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# WHITHER THE NEUTRON BOMB?

## A MORAL DEFENSE OF NUCLEAR RADIATION WEAPONS

by

SAMUEL T. COHEN

**M**ilitary weapons by themselves can hardly be classified in moral terms. Unto themselves they are inanimate objects incapable of either moral or immoral behavior. Moral ascriptions have to be related to human beings and human behavior; and if one is to make moral determinations regarding military weapons it has to be in the context of how these weapons are used and to what purpose.

If the use of a military weapon is viewed as morally acceptable or unacceptable, the viewer presumably perceives the results of such use in terms of an effect on a human situation. In this sense, most of those holding to Western civilized values assess the moral implications of weaponry in terms of societal impact—particularly with respect to the impact on the welfare of noncombatants. Even here, moral judgment mainly reflects values easier to uphold in peacetime, for war can bring out passions and emotions which sharply degrade normally held values. In World War II, there was a massive breakdown of Western values as evidenced by population bombing against Germany and Japan, culminating in the atomic bombings of Hiroshima and Nagasaki.

Although there were some who found the high explosive and incendiary attacks against German and Japanese cities to be morally objectionable, there were many more who took even greater exception to the atomic bombings. In this second category,

there was a significant proportion who had relatively minor qualms over the conventional bombings but found the atomic bombings to be singularly repugnant.

After World War II, the Western countries—led by the United States, which held a monopoly on nuclear weapons—mounted an effort through the United Nations to rid the world of nuclear weapons on the ground that they represented a potential threat to civilization. Despite the massive global carnage and destruction resulting from the employment of conventional weapons in the war, the specter of Hiroshima came to dominate Western thinking. The belief that nuclear weapons represented a demarcation point in human affairs was elevated to a theological tenet. The Western objective was to ensure that never again would nuclear weapons be used, and the best way to achieve this objective was to achieve their eradication.

To eradicate from the world the weapon it created, the United States immediately after the war established an Advisory Panel to the State Department on the international control of nuclear weapons. Appointed to chair the Advisory Panel was the late David Lilienthal, a man of vision and possessed of the highest ideals for mankind. Working with Lilienthal on the panel was Robert Oppenheimer, who had directed the US atomic bomb development during World War II and later was to fight an unrelenting war

against the hydrogen bomb (the development of which he stringently questioned on moral grounds). The panel was instructed to explore possibilities for curbing, controlling, and, if possible, eliminating nuclear weapons, and then to report its findings to the Secretary of State, Dean Acheson.

From this panel effort came the so-called Acheson-Lilienthal Report, which formed the basis for the nuclear disarmament proposal the United States was to advance to the newly created United Nations. This proposal was put forward to the UN in 1946 by US representative Bernard Baruch, coming to be known as the Baruch Plan. Like Lilienthal, the plan itself was highly idealistic. It would place all the nuclear resources of the world under control of an international authority and would lead, it was hoped, to the elimination of all nuclear weapons from the face of the earth. Were the Baruch Plan to be accepted and fully implemented, the United States stood ready to give up its own nuclear arsenal.

When the plan was introduced to the UN, the idealism of the United States was confronted by the pragmatism of the Soviet Union. It became evident that the Soviets (who, of course, had already decided to develop their own nuclear capability) were not about to accept such an arrangement. They made clear that they would not submit their nuclear destiny to international control. Moreover, they made it clear that they would not tolerate inspection procedures which, as they viewed it, threatened their legitimate national privacy. The plan failed and the buildup of nuclear arsenals around the world commenced, a buildup which continues apace today.

In 1963, 13 years later, Lilienthal journeyed to Princeton University to deliver a lecture titled "The Mythology of Nuclear Disarmament." That his attitude on nuclear weapons had changed from that of 1946, when he was instrumental in formulating the US position on nuclear disarmament, he made very clear:

The basic atomic weapons policy of the United States from almost the beginning

days of Hiroshima has been based upon a fundamental but quite understandable misapprehension.

