Finally, the hurdle of implementation remains even if the first two are cleared. Can a new strategy be given a convincing coherence? Can its relevance for U.S. national interest be made clear enough to overcome entrenched domestic opposition? And can it respond to Southern interests sufficiently to overcome the present distrust and suspicion long enough to attempt an altered process of North-South diplomatic interaction?

The possibilities of failure are obvious. But so too are the growing costs to the United States of not making the effort. The Havana Conference of the Nonaligned Movement closed the decade of the 1970s with ringing denunciations of the United States and the rest of the North, elegant words of praise for the Soviet Union and the socialist countries, unanimous cries for radical change and no public criticism of oil price increases. If such meetings and manifestos have no impact on international relations, there is no lesson for U.S. foreign policy to be drawn from these events. But if they do, one must ask why a distinct minority element within the NAM appeared to emerge victorious by the end of the 1970s.[17] A significant part of the answer is to be found in a decade of failures in U.S. diplomacy. To overstate the case only slightly, U.S. policies had the cumulative effect of undermining the influence of Southern moderates, constraining rather than enhancing Southern pressures on the OPEC countries to limit oil-price increases, and eventually permitting Southern radicals to seize leadership within major Southern institutions. Despite the recent Soviet assist in weakening that leadership, only altered U.S. policies relating to the South and its constituent units can ensure the transition to a more constructive, flexible and potentially complementary range of diplomatic relationships between the United States and the developing regions of the world.

[17] The appearance was somewhat deceptive, as all who follow NAM infighting well know. In this instance the tenuousness of the radicals' "victory" was underlined by Castro's conciliatory appeals to NAM moderates in his U.N. speech in October 1979, and by the January 1980 U.N. speeches and votes of these same countries opposing Soviet intervention in Afghanistan.

NO.5 - SUMMER 1980

Louis J. Halle

A HOPEFUL FUTURE FOR MANKIND

The first question to which I here address myself is that of what chance humankind has of forever escaping such nuclear warfare as might largely foreclose any possibility of a hopeful future. The second is that of what provision our kind might make for the retention of a hopeful future in any case.

In the largest perspective it is not implausible that life as a whole, having developed for so long and so hopefully on earth, should nevertheless disappear from it at last, leaving it as lifeless as other planets—or leaving it inhabited only by such primitive forms as bacteria. Our sun is only one of some ten trillion similar stars that we may suppose to be attended by planets of which some millions, at least, must possess the environmental characteristics that led to the development of life on earth. It is statistically implausible that, in such a universe, life has arisen only on the equivalent of one otherwise undistinguished speck among vast clouds of dust-specks extending over distances measured in billions of light-years. In the immensity of the universe as a whole, it may be that the extinction of life on one planet among millions of others that support it would be no more important than the death of one fish in an ocean that contained millions. Although a nuclear war would not in itself suffice for the immediate extinction of all human life, let alone all the forms of life on earth, it might contribute importantly to a progressive deterioration of the environmental circumstances on which the most developed forms of life, at least, depend.

What distinguishes us human beings from all the less advanced forms of life on earth is that, having at last become conscious of the challenge of survival, we have consciously undertaken to shape our own future. This requires us to look ahead, even beyond the span of any single generation.

Louis J. Halle, recently retired as Professor at the Graduate Institute of International Studies in Geneva, was a member of the Policy Planning Staff in the U.S. Department of State from 1952 to 1954. He is the author of *Men and Nations*, *The Cold War as History*, *The Ideological Imagination*, *Out of Chaos*, and other works.

II

Virtually the sole device by which our kind has averted a nuclear war during the first generation that has possessed nuclear armaments has been that of mutual nuclear deterrence. Granted an element of moral inhibition against destroying life in cold blood, granted an element of uncertainty in the use of weapons never used before, granted an intuitive fear of reaping the whirlwind, the only strategic device we have yet found for preventing nuclear devastation has been the threat of retaliation in kind. So the two principal powers on earth, the United States and the Soviet Union, confront each other like two fighters who, although each holds a pistol aimed at the other, do not fight. How long can such a situation last?

