Selected Resources

Len Traubman

The Beyond War movement is the response by thousands of concerned citizens to the increasing threat of nuclear war. This response has evolved because the destructive power of nuclear weapons has brought humanity to the point where continued reliance upon war to resolve conflicts threatens all of civilization and life itself with extinction.

Beyond War is commited to education because we are certain that when the majority of citizens understand the magnitude of the crisis that confronts humanity they will demand a change. Beyond War is convinced that a change in the way we think about war and consequently the way we act is possible.

The Beyond War educational activities are made possible by the volunteer contributions of time, talent and money given by men and women who are active in all walks of life.

"I know of no safe repository of the ultimate power of society but the people. And if we think them not enlightened enough, the remedy is not to take the power from them, but to inform them by education."

Thomas Jefferson, 1820

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INTRODUCTION

"With the unleashed power of the atom everything has changed save our modes of thinking and we thus drift toward unparalleled catastrophe."

Albert Einstein made this profound observation in 1946 when he sent a telegram to leaders in the United States. For 40 years humanity has failed to understand the totality of the changes that Einstein foresaw because many of us hold to the "great illusions" of our time — illusions that must be dispelled in order to end the *drift* toward catastrophe.

A Nuclear War Would Be Survivable.

Everyone agrees that nuclear war would be horrible, unspeakably devastating, and that hundreds of millions of people will perish. *But,* we still believe humanity will survive. That is an illusion!

In an experiment demonstrating drift, scientists placed frogs in a container of hot water and the frogs responded immediately by jumping out. Then the scientists placed the same frogs in a container of cool water and slowly heated it up. The change in temperature was so gradual that the frogs never registered the change, never jumped out, and boiled to death.

We face a similar situation with the number of nuclear warheads in the world today. For example, looking just at strategic warheads (those that can be delivered across continents), the United States has about 10,000 such warheads and the Soviet Union has about 8,000. Of course, we do not know where the Soviet warheads are targeted, and so let us estimate the damage to California via the "fair share" formula. California consists of 10% of the U.S. population, so let us assume that we will be hit by 800 Soviet strategic warheads in the event of a full scale nuclear war. Now, take a look at a map of California and identify all the cities of moderate or large size. There are 97 such cities. What about the 700 other warheads? The point is simply that the scale of this drift toward catastrophe has reached such proportions that the notion that society will survive such a war is naive.

"...DESTRUCTION WILL BE BOTH RECIPROCAL AND COMPLETE..."

As far back as 1956, President Dwight D. Eisenhower was sensible enough to realize the extent of catastrophe posed by a nuclear arms race. In a confidential letter to Richard Simon, then President of Simon & Schuster, Eisenhower responded to the idea that America must begin stockpiling nuclear armaments to counter the growing Soviet threat. Eisenhower wrote:

> *"(The) problem is not merely man against man or nation against nation. It is man against war... When we get to the point, as we one day will, that both sides know that in any outbreak of general hostilities, regardless of the element of surprise, destruction will be both reciprocal and complete, possibly we will have enough sense to meet at the conference table with the understanding that the era of armaments has ended and the human race must conform its actions to this truth or die".*

To put it simply, there will be no survival in a nuclear war.

It Will Not Happen.

We tend to feel, once we realize the horror of coming war, that it is so awful we simply would not allow it to happen. The psychology of deterrence will prevent it; the President will prevent it; "they" will prevent it; *God* will prevent it! The unfortunate truth is that it is *inevitable*, given the nature of war.

A conventional war among the superpowers would escalate very quickly. General Bernard Rogers, the current NATO Supreme Allied Commander in Europe, stated forthrightly that atomic war would erupt within "a few days" of any Soviet invasion of Western Europe.

What about deterrence? History teaches us another sad lesson regarding the inevitability of General war as our weapons become more and more

powerful. Every weapon that represents a major technological breakthrough has been heralded as the weapon that will end war. Alfred Nobel, the inventor of dynamite, thought he had invented the end of war. Hiram Maxim, the inventor of the machine gun, thought he had invented the ultimate deterrent. Orville Wright thought the same thing about the invention of airplanes.

"...THE PROBLEM IS OUR WILLINGNESS TO USE WAR..."

The point is simple: no weapon system has ever been devised that has not been used!

It is important, however, to remember that nuclear weapons are only the symptom, not the problem. the problem is our willingness to use war as the ultimate arbiter of differences between nations. We may not annihilate ourselves with nuclear weapons at all; we may do it with chemical weapons, biological weapons, lasers, or particle beams from space. Or we may use a technological device that we have not even thought of yet. The point is that we will annihilate ourselves if we continue to view war as an acceptable means to resolve conflict.

In conclusion: the extinction of the human race is inevitable . . . if we go to war.

I Cannot Make a Difference.

The issue seems to us larger than life. How can we affect what Kadafi, Gorbachev, or even Caspar Weinberger do? Some of this feeling may have originated from irresponsibility. We would rather build a career or be with our families with what spare time is available. In a famous and, to most people, a surprising speech made in 1961, General Douglas MacArthur said:

> *"Many will tell you with mockery and ridicule that the abolition of war can be only a dream... But we must go on or we will go under... We are in a new era. We must have new thoughts, new ideas, new concepts... We must have sufficient imagination and courage to translate the universal wish for peace — which is rapidly becoming a universal necessity — into actuality."*

The truth is that the United States must take the lead in creating peace, and that movement begins with the individual citizen. The Soviet Union is probably incapable of generating such a movement because they tend to react rather than initiate. They are "counterpunchers." We can continually put forth new weapons, and they will counterpunch those. Or we can employ our creativity to offer fresh initiatives toward the very long and very difficult road to a world beyond war.

In the United States individuals are the key to change. Political movements of consequence have begun with a handful of people, not the government. The end of slavery, the end of child labor, and the creation of women's suffrage are cases in point.

In the field of armaments, one positive example, the Test Ban Treaty, also began by the concerns of only a few people. A handful of mothers worried about the effects of strontium 90, a byproduct from radioactive fallout in the atmosphere, organized a movement that successfully pressured President John Kennedy to take decisive action. He unilaterally stopped all U.S. atmospheric testing pending an attempt to reach a bilateral agreement with the Soviets. Averill Harriman was dispatched to negotiate with the Soviets, and 13 days later he returned from Moscow with the treaty that has been respected by both nations.

That is how the process of change works in a free society such as ours. Individuals can and do make a difference.

THINKING PEACE

There is no longer such a thing as individual security or national security. There is planetary security or there is no security. The destruction of all we value, if it comes, will originate from a nation acting out of fear for its existence.Therefore, it is in our self-interest to assure every nation on earth of its existence.

As Einstein noted, this task will require a change in our mode of thinking. The change must be no less fundamental than using our human capacity to grasp the truth, to see that we must "mutate" our drive to survive. Instead of thinking in terms of national survival, we must realize that survival today means ensuring the well-being of the entire, interconnected global system.

Our old mode of thinking — using war and the threat of war to secure the national interest — is the threat to our survival. We must use the desire for survival by transforming it to include global survival and a vision that rallies nations to the defense of all life on this planet. The only enemy to be annihilated is ignorance.

KNOWLEDGE

War Is Obsolete

"With thousands of nuclear explosives in the world everyone must come to understand that a military solution of any kind is not a solution at all."

Victor F. Weisskopf, Physicist
Professor Emeritus, MIT
Physics Today, March, 1983

"Unconditional war can no longer lead to unconditional victory. It can no longer serve to settle disputes. It can no longer be of concern to great powers alone. For a nuclear disaster, spread by winds and waters and fear, could well engulf the great and the small, the rich and the poor, the committed and the uncommitted alike. Mankind must put an end to war or war will put an end to mankind."

John F. Kennedy
Sept. 25, 1961
Address to the United Nations

"War in our time has become an anachronism. Whatever the case in the past, war in the future can serve no useful purpose. A war which becomes general, as any limited action might, could only result in the virtual destruction of mankind."

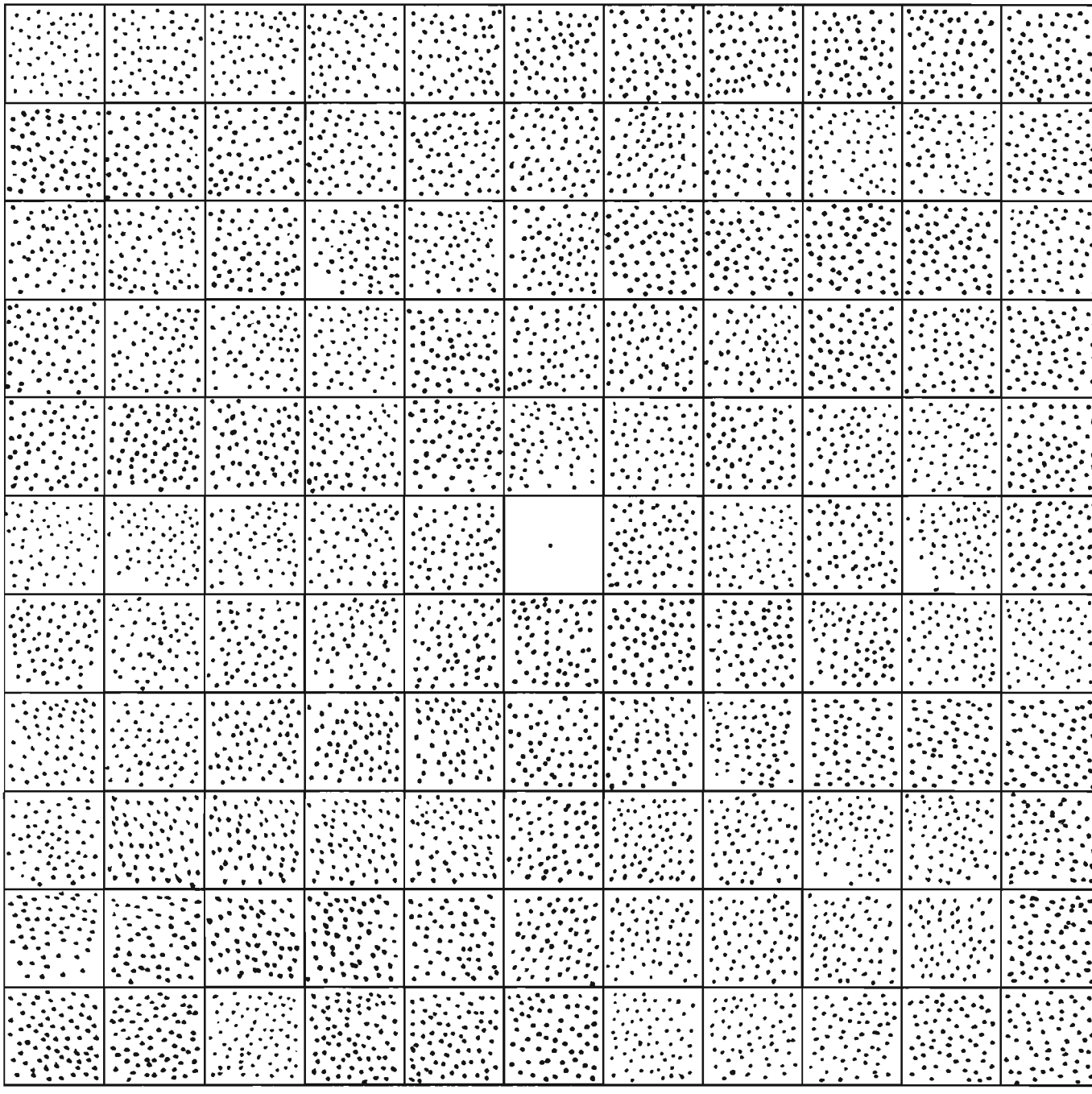
President Dwight D. Eisenhower
Speech, July, 1957

"The very triumph of scientific annihilation (the atom bomb) has destroyed the possibility of war's being a medium for the practical settlement of international differences... Global war has become a Frankenstein to destroy both sides. No longer is it a weapon of adventure — the shortcut to international power. If you lose, you are annihilated. If you win, you stand only to lose... (War) contains only the germs of double suicide. (Abolishing war) is the one issue upon which both sides can agree, for it is the one issue upon which both sides will profit equally. It is the one issue — and the only decisive one — in which the interests are completely parallel. It is the one issue which, if settled, might settle all others."

General Douglas MacArthur
Speech, 1961

"The threat of the atom bomb cannot be met by removing the bomb alone. It can only be met by removing war, by establishing world peace... If a new world war comes, atom bombs are sure to fall. If an atomic holocaust is to be averted, no world war must break out. Every little war threatens to set off a world war. So there must be no more war."

Karl Jaspers, German Philosopher
The Future of Mankind
Awarded German Peace Prize, 1958



FIREPOWER CHART

1 DOT - represents the firepower contained in all the aerial bombing by all the combatants during World War II (1939 - 1945), including the bombs dropped on Hiroshima and Nagasaki: 3 megatons (3 million tons TNT).

8 DOTS - represents the firepower contained in the nuclear missiles of 1 Trident submarine: 24 megatons. This is enough firepower to destroy every major city in the northern hemisphere.

6,000 DOTS - represents the explosive power in the nuclear arsenals of the superpowers today: 18,000 megatons. The United States and the Soviet Union share this firepower with approximately equal destructive capability.

Detonation of a little more than one square could cause a "nuclear winter"

SOURCE: Center for Defense Information
303 Capitol Gallery West, 600 Maryland Ave. S.W., Washington D.C. 20024

A distinguished scientist reveals startling new findings

THE NUCLEAR WINTER

By Carl Sagan, David Duncan Professor of Astronomy and Space Sciences and director of the Laboratory for Planetary Studies at Cornell University.

EXCEPT FOR FOOLS AND MADMEN, everyone knows that nuclear war would be an unprecedented human catastrophe. A more or less typical strategic warhead has a yield of 2 megatons, the explosive equivalent of 2 million tons of TNT. But 2 million tons of TNT is about the same as all the bombs exploded in World War II — a single bomb with the explosive power of the entire Second World War but compressed into a few seconds of time and an area 30 or 40 miles across.

In a 2-megaton explosion over a fairly large city, buildings would be vaporized, people reduced to atoms and shadows, outlying structures blown down like matchsticks and raging fires ignited. And if the bomb were exploded on the ground, an enormous crater, like those that can be seen through a telescope on the surface of the Moon, would be all that remained where midtown once had been. There are now more than 50,000 nuclear weapons, more than 13,000 megatons of yield, deployed in the arsenals of the United States and the Soviet Union — enough to obliterate a million Hiroshimas.

But there are fewer than 3,000 cities on the Earth with populations of 100,000 or more. You cannot find anything like a million Hiroshimas to obliterate. Prime military and industrial targets that are far from cities are comparatively rare. Thus, there are vastly more nuclear weapons than are needed for any plausible deterrence of a potential adversary.

