else's—away from the road to self-inflicted oblivion. The obvious trouble is: most of the public elect most leaders, especially the President, for predominately iconic reasons having almost nothing to do with his perceived intelligence, his capacity for sound judgment, his grasp of complexity, his personal data-base of relevant knowledge. To the contrary: his telegenicity, his profession of religious faith, his ability to frame issues as Aristotelian arguments of the excluded middle, his regional accent, how adequately tall (or too short) he is, the earnestness of his advocacy for the sacredness of life, the rightness of this or that cause and protestations of his desire to serve the American people. It is a virtual certainty that neither Abraham Lincoln, brilliant, self-schooled and superbly articulate, but ill-dressed, awkward, speaking in a high, accented voice, nor the aristocratic, aloof George Washington, would have a very good chance of making it to the White House after appearing a few times on television. Whether the Age of Entrepreneurial Candidates will produce leaders who can measure up to contemporary challenges remains to be seen.

As for leadership spawned, elevated and often revered by various forms of religious totalitarianisms and other authoritarians fixed on most of the world's population—alas! Like Pandora, and all who have succeeded her, it appears that only Hope remains.⁴ Here, then, we are:

The secret formula for Angostura Bitters is said to be locked in a vault somewhere in a Caribbean island. The secret of atomic energy isn't a secret, and it could never have been kept locked up when, for a short time, it almost was. It has long been out of the bottle. It can never be put back.

Have-nots of the wannabe nuclear club are, over decades, able to figure out how to join and determined to do so, emboldened by the manifest failure of the Non-Proliferation Treaty, international inaction, and the knowledge that, once successful, once equalized by atomic arms, not even the U.S. will attack them.

On the one hand, the nuclear have-nots want to imitate the nuclear haves, knowing full well how much power and protection and respect even the threat of possessing nuclear capability will give them.

On the other hand, no existing nuclear country will voluntarily disarm in hopes that Pakistan or North Korea or China or Russia or anybody else will imitate its good example.

Nobody knows how to balance this non-reciprocal imbalance except by recommending concerted international resolve and action on the one hand—a distant dream in today's world—or a monopoly of nuclear power on the other. Both options were passed up fifty years ago.

History does not recount a story or a circumstance remotely like the one touched on here. Human civilizations have evolved on earth for at least five thousand years. About 4,940 of those years were lived without nuclear knowledge or power. It is difficult to imagine how civilization can avoid catastrophe for another 4,940 years—or 500, or maybe even 50—in a world as unstable and anarchic as it is today, and as it seems destined to become in the years ahead.

Granting all that, what, we may ask, can we learn, or have we learned, that may yet be of some value?

Muddling through?

SIOP-62 has been repeatedly modified. Its initial absurdities quickly impressed themselves on policy makers at the highest level, and changes were made. Even the arcane and long-concealed flaws in Minuteman launch and control provisions were eventually, we are told, corrected. Can we then conclude that, in the end, all will be well? Is there something essentially self-correcting about our "system" that ensures that, sooner or later, truth and right and good sense and sound judgment will triumph in the councils of government and the conduct of the governed? Can we reasonably hope that the world will, somehow or other, muddle through? That maybe there *is* no viable "plan" to be followed into the ever-changing future, but maybe, dealing with crises and confrontations successively, as they arise, guided by some combination of luck and sound judgment and good instincts, it will all work out?

After all, Zealots, Thugs and Assassins, came and went. Why won't rogue states and embedded non-state actors and kamikaze "martyrs" just fade away with the passage of time? Surely—maybe—sooner or later, they, too, will.

"Sooner or later" is the trouble. Whenever nuclear catastrophe befalls it will be too soon. "Later," then, will be never. One thing IS certain: nothing even close to creating an uninhabitable globe by the exercise of human scientific and technological ingenuity has *ever* presented itself as an even remote possibility

until just about “now,” meaning the lifetimes of almost half the people on earth.
What's to be done?

A reflection attributed to Pascal, which a search of his writings does not reveal, and the origin of which I have failed to discover, observes that

Man and man's world are absurd, a compound of genius and ignorance, of science without morality, of obedience without responsibility, of energy without reasonable purpose.

It is a sentence that highlights well the absurdities of Minuteman's launch design provisions and the blindly apocalyptic formulations of SIOP-62. But as the world faces its looming future, the non-proliferation regime almost totally broken, a multipolar nuclear world growing exponentially, its inherent instability a presently insoluble challenge, what should be, what can be done, to reverse this version of the “race to oblivion?”

