Chapter 6

Introduction

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Sophisticated deterrence theories have been proposed to justify the acquisition of nuclear weapons by countries; but they are demonstrably flawed and likely to lead to a catastrophic outcome; which has been avoided so far only thanks to the insubordination of individuals who did not follow the instructions mandated by such theories. The relevant military and political decision makers should try to escape from this dangerous situation. This is not easy; but the alternative is doom.

Escape before doom might become possible after the danger of the current situation of humankind due to the presence of nuclear weapons is more widely understood. But it is more likely that a sufficiently potent motive for drastic changes shall emerge only after a major nuclear-weapon catastrophe caused by a diligent implementation of the sequence of the actions carefully programmed to make nuclear deterrence work. All of us—and primarily all those of us having some specific competence or professional involvement in the development and operational management of nuclear weapons (their technologies, their operational rules, and the related domestic and international politics)—especially all those who do believe their activities related to nuclear weaponry help to promote the survival of their fellow citizens and of humankind—all ought to ponder these facts and cooperate in order to move humankind away from the brink.

Si vis pacem, para bellum. “If you want peace, prepare for war”. This advice was probably rather sensible in many of the occasions in which it was uttered and followed throughout human history; but these were circumstances in which the primary goal was to avoid war if at all possible, but otherwise to win the war. Now every reasonable person understands that “a nuclear war cannot be won and must never be fought” (President Ronald Reagan, 1984 State of the Union Address). Hence, any “reasonable” version of nuclear deterrence must have as its primary goal the prevention of nuclear war: indeed, of any deliberate use of nuclear weapons.

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Attempts have been made to translate nuclear deterrence into a precise military doctrine eventually codified into a set of operational rules governing the eventual use *in bello* of nuclear weapons. This task has become extremely difficult after the development of Intercontinental Ballistic Missiles (ICBMs). This is not the place to enter into a sophisticated analysis of the subtleties that have therefore been invented by the theoreticians who have made their living by investigating—in various countries—the operational details of nuclear deterrence deliverable by ICBMs. Being myself a theoretical and mathematical physicist (rather than an experimental physicist), I should respect these intellectual exercises that have occupied the minds of quite clever individuals. But as a natural scientist I must also emphasize the necessity to confront theory with reality.

The theory of nuclear deterrence implies decisions about the development, manufacture and deployment of defensive and offensive nuclear weapons and, most importantly, the operational rules of their command and control systems. At least in one known case—and most probably in several other cases, as hinted at by people in the know (for instance by responsible individuals who served as Ministers of Defense in key nuclear-weapon countries; indeed, some of these cases are widely known)—a catastrophic nuclear exchange was only avoided because an individual—Colonel Stanislav Efgrafovich Petrov—took upon himself the responsibility to disobey orders and not to launch the nuclear-armed missiles under his command, in spite of the evidence that a nuclear attack was incoming. Indeed, the operational rules implied by deterrence theory required that those missiles be launched before being destroyed by the incoming missile attack; thereby providing just that nuclear response the threat of which was supposed to deter the nuclear attack that—in that specific case—was, by all available evidence, in progress.

So, the world was saved from a sudden nuclear catastrophe. Due to the good sense of a single individual.

An individual who, incidentally, behaved in the most “reasonable” manner: by deciding not to launch the missiles under his operational command he opted for the—supposedly “impossible”—chance that the warning of the incoming nuclear missile attack was just due to a mistake, and as a fateful consequence of his decision he and many others did survive (of course he himself might then be shot for not having followed his instructions...); while in the alternative case (no mistake of the warning system, the incoming attack was indeed incoming) he would in any case be incinerated (with his colleagues, and many others). So, his decision was indeed a quite reasonable decision: especially in the context of that cold logic that is supposed to subtend nuclear deterrence theory and the consequent rules governing the operational employment of nuclear weapons (with no place for ethical or humanitarian considerations).

In fact, he was not subsequently shot; nor were shot—as far as I know—those who had designed a deterrence mechanism that was designed so as to produce an unnecessary catastrophe, thereby demonstrating the criminal idiocy of its planners.

When fools are in charge of critically important planning concerning the employment of weapons of mass destruction, we must worry; but we can have little hope of redress after we witness that theories which are both foolish and dangerous continue

to provide the dominant paradigm of the thinking about the operational command and control of nuclear weaponry. Or when totally childish statements are uttered by key decision makers bragging about having a bigger organ, with reference to the size of the nuclear arsenal of which that decision maker is (in principle) ultimately in control.