Nobody knows, of course, how many megatons would be exploded in a real nuclear war. There are some who think that a nuclear war can be "contained," bottled up before it runs away to involve much of the world's arsenals. But a number of detailed analyses, wargames run by the U.S. Department of Defense, and official Soviet pronouncements all indicate that this containment may be too much to hope for. Once the bombs begin exploding, communications

"...MORE THAN 2 BILLION PEOPLE — ALMOST HALF OF ALL THE HUMANS ON EARTH — WOULD BE DESTROYED IN THE IMMEDIATE AFTERMATH..."

failures, disorganization, fear, the necessity of making in minutes decisions affecting the fates of millions, and the immense psychological burden of knowing that your own loved ones may already have been destroyed are likely to result in a nuclear paroxysm. Many investigations, including a number of studies for the U.S. government, envision the explosion of 5,000 to 10,000 megatons — the detonation of tens of thousands of nuclear weapons that now sit quietly, inconspicuously, in missile silos, submarines and long-range bombers, faithful servants awaiting orders.

The World Health Organization, in a recent detailed study chaired by Sune K. Bergstrom (the 1982 Nobel laureate in physiology and medicine), concludes that 1.1 billion people would be killed outright in such a nuclear war, mainly in the United States, the Soviet Union, Europe, China and Japan. An additional 1.1 billion people would suffer serious injuries and radiation sickness, for which medical help would be unavailable. It thus seems possible that more than 2 billion people — almost half of all the humans on Earth — would be destroyed in the immediate aftermath of a global thermonuclear war. This would represent by far the greatest disaster in the history of the human species and, with no other adverse effects, would probably be enough to reduce at least the Northern Hemisphere to a state of prolonged agony and barbarism. Unfortunately, the real situation would be much worse.

"SCIENTISTS INITIALLY UNDERESTIMATED THE EFFECTS OF NUCLEAR EXPLOSIONS. WHAT ELSE HAVE WE OVERLOOKED?"

In technical studies of the consequences of nuclear weapons explosions, there has been a dangerous tendency to underestimate the results. This is partly due to a tradition of conservatism which generally works well in science but which is of more dubious applicability when the lives of billions of people are at stake. In the Bravo test of March 1, 1954, a 15-megaton thermonuclear bomb was exploded on Bikini Atoll. It had about double the yield expected, and there was an unanticipated last-minute shift in the wind direction. As a result, deadly radioactive fallout came down on Rongelap in the Marshall Islands, more than 200 kilometers away. Almost all the childern on Rongelap subsequently developed thyroid nodules and lesions, and other long-term medical problems, due to the radioactive fallout.

Likewise, in 1973, it was discovered that high-yield airbursts will chemically burn the nitrogen in the upper air, converting it into oxides of nitrogen; these, in turn, combine with and destroy the protective ozone in the Earth's stratosphere. The surface of the Earth is shielded from deadly solar ultraviolet radiation by a layer of ozone so tenuous that, were it brought down to sea level, it would be only 3 millimeters thick. Partial destruction of this ozone layer can have serious consequences for the biology of the entire planet.

These discoveries, and others like them, were made by chance. They were largely unexpected. And now another consequence — by far the most dire — has been uncovered, again more or less by accident.

The U.S. Mariner 9 spacecraft, the first vehicle to orbit another planet, arrived at Mars in late 1971. The planet was enveloped in a global dust storm. As the fine particles slowly fell out, we were able to measure temperature change in the atmosphere and on the surface. Soon it became clear what had happened.

The dust, lofted by high winds off the desert into the upper Martian atmosphere, had absorbed the incoming sunlight and prevented much of it from reaching the ground. Heated by the sunlight, the dust warmed the adjacent air. But the surface, enveloped in partial darkness, became much chillier than usual. Months later, after the dust fell out of the atmosphere, the upper air cooled and the surface warmed, both returning to their normal conditions. We were able to calculate accurately, from how much dust there was in the atmosphere, how cool the Martian surface ought to have been.

Afterwards, I and my colleagues, James B. Pollack and Brian Toon of NASA's Ames Research Center, were eager to apply these insights to the Earth. In a volcanic explosion, dust aerosols are lofted into the high atmosphere. We calculated by how much the Earth's global temperature should decline after a major volcanic explosion and found that our results (generally a fraction of a degree) were in good accord with actual measurements. Joining forces with Richard Turco, who has studied the effects of nuclear weapons for many years, we then began to turn our attention to the climatic effects of nuclear war. [The scientific paper, "Global Atmospheric Consequences of Nuclear War," is written by R.P. Turco, O.B. Toon, T.P. Ackerman, J.B. Pollack and Carl Sagan. From the last names of the authors, this work is generally referred to as "TTAPS".]

"...WHAT I AM ABOUT TO DESCRIBE IS HORRIFYING..."

We knew that nuclear explosions, particularly groundbursts, would lift an enormous quantity of fine soil particles into the atmosphere (more than 100,000 tons of fine dust for every megaton exploded in a surface burst). Our work was further spurred by Paul Crutzen of the Max Planck Institute for Chemistry in Mainz, West Germany, and by John Birks of the University of Colorado, who pointed out that huge quantities of smoke would be generated in the burning of cities and forests following a nuclear war.

Ground bursts — at hardened missile silos, for example — generate fine dust. Airbursts — over cities and unhardened military installations — make fires and therefore smoke. The amount of dust and soot generated depends on the conduct of the war, the yields of the weapons employed and the ratio of groundburst to airburst. So we ran computer models for several dozen different nuclear war scenarios. Our baseline case, as in many other studies, was a 5000-megaton war with only a modest fraction of the yield (20 percent) expended on urban or industrial targets. Our job, for each case, was to follow the dust and smoke generated, see how much sunlight was absorbed and by how much the temperatures changed, figure out how the particles spread in longitude and latitude, and calculate how long before it all fell out of the air back onto the surface. Since the radioactivity would be attached to these same fine particles, our calculations also revealed the extent and timing of the subsequent radioactive fallout.

Some of what I am about to describe is horrifying. I know, because it horrifies me. There is a tendency — psychiatrists call it "denial" — to put it out of our minds, not to think about it. But if we are to deal intelligently, wisely, with the nuclear arms race, then we must steel ourselves to contemplate the horrors of nuclear war.

The results of our calculations astonished us. In the baseline case, the amount of sunlight at the ground was reduced to a few percent of normal — much darker, in daylight, than in a heavy overcast and too dark for plants to make a living from photosynthesis. At least in the Northern Hemisphere, where the great preponderance of strategic targets lies, an unbroken and deadly gloom would persist for weeks.

"...VIRTUALLY ALL CROPS AND FARM ANIMALS,...WOULD BE DESTROYED..."

Even more unexpected were the temperatures calculated. In the baseline case, land temperatures, except for narrow strips of coastline, dropped to minus 25° Celsius (minus 13° Fahrenheit) and stayed below freezing for months — even for a summer war. (Because the atmospheric structure becomes much more stable as the upper atmosphere is heated and the lower air is cooled, we may have severely *under* estimated how long the cold and the dark would last.) The oceans, a significant heat reservoir, would not freeze, however, and a major ice age would probably not be triggered. But because the temperatures would drop so catastrophically, virtually all crops and farm animals, at least in the Northern Hemisphere, would be destroyed, as would most varieties of uncultivated or undomesticated food supplies. Most of the human survivors would starve.

In addition, the amount of radioactive fallout is much more than expected. Many previous calculations simply ignored the intermediate time-scale fallout. That is, calculations were made for the prompt fallout — the plumes of radioactive debris blown downwind from each target — and for the long-term fallout, the fine radioactive particles lofted into the stratosphere that would descend about a year later, after most of

the radioactivity had decayed. However, the radioactivity carried into the upper atmosphere (but not as high as the stratosphere) seems to have been largely forgotten. We found for the baseline case that roughly 30 percent of the land at northern midlatitudes could receive a radioactive dose greater than 250 rads, and that about 50 percent of northern midlatitudes could receive a dose greater than 100 rads. A 100-rad dose is the equivalent of about 1000 medical X-rays. A 400-rad dose will, more likely than not, kill you.

The cold, the dark and the intense radioactivity, together lasting for months, represent a severe assault on our civilization and our species. Civil and sanitary services would be wiped out. Medical facilities, drugs, the most rudimentary means for relieving the vast human suffering, would be unavailable. Any but the most elaborate shelters would be useless, quite apart from the question of what good it might be to emerge a few months later. Synthetics burned in the destruction of the cities would produce a wide variety of toxic gases, including carbon monoxide, cyanides, dioxins and furans. After the dust and soot settled out, the solar ultraviolet flux would be much larger than its present value. Immunity to disease would decline. Epidemics and pandemics would be rampant, especially after the billion or so unburied bodies began to thaw. Moreover, the combined influence of these severe and simultaneous stresses on life are likely to produce even more adverse consequences — biologists call them synergisms — that we are not yet wise enough to foresee.

So far, we have talked only of the Northern Hemisphere. But it now seems — unlike the case of a single nuclear weapons test — that in a real nuclear war, the heating of the vast quantities of atmospheric dust and soot in northern midlatitudes will transport these fine particles toward and across the Equator. We see just this happening in Martian dust storms. The Southern Hemisphere would experience effects that, while less severe than in the Northern Hemisphere, are nevertheless extremely ominous. The illusion with which some people in the Northern Hemisphere reassure themselves — catching an Air New Zealand flight in a time of serious international crisis, or the like — is now much less tenable, even on the narrow issue of personal survival for those with the price of a ticket.

"COULD WE HAVE OVERLOOKED SOME IMPORTANT EFFECT?"

But what if nuclear wars *can* be contained, and much less than 5000 megatons is detonated? Perhaps the greatest surprise in our work was that even small nuclear wars can have devastating climatic effects. We considered a war in which a mere 100 megatons were exploded, less than one percent of the world arsenals, and only in low-yield airbursts over cities. This scenario, we found, would ignite thousands of fires, and the smoke from these fires alone would be enough to generate an epoch of cold and dark almost as severe as in the 5000-megaton case. The threshold for what Richard Turco has called The Nuclear Winter is very low.

Could we have overlooked some important effect? The carrying of dust and soot from the Northern to the Southern Hemisphere (as well as more local atmospheric circulation) will certainly thin the clouds out over the Northern Hemisphere. But, in many cases, this thinning would be insufficient to render the climatic consequences tolerable — and every time it got better in the Northern Hemisphere, it would get worse in the Southern.

Our results have been carefully scrutinized by more than 100 scientists in the United States, Europe and the Soviet Union. There are still arguments on points of detail. But the overall conclusion seems to be agreed upon: there are severe and previously unanticipated global consequences of nuclear war — subfreezing temperatures in a twilight radioactive gloom lasting for months or longer.

Scientists,who initially underestimated the effects of fallout, were amazed that nuclear explosions in space disabled distant satellites, had no idea that the fireballs from high-yield thermonuclear explosions could deplete the ozone layer and missed altogether the possible climatic effects of nuclear dust and smoke. What else have we overlooked?

"THERE IS NO MORE IMPORTANT OR MORE URGENT ISSUE"

Nuclear war is a problem that can be treated only theoretically. It is not amenable to experimentation. Conceivably, we have left something important out of our analysis, and the effects are more modest than we calculate. On the other hand, it is also possible — and, from previous experience, even likely — that there are further adverse effects that no one has yet been wise enough to recognize. With billions of lives at stake, where does conservatism lie — in assuming that the results will be better than we calculate, or worse?

Many biologists, considering the nuclear winter that these calculations describe, believe they carry somber implications for life on Earth. Many species of plants and animals would become extinct. Vast numbers of surviving humans would starve to death. The delicate ecological relations that bind together organisms on Earth in a fabric of mutual dependency would be torn, perhaps irreparably. There is little question that our global civilization would be destroyed. The human population would be reduced to prehistoric levels, or less. Life for any survivors would be extremely hard. And there seems to be a real possibility of the extinction of the human species.

It is now almost 40 years since the invention of nuclear weapons. We have not yet experienced a global thermonuclear war — although on more than

one occasion we have come tremulously close. I do not think our luck can hold forever. Men and machines are fallible, as recent events remind us. Fools and madmen do exist, and sometimes rise to power. Concentrating always on the near future, we have ignored the longterm consequences of our actions. We have placed our civilization and our species in jeopardy.

Fortunately, it is not yet too late. We can safeguard the planetary civilization and the human family if we so choose. There is no more important or more urgent issue.

NEWS RELEASE

Press Briefing on CSIS Report "REDUCING THE RISKS OF NUCLEAR WAR"

Excerpts from Opening Comments of Eugene V. Rostow, March 4, 1985

"The Report stresses... that the major risk of nuclear war is through escalation from conventional war. Policy cannot and must not assume that the fallible human beings who control both nuclear and conventional weapons could indefinitely refrain from using nuclear weapons under the stress of battle. It follows, therefore, that it will be impossible to eliminate the serious risk of nuclear war without eliminating war itself."

"To me, that is the principal moral of our Report, and it is a thesis of the utmost importance."

Eugene V. Rostow, Co-chairman of Report
Former Director, Arms Control and Disarmament Agency
Co-founder, Committee on the Present Danger
Former Undersecretary of State

Center for Strategic & International Studies, Georgetown University
1800 K Street N.W., Suite 400, Washington, D.C. 20006

KNOWLEDGE

We Are One

''The human family is only one small and very recent addition to a much larger family in a tree extending back at least 3.5 billion years. Our common ancestor was a single cell from which all subsequent cells derived... It was less than a billion years ago that cells like ours appeared in the first marine invertebrates. Some of the joiners, bacteria that had learned how to use oxygen, are with us still, lodged inside the cells of all animals, all plants, moving us from place to place and doing our breathing for us.''

''The existence of these beings in my cells is enough to relate me to the... tree in my backyard and to the squirrel in that tree... We have an enormous family to look after. We can acknowledge the family ties and with them, obligations.''

Lewis Thomas, M.D., Biologist
''On Altruism''
Discover, March, 1982

''This crisis is essentially a crisis of perception... It derives from the fact that we are trying to apply the concepts of an outdated world view - the mechanistic world view of Cartesian- Newtonian science - to a reality that can no longer be understood in terms of those concepts. We live today in a globally inter-connected world in which biological, psychological, social and environmental phenomena are all interdependent.''

Fritjof Capra, Physicist
The Turning Point, 1977

''There is a new reality - that man is a part of the cosmos and that, just as the individual cell needs the organism of which it is a part, mankind needs - and therefore cannot destroy - his world. Wisdom is becoming the new criterion of fitness.''

Jonas Salk, M.D.
''A Conversation...''
Psychology Today, March, 1983

''The survival of the fittest does not mean those fit to kill; it means those fitting in best with the rest of life.''

Lewis Thomas, M.D., Biologist
''Are We Fit to Fit In?''
Amicus Journal, Summer 1981

''If our aim is to save humanity, we must respect the humanity of every person. For who would be the enemy?''

Jonathan Schell
The Fate of the Earth, 1982

"The nation which indulges toward another an habitual hatred or an habitual fondness is in some degree a slave. It is a slave to its animosity or to its affection... Antipathy in one nation against another disposes each more readily to offer insult and injury, to lay hold of slight causes of umbrage, and to be haughty and intractable when accidental or trifling occasions of dispute occur."