It is customary to conclude an account of dangers past and challenges ahead with “something positive,” with a “plan,” “a solution.” For many, if not most, Americans, there is a solution to every problem, just as there was in sixth-grade arithmetic. One such up-beat, comfortingly actionable conclusion that may seem reasonable if only because its premises imply its conclusion, is this paraphrase of extended and closely reasoned proposals bearing on these matters:

Only total nuclear disarmament can put an end to proliferation and its ever-growing instabilities and the terrifying danger that nuclear weapons will fall into the hands of rogue regimes or non-state actors. To end it, the major nuclear powers, who have agreed to disarm, must do so. The international community must ensure that those who chose to violate the Non-Proliferation Treaty, or to refrain from signing on to it, destroy their nuclear weapons as well. Close and continuing monitoring by international bodies must ensure that no violations occur.

In like manner, no doubt about it, if pigs had wings, they could fly. If I had batteries, I could be a radio. But in the meantime, here on this troubled planet, where the number of sovereign nations has multiplied many times over in the past half-century, the so-called “international community” commands no forces, depends upon wholly voluntary national contributions to support the United Nations, (currently the object of something close to contumely in our national capital), a body that has proven itself incapable of preventing or stopping multiple genocides, wars, nuclear proliferation, or even the cynical, routine violation of human rights by many of its influential members.

Only enlightened, consistent, persistent, and enduring leadership—intellectual leadership for sure, and opinion-forming leadership, and above all political leadership here and abroad—have a chance to reverse the race to oblivion. Major leaders across the world are confronted with the problems, the dangers, the challenges, and the perspectives of hopelessness touched on here.

Whatever hope remains must focus sharply on those leaders, and publics capable of following them, the United States in the vanguard, that may show themselves capable of and willing to steer away from the catastrophic futures seeded in the troubled past. The times will indeed worsen if those for whom the bell tolls may be so ill that they know not it tolls for them.

Glossary

DDR&E	DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
HEADSTART	B-52 BOMBERS ON CONTINUOUS AIRBORNE PATROL IN THE FAR NORTH
LCC	LAUNCH CONTROL CENTER (for Minuteman Missiles squadrons)
MAD	MUTUAL ASSURED DESTRUCTION
ODDR&E	OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
PSAC	PRESIDENT'S SCIENCE ADVISORY COMMITTEE
R&D	RESEARCH AND DEVELOPMENT
REM	ROENTGEN EQUIVALENT—MAN
SACBM	SCIENTIFIC ADVISORY COMMITTEE FOR BALLISTIC MISSILES
SECDEF	SECRETARY OF DEFENSE
USAF	UNITED STATES AIR FORCE
USSR	UNION OF SOVIET SOCIALIST REPUBLICS (the "Soviet Union")
WWI	WORLD WAR I

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Notes

Chapter 1—The Setting

1. Henry Kissinger, then [1961] a Harvard professor and part-time consultant to the National Security Council (and later Secretary of State under Nixon), wrote a memo to McGeorge Bundy, Kennedy's national security adviser, on the growing Berlin issue. He warned that before risking nuclear war over Berlin the president must understand what is meant by "nuclear war," and must define "the nature of our nuclear options." However, U.S. military policy at the time called for "massive retaliation" in the event of general war—shooting off all our nuclear weapons against every target in the Soviet Union, China and parts of Eastern Europe no matter how limited the cause of the war might be . . . [with the SIOP in effect] it would be impossible to launch a smaller-scale nuclear attack even if the president wanted to do so. . . Many feared that a president in crisis would face the choice of "suicide or surrender," "holocaust or humiliation."

Kissinger discussed the desirability of asking the Pentagon to submit a plan for graduated nuclear response with both Harry Rowen and Carl Kaysen. During the summer, William Kaufmann, the RAND strategist who had long advocated a counterforce plan aimed at substantially disarming Soviet nuclear forces while keeping many "counter-value" weapons in reserve, thus holding Soviet civilian targets hostage to Soviet responses, noted that the "missile gap" that Kennedy had made a centerpiece during his campaign for the White House was in reality a gap greatly in favor of the U.S. The Soviets had no more than eight intercontinental ballistic missiles. . . Their bombers sat out on open runways. Their air-defense batteries were virtually worthless. . . Maybe the United States could knock out the whole Soviet nuclear arsenal in a very small sneak attack.

Bundy passed all this on to Kennedy along with Kissinger's message, saying that he, Kissinger and Kaysen all agreed that current war plans and posture were dangerously rigid. Six days later Kennedy held an NSC meeting on Berlin. Among the items on the agenda was: "steps to prepare war plans which would permit the discriminating use of nuclear weapons in Central Europe and . . . against the USSR."

These deliberations continued during the month of July [1961]. Near the end of the month Kennedy spoke to the nation, airing his concerns about a probable crisis over Berlin and announcing increases in the defense budget. On August 13, only three weeks later, East German soldiers arrived with construction materials, equipment and crews and began erecting the Berlin Wall. At first Kennedy and others thought this marked the end of the crisis. But it didn't.

