

The LONG DARKNESS

PSYCHOLOGICAL AND
MORAL PERSPECTIVES
ON NUCLEAR WINTER

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This book grew out of a symposium that was presented in Los Angeles as part of the scientific Program of the 1983 Annual Meeting of the American Psychiatric Association. The views expressed by the contributors do not necessarily represent the American Psychiatric Association.

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Introduction

LESTER GRINSPOON

The crisis we are asking the reader to consider is the most important one that has ever faced humanity and the hardest to examine seriously and steadily. Everyone who truly addresses it accepts the burden of disturbed serenity and complacency.

Many people recognize in some way and at some level that the continuation of the nuclear arms race is a threat to the survival of civilization, nothing less—maybe even, as Dr. Sagan will demonstrate, to the survival of the human species. It is easy to repeat such words, and they have been spoken so often that we no longer hear them; the difficult thing is to make ourselves feel what we know and determine our actions by it. For once this knowledge is truly assimilated, once we have grasped it affectively as well as cognitively, it demands that we redirect our lives in small and large ways. It changes attitudes toward professional life, friendships, marriage, and especially children, including those as yet unborn. It also forces us to become more sensitive to the increasing extent to which our young children and adolescents perceive the threat of nuclear extermination as part of their lives and how these young people who see themselves as having an endangered future retreat into the present. And we cannot ignore the possible consequences of this retreat for their development.

It is natural and even healthy to want to get on with the business of our lives rather than think about a peril to all life that most of us prefer to see as abstract and remote. We do not want to be overwhelmed by anxiety, so we tend to keep the facts we know separate from our feelings.

The late Archibald MacLeish wrote, "Knowledge without feelings is not knowledge, and can only lead to public irresponsibility and indifference, conceivably to ruin. . . . [When] the fact is dissociated from the feel of the fact . . . that peo-

ple, that civilization is in danger" (*Atlantic Monthly* 203 [1959]:40–46). Many people repress their fear, anger, and rebelliousness in response to the nuclear threat; instead they anesthetize themselves. They avoid acquiring information that would make vague fears specific enough to require decisive action; they contrive to ignore the implications of the information they do allow to get through; they resign their responsibilities to leaders and experts; they treat the accelerating nuclear arms race as simply none of their business and convince themselves that there is nothing they can do about it. Just as some dangers are too slight to arouse concern, this one is, paradoxically, too vast to arouse concern.

It is not an easy task to help people grasp affectively as well as cognitively the immensity of the danger. This is not just because we are all so psychologically well equipped to defend ourselves against anxiety that might threaten to overwhelm, but also because the horror itself is so abstract. Physicians, even though their work is often pressured and stressful, continue to be the professional group that smokes the least, and among physicians, thoracic surgeons have the lowest prevalence of smoking. Clearly, direct exposure to the consequences of smoking makes it difficult to deny them. Similarly, physicians have been in the vanguard of the movement to arouse the consciousness of the populace to the dangers of nuclear war. Working in the emergency room makes suffering from blast, fire, cold, radiation sickness, starvation, and infectious disease less of an abstraction. People who have or have had such experience are less likely to suffer from this failure of imagination.

We have to confront the truth in this unprecedented situation. We must rouse ourselves from complacency and passivity and assume responsibility. We need the courage to be afraid and to make our friends, neighbors, and colleagues afraid—with a fear that is not neurotic and panicky but thoughtful, a fear not so much for ourselves as for our children, for civilization, and for this precious world.

A problem for anyone who fully assimilates a consciousness of the nuclear threat is that it requires us to redirect our

thoughts and change our lives in certain ways—a demand that many people understandably prefer to avoid. It means taking some time that we would like to devote to interesting, self-fulfilling work with obvious rewards and devoting it instead to what seems a frustrating, unfulfilling struggle with few intrinsic rewards and an uncertain chance of success. It does not even bring the pleasure of correcting a visible injustice or relieving visible suffering. In fact, like some techniques of psychotherapy, it heightens suffering in the short run for everyone who is shaken out of numbness or self-delusion and into confrontation of the reality.

Psychiatrists have an important role in developing more understanding of how to make these truths available to everyone. Psychotherapy itself is a model for the process of allowing people to deal constructively with disturbing truths. And as psychiatrists we should be strongly impelled to help others confront this unparalleled threat, because our experience makes us acutely aware of both aspects of the situation: the human potential for irrational and self-destructive acts, and also the enormous human capacity for altruism, adaptation, and creative solutions to the most difficult of problems.

We know now that the nuclear danger is even more terrible than we have supposed. The reader may recall that at one point in the Stanley Kubrick movie *Dr. Strangelove*, the title character asks the Soviet ambassador, “You mean you built a doomsday machine and you didn’t tell anybody?” The question was meant to be ludicrous and the doomsday machine a fantasy, but in the December 23, 1983, issue of *Science*, Dr. Sagan and a group of fellow scientists reported an astonishing discovery: the superpowers have inadvertently built a doomsday machine, and it is operational at this very moment. As in the film, the governments of the superpowers are not telling anybody. They behave as though they do not believe it themselves, let alone feel any obligation to let the inhabitants of the planet know of this threat to their survival. Until great numbers of people come to genuinely appreciate the magnitude of this danger to themselves and fu-

ture generations and demand of their governments that they reverse the arms race, the risk of setting off the doomsday machine will increase.