George Washington
Farewell Address, 1796

"From one day to another, another nation is made out to be utterly depraved and fiendish, while one's own nation stands for everything that is good and noble. Every action of the enemy is judged by one standard; every action of oneself by another. Even good deeds by the enemy are considered a sign of particular devilishness, meant to deceive the world, while our deeds are necessary and justified by our noble goals which they serve."

Erich Fromm, Psychologist
May Man Prevail? 1961

"If we insist on demonizing the Soviet leaders - on viewing them as total and incorrigible enemies, consumed only by their fear or hatred of us and dedicated to nothing other than our destruction - that, in the end, is the way we shall assuredly have them, if for no other reason than that our view of them allows for nothing else, either for us or for them."

George Kennan, 1981
Former Ambassador to the USSR

"Einstein said, after he saw the first explosion of a nuclear weapon, that 'all men have become brothers'... Man must come to recognize that his fate is linked with that of his fellow man throughout the world. If we recognize and act upon this simple truth, mankind may proceed to a higher level of human development."

Kenneth Melmon, M.D.
Chairman, Dept. of Medicine
Stanford University, October, 1983

"A human being is part of the whole, called by us the universe. A part limited in time and space. He experiences himself, his thoughts and feelings, as something separate from the rest, a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures."

Albert Einstein
Quoted in **America Without Violence**
Michael Nagler, 1982

On the Uncertainty of SCIENCE

"The endeavor is not, as is sometimes thought, a way of building a solid, indestructible body of immutable truth, fact laid precisely upon fact in the manner of twigs in an ant hill. □ Science is not like this at all: it keeps changing, shifting, revising, discovering that it was wrong and then heaving itself explosively apart to redesign everything. □ It is a living thing, a celebration of human fallibility. At it's very best, it is rather like an embryo."

By Lewis Thomas

Puzzlement is an identifying characteristic of the human species, genetically governed, universal, and a central determinant of human behavior. I can go this far with sociobiology, but then, influenced by this human trait, my mind falls away in confusion. Uncertainty, the sure sense that the ground is shifting at every step, is one of the marks of humanity. We keep changing our minds together, in a biological process rather similar, in its outlines, to evolution itself.

The great body of science, built like a vast hill over the past three hundred years, is a mobile, unsteady structure, made up of solid-enough single bits of information, but with all the bits always moving about, fitting together in different ways, adding new bits to themselves with flourishes of adornment as though consulting a mirror, giving the whole arrangement something like the unpredictability and unreliability of living flesh. Human knowledge doesn't stay put, it evolves by what we call trial and error, or, as is more usually the sequence, error and trial.

Other animals differ from us in this respect. Each of them has at least one thing to be very good at, even superlatively skilled, surefooted. Any beetle can live a flawless, impeccable life, infallible in the business of procreating beetles. Not us: we are not necessarily good at anything in particular except language, and using this we tend to get things wrong. It is built into our genes to veer off from the point; somehow we have been selected in evolution for our gift of ambiguity.

This is how we fell into the way of science. The endeavor is not, as is sometimes thought, a way of building a solid, indestructible body of immutable truth, fact laid precisely upon fact in the manner of twigs in an ant hill. Science is not like this at all: it keeps changing, shifting, revising, discovering that it was wrong and then heaving itself explosively apart to redesign everything. It is a living thing, a celebration of human fallibility. At its very best, it is rather like an embryo.

Ordinarily scientists do not talk this way about their trade, because there is always in the air the feeling that this time we have it right, this time we are about to come into possession of a finished science, knowing almost everything about everything. Biology has been moving so fast, in just the last few years, that there is some risk of making it seem nearly complete, at the very stage in its development when it is, in real life, just getting ready to take off. It is nothing *like* finished, it is only just at its beginning.

We are in trouble whenever persuaded that we know everything. Today, an intellectually fashionable view of man's place in nature is that there is really no great problem: the plain answer is that it makes no sense, no sense at all. The universe is meaningless for human beings: we bumbled our way into the place by a series of random and senseless biological accidents. The sky is not blue: this is an optical illusion - the sky is black. You can walk on the moon if you feel like it, but there is nothing to do there except look at the earth, and when you've seen one earth you've seen them all. The animals and plants of the planet are at hostile odds with one another, each bent on elbowing any nearby neighbor off the earth. Genes, tapes of polymer, are the ultimate adversaries and, by random, the only real survivors.

This grasp of things is sometimes presented as though based on science, with the implication that we already know most of the important knowable matters and this is the way it all turns out. It is the wisdom of the twentieth century, contemplating as its only epiphany the news that the world is an absurd apparatus and we are stuck with it, and in it.

In the circumstance, we would surely have no obligations except to our individual selves, and of course to the genes coding out the selves.

I believe something considerably less than this. I take it as an article of faith that we humans are a profoundly immature species, only now beginning the process of learning how to learn. Our most spectacular biological attribute, which identifies us as our particular sort of animal, is language, and the deep nature of this gift is a mystery. We are aware of our consciousness, but we cannot even make good guesses as to how this awareness arises in our brains — or even, for that matter, that it does arise there for sure. We do not understand how a solitary cell, fused from two, can differentiate into an embryo and then into the systems of tissues and organs that become us, nor do we know how a tadpole accomplished his emergence, or even a flea. We can make up instant myths, transiently satisfying but always subject to abandonment, about the origin of life on the planet. We do not understand why we make music, or dance, or paint, or write poems. We are bewildered, especially in this century by the pervasive latency of love.

The thing about us that should astonish biologists more than it does is that we are so juvenile a species. By evolutionary standards of time we have only just arrived on the scene, fumbling with our new thumbs, struggling to find our legs under the weight and power of our new brains. We are the newest and most immature of all significant animals, perhaps a million or so years along as the taxonomists would define us, but probably only some thousands of years as communal, speaking creatures, uniquely capable of manufacturing metaphors and therefore recognizable as human.

Our place in the life of the world is still unfathomable because we have so much to learn, but it is surely not absurd. We matter. For a time, anyway, it looks as though we will be responsible for the thinking of the system, which seems to mean, at this stage, the responsibility not to do damage to the rest of the life if we can help it. This is in itself an immensely complicated problem, in view of our growing numbers and the demands we feel compelled to make on the planet's resources. There is no hope of thinking our way through the quandary except by learning more, and part of the learning (not all of it, mind you, but a good part) can only be achieved by science, more and better science — not for our longevity or comfort or affluence but for comprehension, without which our long survival is unlikely.

The culmination of a liberal-arts education ought to include, among other matters, the news that we do not understand a flea, much less the making of a thought. We can get there someday if we keep at it, but we are nowhere near, and there are mountains and centuries of work still to be done.

"THE URGE TO FORM PARTNERSHIPS, TO LINK UP IN COLLABORATIVE ARRANGEMENTS, IS PERHAPS THE OLDEST, STRONGEST, AND MOST FUNDAMENTAL FORCE IN NATURE."

One major question needing to be examined is the general *attitude* of nature. A century ago there was a consensus about this: nature was "red in tooth and claw," evolution was a record of open warfare among competing species, the fittest were the strongest aggressors, and so forth. Now it begins to look different. The tiniest and most fragile of organisms dominate the life of the earth: the chloroplasts inside the cells of plants, which turn solar energy into food and supply the oxygen for breathing, appear to be the descendants of ancient blue-green algae, living now as permanent lodgers within the cells of "higher" forms: the mitochondria of all nucleated cells, which serve as engines for all the functions of life, are the progeny of bacteria that took to living as cells inside cells long ago. The urge to form partnerships, to link up in collaborative arrangements, is perhaps the oldest, strongest, and most fundamental force in nature. There are no solitary, free-living creatures: every form of life is dependent on other forms. The great successes in evolution, the mutants who have, so to speak, made it, have done so by fitting in with, and sustaining, the rest of life. Up to now we might be counted among the brilliant successes, but flashy and perhaps unstable. We should go warily into the future, looking for ways to be more useful, listening more carefully for the signals, watching our steps, and having an eye out for partners.

The greatest single achievement of nature to date was surely the invention of the molecule of DNA. We have had it from the very beginning, built into the first cell to emerge, membranes and all, somewhere in the soupy water of the cooling planet three thousand million years or so ago. All of today's DNA, strung through all the cells of the earth, is simply an extension and elaboration of that first molecule. In a fundamental sense we cannot claim to have made progress, since the method used for growth and replication is essentially unchanged.

It is a lucky thing for us that nature has exhibited such restraint and good taste in evolution. Given brains of the size and complexity of ours, capable of manufacturing an infinity of sentences in strings long enough to stretch from here to the sun and back again, we are given at the same time a sense of limitation, preventing us from settling all our affairs once and for all by words alone. In a lesser world, we might have been condemned long ago to string out one huge set of sentences, wrapping ourselves in a cocoon of changeless words, immutable, in which to live forever, like the termites who can never revolutionize the inner structure of their hills. We, in contrast, can make up new thoughts whenever we feel like it. Nature has been kind to us, leaving us leeway, never piling it on too much. Having been given brains with a certain power but limited by a certain fallibility, we are better equipped for finding our way through the future. Our minds are like our hands: it was a marvelous thing to come down from the trees with an opposing thumb, the language maker of the hand, but that was good enough for our needs, and we can be eternally grateful not to have, as we might have had, brains, that are all thumbs.

But maybe, given the fundamental instability of the molecule, it had to turn out this way. After all, if you have a mechanism designed to keep changing the ways of living, and if all the new forms have to fit together as they plainly do, with symbiotic living all over the place, and if every improvised new gene representing an embellishment in an individual is likely to be selected for the species if it turns out to be useful for others, and if you have enough time, maybe the system is simply bound to develop brains sooner or later, and awareness.

"WHAT I WOULD LIKE TO KNOW ABOUT THE DEVELOPING EARTH IS: DOES IT ALREADY HAVE A MIND?"

Biology needs a better word than *error* for the driving force in evolution. Or maybe *error* will do after all, when you remember that it comes from an old Indo-European root meaning to wander about, looking for something.

I cannot make my peace with the randomness doctrine: I cannot abide the notion of purposelessness and blind chance in nature. And yet I do not know what to put in its place for the quieting of my mind. It is absurd to say that a place like this place is absurd, when it contains, in front of our eyes, so many billions of different forms of life, each one in its way absolutely perfect, all linked together to form what would surely seem to an outsider a huge, spherical organism. We talk — some of us, anyway — about the absurdity of the human situation, but we do this because we do not know how we

fit in, or what we are for. The stories we used to make up to explain ourselves do not make sense anymore, and we have run out of new stories, for the moment.

Some people believe that we are in trouble because of science, and that we should stop doing science and go back to living in nature, with nature, contemplating nature. It is too late for us to do this, too late by several hundred years, and there are now too many of us — four billion already, with the likelihood of doubling that population and doubling it again within the lifetime of some of the people here.

What I would like to know most about the developing earth is: Does it already have a mind? Or will it someday gain a mind, and are we part of that? Are we a tissue for the earth's awareness?

I like this thought, even though I cannot take it anywhere, and I must say it embarrasses me. I have that nagging hunch that it is a presumption, a piece of ultimate hubris. A single insect may have only two thoughts, maybe three, but there are a lot of insects. The million blind and almost mindless termites in a hill make up in their collective life an intelligence, a kind of brain, now capable of building endless vaulted chambers and turning perfect arches, thinking all the way. I would like to know what whales are thinking about, or dolphins: but if I were hoping to find out how intercommunication really works on this planet, I would study termites.

I am willing to predict, uncertainly, provisionally, that there is one central, universal aspect of human behavior, genetically set by our very nature, biologically governed, driving each of us along. Depending on how one looks at it, it can be defined as the urge to be useful. This urge drives society along, sets our behavior as individuals and in groups, invents all our myths, writes our poetry, composes our music.

This is why it is so hard being a juvenile species, still milling around in groups, trying to construct a civilization that will last. Being useful is easy for an ant: you just wait for the right chemical signal, at the right stage of the construction of the hill, and then you go looking for a twig of exactly the right size for that stage and carry it back, up the flank of the hill, and put it in place, and then you go and do that thing again. An ant can dine out on his usefulness all his life, and never get it wrong.

It is a different problem for us, carrying such risks of doing it wrong, getting the wrong twig, losing the hill, not even recognizing, yet , the outline of the hill. We are beset by strings of DNA, immense arrays of genes, instructing each of us to be helpful, impelling us to try our whole lives to be useful, but never telling us how. The instructions are not coded out in anything like an operator's manual; we have to make guesses all the time. The difficulty is increased when groups of us are set to work together. I have seen, and sat on, numberless committees, not one of which intended anything other than great merit. Larger collections of us, cities for instance, hardly ever get anything right. And, of course, there is the modern nation, probably the most stupefying example of biological error since the age of the great reptiles — wrong at every turn, but always felicitating itself loudly on its great value. It is a biological problem, as much so as a coral reef or a rain forest: but such things as happen to human nations, error piled on error, could never happen in a school of fish. It is, when you think about it, a humiliation; but then humble and human are cognate words, both derived from an old root meaning, simply, earth. We are smarter than the fish, but their instructions come along in their eggs. Ours we are obliged to figure out, and we are, in this respect, slow learners, error-prone.

If you are going to make up a story about the earth, based on today's scientific information, it is useful to have a third person to tell the tale. For this role, I summon that sagacious and ubiquitous gentleman known as the Extraterrestrial Visitor. Zipping through our part of the galaxy, his attention is caught by our small, suburban solar system, and he comes in among the planets, carrying along a number of instruments in a vehicle whose details I need not bother imagining.

"(EARTH)...MARKED SO EXTRAVAGANTLY BY EXUBERANCE, YOUTH, AND PERFECTION OF DETAIL..."

He spots the earth and sees the difference immediately, moving in for a closer look. No matter where he came from, or what he has seen before, I take it for granted that his first reaction is an indrawn breath at its sheer beauty. I have no doubt that there are colonies of life elsewhere in the universe, and perhaps he has seen them all, but I choose to doubt that there can be many celestial bodies at the very springtime of their development, marked so extravagantly by exuberance, youth, and perfection of detail, as this one.

Let me change the story here, to insert more time. He sees the earth now, but he is one of the older Extraterrestrial Visitors, and has been making periodic detours in our direction since the birth of the structure, the laying down of bone four billion or so years ago, and has been taking time-lapse photographs, close up, every few hundred thousand years. Running the whole film through, say, this year, what sort of impression would he have of us?

I think he would conclude that his lens had caught the gestation, still in progress, of a stupendous embryo, clinging to a warm, round stone by what we call earth, or soil, as though attached all around by a kind of placenta, and turning slowly in the sun. He would have seen this creature starting from a single cell, fertilized by lightning, or ultraviolet light, or cosmic rays, or what-have-you. For two-billion-odd years he would observe the formation of a sort of blastula, a huge cluster of cells multiplying first in the sea and later on land, all pretty much the same kind of primitive, non-nucleated cell. Then the film would show a green tinge here and there; and then, with appearance of oxygen, and thanks to the sun, an explosive emergence of new forms of life would be seen everywhere, new cells with nuclei, new collections of cells gathering to form tissues, coral reefs, and finally roses, dolphins, and then at last ourselves, off and running, making metaphors and music, the newest and youngest

working parts of the planet.