2. "Race to Oblivion" is the title of an excellent book by Herbert F. York, dealing with the broader issues of the Cold War arms race.
3. Athens sent a substantial invasion force to the island of Melos, a colony settled by Spartans, when the Melians refused to submit to Athens. A delegation from the invading force met with Melian magistrates for an abortive negotiation. The Athenians said

since you know as well as we do that right, as the world goes, is only in question between equals in power, while the strong do what they can and the weak suffer what they must, you may as well submit and spare us the trouble of destroying you. The Melians decided to resist, the Athenians besieged the place, there were a couple of minor raids in which the Melians inflicted some losses on the Athenian forces, but after reinforcements arrived from Athens the Melians surrendered, whereupon the Athenians killed all the grown men they captured, sold the women and children into slavery and colonized the place with Athenians. (Thucydides)

4. Even in the early missile era when each missile carried a single operational warhead, an anti-missile system that was, say, 90% effective, knocking out 900 of every 1,000 missiles launched against the U.S., would be grossly ineffective in action since 100 missiles would get through. If nearly all of these worked, if the average missile carried several megatons of nuclear explosive power, and if even a few of these missiles landed in or close to big cities, the damage would be utterly catastrophic and probably fatal to the country's continued existence as a viable democratic, constitutional government. Indeed, the impact of two passenger liners filled with passengers and fuel crashing into the World Trade Center buildings reverberated throughout the American economy and culture months after the event. The effect of even one large nuclear bomb on New York city, and its national repercussions, can scarcely be imagined. In this sense, then, *there is no effective defense against nuclear-tipped missile attack.*

Still, such is the almost magical mystique of modern technology and its scientific underpinnings that an opponent's military advisors are obliged to consider the possibility, however low its probability, that their enemy might, if the enemy says so, have made some sort of unimagined "breakthrough" in "missile defense." If so, the logical response is: build more missiles with multiple warheads. *Some* fraction will always get through.

5. Understandably, the newly independent Air Force led the other two services in making technology a centerpiece of policies and doctrine. I commented on this in the course of some post-Pentagon interviews for the Kennedy Library discussing the long-term vision of the USAF, which was well advanced years before Sputnik 1 appeared. (Moss (1970), slightly redacted)

They even published [circa 1950] an ideological brochure . . . called AFM-I, a disquisition on Air Force doctrine and space apologetics written in a Thomistic way, starts out saying that the world is divided into landmasses, which in turn are divided into . . . nations. [I]t then describes the characteristics of nations, including . . . what is called sovereignty, while proceeding, step by step, to the last paragraph of the document which says: That nation will prevail in war that successfully predominates in the development of space technology and in its laboratories, or words to

1. The Japanese surprise attack on Pearl Harbor that launched the U.S. into WWII left a lasting impression on American thinking. It was a total surprise, an *air* attack thousands of miles from the enemy's homeland. Both sides in the Cold War—the U.S. and the USSR (which had been traumatized by the German surprise of 1941)—saw the other building the weapons needed, even if not necessarily intended, for a preemptive first strike. Each believed that any perceived weakness could and very likely would be exploited by the other to launch such an attack. The leaderships of both gradually realized that they had to do something to avoid the unintended consequences of their potentially unstable posture. Some progress has been made (as of 2006), but by no means enough.
2. See Kaplan (1983) for a comprehensive description of the pervasive influence of a coterie of military think-tank theorists and gradual mutations of U.S. strategic policies. The game—game theory has been one of the pillars of contemporary strategic thinking—changed radically as the number of weapons grew wildly on both sides of the bipolar world, as multiple warheads were introduced into missile technology and, in 1989–1990, with the collapse of the Soviet Union.
The question of missile defense, once agreed upon with the Soviets in the Anti-Ballistic Missile (ABM) treaty, abrogated by President Bush, is again part of the domestic political agenda. No workable system exists. None has even been contemplated. Yet the press prints articles about the “missile shield” and most politicians talk about it as if the only question were when to deploy “it,” and to what extent.
3. As most, if not all readers of this work will know, the military and political prelude leading to WWI was distinctly unstable in precisely this sense, although the time intervals then involved were measured in weeks or even more, not hours or minutes as they are and have been since the early days of the nuclear-armed missile age. It is worth a brief digression to remind ourselves of that prelude and its many points of contact with the Cold War world, and the growing instability of the contemporary world, despite the vast differences between then and now in virtually every level and domain of life on the globe, including modalities of armed conflict.