What is the essence of this great misapprehension? It is this: That because the Atom is such a uniquely powerful force for destruction, a revolutionary kind of destructive power, that in dealing with it we must divorce it, set it apart from everything the human race has previously learned about man's behavior, about war and peace, about our institutions, about foreign policy, about military matters, about science. This simply isn't so . . . we have already learned, the hard way, that it isn't so. But being misled by this belief in the special status of the powerful Atom, we have increasingly brought upon ourselves frustration after frustration.

The fantastic destructive power of the Atom is a reality. The conclusions drawn from this fact are myths. Those myths are still at the foundation of our policies and our outlook.

But Lilienthal's remarks in 1963 had no discernible effect on US policy. Our basic nuclear weapons policy has remained tied to the belief that, except in a negative or deterrent sense, there is no meaningful role for the "Atom" in dealing with Western

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security issues. The policy has been predicated on the assumption that the continued *nonuse* (since the Japanese bombings) of nuclear weapons will best serve Western interests—indeed, world interests. The continued existence of these weapons is rationalized by the contention that their very existence works to deter their use. However, the continued US objective has been to seek arms control agreements which will lead to the reduction and ultimate elimination of nuclear stockpiles so as to provide the ultimate guarantee of nonuse.

The gradual establishment of this basic policy, specifically related to the political acceptability of battlefield nuclear weapons, can be traced in the following statements by national policymakers over the years:

Make no mistake. There is no such thing as a conventional nuclear weapon. For 19 peril-filled years, no nation has loosed the atom against another. To do so now is a political decision of the highest order.<sup>1</sup>

—President Lyndon Johnson  
September 1964

I must stress that our tactical nuclear systems do not now and are most unlikely in the future to constitute a serious substitute for a stalwart nonnuclear defense. In fact, we must recognize in our planning that the decision to initiate the use of nuclear weapons—however small, clean, and precisely used they might be—would be the most agonizing that could face any national leader.

—Secretary of Defense James Schlesinger  
Report on FY 1975 Defense Budget

A decision to cross the nuclear threshold would be the most agonizing decision to be made by any President.<sup>2</sup>

—President Jimmy Carter  
July 1977

In 1945, when we entered the nuclear age, it was thought that our security would no longer depend on the more traditional concerns of the great powers. Now we have discovered that we never left the nonnuclear

world after all. Conventional capabilities remain the most usable of military power; since 1945, in fact, they have been the only form of military power used.

—Secretary of Defense Harold Brown  
Report on FY 1981 Defense Budget

If Western political beliefs, greatly influenced of course by Judeo-Christian moral precepts, dictate that conventional weapons be preferred over nuclear weapons, how well do these beliefs stand up in the light of technological considerations and real-world military considerations? We shall attempt to address this question by discussing in some detail two battlefield nuclear weapon concepts—the neutron bomb and the nuclear barrier—which, by their intrinsic nature, are based on nondestructive effects. They represent, therefore, essentially the antithesis of the widespread and dominant concept of “mass destruction” nuclear weapons. More specifically, these two weapon concepts derive their military effectiveness from nuclear radiation, an effect singled out by many people if not most as perhaps the most insidious and morally repugnant effect associated with any weapon—more so even than chemical and biological weapon effects.

### THE NEUTRON BOMB

Let us first take up the radiation-enhanced bomb—highly publicized as the “neutron bomb” and heralded as the weapon to kill people but not destroy property. This is a device which, in its ultimate form, derives its power not from nuclear fission (which powered the Three Mile Island reactor and which releases certain kinds of radioactivity that caused the nationwide, even worldwide, uproar of 1979) but from nuclear fusion. This process, it might be noted parenthetically, is that by which the sun generates its radiant energy, such radiation being essential for life on earth and coveted by millions of sun-worshippers of whom a not insignificant number thereby become afflicted with squamous cell carcinoma—skin cancer.

In contrast with fission weapons, where most of the energy goes into blast, heat, and

dangerous radioactive emanations, fusion weapons produce a relatively small amount of blast and heat (about 20 percent of the total energy, compared with 85 percent for fission) and no direct radioactivity. The bulk of the energy comes out in the form of high-energy neutrons which can travel through large distances of air to produce military casualties. These distances substantially exceed those at which the blast and heat effects can damage or destroy materiel and property. It is this predominance of the neutrons' range which brought about the appellation "neutron bomb" for this kind of fusion weapon.