One may admit that it can last indefinitely without believing that it can last forever. For one thing, it depends on the maintenance of political control in each of the two countries. But all societies are subject to breakdowns that may entail the replacement of internationally responsible government. It happened in Germany in 1933, in Iran in 1979; and it can happen in virtually any of our countries under the extraordinary strains imposed by the rapidly changing political and economic configurations of our rapidly changing world. An ideological or religious fanatic, a Hitler or a Khomeini, rising to power with the support of mobs that have run wild, might not refrain from the use of nuclear weapons if he had them at his disposal. Indeed, he might, in a state of exaltation, feel a historic or a divine mission to use them for the final destruction of evil.

The danger that mutual deterrence will break down is augmented by the prospect of what appears to be, in the long run, a virtually inevitable nuclear proliferation. The argument for the likelihood of this prospect, and for the danger it entails, is too familiar to need restatement here.

There are thinkers worthy of respect who conclude that the only way out is to abolish nuclear arms entirely, liberating the world from their menace by finally doing away with them all. But how, in the world as it is, would this be possible? Perhaps we may look forward to some distant day when all mankind is united and at peace under a world government, and in such a world the abolition and interdiction of weapons of mass destruction would presumably be routine. But even the cultural foundations for such a world have hardly begun to come into existence, so that, like the advent of the Kingdom of Heaven on Earth, its creation must remain an eschatological rather than a working objective. Even if

it should ever become attainable, our problem remains that of surviving, and of keeping civilization in being, until the day when it is realized.

Mr. George Kennan, a responsible man of vision for whom I feel a special respect, believes that nuclear weapons could be eliminated sooner than that. For how else can one interpret his statement, in *The Cloud of Danger*, that "Our concern should be, of course, to achieve the eventual elimination of the nuclear weapon and all other weapons of mass destruction from national arsenals at the earliest possible moment"?[1] Here the persistence of national arsenals, and therefore of sovereign nations, is assumed.

But nuclear weapons or their components can be hidden where even unlimited inspection could hardly discover them, under lakes or mountains, under the sea, even in barns or haystacks. Can one imagine either the United States or the Soviet Union destroying all its nuclear weapons on the mere word of the other that it was doing so? In the world as it is, neither would do it. Nor would France or China.

Indeed, in the world as it is we might well hesitate even to wish for the abolition of nuclear weapons. For it is the existence of these weapons on both sides that, under circumstances of extreme conflict and strain, has so far prevented the outbreak of a Third World War. Surely the first two wars might have been prevented if great nuclear arsenals had, at the time, existed on both sides. If we are to be realistic we have to acknowledge even the cruelest and most ironic truth—if it is indeed the truth.

At this moment in history, whether we like it or not, control is kept by the mere existence of the nuclear arsenals, with their implicit threat. Imagine, now, a situation in which all nuclear weapons disappeared from the earth with a "poof," as if a magician had waved his wand. Immediately the threat or active use of conventional military force would be less restrained, in some cases virtually unrestrained. Surely the whole of Berlin would quickly become part of the realm that lies under the domination of Russia, either by surrender or by the unopposable military occupation of the western sector that the Western powers are pledged to defend. Yugoslavia would suddenly be far less secure in the independence it won for itself in 1948, and this loss of security might well be registered by a renewed submission to Moscow. This is to suggest that certain situations, which have become stabilized over the past generation, would come unstuck,

[1] George Kennan, *The Cloud of Danger*, Boston: Little, Brown and Co., 1977, p. 205.

setting off waves of destabilizing consequences across the world. If these consequences produced a situation similar to those which led up to and culminated in World Wars I and II, the inhibition that has so far prevented World War III would be found lacking. And so we might well be confronted by the disaster that would not otherwise have occurred.