All major European powers had compulsory military service and millions of trained men in reserve units. Mobilization required sending trains to hundreds of cities and towns to transport troops to army centers. This process typically required at least a few weeks before units could be fully equipped, organized and deployed in a fighting posture. As a practical matter, if any major power began to mobilize, all others who were thereby threatened would regard it as close to a declaration of war.

The outbreak of WWI in 1914 saw the United Kingdom, France and Russia allied in the Triple Entente. Germany found itself between Russia on its eastern and France on its western frontiers, each a potential enemy linked by the Triple Entente. Germany had been making detailed and extensive policy and military preparations for many years designed to cope with the consequent possibility of a two-front war.

When the Austrian Archduke Ferdinand was assassinated in Sarajevo in 1914, Austria declared war on Serbia, whereupon the Russians began to mobilize. Mobilization was a very complicated business. It required commandeering and re-scheduling the national railroads, the acquisition of thousands of horses, carriages and carts, the notification of millions of reserves, all the supply logistics required for

the armies that would be quickly assembled, revving up the production of military weapons, ammunition and supplies, and countless more interacting and detailed requirements almost instantly transforming national life. Once set in motion, changing or reversing mobilization would present enormous difficulties.

France, defeated by Germany in the Franco-Prussian war of 1870, was perceived by Germany as a probably vengeful potential enemy, and a Russian ally to boot, that would have to be swiftly defeated were Germany confronted with a Russian enemy on its eastern border. The German solution was the Schlieffen Plan.

The Plan called for launching a vast army into Northern France by way of Luxembourg, Belgium and Holland, (all of them neutral countries supposedly protected from invasion by treaties with Germany), enveloping Paris and capturing most of the French Army. The idea was to conquer France in a matter of weeks and then move most of the combat forces left over in France to the eastern front before the Russians could build up to full military momentum.

Note that *partial* mobilization was not an option. Partial mobilization would give a fully mobilizing enemy on one's frontiers the insurmountable advantage of weeks if not months of facing a partially armed adversary with a fully armed military. So, expectedly, as the Russians began to mobilize, the Germans followed suit. Thereupon the French High Command explained to Clemenceau that unless he ordered immediate mobilization he would leave France exposed to a German army numbering millions on its eastern frontier. Clemenceau had the nominal power of decision, but no real choice. So France mobilized. It is repeatedly claimed that war is discouraged and even avoided by maintaining a high state of military readiness. Clearly, it depends.

Soon after, with every major European power in arms, the bloodiest war in history up to that time broke out across Europe. Within the first thirty days of August, 1914, as the vast German army marched into France, as French cavalry with drawn swords charged into German machine-gun nests, the combatants suffered 500,000 casualties. Millions would follow.

This melancholy history, so conspicuously analogous to the even more glaring instabilities of contemporary times, tells us at least this: *the evolution of modern military technologies is racing on the fast track toward Destiny. The ability of human societies to compensate for, or even to perceive their own irrationalities and follies, does not appear to advance at an equal pace, if at all.*

4. I had been in the Pentagon about a year or so when Herb York asked me, one day, to go down the hall to the office of Jack Irwin, then Assistant Secretary of Defense (International Security Affairs), and try to explain the concept of “stability” to him. Jack Irwin was a respected Wall Street lawyer. His office served as the chief point of liaison between the DoD and the Department of State.

Mr. Irwin had assembled two or three of his principal assistants to listen to my presentation. His desk, perfectly clear of papers, was decorated only by a small, framed “picture” of Jesus. He was flawlessly urbane, North Eastern, Yale or Harvard, with the self-possession of a WASP elite attorney or diplomat accustomed to dealing with eminent clients. At the conclusion of his administration in early 1961, Eisenhower awarded Jack Irwin the Medal of Freedom.

The pleasantries done with, I began. “Suppose,” I said, “we have before us a glass or ceramic bowl in the shape of a hemisphere, facing in the usual direction,

open side up. If you release a nearly round object—an orange, for example—near the upper edge of the bowl, it will roll toward the bottom after rolling around a bit, it will come to rest on the bottom of the bowl.

“Now, I went on, suppose we invert the bowl. Now its bottom side is up, its rim rests on the table. Suppose we try to pose the orange on the spherical bottom. We find that it tends to roll OFF the bowl. Suppose we manage to balance the orange exactly at the peak of the spherical bottom for an instant. Now the slightest breath of air will displace it and it will cascade down the side of the inverted bowl. The orange tends to NOT STAY anywhere on the outer surface of the inverted bowl. The configuration is UNSTABLE.”

I then pointed out the great dangers of instability built in to the posture of the U.S. vs. the U.S.S.R., owing especially to the threat of surprise attack and the very short warning time available to either side once an attack has been launched—each side fears being disarmed by a first strike. Clearly, the more missiles, the greater the danger of an accidental launch setting the whole thing off.