To be sure, the blast explosive power in a neutron bomb dwarfs that contained in a conventional high-explosive bomb. However, the actual physical destruction resulting from the detonation of a neutron bomb is determined not by its intrinsic explosive power, but rather by how high above the earth's surface the bomb is burst.

If a one-kiloton neutron bomb is burst close to the earth's surface, it will destroy urban structures over an area hundreds of times greater than a large high-explosive bomb. Employed thus, it would truly be a weapon of "mass destruction." But if it is burst at a height of about two to three thousand feet, destructive pressures from its blast will not reach the surface, while enemy personnel over an area of one square mile will become incapacitated within minutes and be unable to fight. In contrast, there is no way to use conventional high explosive weapons effectively in attacks on enemy forces in built-up areas without causing immense damage and destruction to the structures.

Over the centuries since gunpowder was invented, cities have been fiercely contested in ground warfare. A frequent result of such contests has been the all-too-familiar specter of massive urban devastation. In World War II the list of destroyed cities (Stalingrad, Berlin, etc.) constituted appalling testimony to the ravages of conventional war. In the Korean War, South Korea's capital, Seoul, was largely demolished. In the Vietnam War, scores of South Vietnamese villages were destroyed by massive US conventional firepower.

Had neutron weapons been available for use in these conflicts, such widespread devastation and human misery need not have resulted. The question therefore arises: What is it in the nature of the physical effects of neutron weapons, as contrasted with those of conventional weapons, which causes them to be so widely labeled as immoral?

Besides the destruction and misery inflicted on urban populaces during conventional war, there is also to be considered the postwar effects on the military combatants. When dealing with the moral (or immoral) aspects of ground war, it would be incomplete and even morally questionable to consider only the postwar plight of the civilians. Soldiers too are human beings and their predicament after the fighting has stopped—at which time most of them again are civilians—must be taken into account.

When discussing combat casualties in ground warfare, it should first be realized that in all past conventional wars, the underlying objective in employing a given weapon has been to kill the enemy soldier. There has been no direct purpose to physically maim him, and, in fact, weapons designed to produce this result (e.g. dum-dum bullets) have generally been excluded, by agreement, from "civilized" warfare. Unfortunately, however, most of the conventional weapons developed thus far have had the ability to maim as well as kill. As a consequence, in the aftermath of conventional ground wars throughout the centuries has been a huge toll of disabled soldiers—lacking limbs, organs, sight, etc. The numbers of those who fall into this category as a result of the conventional wars of this century alone amount to many millions. In the United States there are more than a million disabled veterans, of which more than 100,000 are totally disabled. Most of these disablements accrued from World War II. However, as distressing as these levels may seem, by comparison with those suffered by other countries during this war they are quite small. Germany and Russia together suffered more than ten times these levels.

Nuclear radiation, in contrast, does not maim. To be sure, those who receive on the

nuclear battlefield substantial (but nonlethal) doses of such radiation can experience distressing symptoms such as vomiting, diarrhea, dizziness, chills, and fever. But who is to say that these effects are more repugnant than those resulting from napalm burns, wounding by fragmentation bombs, rupture of body organs from blast concussion, and the like?

To convey some authentic notion of the symptoms and their severity resulting from nonlethal high radiation exposures, here are medical accounts of two such victims.

[Upon admission to the hospital an hour after exposure] the patient (who had experienced about 400 rads) was in good physical condition. . . . The patient was calm and had no subjective complaints. . . . Although he felt well on admission to the hospital, the patient vomited once several hours later. In the course of the next 12 hours, the nausea disappeared and the patient's appetite returned. There was no diarrhea or other gastrointestinal disturbance. . . . For several days after exposure the patient felt weak and tired and appeared prostrated but was otherwise asymptomatic. . . . The patient's strength improved steadily, and he suffered no untoward reaction to being allowed out of bed several hours a day after the tenth day. . . . On the 15th day the patient was discharged from the hospital. . . . Approximately 10 weeks after exposure, the patient's strength and endurance were back to normal and he returned to work. Since this time he has led an entirely normal life, working hard and engaging in outdoor sports.<sup>3</sup>