I would like to think that we are on our way to becoming an embryonic central nervous system for the whole system. I even like the notion that our cities, still primitive, archaic, fragile structures, could turn into the precursors of ganglia, to be ultimately linked in a network around the planet. But I do worry, from time to time, about that other possibility: that we are a transient tissue, replaceable, biologically representing a try at something needing better means of perfection, and therefore on our way down under the hill, interesting fossils for contemplation by some other kind of creature. In my more depressed moments I find this a plausible form of heartsink. But at better times, remembering how skilled our species is with language and metaphor, almost from birth, how good we are at recognizing and recording our mistakes, how spectacularly we excel all other creatures on this planet, because of the emergence of Johann Sebastian Bach as an example of what we can do as a species when we really try to use our brains, and remembering that nature is by nature parsimonious, tending to hang on to useful things when they really do work, I have hopes for our survival into maturity, milennia ahead. Perhaps, after all, we do have a long way to go, but if this is so we have a lot to learn, and I do like that thought.

"...THERE IS ONE CENTRAL, UNIVERSAL ASPECT OF HUMAN BEHAVIOR...THE URGE TO BE USEFUL."

Lewis Thomas is the author of two highly acclaimed books of essays, The Lives of a Cell *(1974) and* The Medusa and the Snail *(1979). Both had their origins in "Notes of a Biology Watcher," a column he has written for the New England Journal of Medicine since 1971. A Princeton graduate who took his M.D. at Harvard in 1937, Thomas is now chancellor of the Memorial Sloan-Kettering Cancer Center in New York. "On the Uncertainty of Science" was presented in June as this year's Harvard Phi Beta Kappa Oration.*

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PSYCHOLOGICAL CAUSES OF THE NUCLEAR ARMS RACE

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By Jerome D. Frank

Leaders of the nuclear powers are behaving in a self-contradictory fashion. All agree that an all-out nuclear exchange would be an incalculable, perhaps irretrievable, catastrophe for all nations involved; yet they pursue policies that steadily increase the probability that it will occur.

We psychiatrists can contribute to the prevention of nuclear war by calling attention to certain mental processes that prevent national decision makers from breaking out of the nuclear arms race. Let me emphasize immediately that although psychiatrists learn by studying mental patients, these mental processes are in no sense abnormal. They are universal and under most conditions are necessary for survival. Only under rare and unprecedented circumstances such as those created by nuclear weapons do they become dangerous.

I will only mention four of the many mental processes that contribute to this paradoxical behavior.

- First is inability to change habits of thinking and behavior rapidly and drastically enough to adapt to sudden, profound changes in the international scene created by the emergence of nuclear weapons. This is made easier by the psychological unreality of these weapons.
- Second is the propensity to resort to violence when frustrated or frightened.
- Third is the inevitable mutual formation of the image of the enemy by groups in conflict.
- Fourth is the primitivizing effect of emotions on thought, which contributes to the instability of deterrence.

A major psychological obstacle to coping with nuclear weapons is that they are psychologically unreal. In contrast to previous weapons, which most humans have seen in action either personally or on film, the magnitude of the destructive power of nuclear weapons, corresponds to nothing in previous human experience, except perhaps major volcanic eruptions, and these have been experienced by only a small fraction of humanity. Except for the remaining survivors of Hiroshima, Nagasaki, and the few who have seen films of their devastation, as well as the even fewer who have actually witnessed atmospheric nuclear tests, the destructive power of these weapons exists only in imagination. To my knowledge, none of today's national leaders have ever actually seen a nuclear explosion. Since nuclear weapons in distant countries poised for annihilation cannot be seen, heard, smelled, tasted, or touched, we must constantly use our imaginations to keep in mind how threatening they are. Perhaps some of those Americans who speak so calmly about limited, contained nuclear war do so because no living American has experienced the devastation wrought by any weapon of war on American soil.

"...NO LIVING AMERICAN HAS EXPERIENCED THE DEVASTATION WROUGHT BY ANY WEAPON OF WAR ON AMERICAN SOIL."

All of today's national leaders started their climb to power in a world of conventional weapons; they are masters of the prenuclear international game, in which war is the final resort and the nation possessing more and better arms wins. Therefore, the appropriate national behavior is to try to outarm one's rivals in the hope of deterring them from resorting to force and defeating them if deterrence fails.

When humans face an entirely new and unprecedented problem, they try to make it appear like a familiar one, and handle it with methods that have worked in the past. So national leaders still try to accumulate more and better nuclear weapons than their adversaries, even though they know intellectually that, as Harold Brown, former Secretary of Defense under Carter, wrote: "Comprehensive military supremacy for either side is a military and economic impossibility."

Here we see that mere intellectual insight is virtually powerless to change maladaptive behavior, especially when, as with war, it has been ingrained over millennia, linked to a biological drive (in this case self-preservation), and supported by strong emotions. Our intellect may tell us what we should do, but our emotions too often prevent us from doing it.

Unfortunately, our thinking and behavior are guided more by events as we perceive them than as they are in actuality. Prenuclear weapons, from spears and clubs to bombs and shells, have conferred strength on their possessors both in appearance and in actual fact. The image of strength projected by nonnuclear weapons was based on real strength. The more a nation possessed, the stronger and more secure it really was. Therefore, it was realistic for national leaders to accumulate them to reassure themselves, intimidate their actual or potential enemies, and hold the loyalty of their allies. Nuclear weapons have abruptly and permanently broken the connection between weaponry and strength in one respect, but not in another. Perceived and actual reality still coincide in that the strategic nuclear weapons of one adversary gravely menace the other. They differ sharply however, in that beyond a level long since passed by the U.S. and the U.S.S.R., accumulating more powerful and sophisticated strategic weapons decreases the security of all nations, including the possessor. The more persons who have hands on these weapons within and among nations, the greater the likelihood that one will be fired by malice or by accident, thereby triggering the computers poised to launch a strategic nuclear exchange. With these weapons, one cannot afford a single mistake.

It's us or them

As long as the world's leaders perceive nuclear weapons as simply bigger conventional ones, however, the country that has a smaller or less technically advanced stockpile will see itself as weaker and will be seen as weaker by its opponents and allies. So it will act as if it actually were weaker — that is, it will be more easily intimidated, will act less decisively in crises, and will be in danger of losing its allies and tempting its opponents to seize the initiative.

As Adm. Stansfield Turner put it: "But whatever we do, it must not only correct the actual imbalance of [nuclear] capability; it must also correct the perception of imbalance... Changing the world's perception that we are falling behind the Soviet Union is as important as not falling behind in fact." Reference to "actual imbalance" and "falling behind in fact," of course, means that he still views nuclear weapons as simply bigger conventional ones.

In short, the pursuit of security through illusory nuclear superiority is in reality more a race for prestige than actual strength. The nuclear arms race is an especially costly and dangerous form of psychological warfare.

Behind the arms races and wars lies a trait humans share with all social animals: fear and distrust of members of groups other than their own. When two human groups compete for the same goal, this distrust rapidly escalates into the mutual "image of the enemy."

The power of group relationships to determine how members of groups perceive each other has been neatly shown by the vicissitudes of this image, which always arises when two nations are in conflict and which is always the same no matter who the conflicting parties are. *Enemy-images* mirror each other — that is, each side attributes the same virtues to itself and the same vices to the enemy. "We" are trustworthy, peace-loving, honorable, and humanitarian; "they" are treacherous, warlike, and cruel. In surveys of Americans conducted in 1942, the first five adjectives chosen to charaterize both Germans and Japanese (enemies) included warlike, treacherous, and cruel, none of which appeared among the first five describing the Russians (allies); in 1966 all three had disappeared from American characterizations of the Germans and Japanese (allies), but now the Russians (no longer allies, although more rivals than enemies) were warlike and treacherous. In 1966 the mainland Chinese, predictably, were seen as warlike, treacherous, and sly. After President Nixon's visit to China, these adjectives disappeared from our characterization of the Chinese, whom we now see as hard-working, intelligent, artistic, progressive and practical.

The image of the enemy creates a self-fulfilling prophecy by causing enemies to acquire the evil characteristics they attribute to each other. In combating what they perceive to be the other's cruelty and treachery, each side becomes more cruel and treacherous itself. The *enemy-image* nations form of each other thus more or less corresponds to reality. Although the behavior of the enemy may be motivated by fear more than aggressiveness, nations failing to recognize their enemies as treacherous and warlike would not long survive.

Unfortunately, this mutual perception, however justified, aggravates mutual hostilities and impedes resolution of conflict in several ways. It leads to progressive restriction of communication (after all, why bother to communicate with a chronic liar?), thus increasing the likelihood of serious misunderstandings of enemy's intentions. Moreover, the *enemy-image* acts like a distorting lens, which overemphasizes information that confirms it and filters out information that is incompatible with it. Thus the mass media play up incidents of an enemy's treachery or cruelty, and ignore examples of humanitarian or honorable behavior. The same behavior is seen positively if performed by our side and negatively if performed by an enemy. For example, although in wartime both sides always commit atrocities, the enemy's atrocities are evidences of his evil nature, whereas ours are portrayed as regrettable necessities.

Finally, because anything the enemy wants must by definition be bad for us, the *enemy-image* blinds both sides to interests they might have in common. Thus when the Soviet Union stresses the horrors of nuclear war, many Americans perceive this as a ruse to cause us to stop our nuclear arms buildup. They cannot entertain the possibility that mutual reduction of nuclear stockpiles would benefit both countries.

Faced with an adversary perceived as treacherous and implacably malevolent in a world without effective international peace-keeping institutions, the only recourse is to confront the adversary with superior force in the hope that this will deter hostile acts through threat of retaliation, or enable us to defeat him should deterrence fail. Since resorting to nuclear weapons would be suicidal, nuclear powers are forced to rely on the hope of maintaining deterrence indefinitely. There are strong psychological grounds for believing that such a hope will continue to be vain in the future, as it always has been in the past.

"STRONG EMOTION IMPELS TO IMPULSIVE ACTION."

Deterrence is the attempt of one party to control another by treat of punishment should the latter attempt to perform a forbidden act. This creates an inherently unstable system. It breaks down when one of the parties calculates, correctly or incorrectly, that the potential benefits of the forbidden action outweigh the probable costs, or when emotional tensions reach such a pitch that leaders throw caution to the winds. This is the point when, as Bertrand Russell put it, the desire to destroy the enemy becomes greater than the desire to stay alive oneself. In the grip of strong emotions, a person's thinking becomes more primitive — that is, he or she perceives fewer alternatives, simplifies issues, and focuses exclusively on combating the immediate threat without sufficiently considering remote or long-term consequences. Strong emotion impels to impulsive action. There is nothing harder, when under emotional stress, than to do nothing.

We can, perhaps, derive some comfort from the recognition that most national leaders would not have survived the struggle to reach the top unless they were able to preserve good judgment under stress. Yet the graveyard of history is littered with the remains of societies whose leaders' judgments failed under emotional pressure. As Robert Kennedy indicated in his book on the Cuban missile crisis, even some of the "best and brightest" can reach a breaking point:

> *"...some [of the decision makers], because of the pressure of events, even appeared to lose their judgment and stability."*

It's us and them

So much for some of the psychological forces propelling the world's leaders toward nuclear disaster. To turn now to new hopes for survival, we must start by recognizing that from now on any war can escalate into a nuclear one. And since humans will never forget how to make nuclear weapons, the only ultimate solution requires the elimination of war itself.

Before considering some hopeful psychological steps toward this distant and difficult goal, we must pause to consider the biological argument that the elimination of war is impossible. This asserts that war is an inevitable manifestation of the biological human impulse to respond to threat or frustration with violence. It is true that programs of violent behavior are built into the human central nervous system, but they are released inappropriately only when the brain is diseased. Since human individuals and groups are self-aggrandizing, however, they will always push until they come up against frustrating obstacles, of which the most common are other individuals or groups pursuing conflicting goals. Group conflicts are inevitable. This does not mean, however, that wars are inevitable, for there is no direct link between biological drives and learned, complex social behaviors such as war.

"GROUP CONFLICTS ARE INEVITABLE. THIS DOES NOT MEAN, HOWEVER, THAT WARS ARE INEVITABLE,..."

The expression of biological needs is channeled and shaped by cultural values and institutions. To claim that, because humans are innately violent, war is inevitable would be like saying that because they are violent, human sacrifice in religious rites is inevitable; or that because humans are innately carnivorous, cannibalism is inevitable. Social institutions wither away when they cease to perform useful social functions. Nuclear weapons are destroying the usefulness of war for resolving international conflicts. Since Hiroshima, no war, except one that could involve the nuclear superpowers, has been fought to victory. That war was Vietnam, and the superpower lost. In this, I believe, lies the hope that, like slavery, human religious sacrifices, cannibalism, and dueling, war will eventually wither away.

Societies have found internal ways of keeping domestic violence within tolerable bounds. They have accomplished this by developing rules for peacefully resolving conflicts, enforced by appropriate institutions. Analogously, international anarchy must eventually be replaced by an effective world government. The authority of all peace-keeping institutions within nations depends on a consensus of those who support them. Jurists have pointed out that even in dictatorships no law can be enforced unless more than 90% of the citizens comply voluntarily.

Similarly, from a psychological standpoint, developing international peace-keeping institutions requires the creation of a sense of community of all the world's peoples transcending their national allegiances. This would make it possible for each nation to relinquish some of its national sovereignty to international peacekeeping organizations. The achievement of this distant goal lies primarily in the realm of political science, jurisprudence, economics, and similar disciplines. One aspect to which students of human behavior could contribute, however, lies in the very first step, the reduction of mutual fear and mistrust among nations.

The same technological advances that have created the new dangers to survival have produced new means for progress toward this goal. These include means of constant electronic communication between national decision makers without the distorting effects of intermediaries. I speak of the hotline, and direct surveillance by satellites. Both of these methods increase the accuracy and completeness of information concerning the opponents' intentions and capabilities. In itself, this reduces fears generated by mutual uncertainty by imposing restraints on preparations for hostilities by both sides.

Television and radio are by far the most powerful communication tools ever devised for combating mutual fears and promoting mutual understanding. Transistor radios are widely distributed throughout the world, even small villages often have television receivers set up in the village square. Thus for the first time the same message can be sent to everyone in the world by satellites simultaneously — a message that jumps the literacy barrier and is more powerful than the written word. Although often used to inflame antagonisms, the untapped constructive potentials of electronic audiovisual communication are boundless.

The greatest hope for fostering a sense of world community, however, probably lies in the new incentives and opportunities for nations to work together toward the achievement of superordinate goals — goals that all nations want, but that can be achieved only by international cooperation.

These are not idle dreams. Smallpox has been eradicated, and nations have undertaken highly successful joint ventures, such as the international Geophysical Year and the Barcelona conference on cleaning up the Mediterranean. In this conference, Turks and Greeks, Arabs and Israelis, worked together. Such examples raise hope for the tension-reducing potentials of other cooperative international activities.

Jerome D. Frank, professor emeritus of psychiatry at the Johns Hopkins School of Medicine (Baltimore, MD. 21205; 301-955-5000), served as major in the U.S. medical corps in the Philippines when the bombs were dropped on Hiroshima and Nagasaki. His conclusion, strengthened in the intervening years, was that the price of civilization was the elimination of nuclear weapons and of war itself. He received a Ph.D. and M.D. at Harvard.