The Austrian poet and satirist Karl Kraus wrote in 1917, during the darkest days of World War I, "If we still had imagination, we would no longer wage war." If the people of Europe had been able to conceive the horrors of trench warfare, they would not have acquiesced in the policies that made it inevitable. Nuclear war is infinitely more horrible and more difficult to imagine, and most people, including many in high office, do not attempt to imagine it. The authors of this book are contributing to a struggle against unimaginativeness and insensibility either imposed by circumstances or deliberately cultivated. Dr. Sagan will describe the consequences of a nuclear war; the other authors will explain how we have become trapped into risking these consequences and how political use of the nuclear threat affects our lives.

H. G. Wells once pointed out that human history has become more and more a race between education and catastrophe; the race has become even more desperate since then. A terrible thought is that our education might be provided by catastrophe itself, by nuclear destruction short of nuclear war—a nuclear weapon detonated by mechanical error or human error or madness—an accident more devastating by orders of magnitude than the one at Three Mile Island that helped so much to educate us about industrial nuclear power. That would be learning the hardest way of all. We present this book in the hope that a better kind of education is still possible, that if we allow ourselves to learn and think about what is being prepared for us, and in our name, we will reject it and make it our business to work for a change.

Nuclear War and
Climatic Catastrophe:
Some Policy Implications

CARL SAGAN

It is not even impossible to imagine that the effects of an atomic war fought with greatly perfected weapons and pushed by the utmost determination will endanger the survival of man.

EDWARD TELLER

Bulletin of the Atomic Scientists 3, 35 (February 1947).

The extreme danger to mankind inherent in the proposal [by Edward Teller and others to develop thermonuclear weapons] wholly outweighs any military advantage.

J. ROBERT OPPENHEIMER ET AL.

*Report of the General Advisory Committee,
U.S. Atomic Energy Commission, October 1949.*

The fact that no limits exist to the destructiveness of this weapon makes its very existence and the knowledge of its construction a danger to humanity. . . . It is . . . an evil thing.

ENRICO FERMI & I. I. RABI

Addendum, *ibid.*

A very large nuclear war would be a calamity of indescribable proportions and absolutely unpredictable consequences, with the uncertainties tending toward the worst. . . . All-out nuclear war would mean the destruction of contemporary civilization, throw man back centuries, cause the death of hundreds of millions or billions of people, and, with a certain degree of probability, would cause man to be destroyed as a biological species.

ANDREI SAKHAROV

Foreign Affairs, 61, 1001 (1983).

To be taken seriously, apocalyptic predictions require higher standards of evidence than do assertions on other matters where the stakes are not as great. Since the immediate effects of even a single thermonuclear weapon explosion are so devastating, it is natural to assume—even without considering detailed mechanisms—that the more or less simultaneous explosion of ten thousand such weapons all over the Northern Hemisphere might have unpredictable and catastrophic consequences.

And yet, while it is widely accepted that a full nuclear war might mean the end of civilization, at least in the Northern Hemisphere, claims that nuclear war might imply a reversion of the human population to prehistoric levels, or even the extinction of the human species, have, among some policymakers at least, been dismissed as alarmist or, worse, irrelevant. Popular works that stress this theme, such as Nevil Shute's *On the Beach* and Jonathan Schell's *The Fate of the Earth*, have been labeled disreputable. The apocalyptic claims are rejected as unproved and unlikely, and it is judged unwise to frighten the public with doomsday talk when nuclear weapons are needed, we are told, to preserve the peace. But, as the epigraphs that open this chapter illustrate, comparably dire warnings have been made by respectable scientists with diverse political inclinations, including many of the American and Soviet physicists who conceived, devised, and constructed the world nuclear arsenals.¹

A somewhat briefer version of this chapter appeared in *Foreign Affairs* 62, no. 2 (Winter 1983–84): 257–292.

1. And many others. The following impression of early thermonuclear weapons explosions by Thomas E. Murray in 1953, then commissioner of the U.S. Atomic Energy Commission, is typical: "Had you been with me last fall, out in the Pacific at our testing station at Eniwetok, you would have no doubt that mankind now has within the range of his grasp means to exterminate the human race."

Part of the resistance to serious consideration of such apocalyptic pronouncements is their necessarily theoretical basis. Understanding the long-term consequences of nuclear war is not a problem amenable to experimental verification—at least not more than once. Another part of the resistance is psychological. Most people—recognizing nuclear war as a grave and terrifying prospect and nuclear policy as immersed in technical complexities, official secrecy, and bureaucratic inertia—tend to practice what psychiatrists call denial: putting the agonizing problem out of our heads, since there seems nothing we can do about it. Even policymakers must feel this temptation from time to time. But for policymakers there is another concern: if it turns out that nuclear war could end our civilization or our species, such a finding might be considered a retroactive rebuke to those responsible, actively or passively, in the past or in the present, for the global nuclear arms race.