In June 1974, a radiation worker at an industrial plant in New Jersey accidentally received a whole body dose of approximately 600 rads. . . . The victim exhibited prodromal symptoms (specifically nausea and vomiting) of acute radiation sickness, commencing some 30 to 60 minutes post-exposure. During the 2½ to 3 hours that elapsed between the exposure and the victim's arrival at the hospital emergency

room, he experienced 10 episodes of vomiting. He was described as being concerned, but not unduly anxious, about his condition [being the calmest individual in the hospital emergency room]. In the days following his admission to the hospital, his white blood cell and platelet counts steadily decreased. During the 22nd to 35th days post-exposure, his blood count had dropped so low that only [transfusions] maintained his life. After the 35th day, his condition improved rapidly; he was discharged from the hospital on the 45th day and subsequently returned to full-time work.<sup>4</sup>

In both these cases, the victims were lucky to survive. At a dose level of 400 rads, the average person stands an even chance of dying; and at the 600 rads level, the chance of dying is nine to one. Yet, as severe as these radiation accidents were, there is nothing to indicate that the symptoms even approached in severity those of wounds regularly experienced from conventional weapons. In fact, from bouts with any number of virus and bacterium diseases (or occasional alcoholic over-indulgence) most of us have gone through somewhat similar discomforts. Most important, however, in both these cases the victims appeared to return to normal some weeks after exposure. This outcome is of a drastically different complexion than the fate of conventional weapon victims whose permanent disabilities have been earlier described.

Within the last few years, widespread publicity has been given to a relatively small number of US troops who were exposed to radiation from atomic bomb tests during the 1950s and subsequently (many years later) were afflicted with cancer. What fraction of the troops so afflicted was due to radiation exposure and what fraction might have gotten cancer anyway remain highly controversial issues which, owing to our inadequate understanding of the subject, may not be resolved for many years. On an individual basis, there is no way to determine the cause of cancer in these troops, especially since the radiation doses were so low.

On the other hand, as a consequence of the much higher doses which might be received by large numbers of soldiers in a battlefield nuclear war, there is little doubt that the rate of cancer incidence would rise substantially over the normal incidence (based on the extensive data resulting from the atomic bombing of Hiroshima and Nagasaki). This is particularly true for leukemia, where the rate for those in Japan who received substantial radiation doses was about 30 times normal. However, although this would seem to represent a very large increase, it should be realized that the leukemia rate from natural radiation exposure is but a small number per hundred thousand. Thus, the estimated leukemia rate after bomb radiation exposure would only be on the order of one per thousand.

If we were to translate this estimated rate onto the nuclear battlefield and envisage a NATO-Warsaw Pact conflict, even were the number of soldiers falling into this exposed category to be in the hundreds of thousands (a number probably substantially higher than what would actually be the case), the number of subsequent leukemia victims would be only in the hundreds. In comparison with the number of long-term casualties to be expected were a large-scale *conventional* war to take place between these two adversaries, this level has to be regarded as minuscule.

If neutron weapons are more sparing of the civilian societal fabric and promise far less devastation (and the human misery resulting from such devastation) than conventional weapons, on what grounds can their employment—by either side in a war—be deemed immoral? If nuclear radiation effects directed against military personnel do not produce the lasting human disablement, disfiguration, and even mutilation which conventional weapons have produced for hundreds of years, why should a weapon exploiting these effects—such as a neutron bomb—be singled out for moral condemnation?

#### NUCLEAR BARRIER

In 1961, I went to the office of US Senator Albert Gore to brief him on the

neutron bomb concept. A man of deep moral conviction, he was a leading figure in the development of US nuclear arms control policy. The Senator listened attentively, but as the briefing progressed his distress over the subject itself became increasingly apparent. He said, in effect, that the development of such weapons would symbolize the tragic condition of humanity. While not declaring himself against their development, he sadly intimated that the existence of such devices would constitute a species of moral affront to mankind.