For the feature that distinguished the Third World War from the other two would be that, although it began with conventional arms, its conclusion would be determined by the outcome of a race between the two sides to be the first to rebuild their nuclear arsenals. After all, the knowledge and technology on which the manufacture of nuclear weapons is based would not have been abolished with the weapons themselves. Who can say, then, that the abolition of all nuclear armaments would not, by itself, open the door to the nuclear disaster that might otherwise have been averted?

I am driven to the conclusion that the problem of mankind, today and for an indefinite future, is not that of how to abolish nuclear armaments but that of how to live with them.

Our dilemma, however, is that the prospect of continuing to live with them throughout a future without end seems, at best, doubtful. Ever since the twelfth century, the weapons of war have been getting steadily more terrible, and not only is this continuing but it is accelerating. In our own time weapons have at last become so terrible as to have an inhibiting effect on all impulses to engage in military adventure, and to deter completely the deliberate resort to war on a global scale by any government that, having the capacity to start such a war, also has the disposition and ability to restrain itself. Perhaps this situation could continue for another generation, conceivably it could continue for another thousand years, by which time the evolution of circumstances would surely have transformed the problem in ways we could not now foresee.

However, even if there were as much as a 50 percent chance of averting the holocaust for a thousand years, the inadequacy of such a chance would be cause for extreme alarm. We would want to do something about it if there were anything we could do. This raises the second of my two questions: whether there is, in fact, anything we could do.

Before taking it up I call attention to the fact that a nuclear holocaust is not the only danger that threatens the apparently shrunken and increasingly fragile planet to which we find ourselves confined. Even without such a disaster, the livable environment we now know might be made increasingly unlivable by demographic, industrial or technological developments. The fertility of the earth might be largely lost, the carbon dioxide in the atmosphere might increase disastrously, the layer of ozone that now protects us from excessive ultraviolet radiation might be definitively damaged. This is to say that there are other developments besides that of nuclear armaments which might make the continuation of advanced life on this planet uncertain, if not impossible.

And so I turn to the question of what we might do to save ourselves—which is the question of what we could do, and therefore should do, to make our future both secure and hopeful.

III

It is not unreasonable to assume a probability that human life on earth will, in the course of the next hundred years, suffer global disaster—whether cataclysmically, as in the case of a nuclear holocaust, or gradually, in consequence of economic and political breakdown, the exhaustion of vital resources, or a general transformation of the environment. However, even if the chance of disaster were only one in a hundred, so much is at stake that the question of what might be done about it would still have to be taken seriously.

Let us suppose, what still seems fantastic to most of us, that humankind had established permanent, thriving and proliferating colonies in outer space, detached from the earth although in its vicinity to begin with. Such colonies, supported by unlimited solar energy, would not be dependent for their survival or well-being on our old earth, or on the parent societies which continued to inhabit it as the European societies continued in Europe after the American colonies had been established. Even though the most extreme contingency referred to above, that of the extinction of life on earth, should be realized, human life and civilization would go on in space, constantly proliferating and spreading as new colonies were created to accommodate the ever-increasing populations. Although the horror of what happened on the ancestral earth remained undiminished, the life that had been originally engendered on it would not thereby be extinguished. On the contrary, it would continue, enjoying the prospect of what had now become an unlimited future. Indeed, human civilization would have become essentially unextinguishable.

Assuming the most extreme case of earthly disaster, few readers

of these lines would demur on rational grounds at this resolution of the problem—if they thought it possible. But those who are exposed to it for the first time may be disposed, initially, to regard it either as fantastic in itself, or as possible only in such a distant future that it could be of no immediate concern. Others, who have followed the relevant technological developments and the studies made in the past few years at various American universities, including some under the auspices of the National Aeronautics and Space Administration (NASA), know that the first space colony could almost surely be established early in the coming century, on the basis of present technology alone, if given the highest priority. Without such priority it would take longer and would have that much more chance of coming too late.

