

CONCERNING THIS ISSUE

In this issue of *Educational Perspectives*, we present five papers on nuclear education. These were originally presented in a symposium, "The Role of the Academy in Addressing the Issue of Nuclear War," sponsored by Hobart and William Smith Colleges, the Association of American Colleges and the American Council on Education, March 25-26, 1982.

While it is not the policy of *Educational Perspectives* to reprint articles, the Editors felt that these, by nationally recognized experts in the field, had so much to offer as background in the development of adequate nuclear curricula for school classes at all levels that they were worthy of republication.

Reading these papers will surely stimulate you to ask many questions about how we managed to get ourselves into the critical situations we face today—which seem to involve basic choices between the survival of our "liberties" or our "civilization" or even all life on our beautifully unique planet Earth.

As Jonathan Schell writes in *Fate of the Earth*:

The species overarches and contains all benefits of life in the common world, and to speak of sacrificing the species for the sake of 'liberty,' or any other benefits that life produces, involves one in the absurdity of wanting to destroy something in order to preserve one of its parts. Furthermore, the peril of extinction is the price that the world pays, not for 'safety' or 'survival,' but for its insistence on continuing to divide itself up into sovereign nations. The world could escape nuclear annihilation by disarming. However, nuclear powers put a higher value on natural sovereignty than they do on human survival.

The promise of nuclear military superiority has led to a nuclear arms race—and a standoff between the

nuclear superpowers—that has produced tremendous stockpiles of weapons in the world today. These are equivalent to six thousand times the total firepower used during the Second World War. Any use of these weapons threatens to escalate into a worldwide nuclear holocaust—a war without any winners! Our present civilization and, possibly, all life on our planet could be destroyed with the use of only a fraction of this available nuclear firepower.

How did we get into this critical situation?

By the late 1960s, a fairly stable mutual nuclear deterrence structure had been established. Each of the nuclear superpowers had available several thousand relatively invulnerable nuclear weapons of limited accuracies that could be used to destroy the other side's cities and population in case they themselves were attacked.

However, by the early 1970s, two technical developments had destroyed the credibility of this deterrence—and led to the spiralling arms race. First, multiple independent re-entry vehicles (MIRVs) were developed which increased the number of targets that could be destroyed with each ballistic missile. Second, the aim accuracies of the MIRVs were increased to where they now had a high probability of destroying enemy missiles located in hardened silos.

This led to the assertion, on the part of many "military hawks" in both the US and USSR, that all sorts of new nuclear capabilities were needed to develop counterforce capabilities to fight and "win" a nuclear war at any level of conflict. Thus, the arms race was spawned.

A result of this arms race has been a plan to install nuclear-tipped Pershing II intermediate range ballistic missiles (ICBMs), and nuclear cruise missiles in Europe to counter the existing Soviet SS-20 IRBMs that are targeted against Western Europe. There have been many US and USSR and third-world country objections to this plan—on the basis that it would further destabilize the nuclear arms situation in Europe; it would tend to shorten the warning times available to Moscow, provide vulnerable targets for Soviet missiles, and increase the probability of an accidental launch of USSR missiles through the failure of some faulty Soviet computer component.

In the opinion of George Kennan, former US Ambassador to the Soviet Union, the principal, immediate danger in the current military posture of the NATO alliance is not that it will lead to large-scale war—either conventional or nuclear. He feels that the present balance of terror and the caution of both sides appear strong enough to prevent such a catastrophe today—at least in the absence of some deeply destabilizing political linkage which might lead to panic or adventurism on either side.

However, he feels that the present, unbalanced reliance of the United States on nuclear weapons to produce deterrence of the Soviets in Europe—if continued—might, eventually, produce a political change. Recent events have shown that differing perceptions among our allies of the role of nuclear weapons in Europe can lead to destructive recriminations and, when these differences are compounded by

understandable disagreements on other matters, such as Poland, Afghanistan and the Middle East, the possibilities for trouble among our NATO allies—as well as between the US and Soviets—are evident.

A number of suggestions have been presented in attempts to alleviate this situation, including a proposal by McGeorge Bundy, Robert McNamara, Gerard Smith and Kennan for “no first use” of nuclear weapons. They point out that a major element in every NATO alliance document of the past has been that the US has asserted its willingness to be the first to use nuclear weapons to defend against Soviet aggression in Europe. They feel that it is this element of the doctrine that needs reexamination now—both in regard to its cost, the coherence of the NATO alliance, and its threat to the safety of the world—all of which are rising, while deterrence credibility declines.

They propose to maintain deterrence in Europe by increasing conventional force capabilities. Once this is done, they feel that “we can escape from the notion that we must, somehow, match everything the Soviet rocket commanders extract from their government.”

How does this sit with the European countries?