Irwin was more than polite. He praised what he characterized as a very lucid, organized presentation. “Just the same,” he concluded, “I believe we must have plenty of missiles.”

5. SETD stands for System Engineering and Technical Direction.
6. This committee, initially set up by and reporting to President Eisenhower, was originally chaired by John von Neumann, the worthily famous Hungarian scientist who made many original contributions to quantum theory, the theory of games and who is credited with proposing the architecture of the modern digital computer. The committee, named the Strategic Advisory Committee on Ballistic Missiles, jump-started America's long-range ballistic missile development program. In later years the Committee, for several years chaired by Clark Milliken of Caltech, was transferred to the Defense Department, reporting to the Secretary of Defense.
7. Because they would be vulnerable to attack for comparatively long periods, exposed to surface blast effects that would easily destroy “soft” targets, these were considered unlikely to survive a first strike.
8. TITAN missiles were later installed in such silos, too.
9. Moss, op. cit., p. 106
10. The bulletproof glass separator was intended to ensure that a small group of plotters could not force unwilling colleagues to engage with them in an unauthorized launch. It was never clear to me just how the threatened airman would work things out with his armed colleague after refusing to comply, once they emerged from the silo or even from their seats where there would be no bullet-proof glass between them!
11. It would be comforting to believe that the procedures and safeguards designed to prevent unauthorized launch commands from triggering the end of the civilized world are and always have been firmly in place, safeguarded by the highest levels of classification and in the hands of only the most responsible civilian and military officials. Perhaps. But the fact is, everyone puts their trousers on one leg at a time.

The premise in *Strangelove*, and the novel *Red Alert* on which it was based, was that a deranged Air Force colonel commanding a SAC base issues an unauthorized command to a B-52 bomber flying near the Arctic circle on patrol, armed with two hydrogen bombs, to proceed into the USSR and drop his bombs on

Moscow. The bomber pilots accept his order and are flying toward their target as the American president tries desperately to stop the attack. The colonel knows and hopes this will trigger a central nuclear exchange between the two great nuclear powers.

As noted in the introduction, at least one newspaper account informs us that a Los Alamos Laboratory contract employee with a clearance which appears to have allowed her access to “permissive link” codes, was discovered to have copied several hundred highly classified files onto her flash memories and left them and her laptop in her mobile home for an extended period. How many comparable lapses go unreported cannot be known. Security, over long periods of time, especially where dozens or hundreds or even more workers are involved, is almost certain to be imperfect.

12. These figures apply to a squadron of fifty missiles controlled by five launch control centers. At full build-out, which ultimately came to more than 20 squadrons and over 1,000 missiles, *all* would be launched at essentially the same time, assuming the command to launch were delivered to all squadrons at once.
13. Moss, op. cit., pp. 107–109. Eventually, Minuteman was equipped with multiple warheads called MIRVs, (Multiple Independently-targetable Re-entry Vehicles.) A “re-entry vehicle” (RV) is nothing more or less than a transparent euphemism for a warhead. With MIRVs, the number of warheads—bombs, if you prefer—launched when, as some used to say, “the whistle blows,” has become some classified multiple of the number of missiles.
14. Neither I nor, so far as I knew, anybody else, ever questioned *why* these men, sitting deep underground in a concrete silo in the midst of a vast prairie studying for a calculus exam or yielding to some more entertaining distraction, would be *armed*.
15. Moss (1970), p. 110
16. The Air Force proposed various goals for the total number of Minuteman missiles, ranging from a low of about twenty squadrons (1,000 missiles) to twice that number. General Power argued for 10,000. Somewhat more than 1,000 were eventually deployed.
17. Moss, op. cit, p. 109
18. ODDR&E log #60–5609 dtd 2 November 1960. The document requires a study of “the feasibility of introducing a capability for a selective firing sequence permitting single missile launches.” It requires studying a way to facilitate selecting one of a number of distinctly different targets when programming each missile, without excessive complexity or time being required. A last requirement, indirectly related to launch control, calls for examining alternatives that might increase system life under and after attack to more than six hours in case of major power failure.
19. Moss, op. cit, p. 111
20. The cited document was written by Dr. [Max] Oldham on 7/7/61 and rewritten by me on 7/11 (JHRubel/sb/7/11/61 3E-1009, X57178, ASD (DDR&E), a rather dubious identifier for this document. Harold Brown's handwritten notes from a month before are included in a small package of related memos. The bottom line is simply that only now, after nearly a year from the memo I sent to the Air Force in November 1960, we were a couple of white papers, several memos and a Task Force of experts from where we had been, but no further! The Minuteman problem(s) had worked their way to the SecDef level six months earlier without any tangible consequences

Notes
Chapter 2—Minuteman

by mid-summer. One might surmise that the Air Force had not displayed much enthusiasm for this matter. But it was not to go away!

