

There are worlds on which life has never arisen. There are worlds that have been charred and ruined by cosmic catastrophes. We are fortunate: we are alive; we are powerful; the welfare of our civilization and our species is in our hands. If we do not speak for Earth, who will? If we are not committed to our own survival, who will be?

The human species is now undertaking a great venture that if successful will be as important as the colonization of the land or the descent from the trees. We are haltingly, tentatively breaking the shackles of Earth—metaphorically, in confronting and taming the admonitions of those more primitive brains within us; physically, in voyaging to the planets and listening for the messages from the stars. These two enterprises are linked indissolubly. Each, I believe, is a necessary condition for the other. But our energies are directed far more toward war. Hypnotized by mutual mistrust, almost never concerned for the species or the planet, the nations prepare for death. And because what we are doing is so horrifying, we tend not to think of it much. But what we do not consider we are unlikely to put right.

Every thinking person fears nuclear war, and every technological state plans for it. Everyone knows it is madness, and every nation has an excuse. There is a dreary chain of causality: The Germans were working on the bomb at the beginning of World War II; so the Americans had to make one first. If the Americans had one, the Soviets had to have one, and then the British, the French, the Chinese, the Indians, the Pakistanis . . . By the end of the twentieth century many nations had collected nuclear weapons. They were easy to devise. Fissionable material could be stolen from nuclear reactors. Nuclear weapons became almost a home handicraft industry.

The conventional bombs of World War II were called blockbusters. Filled with twenty tons of TNT, they could destroy a city block. All the bombs dropped on all the cities in World War II amounted to some two million tons, two megatons, of TNT—Coventry and Rotterdam, Dresden and Tokyo, all the death that rained from the skies between 1939 and 1945: a hundred thousand blockbusters, two megatons. By the late twentieth century, two megatons was the energy released in the explosion of a single more or less humdrum thermonuclear bomb: one bomb with the destructive force of the Second World War. But there are tens of thousands of nuclear weapons. By the ninth decade of the twentieth century the strategic missile and bomber forces of the Soviet Union and the United States were aiming warheads at over 15,000 designated targets. No place on the planet was safe. The energy contained in these weapons, genies of death patiently awaiting the rubbing of the lamps, was far more than 10,000 megatons—but with the destruction concentrated efficiently, not over six years but over a few hours, a blockbuster for every