In general, the Scandinavians appear to welcome a no-first-strike proposal. There are also strong peace movements throughout the other countries of Western Europe. In West Germany the impending introduction of Pershing II and cruise missiles has become a hot issue. However, four top German policymakers, including a general who is a former commander of NATO Central European forces, reject the idea of no-first-use. They contend that such a pledge by NATO would encourage Soviet aggression and concede a huge military advantage to numerically superior Warsaw Pact forces and that the

Soviets—even in the case of a large-scale conventional attack—“could be certain that their own land would remain a sanctuary from a US nuclear response as long as the Soviets did not, themselves, resort to nuclear weapons.”

In response, Bundy, et al, explain that “it is precisely the overwhelming difference between thermonuclear warfare and any past wars that makes the threat to resort to nuclear arms so dangerous and so hard to believe and, therefore, so unreliable as a deterrent.”

They indicate that “there seems to be general agreement, especially among Americans, that it is right to press for conventional strength, and urgent to raise the nuclear threshold by a no-first-strike policy, and necessary to take account of the reality that truly enormous nuclear forces are now available in the European Theatre”—including British and French nuclear forces, as well as those of the United States and Russia.

Moreover, they point out that these forces would remain enormous even if President Reagan’s Zero Option proposal is accepted by Moscow, since a majority of our tactical forces are now equipped with nuclear weapons. They conclude that “it appears compelling that no one should ever be the first to set a nuclear match to those stockpiles, and not undertaking to do so is a proper part of the defense of a sane government.”

The above are examples of the types of nuclear problems that have arisen through a lack of foresight on the part of past decisionmakers; the uncertainties, risks and inadequate analyses of the consequences of using nuclear fissionable materials, and the manner in which we have chosen to use these materials in dangerous military applications.

In facing this dilemma, the choice seems to be between national sovereignty and either deterrence or nuclear war, on the one hand, or world government and nuclear disarmament, on the other. In Schell’s opinion, it is almost certain that the human race will die, eventually, by continuing in the former course—if not by deliberate attacks in trying to “win” a nuclear war, then by accidents, third-country actions, or even terrorist attacks that escalate to a worldwide nuclear holocaust.

As the authors in the following articles point out, the *stability* of deterrence is particularly critical in the situations we face today—and will certainly face in the future if we continue to opt for nuclear arms.

The stability of our deterrence posture—and that of the Soviets—should be viewed in terms of a closed system with reactive capabilities, i.e., a feedback system. The stability of such a system can always be improved by increasing the reliability of the system, decreasing “noise” or extraneous signals in the system, and increasing the feedback response time, i.e., by making the system less sensitive to input signals.

In terms of nuclear weapons systems, stability can be improved by (1) increasing warning times available to both sides in a nuclear standoff, (2) decreasing the vulnerabilities of the nuclear weapons systems of both sides, (3) reducing to a minimum the number of nuclear weapons on each side that are used to maintain mutually assured destruction of cities or the population of the opponent, and (4) increasing the reliability of nuclear weapon operations and control systems, to reduce the probability of starting a nuclear conflict by accidental means.

Even if the nations of the world eventually choose to go the route of world government and nuclear

disarmament, it appears highly unlikely that this can be done immediately. Rather, a period of gradual disarmament over a period of several decades appears more likely and would include (1) abandoning the use of accurate Pershing II, cruise missiles, S-20 and other intermediate range, land-based ballistic missile systems, (2) implementing the recommendations of the Palme Commission in establishing a nuclear-free zone between the NATO and Warsaw Pact forces along West Germany's border with East Germany and Czechoslovakia, and (3) opposing the development and use of limited-war strategies, first-use, first-strike and other policies that can lead to escalation and mutual national suicide.

Since, as previously mentioned, the majority of our nuclear problems were generated by past decisionmakers, it is clear that educational tools are needed to inform future decisionmakers about these nuclear problems and instruct them on methods of coping with them. It is anticipated that—to supplement the number of books, magazine articles, filmstrips, videotapes and other educational materials on nuclear subjects currently available—suitable educational curricula will be developed that treat not just the technical and economical aspects of nuclear arms, but also the social, political, environmental and moral implications of the use of such systems.

Frank R. Eldridge



Frank R. Eldridge is a Physicist. He received his Bachelor of Science degree from George Washington University, where he was a student of scientists Edward Teller and George Gamow, and observed the first laboratory demonstration of atom splitting in the United States in 1940. He did graduate work at Johns Hopkins University, where he was Assistant Professor of Physics and Director of the Controls Research Laboratory during the late 1940s. During the 1950s he was Project Leader for Strategic Command Control and Communication Studies at the RAND Corporation. In the 1960s, he served as Special Assistant for Command Control and Communications in the office of the Secretary of Defense and, still later, as Associate Director of Telecommunications Management in the executive office of the President of the United States. Mr. Eldridge has also served on a number of Presidential Task Forces and Study Groups dealing with problems associated with the control of nuclear weapons.