Notes
Chapter 3—The Fletcher Committee

1. Ultimately, according to Kaplan, nearly a billion dollars was spent revising the design of the system to cure the problems recited here and to provide for selective targeting and launch of individual missiles.

1. See Kaplan (1983) pp. 261–272. “The Joint Strategic Target Planning Staff, the JSTPS—finished the SIOP on December 14, 1960, just as Eisenhower had ordered. It was labeled SIOP–62, meaning that it was to go into effect in fiscal year 1962, which would begin June 1961. It called for shooting off, as quickly as possible, the entire portion of the U.S. strategic nuclear force that was on alert, 1,459 nuclear bombs, ranging from ten kilotons to twenty-three megatons, totaling 2,164 megatons in all, against 654 targets—military and urban-industrial, simultaneously, in accordance with SAC’s ‘optimum mix’ strategy—in the USSR, Red China and Eastern Europe. . . .” These figures do not exactly match others cited in other sources, but as a practical matter, the difference between two very large numbers depicting the power of nuclear weapons in broad terms is not particularly meaningful in any case. At some point an atomic attack far short of those so blandly contemplated here would forever destroy the foundation structures of entire societies.

If the entire force were launched—and this is what was called for if the U.S. fired a preemptive first-strike—the attack would involve 3,423 nuclear weapons, totaling 7,847 megatons; equivalent to about 10 tons of TNT-equivalent nuclear explosive power for every man, woman and child in the USSR and China combined at that time. The charts shown by the briefers predicted that the attack would kill some 100 million Russians and 300 Chinese, and severely injure millions more. None of these figures included casualties in central Europe or fallout victims around the world, including the United States from this attack, not to mention retaliatory strikes from the Soviet side.

2. All operational commands report to the Joint Chiefs. Those that include units from more than one Service—both Air Force and Army units, for example—are called Unified Commands. Commands including ONLY members of a single Service—in those days, SAC, for example—were and are called Specified Commands. In theory they report to the Chiefs, too, *not* to any staff officer in the military department. The Chief of Staff of the Army and the Air Force is just that—the chief of *staff*, not in charge of any *line* (that is, operational) commands. The Navy’s chief is called the CNO, the Chief of Naval Operations, but in those days he had only one boat to command, the Navy’s ceremonial yacht on the Potomac River. He, too, was a chief of *staff*. No doubt the system did not work in practice exactly the way it was described on paper. Today the Strategic Command, a unified command, includes components of all three military departments, including SAC.
3. A Roentgen is a measure of the energy of medium voltage x-rays. A Rad is the dose of energy absorbed by soft tissue exposed to one Roentgen. A rem is a measure of the biological equivalent of radiation from a diverse mixture of radioactivity that may include but is not limited to x-rays. One rem is biologically equivalent to exposure to one Rad of x-ray radiation. This measure is necessarily approximate. In the wake of a nuclear or thermonuclear explosion, radioactivity from the bomb itself may or may not be augmented by dust particles made radioactive by the bomb, depending on whether it is exploded near to or high above ground. Thus, victims may be exposed to radiation from radioactive materials ingested or inhaled as well as from radiation entering from outside the body.

1. According to Kaplan, *op. cit.*, the service secretaries attended a repetition of the briefing on the day following the first briefing.
2. Burke objected to a SIOP directed by SAC. He believed the Air Force aimed at creating an umbrella strategic strike organization that would embrace the Navy and the Army under Air Force control. To an aide who remarked that he felt the Air Force’s motives were “decent,” Burke replied, “You’re more generous than I am. . . . They’re dishonest. They’re dishonest and they know it . . . they have no feeling at all that they are responsible for anything but the Air Force.” (Kaplan, *op. cit.* p. 265)
3. Kaplan interviewed me in December 1981. He cites almost exactly these words, which he probably heard from me, and which I wrote here before consulting his account.
4. When we landed back in Washington after the SIOP briefings, Secdef Tom Gates invited me to ride in his limousine that was waiting at the airport to take him home. In only a couple of months there would be a new administration. His Washington days would be over. I asked him how he felt about leaving, and what his most difficult challenges had been. He said his years in the Pentagon, first as Secretary of the Navy, then, for the last year, Secretary of Defense, had been marvelous. He recalled his most trying times. Early in the spring of 1960 he had testified before a Congressional Committee regarding the size of U.S. projected ICBM forces. How come they weren’t bigger, someone asked. Gates indicated that there was no reason for larger forces. Why not? He said something to the effect that the enemy (the U.S.S.R.) had no intention of enlarging *its* forces to a point requiring more U.S. forces than planned.