Many will be put off by a natural supposition that life in what they think of as a spaceship, a sort of metal capsule jammed with machinery, would hardly be worth living. But this is not what is being projected by those who are working on the project—chiefly at the Space Studies Institute in Princeton under the direction of the physicist, Gerard K. O'Neill. His projected space habitats include towns, villages, wooded and open countryside with birds and butterflies, lakes with fish. They would provide an environment compatible with our spiritual as well as our physical needs.[2] As to these needs, another eminent physicist, Freeman Dyson, has written:

> There are three reasons why, quite apart from scientific considerations, mankind needs to travel in space. The first reason is garbage disposal; we need to transfer industrial processes into space so that the earth may remain a green and pleasant place for our grandchildren to live in. The second reason is to escape material impoverishment: the resources of this planet are finite, and we shall not forego forever the abundance of solar energy and minerals and living space that are spread out all around us. The third reason is our spiritual need for an open frontier. The ultimate purpose of space travel is to bring to humanity, not only scientific discoveries and an occasional spectacular show on television, but a real expansion of our spirit.[3]

[2] Gerard K. O'Neill, *The High Frontier: Human Colonies in Space*, New York: William Morrow and Co., Inc., 1977, pp. 49, 65. In a style that is as engaging as it is persuasive, this book describes the technology needed to transport human colonies to livable habitats in space and the characteristics such colonies might have, including the possibility that they might largely pay for their high initial costs by furnishing solar energy to the earth. O'Neill estimates that the first community in space might be established by 1990, and projects, at least as a technical possibility, ultimate human populations in space of 9.2 million within 20 years after the first colony and of 7.3 billion within 35 years. *Ibid.*, pp. 17, 221.

[3] Freeman Dyson, *Disturbing the Universe*, New York: Harper & Row, 1979, pp. 116–17. Dr. Dyson includes an interesting table comparing the projected costs of the kinds of colonies envisaged by O'Neill with the historic costs of other pioneering emigrations within the earth itself. He concludes: "O'Neill and I have a dream, that one day there will be a free expansion of small groups of private citizens all over the solar system and beyond." *Ibid.*, pp. 123–26.

IV

Even if we did not now confront what is surely the greatest crisis in the history of life on earth, there would still be reason to believe that, in its progressive evolution, life has at last reached the point where it is about to expand into outer space, as if it had been programmed in advance. For, as evolution has a direction, so it has a destiny implicit in that direction; although it might fail to realize that destiny as an infant might be killed by accident before it had realized its own destiny of achieving adulthood.

There is a precedent for what we may properly regard as the imminent emergence of life from the earth's atmosphere into outer space. Up to 350 million years ago, after 3 billion years of evolution, life was still entirely confined to the waters of the earth, which constituted its only natural habitat. But those waters were becoming increasingly crowded. Looking back from our present vantage point we can see that the spreading life of this time was destined to emerge into the "unnatural" environment of what was, for it, the equivalent of outer space, the dry land and aerial atmosphere that stretched above them. It was the development of the amniotic egg in reptiles, the egg with a shell or amnion, that finally made this possible by packaging the liquid environment which was still needed by the germ cell. One can imagine an intelligent fish of the time revolting at the thought of abandoning its familiar water for the "unnatural" and hostile environment of outer space. But it would have been wrong; for the emergence of life from the water, which we may now regard as destined, added immeasurably to its potentiality for further expansion and development. Indeed, as hindsight now enables us to see, all the hopefulness of life turned on this emergence from a traditional confinement. I surmise that all the hopefulness of life now turns on its emergence from its earthly envelope.