At the time of my briefing of Senator Gore, the United States was at peace and had been for some time. Ten years earlier, however, it had been immersed in a vicious war in Korea. The national moods in 1950-54 and 1961 were starkly different, as were the moods of the Congress. In the earlier period, Congressman Albert Gore was sufficiently distressed over the US conduct of the war and the attrition of American servicemen in combat to make a bold proposal for ending the bloodshed. Writing to President Truman on 14 April 1951, he made the following observations and recommendations:

Korea has become a meat grinder of American manhood. Military authorities, including General Ridgway, have said that under present policies a conclusive military victory is impossible. We must recognize that under present policies our Communist foes have the capacity, what with geographic and human preponderances in their favor, to continue this meat grinder operation indefinitely. We are told that a spring offensive is being mounted now. True, our men have learned better how to meet the foe; true, they will fight bravely; true, enemy losses will be staggering. But what about ours? When is this to end? It is for a solution to this problem that America desperately needs leadership and unity. Something cataclysmic, it seems to me, is called for. We have it. Please consider using it. . . .

I suggest therefore:

After removing all Koreans therefrom, dehumanize a belt across the Korean

Peninsula by surface radiological contamination. Just before this is accomplished, broadcast the fact to the enemy, with ample and particular notice, that entrance into the belt would mean certain death or slow deformity to all foot soldiers; that all vehicles, weapons, food, and apparel entering the belt would be poisoned with radioactivity; and further, that the belt would be regularly recontaminated until such a time as a satisfactory solution to the whole Korean problem shall have been reached. This would differ from the use of the atomic bomb in several ways and would be, I believe, morally justifiable under the circumstances.<sup>5</sup>

What Senator Gore proposed almost 30 years ago was, at that time, neither technically nor militarily feasible. Moreover, while he was not specific about the nature of the defensive belt, it was clear that he was talking about radioactive "poisoning" which some, if not many, might find morally objectionable—especially in view of the explicit threat of "slow deformity." However, there was one feature of Gore's proposal which seemed to have a positive moral aspect. This had to do with attempting to deter conflict by emplacing an impenetrable barrier between the potential combatants in contrast to the time-honored way of solving international disputes by direct engagement of the disputants on the field of battle. It also had to do with the difference between active and passive defense: active defense deliberately seeks to kill the aggressor, whereas passive defense can put the responsibility for the aggressor's death solely on the aggressor himself—a moral shading which many find important.

Today, South Korea has erected a conventional barrier at the 38th Parallel, replete with mines, tank obstacles, barbed wire, and fortifications, to keep out the North Korean army. However, relatively few expect that this conventional barrier would do more than delay a determined assault. If war comes, the likelihood is that the barrier will be breached, and the war will have to be fought by classical conventional means on

South Korean territory, with the large city of Seoul once again at risk of devastation.

Suppose, however, along the general lines of Senator Gore's proposal, a barrier were to be emplaced along the 38th Parallel which fully exploited modern nuclear technology—in particular what the neutron warhead has to offer. Such a nuclear barrier system would consist essentially of hardened underground fortifications manned by conventionally armed forces, supported and complemented by neutron weapons in the barrier zone and to the rear, and backed up by rearward-based mobile forces using both neutron and conventional weapons.

The barrier zone component of the total defensive system would consist of:

- A series of hardened fortifications armed with antiarmor and antipersonnel weapons.

- Antiarmor and antipersonnel obstacles—e.g. antitank ditches, dragon's teeth, minefields, and barbed wire.

- An extensive sensor system placed both within the barrier and to its front, to enhance the effectiveness of both nuclear and conventional firepower against targets in the barrier area.

- Hardened local air defense sites, to cope with aircraft and helicopter attacks against the fortified units and with possible airborne assaults behind the barrier.

- A variation on the Gore proposal for the radioactive belt—namely, a series of pipes filled with radioactivity of a specified duration, produced by low-yield underground neutron warhead bursts. The pipes would run, at the surface, through the obstacle zones, irradiating advancing enemy personnel with gamma rays.

The rearward-based mobile force would consist of:

- A short-range ballistic missile system designed primarily to provide covering nuclear fires, using neutron warheads, over the barrier zone, but also capable of attacking any enemy units to the rear which have penetrated, overflowed, or circumvented the barrier.

- A force of light armored vehicles capable of high-speed amphibious and cross-



country operations. This mobile force could be brought to bear quickly on enemy units which had succeeded in breaching the barrier, airborne forces dropped behind the barrier, and seaborne forces which had flanked the barrier.