The stakes are too high for us to permit any such factors to influence our assessment of the consequences of nuclear war. If nuclear war now seems significantly more catastrophic than has generally been believed in the military and policy communities, then serious consideration of the resulting implications is urgently called for. It is in that spirit that this chapter attempts, first, to present a short summary, in lay terms, of the climatic and biological consequences of nuclear war that emerge from extensive scientific studies conducted over the past two years, the essential conclusions of which have now been endorsed by a large number of scientists. These findings were presented in detail at a special conference in Cambridge, Massachusetts, involving almost one hundred scientists on April 22–26, 1983, and were publicly announced at a conference in Washington, D.C., on October 31 and November 1, 1983. A detailed statement of the findings and the underlying evidence has been published (Turco et al., *TTAPS*, 1983), as have a number of subsequent corroboratory studies (for summaries, see Covey et al., 1984; Chagas et al., 1984; National Research Council, 1985; Hare et

al., 1985; Pittock et al., in press; Sagan, 1985). The present summary is designed particularly for the lay reader.

Following this summary, I explore the possible strategic and policy implications of the new findings. They point to one apparently inescapable conclusion: the necessity of moving as rapidly as possible to reduce the global nuclear arsenals to low levels that could conceivably cause the kind of climatic catastrophe and cascading biological devastation predicted by the new studies. Such a reduction would have to be to a small percentage of the present global strategic arsenals.

The Climatic Catastrophe

The immediate consequences of a single thermonuclear weapon explosion are well known and well documented (Glasstone & Dolan, 1977)—fireball radiation, prompt neutrons and gamma rays, blast, and fires. The Hiroshima bomb that killed between 100,000 and 200,000 people was a fission device of about 12 kilotons' yield (the explosive equivalent of 12,000 tons of TNT). A modern thermonuclear warhead uses a device something like the Hiroshima bomb as the trigger—the match to light the fusion reaction. A typical thermonuclear weapon might have a yield of about 500 kilotons (or 0.5 megatons, a megaton being the explosive equivalent of a million tons of TNT). There are many weapons in the 9- to 20-megaton range in the strategic arsenals of the United States (U.S.) and the Soviet Union (S.U.) today. The highest yield weapon ever exploded (set off by the S.U. in Novaya Zemlya on October 30, 1961) was 58 megatons.

Strategic nuclear weapons are those designed for delivery by ground-based or submarine-launched missiles, or by bombers, to targets in the adversary's homeland. Many weapons with yields roughly equal to that of the Hiroshima bomb are today assigned to "tactical" or "theater" military missions, or are designated "munitions" and relegated to ground-to-air and air-to-air missiles, torpedoes, depth charges, and artillery. While strategic weapons often have higher yields

than tactical weapons, this is not always the case.² Modern tactical or theater missiles (for example, Pershing 2, SS-20) and air support (for example, F-15, MiG-23) have sufficient range to make the distinction between “strategic” and “tactical” or “theater” weapons increasingly artificial. Both categories of weapons can be delivered by land-based missiles, sea-based missiles, and aircraft, and by intermediate-range as well as intercontinental delivery systems. Nevertheless, by the usual accounting, there are around 18,000 strategic thermonuclear weapons and the equivalent number of fission triggers in the American and Soviet strategic arsenals, with an aggregate yield of about 10,000 megatons. The total number of nuclear weapons (strategic plus theater and tactical) in the arsenals of the two nations is close to 50,000, with an aggregate yield near 15,000 megatons. For convenience, we here collapse the distinction between strategic and theater weapons and adopt, under the rubric “strategic,” an aggregate yield of 13,000 megatons. The nuclear weapons of the rest of the world—mainly Britain, France, and China—amount to many hundreds of warheads and a few hundred megatons of additional aggregate yield.

No one knows, of course, how many warheads with what aggregate yield would be detonated in a nuclear war. Because of attacks on strategic aircraft and missiles, and because of technological failures, it is clear that less than the entire world arsenal would be detonated. On the other hand, it is generally accepted, even among most military planners, that a “small” nuclear war would be almost impossible to contain before it escalated to include much of the world arsenals (see, for example, Ball, 1981; Bracken & Shubik, 1982, p. 155). (Precipitating factors include command and control malfunctions, communications failures, the necessity for in-

2. The “tactical” Pershing 1, for example, is listed as carrying warheads with yields as high as 400 kilotons, while the “strategic” Poseidon C-3 is listed with a yield of only 40 kilotons (“World Armaments and Disarmament, SIPRI Yearbook 1982,” Stockholm International Peace Research Institute [London: Taylor & Francis, 1982], and J. Record, “U.S. Nuclear Weapons in Europe” [Washington, D.C.: Brookings Institution, 1974]).