KNOWLEDGE

New Mode of Thinking

"No great improvements in the lot of mankind are possible until a great change takes place in the fundamental constitution of their modes of thought."

John Stuart Mill
Philosopher and Economist
1817 - 1863

"... war is an old habit thought, an old frame of mind, an old political technique, that must now pass as human sacrifice and human slavery have passed. I have faith that the human spirit will prove equal to the long heavy task of ending war."

Herman Wouk
War and Remembrance, 1978

"We have to develop a new way of thinking, appreciating our differences and working out ways to live with each other. We must restructure our way of thinking and learn to co-exist or we will die together."

Betty Bumpers, 1983
Founder of **Peace Links**

"We are surrounded by recent fundamental changes in society. In the last two centuries, abject slavery, with us for thousands of years or more, has been almost eliminated in a stirring planet-wide revolution. In only a few decades, sweeping global changes have begun to move in precisely the directions needed for human survival. A new consciousness is developing which recognizes that we are one species. Our loyalities are to the species and the planet. We speak for Earth. Our obligation to survive is owed, not just to ourselves, but also to the cosmos, ancient and vast, from which we spring."

Carl Sagan
Cosmos, 1980

"One day somebody should remind us that, even though there may be political and ideological differences between us, the Vietnamese are our brothers, the Russians are our brothers, the Chinese are our brothers; and one day we've got to sit down together at the table of brotherhood."

Martin Luther King, Jr.
December 24, 1967
The Trumpet of Conscience

"The often very deep difference between cultures should not be seen as divisions between people. Instead cultures should be interpreted for what they really are: the ultimate declaration of belonging to the human species. We are one people; and we can all strive for one aim: the peaceful and equitable survival of humanity."

Richard Leakey
Origins, 1977

NO FRAMES, NO BOUNDARIES

By Russell Schweickart who was the Lunar Module Pilot for the Apollo 9 earthorbital flight in March 1969, during which he made the first space walk without an umbilical.

But up there you go around every hour and a half, time after time after time. And you wake up usually in the mornings, just the way the track of your orbit goes, over the Middle East and over North Africa. As you eat breakfast, you look out the window as you're going past, and there's the Mediterranean area, Greece and Rome and Northern Africa and the Sinai, that whole area. And you realize that in one glance what you're seeing is what was the whole history of man for years -- the cradle of civilization. And you go down across North Africa and out over the Indian Ocean and look up at the great subcontinent of India pointed down toward you as you go past it, Ceylon off to the side, then Burma, Southeast Asia, out over the Philippines and up across that monstrous Pacific Ocean, that vast body of water — you've never realized how big that is before. And you finally come up across the coast of California, and you look for those friendly things, Los Angeles and Phoenix and on across to El Paso. And there's Houston, there's home, you know, and you look and sure enough there's the Astrodome — and you identify with that, it's an attachment. And on across New Orleans and then you look down to the south and there's the whole peninsula of Florida laid out. And all the hundreds of hours you've spent flying across that route down in the atmosphere, all that is friendly again. And you go out across the Atlantic Ocean and back across Africa, and you do it again and again and again.

"...YOU BEGIN TO RECOGNIZE THAT YOUR IDENTITY IS WITH THAT WHOLE THING. AND THAT MAKES A CHANGE."

And you identify with Houston and then you identify with Los Angeles and Phoenix and New Orleans. And the next thing you recognize in yourself is that you're identifying with North Africa — you look forward to that, you anticipate it, and there it is. And that whole process of what it is you identify with begins to shift. When you go around the Earth in an hour and a half, you begin to recognize that your identity is with that whole thing. And that makes a change.

You look down there and you can't imagine how many borders and boundaries you cross, again and again and again, and you don't even see them. There you are — hundreds of people in the Mid-East killing each other over some imaginary line that you're not even aware of, that you can't see. And from where you see it, the thing is a whole, and it's so beautiful. You wish you could take one in each hand, one from each side in the various conflicts, and say, "Look. Look at it from this perspective. Look at that. What's important?"

And a little later on, your friend, again one of those same neighbors, the person next to you, goes out to the moon. And now he looks back and he sees the Earth not as something big, where he can see the beautiful details, but now he sees the Earth as a small thing out there. And the contrast between that bright blue and white Christmas tree ornament and the black sky, that infinite universe, really comes through, and the size of it, the significance of it. It is so small and so fragile and such

"...ON THAT SMALL SPOT, THAT LITTLE BLUE AND WHITE THING, IS EVERYTHING THAT MEANS ANYTHING TO YOU — ALL OF HISTORY AND MUSIC AND POETRY AND ART AND DEATH AND BIRTH AND LOVE, TEARS JOY, GAMES, ALL OF IT ON THAT LITTLE SPOT OUT THERE THAT YOU CAN COVER WITH YOUR THUMB."

a precious little spot in that universe that you can block it out with your thumb, and you realize that on that small spot, that little blue and white thing, is everything that means anything to you — all of history and music and poetry and art and death and birth and love, tears, joy, games, all of it on that little spot out there that you can cover with your thumb. And you realize from that perspective that you've changed, that there's something new there, that the relationship is no longer what is was.

And then you look back on the time you where outside on that EVA and on those few moments that you could take, because a camera malfunctioned, to think about what was happening. And you recall staring out there at the spectacle that went before your eyes, because now you're no longer inside something with a window looking out at a picture. Now you're out there and there are no frames, there are no limits, there are no boundaries. You're really out there, going 25,000 miles an hour, ripping through space, a vacuum. And there's not a sound. There's a silence the depth of which you've never experienced before, and that silence contrasts so markedly with the scenery you're seeing and with the speed with which you know you're moving.

And you think about what you're experiencing and why. Do you deserve this, this fantastic experience? Have you earned this in some way? Are you separated out to be touched by God, to have some special experience that others cannot have? And you know the answer to that is no. There's nothing that you've done that deserves that, that earned that; it's not a special thing for you. You know very well at that moment, and it comes through to you so powerfully, that you're the sensing element for man. You look down and see the surface of that globe that you've lived on all this time, and you know all those people down there and they are like you, they are you — and somehow you represent them. You are up there as the sensing element, that point out on the end, and that's a humbling feeling. It's a feeling that says you have a

responsibility. It's not for yourself. The eye that doesn't see doesn't do justice to the body. That's why it's there; that's why you are out there. And somehow you Precognize that you're a piece of this total life. And you're out there on that forefront and you have to bring that back somehow. And that becomes a rather special responsibility and it tells you something about your relationship with this thing we call life. So that's a change. That's something new. And when you come back there's a difference in that world now. There's a difference in that relationship between you and that planet and you and all those other forms of life on that planet, because you've had that kind of experience. It's a difference and it's so precious.

And all through this, I've used the word "you", because it's not me, it's not Dave Scott, it's not Dick Gordon, Pete Conrad, John Glenn — it's you, it's we. It's life that's had that experience.

I'd like to close now with a poem by e. e. cummings. It's just become a part of me somehow out of all this and I'm not really sure how. He says:

i thank you god for this most amazing
day: for the leaping greenly spirits of trees
and a blue true dream of sky; and for everything
which is natural which is infinite which is yes

COURAGE. LOVE. FORGIVENESS.

Dr. Jonas Salk's Formula for the Future

By Arianna Stassinopoulos

"The brontosaurus became extinct, but it wasn't its fault, so to speak. If we become extinct, it will be our fault... In order to survive, man has to evolve."
Jonas Salk

"YOUNG MAN," said Ed Murrow to Dr. Jonas Salk in the spring of 1955, "a great tragedy has just befallen you — you have lost your anonymity."

On April 23, 1985, it will be exactly 30 years since Jonas Salk became, overnight, a hero; a legend and a monument. With all the fanfare of a national celebration, the world learned that this 39-year-old research scientist at the University of Pittsburgh School of Medicine had developed a vaccine that promised to eradicate one of the most dreaded diseases of the time: polio. A public overflowing with gratitude named schools, streets, hospitals and babies after him, sent him pressed flowers, candy, large checks and offers of jobs, vacations and honorary degrees.

In developing a polio vaccine from killed viruses, Jonas Salk had challenged medical orthodoxy, according to which only vaccines made of living viruses could offer durable protection. The controversies that followed, the passions and antagonisms that were aroused, thrust Salk into a different kind of laboratory — the laboratory of human behavior, of human values and emotions. Out of this grew his conviction that the healing of sick minds had to go hand in hand with the healing of sick bodies. So, since 1955, the focus of his energies has shifted to include broader human problems as well as more narrow scientific ones — not only a sick body but also a sick planet that he believes is going to become unmanageably sicker unless we discover within ourselves our own healing power and instinctive wisdom. It is a question, in short, of our destiny as a species.

I met Jonas Salk three years ago in La Jolla, Calif., where he lives with his second wife, Francoise Gilot, the painter and writer who for 10 years shared her life with Picasso. They live in a house that gives the feeling of being suspended over the sea, 450 feet above the Pacific. The house is five minutes from the Salk Institute, founded by Jonas Salk in 1960 with the aim of bringing together science, philosophy and art to help fulfill man's greater potential — an evolutionary step Salk believes is essential to human survival.

Over the last three years, I have discussed these issues with Jonas Salk, both alone and with others — scientists, businessmen, politicians. And every time, however different the circumstances, I have been struck by two things; the rigor with which he constantly relates the larger questions to our everyday problems, and his fundamental optimism about human nature. "As I see increasing evidence of more and more inhumanity, terrorism, crime," he said on one occasion, "I also see the countervailing responses that will, hopefully, take hold and dominate those influences. You see, I think that goodness and nobility are genetically inscribed, but they need to be evoked. They need to be taught — not as reading, writing, arithmetic, and biology are taught, but by example and experience. They can't be taught passively. They must be taught actively — in the same way as we speak

of active immunization as distinct from passive immunization. Passive immunization transfers antibodies from one person to another, but it doesn't last. In active immunization, you form your own antibodies: you evoke your own potential for nobility."

Jonas Salk's speech is strewn with such biological metaphors. His mind is constantly making connections — between the science of biology and the art of living, between the purpose revealed in nature and the meaning he finds hidden in the apparent chaos of everyday life.

"After meetings or activities or travel," he explains, "I need time to be able to reflect on what happened, on what it all means. The best time for me to discover what is going on in my life and in my mind is when I wake up. And then, without disturbing anything, I simply watch what's happening in my mind, writing down whatever seems to crystallize."

It is in these misty hours that the intuitive part of his mind is at its most active. At the beginning of each entry, he records the date, the place and the time: "27 March, 1984 — La Jolla — 3:15 a.m."

"I now see that the major shift in human evolution is from behaving like an animal struggling to survive to behaving like an animal choosing to evolve. In fact, in order to survive, man has to evolve. And to evolve, we need a new kind of thinking and a new kind of behavior, a new ethic and new morality. It will be that of the evolution of everyone rather than the survival of the fittest."

He continues writing until 4:55 a.m. The next entry on the same day begins at 6:15 a.m. and ends at 6:55 a.m. The thrust of it is that we must, in our thinking and behavior, replace survival behavior with conscious evolutionary behavior: "We are driven both by survival and by evolutionary instincts," he writes. "The evolutionary instinct compels us to bring out the best in ourselves and in each other, to recognize our interconnectedness with everyone else."

In my case, the most obvious change in switching from survival to evolutionary behavior had to do with taking risks, especially risks in expressing what was true for me, both in personal relationships and at work. And many things that I would have put up with or settled for, out of fear of losing what I had, became unacceptable, limiting. When I stopped elevating my preferences and desires to the status of "survival needs," I stopped being run by them.

I also began to notice a shift in my attitude toward life's ups and downs, a deep acceptance of everything that happens to us — the painful no less than the joyful — as grist for the mill of our growing, learning and becoming more of who we really are. If we only let it.

There are certain habitual ways of thinking and reacting — such as vindictiveness, keeping score, getting even — for which there is no room when we begin to think and act in terms of evolution. They very soon become obsolete. Forgiving — which starts with self-forgiving — becomes a constant process, a way of living. It means shedding past resentments and moving on. It's not easy, but it's worth every difficulty.

There is nothing mushy, vague or soft-headed about loving and forgiving. In fact, the end result, as Salk puts it, would be "to release the power in the nucleus of each individual — a power much greater in its positive effects than atomic power is in its negative."

Living like this takes on the intensity of an adventure that could transform our world. "Major developments in the realm of human relations," says Salk, "are as important today as was the advent of agriculture 10,000 years ago or the understanding of microbes and machines in the past couple of centuries. The challenge of evoking the best in us may seem utterly forbidding but, surely, no more so than previously 'impossible' challenges — heavier-than-air flight, electricity, space travel."

If we can be courageous one more time than we are fearful, trusting one more time than we are anxious, cooperative one more time than we are competitive, forgiving one more time than we are vindictive, loving one more time than we are hateful, we will have moved closer to the next breakthrough in our evolution.

One warning: Evolutionary behavior is addictive. Once you start, it's very hard to stop. After all, why live and evolve unconsciously when we can live consciously and, at the same time, speed up the process of evolution for ourselves and others?

Jonas Salk likens conscious evolution to "a spreading infection, a veritable epidemic of integrity and responsibility with more and more people becoming carriers!" He adds, "It is a law of nature, whether among human beings or among fruit flies, that evolutionary changes in behavior spread quickly through a built-in mechanism — as if there had been a town hall meeting or a report on the 7 o'clock news."

We are living through a turning point in our evolution, Salk says. At such a time, great tensions naturally develop. And, depending on whether we choose to focus on what is dying or on what is being born, we will be apocalyptic or optimistic. Jonas Salk has no doubt: "Because of the urgency, because we see not only the handwriting on the wall but also the crack in the wall, and it's beginning to crumble, people are taking notice. What is happening is unprecedented in the history of evolution. The brontosaurus became extinct, but it wasn't its fault, so to speak. If we become extinct, it *will* be our fault. We are the cause of the effects that we are feeling. And, unlike any other species, we can choose to influence the process of evolution and stop ourselves from being drawn into our own destruction."

Arianna Stassinopoulos is the author of "Maria Callas", "The Female Woman", "After Reason", and "The Gods of Greece." She is writing a biography of Pablo Picasso.

DECISION

"The full dimensions of the peril must be seen and recognized. Only then will we be prepared to make the decisions necessary to assure survival... The main test before man is his will to change, rather than his ability to change. That he is capable of change is certain."

Norman Cousins
Modern Man is Obsolete, 1945

"Unlike our forebearers, who became extinct, we are an animal capable of almost limitless choice. The problem facing us today is our inability to recognize the fact that we are able to choose our future. It is my conviction that our future as a species is in our hands and ours only... For me the search for our ancestors has provided a source of hope. We share our heritage and we share our future. With an unparalleled ability to choose our destiny, I know that global catastrophe at our own hands is not inevitable. The choice is ours."

Richard Leaky
Origins, 1977

"Man is by no means merely a product of heredity and environment. There is a third element: decision. Man ultimately decides for himself. And, in the end, education must be education toward the ability to decide. Man has the grand option to choose for evolution or destruction."