The committee and the press picked up on Gates’s use of “intentions.” What do WE know about *their* “intentions?” How can we safely base OUR force structure on speculating about THEIR intentions? This pseudo-issue became red meat for headline writers and Congressional attacks, fueled by election-year politics. “Soon I was getting up at 3–4 in the morning to prepare myself,” Gates said. “I would spend hours on the Hill, then work until midnight. The attacks continued day after day after day. I was becoming exhausted.”

I could well imagine the near-panic that dreadful situation could trigger. “So I went down to Florida where Doug Dillon (Secretary of State) has a place with a swimming pool. We just lay around the pool all day drinking martinis and rolling into the water from time to time. After about a week I went back to Washington feeling a lot better. I decided to take the offensive. When I did, the whole thing quieted down.”

It is interesting to reflect on this episode, that was big news in the early part of 1960. When McNamara became SecDef, he was asked the same question. He replied that yes, if missiles were the only Soviet weapon being manufactured, they could produce a lot more than we were estimating. The same was true of their bomber fleet—they could produce a lot more than they were producing IF they focused on bombers to the exclusion of other things. But like us, they could not produce the theoretical maximum of everything at once. So our estimates are based on assessing their overall capabilities, and monitoring their actual deployments over time.

The Committees accepted that lucid, reasonable and believable answer that co-

opted “Soviet intentions” under a larger logical framework. The “intentions” issue disappeared from the radar screen.

However, more than 40 years later, the Bush administration is big on “enemy intentions.” “Yes,” says Bush and several of his senior officials, “yes, there were no Weapons of Mass Destruction (WMD) found in Iraq. But they had programs. They had the *intention* to possess capabilities to produce and to possess . . . chemical, biological and nuclear weapons.”

So far, nobody has publicly questioned these *intentions* statements, repeated for years. The administration’s aggressive public relations efforts, the supine posture of the newspapers and T.V. media and the miasma of fear, suspicion and embattlement cultivated among the American public let the Bush people get away with this unchallenged. Indeed, the atmosphere is such that political opposition, rarely if ever dares question the “intentions” mantras that have become virtually axiomatic in the political arena.

5. York (1987) p. 186
6. *ibid.* pp. 184–186. York recalls being present at both SIOP briefings, the first in December 1960 and the next in February 1961, soon after McNamara took office. I was not invited to the latter.

1. Kaplan (2001). This is an exceptionally valuable article. The treatment in it may eventually be included in an up-dated book-length treatment of the Cold War era as more still-classified information surfaces.
2. Rowen, as noted, was deputy assistant secretary of defense for International Security Affairs under Paul Nitze. Formerly from RAND, Rowen later became a professor at Stanford. Kaysen served as an assistant to McGeorge Bundy. He later became director of the Princeton Institute for Advanced Study.
3. “Counterforce” was, in theory, the strategy of targeting enemy military and other “strategic” forces and assets. “Countervalue” meant hitting population centers—Hamburg, Dresden, Tokyo, Osaka and some 64 large towns and cities across Japan—with incendiary and high-explosive bombs. Most of the Japanese cities were from thirty- to fifty-percent destroyed. Hiroshima, Nakasaki had even more devastating effects. As a practical matter, given the enormous radius of action of powerful nuclear weapons, not to mention the vastly extended effects of radioactive fallout, the so-called “collateral” effects of “counterforce” makes it virtually indistinguishable from “countervalue” as the number and lethality of weapons increases.
4. Recall from the preceding chapter that the Air Force was still dragging its feet about doing anything at all about the MINUTEMAN system—its safety and its essentially total inflexibility—issues I had been working on for more than two years.
5. See the Bibliography notes on Kaplan (2001) which briefly recounts the origin and surfacing of this critical document, without which this account could not have been composed.
6. General Joe Walsh was the Air Force DCS (Deputy Chief of Staff) for intelligence in 1960 and part of 1961. No sooner did the early DISCOVERER pictures begin flooding in during the latter part of 1960 and the early part of 1961 than he began paying almost daily visits to my office, urging me to come up to his obscure, windowless chamber on the fifth floor of the Pentagon. He operated in the back room of an office that opened out to a Pentagon corridor, a hideaway that one never suspected was there until shown. It always reminded me of Kafka’s CASTLE, a mysterious room pretty much concealed behind a normal room in a labyrinthine structure.

There he would show me satellite photo images taken over some part of Russia. He would furnish me with a magnifying glass, then point to some great stretch of forest and intermittent plains saying, “See? See!” It looked like wild forests and empty plains to me, but he would insist. I thought of the Emperor’s New Clothes. Maybe, I thought, if I stare long enough at the spots he indicates the eyes will glaze over and those fine, golden threads will appear.