- Mobile air defense units to cope with aircraft and helicopter attacks against the rearward forces, and also for use against airborne assaults.

Were such a border defense to be implemented, it would be possible for a country such as South Korea to defend itself against aggression without subjecting its population, towns, and cities to the wholesale ravages of ground warfare. And it could do so without objectionable moral costs. Unlike the bullets from machine guns, the fragments from shells, or, for that matter, the neutrons from a neutron bomb, the gamma rays emanating from a pipe are not directed toward an enemy soldier with the purpose of killing. In fact, they are not directed toward anything in particular. If the invading enemy soldier exposes himself to a lethal dose of radiation, it is by his own decision. In this sense, such a radiation barrier represents a purely passive defense. It serves essentially the same purpose as an electric fence designed to keep out unlawful intruders.

In contrast with the grim purposes for which Senator Gore proposed his radioactive belt ("slow deformity" and radioactive poisoning—which the Senator found to be "morally justifiable under the circumstances"), and in contrast with the physical maiming which can result from weapons used in a conventional barrier scheme, the gamma rays—should the aggressor deliberately expose himself—will not produce lasting disabilities.

Historically, one of the commonest occasions for war has been mutual distrust between neighboring countries. Country A, for example, fearing that country B plans to attack, decides to preempt and sends its troops marching across the border. Had country B fashioned its border defenses in accordance with the barrier concept described above, however, country A could in no way have concerned itself with aggressive cross-

border intentions by country B. Barriers can't march. Country A would thus not have been tempted to launch its preemptive ground attack. As a matter of fact, if country A feels such distrust of country B, would it not want to provide itself with a barrier system? Were both sides to possess such barriers, in essence a *de facto* non-aggression pact would be in effect, at least so far as ground invasion were concerned.

Another common historical occasion for war has been one country's belief that its neighbor has let down its defenses and become vulnerable to attack. All other factors being equal, country C can be morally condemned for capitalizing on its opportunity to launch aggressive war against its foolish, trusting, and self-chosenly weak neighbor, country D. But in the sense that country D jeopardized the safety of its citizens by allowing its defenses to weaken, thus tempting an aggressor, it shares a moral taint. One might fairly condemn both sides on moral grounds for bringing the war about. However, were a nuclear barrier along the mutual border of countries C and D successful in deterring such an opportunistic war, could not the decision to construct it be regarded as morally correct? Indeed, could not such construction be regarded as even a moral imperative?

The point to be made is that moral deliberations on nuclear radiation weapons should not be obscured by narrow fixations on the "mass destruction" potential of the more familiar nuclear and thermonuclear bombs. To be morally objective, one should examine how a specific weapon is to be used, for what purposes, how it achieves its effects, and how its use relates to the affairs and existence of human beings. If the underlying purpose of using nuclear explosives is to enable a country to defend its borders successfully against aggression by its neighbor, thereby sparing its people the ravages of armed invasion and at the same time ensuring that these explosives cannot themselves be used for aggression against the would-be attacker, one cannot legitimately determine this course to be morally objectionable. For if nuclear radiation can be

harnessed and controlled for purely defensive purposes, it squares perfectly with the Augustinian distinction between the "just war" fought to defend civilized order and the "unjust war" fought for aggrandizement.<sup>6</sup>

### CONCLUSION

After World War II, there were many who construed as morally reprehensible the actions (or inactions) of those French and British political leaders responsible for not preparing their countries to fend off Hitler's juggernaut. Considering the consequences of the failures of these leaders, perhaps there was some justification for this moral condemnation. And if we should someday stumble into World War III, having tempted the Soviets to attack by our failure to prepare optimally for our defense, we shall be no less morally blameworthy than the Chamberlains of the 1930s. Nuclear radiation weapons offer a feasible means of strengthening our ability to defend Western Europe without destroying it, but we have thus far refused to

deploy these weapons, despite the fact that such is now technically feasible. Paradoxically, the objection to deployment seems to rest in large measure on moral grounds. However, based on the foregoing discussion, one might argue that our failure to capitalize on the unique effects of radiation weapons—not only in Western Europe but elsewhere as well—could constitute blind immorality of a far more serious order.

### NOTES

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