Viktor Frankl, M.D.
The Doctor and the Soul, 1955

"I have set before you life and death, blessing and curse. Therefore, choose life, that you and your descendants may live."

Deuteronomy 30:19
The Bible

"The conscious choice to take responsibility for the continuation of human life is further complicated by the fact that we are able to respond to it only before it happens. Since after extinction no one will be present to take responsibility, we have to take full responsiblity now."

Jonathan Schell
"The Abolition"
The New Yorker, Jan. 2, 1984

"In the past, it was possible to destroy a village, a town, a region, even a country. Now it is the whole planet that has come under threat. This fact should fully compel everyone to face a basic moral consideration; from now on, it is only through a conscious choice and then deliberate policy that humanity can survive."

Pope John Paul II
Speech at Hiroshima
February, 1981

"ONLY THEN SHALL WE FIND COURAGE"

By Albert Einstein, In an Interview with Michael Amrine

Many persons have inquired concerning a recent message of mine that "a new type of thinking is essential if mankind is to survive and move to higher levels."

Often in evolutionary processes a species must adapt to new conditions in order to survive. Today the atomic bomb has altered profoundly the nature of the world as we know it, and the human race consequently finds itself in a new habitat to which it must adapt its thinking.

In the light of new knowledge, a world authority and an eventual world state are not just *desirable* in the name of brotherhood, they are *necessary* for survival. In previous ages a nation's life and culture could be protected to some extent by the growth of armies in national competition. Today we must abandon competition and secure cooperation.

"FUTURE THINKING MUST PREVENT WARS."

This must be the central fact in all our considerations of international affairs; otherwise we face certain disaster. Past thinking and methods did not prevent world wars. Future thinking *must* prevent wars.

Modern war, the bomb, and other discoveries present us with revolutionary circumstances. Never before was it possible for one nation to make war on another without sending armies across borders. Now with rockets and atomic bombs no center of population on the earth's surface is secure from surprise destruction in a single attack.

America has a temporary superiority in armament, but it is certain that we have no lasting secret. What nature tells one group of men, she will tell, in time, to any group interested and patient enough in asking the questions. But our temporary superiority gives this nation the tremendous responsibility of leading mankind's effort to surmount the crisis.

Being an ingenious people, Americans find it hard to believe there is no foreseeable defense against atomic bombs. But this is a basic fact. Scientists do not even know of any field which promises us any hope of adequate defense. The military-minded cling to old methods of thinking and one Army department has been surveying possibilities of going underground, and in wartime placing factories in places like Mammoth Cave. Others speak of dispersing our population centers into "linear" or "ribbon" cities.

Reasonable men with these new facts to consider refuse to contemplate a future in which our culture would attempt to survive in ribbons or in underground tombs. Neither is there reasurrance in proposals to keep a hundred thousand men alert along the coasts scanning the sky with radar. There is no radar defense against the V-2, and should a "defense" be developed after years of research, it is not humanly possible for any defense to be perfect. Should one rocket with an atomic warhead strike Minneapolis, that city would look almost exactly like Nagasaki.

Rifle bullets kill men, but atomic bombs kill cities. A tank is a defense against a bullet but there is no defense in science against the weapon which can destroy civilization.

Our defense is not in armaments, nor in science, nor in going underground. Our defense is in law and order.

Henceforth, every nation's foreign policy must be judged at every point by one consideration: does it lead us to a world of law and order or does it lead us back toward anarchy and death? I do not believe that we can prepare for war and at the same time prepare for a world community. When humanity holds in its hand the weapon with which it can commit suicide, I believe that to put more power into the gun is to increase the probability of disaster.

Remembering that our main consideration is to avoid this disaster, let us briefly consider international relations in the world today, and start with America. The war, which began with Germany using weapons of unprecedented frightfulness against women and children, ended with the United States using a supreme weapon killing thousands at one blow.

Many persons in other countries now look on America with great suspicion, not only for the bomb but because they fear she will become imperialistic. Before the recent turn in our policy, I was sometimes not quite free from such fears myself.

Others might not fear Americans if they knew us as we know one another, honest and sober and neighbors. But in other countries they know that a sober nation can become drunk with victory. If Germany had not won a victory in 1870, what tragedy for the human race might have been averted!

"...ARE WE ARDENTLY SEEKING A WORLD IN WHICH THERE WILL BE NO NEED FOR BOMBS?..."

We are still making bombs, and the bombs are making hate and suspicion. We are keeping secrets and secrets breed distrust. I do not say we should now turn the secret of the bomb loose in the world, but are we ardently seeking a world in which there will be no need for bombs or secrets; a world in which science and men will be free?

While we distrust Russia's secrecy and she distrusts ours, we walk together to certain doom.

The basic principles of the Acheson-Lilienthal Report are scientifically sound and technically ingenious, but as Mr. Baruch wisely said, it is a problem not of physics but of ethics. There has been too much emphasis on legalisms and procedure; it is easier to denature plutonium than it is to denature the evil spirit of man.

The United Nations is the only instrument we have to work with in our struggle to achieve something better. But we have used U.N., and U.N. form and procedure to outvote the Russians on some occasions when the Russians were right. Yes, I do not think it is possible for any nation to be right all the time or wrong all the time. In all negotiations, whether over Spain, Argentina, Palestine, food or atomic energy, so long as we rely on procedure and keep the threat of military power, we are attempting to use old methods in a world which is changed forever.

No one gainsays that the United Nations Organization at times gives great evidence of eventually justifying the desperate hope that millions have in it. But time is not given to us in solving the problems science and war have brought. Powerful forces in the political world are moving swiftly toward crisis. When we look back to the end of the war — it seems ten years ago! Many leaders express well the need for world authority and an eventual world government, but actual planning and action to this end have been appallingly slow.

Private organizations anticipate the future, but government agencies seem to live in the past. In working away from nationalism toward a supra-nationalism, for example, it is obvious that the national spirit will survive longer in armies than anywhere else. This might be tempered in the United Nations military forces by mixing the various units together, but certainly not by keeping a Russian Unit intact side-by-side with an intact American unit, with the usual inter-unit competition added to the national spirit of the soldiers in this world enforcement army. But, if the military staffs of the U.N. are working out concrete proposals along these lines for a true internationally minded force, I have yet to read of it.

Similarly, we are plagued in the present world councils over the question of representation. It does not seem fair to some, for example, that each small Latin-American nation should have a vote while much larger nations are also limited to one vote. On the other hand, representation on a population basis may seem unfair to the highly developed states, because surely great masses of ignorant, backward peoples should not carry as much voice in the complicated technology of our world as those with greater experience.

Fremont Rider in an excellent book, *The Great Dilemma of World Organizations,* discusses the idea of representation on the basis of education and literacy — number of teachers, physicians, and so on. Backward nations looking forward to greater power in the councils of men would be told, "To get more votes you must *earn* them."

These and a hundred other questions concerning the desirable evolution of the world seem to be getting very little attention. Meanwhile, men high in government propose defense or war measures which would not only compel us to live in a universal atmosphere of fear but would cost untold billions of dollars and ultimately destroy our American free way of life — even before a war.

To retain, even a temporary total security in an age of total war, government will have to secure total control. Restrictive measures will be required by the necessities of the situation, not through the conspiracy of willful men. Starting with the fantastic guardianship now imposed on innocent physics professors, outmoded thinkers will insidiously change men's lives more completely than did Hitler, for the forces behind them will be more compelling.

Before the raid on Hiroshima, leading physicists urged the War Department not to use the bomb against defenseless women and children. The war could have been won without it. The decision was made in consideration of possible future loss of American lives — and now we have to consider possible loss in future atomic bombings of *millions of lives.* The American decision may have been a fatal error, for men accustom themselves to thinking that a weapon which was used once can be used again.

Had we shown other nations the test explosion at Alamogordo, New Mexico, we could have used it as an education for new ideas. It would have been an impressive and favorable moment to make considered proposals for world order to end war. Our renunciation of this weapon as too terrible to use would have carried great weight in negotiations and made convincing our sincerity in asking other nations for a binding partnership to develop these newly unleashed powers for good.

"TO THE VILLAGE SQUARE WE MUST CARRY THE FACTS OF ATOMIC ENERGY. FROM THERE MUST COME AMERICA'S VOICE."

The old type of thinking can raise a thousand objections of "realism" against this simplicity. But such thought ignores the *psychological realities.* All men fear atomic war. All men hope for benefits from these new powers. Between the realities of man's true desires and the realities of man's danger, what are the obsolete "realities" of protocol and military protection?

During the war many persons fell out of the habit of doing their own thinking, for many had to do simply what they were told to do. Today, lack of interest would be a great error, for there is much the average man can do about this danger.

This nation held a great debate concerning the menace of the Axis, and again today we need a great chain reaction of awareness and communication. Current proposals should be discussed in the light of the basic facts, in every newspaper, in schools, churches, in town meetings, in private conversations, and neighbor to neighbor. Merely reading about the bomb promotes knowledge in the mind, but only talk between men promotes feelings in the heart.

Not even scientists completely understand atomic energy, for each man's knowledge is incomplete. Few men have ever seen the bomb. But all men, if told a few facts, can understand that this bomb and the danger of war is a very real thing, and not something far away. It directly concerns every person in the civilized world. We cannot leave it to generals, senators, and diplomats to work out

a solution over a period of generations. Perhaps five years from now several nations will have made bombs and it will be too late to avoid disaster.

Ignoring the realities of faith, good will, and honesty in seeking a solution; we place too much faith in legalisms, treaties, and mechanisms. We must begin through the U.N. Atomic Energy Commission to work for a binding agreement, but America's decision will not be made over a table in the United Nations. Our representatives in New York, in Paris, or in Moscow depend ultimately on decisions made in the village square.

To the village square we must carry the facts of atomic energy. From there must come America's voice.

"...THE REAL PROBLEM IS IN THE MINDS AND HEARTS OF MEN."

This belief of physicists prompted our formation of the Emergency Committee of Atomic Scientists, with headquarters at Princeton, N.J., to make possible a great national campaign for education on these issues. Detailed planning for world security will be easier when negotiators are assured of public understanding of our dilemmas.

Then our American proposals will be not merely documents about machinery, the dull, dry statements of a government to other governments, but the embodiment of a message of humanity from a nation of human beings.

Science has brought forth this danger, but the real problem is in the minds and hearts of men. We will not change the hearts of other men by mechanism, but by changing *our* hearts and speaking bravely.

We must be generous in giving to the world the knowledge we have of the forces of nature, after establishing safeguards against abuse.

We must be not merely willing, but actively eager to submit ourselves to binding authority necessary for world security.

We must realize that we cannot simultaneously plan for war and peace.

When we are clear in heart and mind — only then shall we find courage to surmount the fear which haunts the world.

Reprinted with permission from *The New York Times Magazine,* **23 June 1946**

"The challenge civilization faces - we face - is the effective abolition of war. We need not fail. The deepening twilight need not end in darkness and disaster - it can lead to fulfillment and a greater future for humanity. Each of us bears his share of responsibility for the decision which is the historic role of our age to take. We must not fail the challenge - we cannot fail if we but use the vast reserves of intelligence and courage which lie untapped within every human being."

Norman Cousins
Saturday Review of Literature
August 7, 1948

(With regard to the end of slavery in the United States)
"In the last analysis no matter how ripe the time (for such a change) there would have been no coalescing of antislavery opinion until specific decisions and commitments were taken by individual men."

David Brian Davis
Slavery in Western Culture, 1967

"Commitment to any of the greatest enterprises is heroic because it is a commitment to the unknown... A great enterprise is one for which a reliable timetable is impossible. By definition it is what has never before been accomplished."

Daniel Boorstin,
Librarian of Congress
Speech, 1981

ACTION

"An invasion of armies can be resisted, but not an idea whose time has come."

Victor Hugo
1852

"...for it isn't enough to talk about peace. One must believe in it. And it isn't enough to believe in it. One must work for it."

Eleanor Roosevelt
1951

"If 5 percent of the people work for peace, peace will prevail."

Albert Einstein
As quoted by Michael Nagler,
America Without Violence, 1982

"It is not only upon the responsible men of science and the responsible men of faith that the ultimate issue depends, but upon the responsible men and women in all walks of life: the teachers, doctors, industrialists, housewives, nurses, bankclerks, miners, drivers, seamen, farmers, civil servants, engineers, and a hundred other. They alone can change the values, the practices, institutions, by which we live; and it is by deeds, much more than by words, that the great majority of the peoples of the world will be reached."

P.W. Martin
Experiment in Depth, 1955

"The force which threatens to blow the world asunder resides not in the clouds or mountains, but in the invisible heart of the atom. The inner force too, which like the power of the atom can either remake or shatter civilization, resides in the smallest unit of society - the individual. The individual is the secret advance base from which the power sets out to invade committee rooms, mothers' meetings, county councils, parliaments, continents and nations."

Laurens Van Der Post
Dark Eye of Africa, 1955

TO PRESERVE A WORLD GRACED BY LIFE

By Carl Sagan

There is no issue more important than the avoidance of nuclear war. Whatever your interest, passions or goals, they and you are threatened fundamentally by the prospect of nuclear war. We have achieved the capability for the certain destruction of our civilization and perhaps of our species as well. I find it incredible that any thinking person would not be concerned in the deepest way about this issue.

In the last 20 years, the United States and the Soviet Union have accomplished something stunning and historic — the close-up examination of all those points of light, from Mercury to Saturn, that moved our ancestors to wonder and to science. Every one of these worlds is lovely and instructive, and there are premonitions and stirrings of life on Titan and Iapetus and some other worlds. But apparently life does not exist on these worlds. Something has gone wrong. Some critical step was lacking. Or perhaps life arose once and subsequently died out. The lesson we have learned is that life is a comparative rarity, that you can have 20 or 30 or 40 worlds and on only one of them does life appear and sustain itself.

What has evolved on our planet is not just life, not just grass or mice or beetles or microbes, but beings with a great intelligence, with a capacity to anticipate the future consequences of present actions, with the ability even to leave their home world and seek out life elsewhere. What a waste it would be if, after four billion years of tortuous biological evolution, the dominant organism on the planet contrived its own annihilation. No species is guaranteed its tenure on this planet. And we've been here for only about a million years, we, the first species that has devised the means for its self-destruction. I look at those other worlds, cratered, airless, cold, here and there coated with a hopeful stain of organic matter, and I remind myself what an astonishing thing has happened here. How privileged we are to live, to influence and control our future. I believe we have an obligation to fight for that life, to struggle not just for ourselves, but for all those creatures who came before us, and to whom we are beholden, and for all those who, if we are wise enough, will come after us. There is no cause more urgent, no dedication more fitting for us than to strive to eliminate the threat of nuclear war. No social convention, no political system, no economic hypothesis, no religious dogma is more important.

The dangers of nuclear war are, in a way, well-known. But in a way they are not well-known, because there is a psychological factor — psychiatrists call it denial — that makes us feel it's so horrible that we might as well not think about it. That element of denial is, I believe, one of the most serious problems we face. If everyone had a profound and immediate sense of the actual consequences of nuclear war, we would be much more willing to confront and challenge national leaders of all nations when they present narrow and self-serving arguments for the continuation of mutual nuclear terror.