They never did, but General Walsh, a diligent toiler in the vineyards of imagined nuclear threats, who reputedly went to Mass every morning before reporting to the Pentagon, persevered. He trotted me up to his hideaway many, many times. If every spot on a grainy image to which he pointed really *did* reveal a missile installation utterly invisible to me, then General Power would have been right, the Soviets would have had hundreds more weapons than anybody outside Walsh’s charmed circle had been able to detect.

McNamara had him shunted off to a less critical post soon after taking office. Nearly 25 years later I met him again when we moved to Santa Fe, where Gen.

Walsh ran his own real estate brokerage company. His persona seemed altered by his new and more mundane role, a small, aging real estate agent in mufti. He seemed a bit vague or distracted, no longer in his little back room, but out in the open like everybody else, with no arcane satellite photographs to pore over. I was never sure, when we met on a few occasions, whether he remembered who I was or not.

7. Kaplan (1983) pp. 299–300.
8. “Kennedy’s resistance [to pressure from the military] reached a climax during the Cuban Missile Crisis. . . . The blockade or quarantine of Cuba that he imposed to force the removal of nuclear weapons did not satisfy the Joint Chiefs. When Kennedy first proposed it, General LeMay said he saw direct military intervention as a necessity. ‘This blockade and the political action I see leading into war,’ he told Kennedy in a conversation captured on tape by a White House recording device. ‘I don’t see any other solution. It will lead right into war. This is almost as bad as the appeasement at Munich.’ LeMay indirectly threatened to make his dissent public. ‘I think that a blockade, and the political talk, would be considered by a lot of our friends and neutrals as being a pretty weak response to this. And I’m sure a lot of our own citizens would feel that way too. In other words, you’re in a pretty bad fix at the present time.’ ”

“LeMay’s words angered Kennedy, who asked, ‘What did you say?’ LeMay repeated: ‘You’re in a pretty bad fix.’ Kenneth O’Donnell recalled in his memoirs that after the meeting, Kennedy asked him, ‘Can you imagine LeMay saying a thing like that? These brass hats have one great advantage in their favor. If we listen to them, and do what they want us to do, none of us will be alive later to tell them that they were wrong.’ ”

“Meetings with Curtis LeMay—the Air Force chief of staff, ‘drove Kennedy into a ‘sort of fit.’ ” (Kaplan, 2001)

9. Kaplan, p. 280. This account smacks a bit of hyperbole. But the outcome was the successful culmination of the efforts I began more than two years before in the spring of 1959. What a detailed technical audit of the modified system would have revealed, or perhaps did reveal if one was ever made, remains shrouded beneath layers of secrecy and technical details seldom understood or attended to by policy makers.
10. *Ibid.* p. 301

1. Epstein, Jacob, (2007)
2. The nuclear policies of the U.S. are not perfectly clear at this writing. In September 2005 the Pentagon posted a nuclear doctrine on the Internet which it withdrew soon after. Since then, no revision or any other documentation has been made public. A Pentagon spokesman said that the “document was taken down ‘because even in an unclassified world this is not the kind of thing you want flying around the Internet.’ ” (AP, Washington (AFP) September 20, 2005 *Pentagon Pulls Draft That Discusses Preemptive Use of Nukes From Website*, http://www.Spacewar.com/news/nuclear_doctrine_05zzh.htm)

In a discussion of the document before it was withdrawn, Hans M. Kristensen writes: “Unfortunately, but perhaps not surprisingly, the updated doctrine falls far short of fulfilling the administration’s claim [that it is significantly reducing the role of nuclear weapons]. Instead of reducing the role of nuclear weapons, the new doctrine reaffirms an aggressive nuclear posture of modernized nuclear weapons maintained on high alert. Conventional forces and missile defenses merely complement . . . nuclear weapons. . . . It also reflects a decade-old rivalry between the regional combatant commanders and U.S. Strategic Command (STRATCOM) over who ‘owns’ regional nuclear strike planning.” (Kristensen 2005)

In a statement cited by Michel Chossudovsky (2006), Robert S. McNamara states: “Much of the current U.S. nuclear policy has been in place since before I was secretary of defense, and it has only grown more dangerous and diplomatically destructive in the intervening years.” (See: <http://www.armscontrol.org/act/2005/Kristensen/asp?print>)

3. <http://www.snopes.com/quotes/goering.htm>
4. Prometheus, the forward-looker, had a brother, Epimetheus, he of the afterthought, the backward-looker. Zeus, partly to punish Prometheus for having stolen fire from the gods, gave the seductive Pandora to Epimetheus. She possessed a sealed jar, never to be opened. When she disobeyed, and tried in vain to re-cap the jar (a “jar,” not a “box,” a significant distinction, given Freudian associations with a jar) before all the furies in it escaped into the world. She failed. All that remained was Hope.