The parallel between the position of life then and today is more than metaphorical, for the differences are secondary rather than essential. The fact that today our overcrowded planet is threatened with an increasing poisoning of its environment by the waste products of our spreading civilization, together with the nuclear danger, makes the crisis far more urgent than that of 350 million years ago. But the pace of evolution has been constantly accelerating, especially in the past 10,000 years, during which cultural evolution has come increasingly to supplement and set the pace for biological. Unlike the amniotic egg, produced by genetic evolution, the amniotic spaceship and the amniotic spacesuit,

packaging the environment needed by earthly space travelers, are the technological products of such cultural evolution as can occur in a single generation. So the urgency of the present crisis is matched by the speed with which progress can now be made.

However, the natural conservatism of our human societies, associating security with the womb of Mother Earth, appears to rule out the chance that our kind will realize this possibility of salvation with the dispatch that might otherwise be expected. Although, having regard for what is at stake, we take the view that the highest wisdom would favor top priority for the colonization of outer space, in operative terms we are faced with the immediate competition among rival claims on NASA's shrunken budget.

However, the prospective colonization of space responds, not to the particular problems of the American nation, or of any other nation, but to those of mankind as a whole. (Indeed, in the perspective of three billion years it responds to the problems of life on earth as one categorical whole.) While the American society, by the skills and resources it commands, is best able to give the necessary lead, such an undertaking should properly be global. It should, indeed, be a concern of the United Nations. Therefore one would wish to see the United States, while taking the lead, invite all the other societies of the world to participate, each within the measure of its means. In an ideal view, such an undertaking by mankind as a whole would tend to divert it from its present preoccupation with international conflict, would tend to channel its energies into the pursuit of a great common purpose.

Although we have to recognize that the cultural foundations for the realization of this ideal view are far from existing in the world as it is, what is contemplated here is a matter of degree. The immediate problem is to make a start, and for this one must look first of all to the American nation, with its latent idealism, with its pioneering tradition, with its combined resources of skill, of energy, and of material means.

Today we appear to be approaching the end of an era in which technology has been leading toward disaster. But technology can be used to save as well as to destroy. And, as Freeman Dyson has put it, in words that should appeal particularly to Americans, with their history: "The expansion of life over the universe is a beginning, not an end."

Amory B. Lovins,
L. Hunter Lovins,
Leonard Ross

NUCLEAR POWER AND NUCLEAR BOMBS

After the final no there comes a yes
And on that yes the future of the world depends.
—Wallace Stevens

The nuclear proliferation problem, as posed, is insoluble.

All policies to control proliferation have assumed that the rapid worldwide spread of nuclear power is essential to reduce dependence on oil, economically desirable, and inevitable; that efforts to inhibit the concomitant spread of nuclear bombs must not be allowed to interfere with this vital reality; and that the international political order must remain inherently discriminatory, dominated by bipolar hegemony and the nuclear arms race. These unexamined *assumptions*, which artificially constrain the arena of choice and maximize the intractability of the proliferation problem, underlay the influential Ford-MITRE report and were embodied in U.S. policy initiatives under Gerald Ford and especially Jimmy Carter to slow the spread of plutonium technologies.[1] Identical assumptions underlay the recently concluded multilateral two-year International Nuclear Fuel Cycle Evaluation (INFCE), whose lack of sympathy for those U.S. initiatives is now

[1] *Nuclear Power Issues and Choices: Report of the Nuclear Energy Policy Study Group*, Sponsored by the Ford Foundation, Administered by The MITRE Corporation, Cambridge, Mass: Ballinger Publishing Company, 1977.

Amory B. Lovins, British Representative of Friends of the Earth (FOE), Inc., is a consultant physicist active in energy policy in 15 countries. He works as a team with his wife and colleague L. Hunter Lovins, who is a lawyer, sociologist, political scientist, and forester. Leonard Ross, formerly a California Public Utility Commissioner, now teaches law at the University of California, Berkeley. All three write here in their private capacities. This article summarizes an annotated book to be published in late summer by FOE (124 Spear St., San Francisco, CA 94105) under the title *Proliferation Is the Answer (But What Was the Question?)*. The writing was partly supported by the Lindisfarne Association.