Denial, however, is remarkably strong and there are many cases in human history where, faced with the clearest signs of extreme danger, people refuse to take simple corrective measures. Some 25 years ago, a tsunami, a tidal wave in the Pacific, was approaching the Hawaiian Islands. The people there were given many hours warning to flee the lowlands and run to safety. But the idea of a great, crashing wave of water 30 feet high surging inland, inundating and washing your house out to sea was so unbelievable, so unpleasant, that many people simply ignored the warning and were killed. In fact, one school-teacher thought the report to be so interesting that she gathered up her children and took them down to the water's edge to watch. I believe that one of the most important jobs that scientists have in this dialogue on the dangers of nuclear war is to state very clearly what the dangers are.

"NO NATION IS EVER SATISFIED THAT IT HAS ENOUGH WEAPONS."

The evidence is compelling that weapons proliferation leads to a substantial, indeed to an exponential growth of nuclear weapons worldwide. The situation is like that of two or more coupled linear differential equations; each nation's rate of growth of nuclear weapons is proportional to some other nation's stockpile of nuclear weapons. No nation is ever satisfied that it has enough weapons. Any "improvements" by the other side force us to "improve" our weapons systems. Exponentials not only go up, they also go down, suggesting that a concerted effort to increase the nuclear weapons systems stockpiled by one nation will result in a corresponding increase by other nations. But likewise, a concerted effort by any one nuclear power to decrease its stockpile might very well have as a consequence a decline in the stockpiles of other nations, and, at least up to a point, the process can be self-sustaining. I therefore raise the question of whether the nation that first developed and used nuclear weapons on human populations has some special obligation to decelerate the nuclear arms race.

There is a wide range of possible options, including small and safe unilateral steps to test the responses of other nations, and major bilateral and multilateral efforts to negotiate substantial, verifiable force reductions.

Disarmament, done in such a way as to preserve deterrence against a nuclear attack, is in everybody's interest. It's only a matter of getting started. Of course there's some risk. It takes courage. But as Einstein asked, in precisely this context, "What is the alternative?"

An extraterrestrial being coming upon the Earth might note that a few nations, one of them being the United States, actually have organizations devoted to peace as well as to war. The United States has something called the Arms Control and Disarmament Agency.

But its budget is less than one hundred thousandth of the budget of the Department of Defense. This is a numerical measure of the relative importance that we place on finding ways to make war and finding ways to make peace. Is it possible that the intelligence, compassion and even self-interest of the American people have been thoroughly exhausted in the pursuit of solutions to the threat of nuclear war? Or is it more likely that so little attention is given to it, so little encouragement is provided to bright young people to consider this issue, that we have not even begun to find innovative and imaginative solutions?

Through the courageous examination of these deep painful issues, and through the political process, I am convinced we can make an important contribution toward preserving and enhancing the life that has graced our small world.

Carl Sagan is director, Laboratory for Planetary Studies and David Duncan Professor of Astronomy and Space Sciences, Cornell University.

"...We now have a unique chance to halt the occurrence of what has looked like an inevitable collision (between the United States and the Soviets). What has to be done now is to... attempt to operate on a higher plane of thought, one in which the lure of cooperation is stronger than that of confrontation."

Marshall Goldman, Associate Director
Russian Research Center
Harvard University
February, 1983

"Every major problem that confronts us is global. Even to mitigate the problems requires the cooperation of statesmen, scientists, moral philosophers... in every country. Americans should find it easier to achieve such cooperation than did people of Old World nations, for they are the heirs and the beneficiaries of a philosophy that proclaimed that all men were created equal and endowed with unalienable rights to life, liberty and the pursuit of happiness."

Henry Steele Commager, Historian
"Outmoded Assumptions"
Atlantic, March, 1982

"Years ago we fought a war to make the world safe for democracy. In our time you and I can use our heritage of democracy to make the world safe from war."

Thomas Watson, Jr.
Chairman Emeritus, IBM
Former U.S. Ambassador to the USSR
Speech, 1982

"The ultimate objective is not to control weapons per se, but to control war. The public voice must continue to make itself heard."

Barbara Tuchman, Historian
Pulitzer Prize Winner, 1983

HOW THE ARMS RACE WAS ENDED

This article expresses actions that could follow a decision and agreement to build a world beyond war.

By Harold Gilliam

In the spring of 1983, it became clear that something big was under way in Washington. For weeks, the lights burned late in the state Department and the west wing of the White House. Administration spokesmen would say only that a major policy review was taking place.

Then, on June 10, when the President made a commencement speech at Georgetown University, it was clear from the start that he was proposing some totally new directions. He spoke in solemn terms about the threat of nuclear war and said avoiding such a holocaust was the most important task facing the human race.

He said that he was certain the people of the Soviet Union, who had suffered greatly in World War II, did not want nuclear war any more than Americans did. Americans reject communism, he continued, but can still hail the Russian people for their achievements.

"WE ALL BREATHE THE SAME AIR; WE ALL CHERISH OUR CHILDREN'S FUTURE"

Both nations, he emphasized, were devoting vast sums to massive weapons that could better be used to combat ignorance, poverty and disease. Without being blind to our differences, he said, we can consider our common interests, including the fact that we all inhabit this planet; we all breathe the same air; we all cherish our children's future.

The President said that he had decided to launch a series of peace initiatives in the hope that they would reduce international tensions and facilitate the arms negotiations in Geneva, which had been stalled for months. The initiatives, he said, would start small and expand gradually, depending on the Soviet response.

One initiative he was announcing immediately was to lift the travel restrictions that had been imposed on Soviet officials and citizens in the U.S.

Two days later, the complete text of the President's speech was printed in both Pravda and Izvestia. The following week, the Soviet premier made a speech welcoming the U.S. initiatives and announced that restrictions on Americans traveling in the Soviet Union would be lifted. And he invited American students and scientists to study in the Soviet Union under special new programs that would be established.

In July, the President announced that many aspects of NASA's space programs were being opened to international observers, including Soviet scientists.

Intourist subsequently ran full-page ads in major American newspapers announcing a series of special bargain tours for Americans to various parts of the Soviet Union.

In August, the mayor of San Francisco announced that her city, with the encouragement of the State Department and the Soviet government, was planning to adopt Odessa as a sister city and to arrange for San Franciscans and residents of Odessa to exchange homes during summer vacation.

"FEAR AND TENSION LEVELS WERE REDUCED MEASURABLY..."

The President next announced the creation of a U.S. Peace Academy (corresponding to Annapolis and West Point) to train potential foreign service personnel and others in conflict resolution. The Soviet government was invited to send students and observers.

A month later he declared that the U.S. would suspend underground testing of nuclear weapons for a six-month trial period. Shortly thereafter the Russians said they would do the same and would admit U.N. inspectors to examine seismic monitoring stations to ascertain compliance.

In November, the President invited the Soviets to participate in a joint conference in Washington on the disposal of nuclear wastes; they accepted, and the conference was scheduled for February, 1984. At his opening speech at the February conference, the President declared that the U.S. was making New England a nuclear-free zone and invited international inspection. Six weeks later the Soviets responded by declaring a similar nuclear-free zone on the Black Sea, and also invited inspection.

In April, the President proposed that Warsaw Pact and NATO forces pull back ten miles from their line of contact between East and West Germany. The following month the Soviet Premier responded that his country would accept the pullback "in principle" but recommended that it first be tried experimentally along a 20-mile front in southern Germany. At the same time, he proposed a joint Soviet-American program to extend technical aid to Third World countries, particularly in the improvement of agricultural methods and medical and family-planning assistance.

The most significant result of these peace initiatives was the general cooling-off of the international atmosphere. Fear and tension levels were reduced measurably, and a veritable wave of relief swept across Europe. The arms negotiations in Geneva took on new life.

With arms-reduction agreements emerging between the two superpowers, it seemed possible to

move on to the next vital item of business — to halt worldwide nuclear proliferation. The world appeared to have stepped back from the nuclear brink, and people everywhere were able to breathe more easily.

This scenario is more than a fantasy. The President's initial speech is patterned on John F. Kennedy's commencement address on June 10, 1963, at American University, which led to the treaty prohibiting nuclear testing in the atmosphere and opened the era of detente.

The initiatives are based on the program of "Graduated and Reciprocated Initiatives in Tension-reduction" (GRIT) devised by Professor Charles Osgood of the University of Illinois, former president of the American Psychological Association; on suggestions by the American Initiatives Project headed by Robert Pickus of the World Without War Council in Berkeley; on consultations with two members of Stanford's Arms Control and Disarmament Program, Phillip Farley, former State Department diplomat, and John Barton, law professor and author of "The Politics of Peace."

These authorities, however, are not responsible for the form the scenario takes here.

This scenario is intended only to indicate possibilities. Readers are invited to send *This World* their own recommendations for peace initiatives. The results will be published here at a later date.

Reprinted from THIS WORLD, San Francisco Chronicle, January 23, 1983 and May 8, 1983

The readings in this volume are a part of the rich resource which produced the Beyond War movement. Taken collectively, they represent a new way of thinking emerging from a remarkably broad variety of disciplines. The Beyond War statement, which follows, is a distillation of the essence of this new thinking. It is the basic document upon which this movement is founded.

BEYOND WAR™

A New Way of Thinking

"The unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe".
Albert Einstein, 1946

The development, deployment and use of nuclear weapons have forever altered our environment. For the first time, a species has the capability of destroying itself and its life support system. Our thinking, however, has not yet caught up with that reality. In order to survive, we must change our mode of thinking. This change requires knowledge, decision and action.

I. KNOWLEDGE.

A. War is Obsolete

Throughout recorded history, war has been used to acquire, to defend, to expand, to impose, to preserve. War has been the ultimate arbiter of differences between nations. War and the preparation for war have become intrinsic to human culture. Now we must accept the reality that war has become obsolete.

We cannot fight a full-scale nuclear war. A full-scale nuclear war would destroy civilization as we know it and would threaten life itself.

We cannot fight a limited nuclear war. Detonation of even a small percentage of the world's nuclear arsenals could trigger a "nuclear winter" and cause the extinction of humanity. It is also highly probable that a limited nuclear war would escalate to a full-scale nuclear war.

We cannot fight a conventional war among the superpowers. Such a war would likely escalate to a nuclear war.

We cannot fight a conventional war among the non-superpowers without potentially involving the superpowers. The growing interdependence of nations has produced a network of "vital interests" that the superpowers have pledged to defend. This defense could, in turn, escalate through conventional war to nuclear war.

Today, because war has become obsolete, we must learn to resolve conflict without violence.

B. We Are One

"Once a photograph of the earth, taken from the outside, is available... a new idea as powerful as any in history will let loose."
Sir Fred Hoyle, 1948

The view of the earth from space is a symbol of the interconnectedness of all life. This symbol of oneness is validated by a variety of scientific discoveries of the last century.

Physics demonstrates that nothing exists in isolation. All of matter, from sub-atomic particles to the galaxies in space, is part of an intricate web of relationships in a unified whole.

Ecology provides the understanding that all parts of a living system are interconnected and that greater stability results from increased diversity.

Biology reveals that, in a totally interrelated system, the principle of survival of the fittest has new meaning. The "fittest" is now seen as that species which best contributes to the well-being of the whole system.

Psychology explains the projection of the dark side of the personality upon an "enemy." That knowledge gives us new tools to understand conflict and to improve relationships between individuals and between nations.

Together these discoveries reveal in a new way the meaning of "One." We are one interconnected, interdependent life-system, living on one planet.

C. The New Mode of Thinking

The knowledge that war is obsolete and that we are one is the foundation of the new mode of thinking. Our mode of thinking is what we identify with. It determines our values, our attitudes, our motivation, and our actions.

Until recently, we had not experienced the earth as one integrated system. We had limited experience of other peoples and other cultures. Therefore, our primary loyalty has been limited to our family, tribe, race, religion, ideology, or nation. Our identification has been restricted, and we have often seen those beyond that identification as enemies.

In the nuclear age this limited identification threatens all of humanity. We can no longer be preoccupied with enemies. We can no longer see ourselves as separate. Modern transportation, communication systems and the discoveries of science have increased tremendously our direct and indirect experience of the world. We now see that all of life is interdependent, that we share a common destiny, that our individual well-being depends on the well-being of the whole system. We must now identify with all humanity, all life, the whole earth. This expanded identification is the new mode of thinking.

It may be that we will never eliminate conflict between individuals or between nations. There will always be different perspectives, different ideas and different approaches to problems. However, an overriding identification with the whole earth will enable us to resolve conflicts by discovering solutions that benefit all. Diversity will no longer be a cause of war. When we change our mode of thinking, diverse points of view will become a source of creative solutions.

The human species has repeatedly demonstrated the ability to change its mode of thinking. As we have matured and acquired new knowledge, we have expanded our identification beyond the tribe, the clan and the city-state. As we began to expand our identification beyond race, we abolished the institution of slavery. Now, by expanding our identification to the whole earth and all humanity, we will build a world beyond war.

"The Age of Nations is past. The task before us now, if we would not perish, is to shake off our ancient prejudices, and to build the earth."
Pierre Teilhard de Chardin, 1936

II. DECISION

The process of building a world beyond war begins with the acknowledgement that war is obsolete and that we are one. Change, then, requires a decision to reject totally the obsolete and to commit totally to build upon the new identification.

Decision means "to cut" (-cision) "away from" (de-), to reject forever an option, to close the door to an existing possibility. Without a decision it is impossible to discover the new. There is always peril in moving into the unknown. We cannot preview all that will happen. We must draw upon our individual and collective experience of making such "leaps" in the past.

The decision to change our mode of thinking must be made on an individual basis. Individuals are the basic elements of societies. Without individual change, societal change cannot occur. Each of us must decide to adopt the new mode of thinking as the basis of his or her life.

"To compromise in this matter is to decide; to postpone and evade decision is to decide; to hide the matter is to decide... There are a thousand ways of saying no; one way of saying yes; and no way of saying anything else."

Gregory Vlastos, 1934

III ACTION: BUILDING AGREEMENT

Societies generate their own visions of what is possible and draw their behavior from those visions. This nation must renew its commitment to the vision upon which it was founded and build agreement about the implications of that vision in the contemporary world.

"We hold these truths to be self-evident: that all men are created equal; that they are endowed by their Creator with certain unalienable rights; that among these are life, liberty, and the pursuit of happiness; that, to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed."

Declaration of Independence, 1776

We have not always lived up to the highest expression of our founding principles. For example, the principal that "all men are created equal" originally meant only white, tax-paying, property-owning males. Clearer understanding of these principles has resulted in creative change. When enough of us agreed that "all men are created equal" meant black and white, we abolished slavery. When enough of us agreed that it meant women and men, we instituted women's suffrage. When enough of us agreed that it meant more than "separate but equal," we recognized civil rights.

When new agreements about principles are reached, laws, treaties and policies are developed to implement them. That is the only sequence of lasting change: agreement about principle, then law. Law cannot effectively precede agreement. Agreement must spring from new understanding of principles. The action through which agreement is built is education.

Today education must be based upon the knowledge that war is obsolete and that we are one. We now know that the principle "all men are created equal" applies to every human being on the planet. We now know that the unalienable right to life, liberty and the pursuit of happiness cannot be secured by war. We must now work together to build agreement based on that knowledge throughout our society.

Power comes from individuals who are connected to universal principles and who are working together to build new agreements. The power of this nation has come from the involvement of the people in the unfolding of our founding principles. We have always agreed that such involvement is not the exclusive right of the elite. Truth is self-evident: it is available to all. Power flows not from the top, but from the *consent of the governed*. Our Great Seal says it clearly: "E Pluribus Unum — Out of Many, One."

We have become a demonstration of that statement on our Great Seal. The possibility that resulted from the process of involving people in the pursuit of truth has been unfolding for 200 years. This process has served as a beacon of hope and inspiration to people around the world. It has drawn the largest diversity of people ever assembled in one nation. We have gathered the "Many" — the religions, the races, the nationalities — working for the well-being of the "One," the Whole, the United States of America.

To fulfill the purpose and vision upon which this nation was founded, we must change our understanding of the principle "Out of Many, One" to include the whole earth and all life. We must now work together to build a world beyond war.

"I know of no safe repository of the ultimate power of society but the people. And if we think them not enlightened enough, the remedy is not to take the power from them, but to inform them by education."

Thomas Jefferson, 1820

BEYOND WAR RESPONSES TO FREQUENTLY ASKED QUESTIONS

People naturally have questions when they attempt to envision a world beyond war. Certain questions that arise time and time again are included in this appendix because the answers reveal how the new mode of thinking provides creative new solutions to seemingly insoluble problems.

These problems seem insoluble unless we recognize that our survival is at stake. Until we accept that reality, we are stuck in the old mode of thinking and can see only two narrow, undesirable alternatives: being overrun by our enemies or continuing on our precarious course of deterrence through mutually assured destruction.

To find answers to these and other challenging questions, we must be convinced that not finding an answer means the loss of all that we value. By linking the tremendous energy and ingenuity of our will to survive with the new mode of thinking, we open our minds to an entirely new range of possibilities. Approached in this manner, seemingly impossible problems cease to be barriers. Instead, they become bridges to the future.

Doesn't moving beyond war require unilateral disarmament?

No. Unilateral disarmament means one side would suddenly, in one dramatic act, destroy all its weapons and be defenseless, naively hoping that its adversary would follow suit. Such an act is neither practical nor desirable — because it is destabilizing, it might even encourage war. To build a world beyond war, we must take the time to explain our intentions, explore mutual interests, and build relationships based on common goals. There are no short cuts to that process.

When that process is followed, incremental steps which lead to mutual disarmament are both practical and possible. Without jeopardizing our security, we could begin by retiring a few of our 30,000 nuclear weapons and inviting the Russians to follow suit.

What about the Russians? Can we trust them?

We can trust the Russians to do what is in their self-interest. It is in their self-interest to survive and, today, their survival depends on our survival. If we approach negotiations with that goal — our joint survival — we can trust the Russians to abide by the agreements which result. Agreements which are to our mutual advantage are the only kind we can trust.

Our mutual suspicion, based on years of antagonism, understandably prevents agreements which require faith in the other's good intentions. Fortunately we have the means to make viable treaties which are not based solely on faith, but on our ability to verify compliance. General Homer Boushey, U.S. Air Force (Retired), has stated, "We do not need to trust the Russians. We can get the information that is necessary [to verify treaty compliance] by means we already have. They cannot test a weapons system without us knowing about it."

Paul Warnke, who sat face-to-face with the Russians and negotiated the SALT II treaty declared, "If you have a clear, unambiguous arms control agreement, the record of compliance on both sides is good. Now, I know there have been suggestions of cheating. We have had a Standing Consultative Commission [of American and Soviet representatives] that has met regularly in Geneva ever since SALT I, and they have found satisfactory answers to the charges on both sides. The record in this regard is good. The Soviets live up to the letter, and you can emphasize the letter, of an arms control agreement. They have self-interest in seeing to it that those agreements are reached. They have a selfish interest in seeing to it that those agreements remain in force. They recognize that, were we to detect violations of these treaties, that would mean a total end of the arms control regime, and they do not want that to happen. That is why I am confident we can continue to negotiate with them in this vital area of nuclear arms control."

We live in a democratic society where the people can change government policy. The Soviets do not. What good does it do for us to influence our government when the Soviets cannot do the same?

In resolving any conflict, the first move has to be made by one side. That is always the way it works. Because we live in a society where we have the freedom and flexibility to initiate change, we must be the ones to make the first move.

Many credible initiatives have been proposed which would enhance, not jeopardize, our national security. In a recent article, former Secretary of Defense, Robert S. McNamara, suggested eighteen actions which he believes would have that effect and noted, "Some of these steps would require agreement with the Soviet Union, but many could be taken unilaterally." There is no shortage of ideas. All that is lacking is the decision to try them.

Any initiative entails a degree of risk. But, if we stay on our current course, we face the ultimate risk — we guarantee our total destruction. In the nuclear age there are no risk free options. Properly implemented initiatives diminish the risk and enhance our security by reducing tension between the superpowers. In this new atmosphere of increased understanding and cooperation, unilateral initiatives can grow into the required joint actions.

Can we move beyond war when the Russians are extending their influence around the world?

Closer examination shows there is little basis in fact for the fear that the Soviets are aggressively extending their sphere of influence and one day might encircle us. In 1980, the Center for Defense Informa-

tion conducted a study which evaluated the ebb and flow of Soviet influence and found that the facts do not support the perception of consistent Soviet advances and devastating U.S. setbacks. Rather, the study found:

- Soviet influence peaked at 14 percent of the world's nations in the late 1950's and has since declined to 12 percent.
- The Soviets have been successful in gaining influence primarily among the world's poorest and most desperate countries.
- Soviet setbacks in China, Indonesia, Egypt, India and Iraq dwarf marginal Soviet advances in lesser countries.
- The record of Soviet influence provides no justification for American alarmism or military intervention.

What about the Soviet invasion of Afghanistan? Doesn't that show they are bent on world domination?

No. To understand why, we must better understand the Soviet view of the world. We need not agree with that view, but we must understand it. Over the centuries, Russia has been invaded by the Mongols, the Moslems, the Turks, the Swedes, the Poles, the Austrians, the French, and the Germans. During World War II alone, twenty million Soviet citizens were killed. With this history, the Soviet Union has an understandable, deep-seated fear concerning unrest near its borders.

With this background, we must then remember that the USSR shares uneasy borders with three Moslem countries, Turkey, Iran and Afghanistan; that there is significant minority unrest within the Soviet Union; that twenty percent of the Soviet population is Moslem; that a militant Moslem regime has come to power in Iran; and that the insurgents in Afghanistan are fighting to establish a similar regime there.

Seen in this light, the Soviet invasion of Afghanistan is analogous to our own reaction to unrest in Latin America. Since 1846 the United States has intervened militarily more than sixty times in Central America, Mexico and the Caribbean. We have assisted in the overthrow of governments in Guatemala and Chile and occupied the Dominican Republic for eight years and Nicaragua for seven. We abetted an attempted invasion of Cuba at the Bay of Pigs. And, today, American aid is being used for the declared purpose of destabilizing the government of Nicaragua.

The Soviet invasion of Afghanistan is not some aberration committed by a nation bent on world domination; it is the inevitable consequence of the current mode of thinking found throughout the world. This thinking justifies military intervention, however brutal and dangerous, whenever a nation believes its national security might be diminished by unrest in another country. To avoid future Afghanistans, Czechoslovakias, Vietnams, and Nicaraguas we must lead the way to a new mode of thinking which recognizes that in the nuclear age, military intervention is an obsolete mode of behavior. We must put both sides' past mistakes behind us and look to the future for new and better possibilities.

What about nuclear proliferation — countries like Libya and Iraq getting their own nuclear weapons?

The only long-term defense against nuclear proliferation is to move beyond war, thereby removing the motivation for all nations to build nuclear weapons. We can and must slow the transfer of nuclear weapons technology to Third World countries, but we cannot stop it completely. Any country which wants them will eventually possess nuclear weapons. So we have to create an environment in which no country wants nuclear weapons.

Right now, we are doing the exact opposite. In the nuclear non-proliferation treaty, nations without nuclear weapons agreed to forego their development in return for the superpowers "declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to undertake effective measures in the direction of nuclear disarmament." Since signing that treaty in 1968, we have increased the number of our strategic nuclear weapons from 2,000 to 8,000; we have deployed MIRVs and the Poseidon SLBM; and we are planning to spend $1.7 trillion over the next five years on an unprecedented peacetime military buildup.

These actions, and the corresponding Soviet actions, lend little credence to both countries' statements that other nations do not need nuclear weapons. In consequence, Argentina, Brazil, Iraq, Israel, South Africa, South Korea, Taiwan, and Pakistan all are believed to be working on nuclear weapons. As world leaders, we set an example by what we do, not by what we say.

We must begin to lay the foundation for a world beyond war immediately, or soon nuclear blackmail will be a constant threat and terrorism will assume a new, more ominous role.

Isn't war part of human nature?

There is a great deal of evidence that cooperation, not war, is intrinsic to human nature. Human beings became the dominant life form on the planet because of our ability to cooperate. For millions of years, our survival depended on the cooperative hunt and sharing of food. In an industrial economy, millions of individuals cooperate: some produce food, others mine minerals, others design machinery. Industrialized countries are massive cooperative endeavors and we are rapidly moving from national economies to one global economy.

War itself has been an ironic cooperative response to threats to our homeland. In the nuclear age our homeland is no longer limited to a city or a nation; it is the small, fragile planet which we all share. To protect our homeland today, we can only move beyond war.

To say that war is the dominant human behavior is like saying that the most important thing about a plane is that it can crash. The promise of a plane is in its flying, and the promise of humans is in our ability to adapt to new environments and work cooperatively. Building a world beyond war is working with human nature, not against it.

Wouldn't a move beyond war hurt the economy?

Defense expenditures are not required for a robust economy. Japan spends less than one percent of its GNP on defense; the United States spends close to seven percent. Yet the Japanese economy is an astounding success.

The low level of Japan's defense spending permits it to invest more in capital equipment and plants, increasing the efficiency and competitiveness of Japanese industry. The high level of American defense spending is inflating our federal deficit, straining the ability of our financial markets to meet legitimate investment needs. Weapons expenditures generate income but no goods or services for that income to buy — the classic condition for inflation. There is ever-increasing evidence that defense spending is sapping, not supporting, the American economy.

While the overall economy will be better off in a world beyond war, individuals and companies engaged in defense production will suffer dislocations. Proper planning can minimize economic dislocations caused by any major shift in production, be it a move beyond war or a shift in international markets. Because moving beyond war is not an instantaneous act, we have time to plan for economic conversion of the military sector. Because moving beyond war requires solving many complex problems, there are productive functions to which we can convert the military sector — all kinds of new possibilities are created with billions of dollars of unproductive expenditures removed from the federal budget.

What is the action?

Communication, education and building agreement are the required action. Thomas Jefferson stated the fundamental philosophy of democracy in 1820: "I know of no safe repository of the ultimate power of society but the people. And if we think them not enlightened enough, the remedy is not to take the power from them, but to inform them by education." Through education people gain conviction. Once they have conviction, they take actions consistent with their new understanding. Because societal change is required, the educational process requires more than individual education — it requires building new agreements within society.

The Copernican Revolution provides a good example of how this process works in practice. As early as the third century B.C., Greek philosophers had suggested that the earth was not the center of the universe, but the idea was far from generally accepted. In 1543, Copernicus communicated the idea of a sun-centered solar system in his treatise, *On the Revolution of the Celestial Spheres*. While many individuals adopted the idea, society did not — Copernicus' work was declared "false and erroneous." Galileo's espousal of the Copernican doctrine was heresy punishable under law. Only after a long process of education was societal agreement built. And, only then, could we change the laws under which Galileo had been prosecuted.

War has its roots in the old mode of thinking which justifies war as acceptable. Education to change that mode of thinking is the only effective action in the long-run because only then can we eliminate the root cause of war.

Can I, as one individual, really make a difference?

Yes, absolutely. Individuals are the basic decision-making elements in our society. The great changes that have occurred in the thinking of this country have never originated in the Congress or the legislatures. The great movements — to establish this country, to free the slaves, to establish women's rights, the labor movement, the ecology movement — all began with a few individuals, not in the halls of government. More recently, the civil rights movement was catalyzed when one individual, Rosa Parks, refused to give up her seat on a bus in Montgomery, Alabama. Another individual, Randall Forsberg, started the nuclear freeze concept.

The two great successes of nuclear arms control, ceasing atmospheric tests and banning anti-ballistic missile systems, came when enough individuals demanded them. In the first case, individuals were deeply troubled about strontium-90 poisoning our milk. In the second, we did not want nuclear-tipped ABM's ringing our cities, even though they were supposed to protect us. Today, individuals must be perceptive enough to demand the removal of an even greater danger, our complete extinction, before it manifests itself directly.

Individual initiative in the solution of societal problems is the basis of democracy. President Eisenhower stated that principle on this very issue in 1957: "I like to believe that people in the long run are going to do more to promote peace than are governments. Indeed, I think that people want peace so much, that one of these days governments had better get out of their way and let them have it."

REFERENCES TO BEYOND WAR RESPONSES TO FREQUENTLY ASKED QUESTIONS

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Page 32, Paul Warnke quote: "What About the Russians?", videotape and transcript available from Educational Film and Video Project, 1725 Seabright Avenue, Santa Cruz, CA 95062, 1983, page 7.

Page 32, Robert S. McNamara quote and suggestions: "What the U.S. Can Do," *Newsweek,* December 5, 1983, pages 48-55.

Page 32, Center for Defense Information study: Center for Defense Information, "Soviet Geopolitical Momentum: Myth or Menace?," *The Defense Monitor,* Vol IX, No. 1, 1980.

Page 33, quote from Treaty on the Non-Proliferation of Nuclear Weapons: John H. Barton and Lawrence D. Weiler, eds., *International Arms Control,* Stanford, CA, Stanford University Press, 1976, page 414.

Page 33, countries believed to be working on nuclear weapons: "Who Has the Bomb?," *Newsweek,* December 5, 1983, pages 56-58.

Page 33, war and human nature: Richard E. Leakey and Roger Lewin, *Origins,* New York, E. P. Dutton, 1977, Pages 221-223 and 243-244.

Page 34, levels of U.S. and Japanese defense spending: telephone interview, June 26, 1984 with Dr. Coit Blacker, Stanford University Center for International Security and Arms Control.

SELECTED RESOURCES
ERRATA

DOT CHART (page 2)

One dot: 3 megatons: Allied aerial bombing in World War II, not total bombing.

Six dots: Current firepower of one Trident submarine (with D4 missiles): 19 megatons.

Eight dots: Firepower of one Trident submarine when fitted with D5 (Trident II) missiles expected in 1988: 24 megatons. All Tridents will be retrofitted at that time.

Source: Center for Defense Information. (1985).
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