My conclusion is that we must all try and fulfill the responsibility to point out that a world with large numbers of high-yield nuclear weapons the purpose of which is—without being used; just by their presence—to deter the use of nuclear weapons by potential enemies; such a world has now been shown to be based on stupid rules: survival has been experimentally demonstrated to require that those rules not be followed! The rules meant to implement nuclear deterrence being clearly foolish, the “enemy” has every reason to expect that they in fact shall not be implemented: hence there is no logic in the claim that deterrence over time worked, since the world was spared the actual use of nuclear weapons *in bello* for over 70 years. In fact, the world has not witnessed a catastrophic employment of nuclear weapons—after Hiroshima and Nagasaki—not thanks to nuclear deterrence, but in spite of nuclear deterrence: only because the rules meant to implement nuclear deterrence were not followed. And note that this clearly indicates that the eventual planner of a nuclear attack may well expect that there shall be no nuclear retaliation; or at least that this is not likely to happen, being a quite irrational act.

Yet the myth of the effectiveness of nuclear deterrence continues to be instrumental to sustain the development and deployment of nuclear weaponry; and the belief of its relevance is perhaps the main cause impeding progress towards the elimination of nuclear weaponry: the eventual actual employment of which constitutes the major threat to the survival of our civilization, perhaps of *homo sapiens*.

Moreover, it now begins to be—quite logically!—suggested that, in order to guarantee that the threat of catastrophic retaliation on which deterrence theory is based is a certainty, its implementation should be turned over to intelligent computers, so as to eliminate the unreliable intervention of humans and thereby make it quite certain that nuclear deterrence work! Opening eventually the way to interventions of more intelligent hackers.

Our current scientific understanding of cosmology and of the emergence of intelligent life on our planet is not sufficient to make reliable estimates of the probability that other intelligent communities exist in the universe; so there is no cogent scientific reason to be surprised by the fact that so far we got no signals indicating their existence. Yet a reasonable conjecture is that this may be due to the fact that all sufficiently intelligent civilizations which emerged in our universe, eventually discovered enough about microphysics to become able to manufacture nuclear weaponry; and then eventually these weapons were accumulate and used; and this “inevitable” development caused the disappearance of that civilization. So, this seems our ultimate fate.

Indeed, the task to eliminate nuclear weapons—before they eliminate us—is by no means easy in the current world context. Important progress in this direction had been made, perhaps culminating—a decade ago—in the statement by President Obama in Prague (April 9th, 2009): [...] So today, I state clearly and with conviction America’s commitment to seek the peace and security of a world without nuclear

weapons. This goal will not be reached quickly—perhaps not in my lifetime. It will take patience and persistence. But now we, too, must ignore the voices who tell us that the world cannot change. We have to insist, “Yes, we can.” [...].

But in the last decade there has been regress, motivating the pessimistic conjecture that significant progress shall occur only after a major nuclear-weapon catastrophe.

Yet all of us—and primarily all those of us having some specific competence or professional involvement in the development and operational management of nuclear weapons (their technologies, their operational rules, and the related domestic and international politics)—all those who sincerely believe that their activities related to nuclear weaponry help to promote the survival of their fellow citizens and of humankind—we all ought to recognize and advertise the demonstrated, dangerous folly of nuclear deterrence theory and of the military doctrines and operational rules implied by it; trying moreover to cooperate in order to move humankind back from the brink of nuclear annihilation.

A final warning. If you suspect that the point of view expressed above about the current operational aspects of nuclear deterrence is excessively alarmistic, you are advised to read the short paper (dated September 10th, 2019; available from the website of the Carnegie Endowment for International Peace) entitled “A Common-sense Policy for Avoiding a Disastrous Nuclear Decision”, authored by James A. Winnefeld, who served as the commander of NORAD (North American Aerospace Defense Command) and who retired in 2015 as the ninth Vice Chairman of the USA Joint Chiefs of Staff. Its 3 sections—entitled “The current command-and control system is under stress”, “How the current system might fail”, and “How a decide-under-attack option would work”—are a terrifying description of the current operational situation and of the strategic thinking underlying the actual employment of nuclear weaponry, as described by someone who has been until rather recently in charge of it in one of the two nuclear-weapon superpowers. Indeed, the diagnosis of the risks of the current situation is, coming from such a competent source, quite compelling. While the proposed improvement—“reasonable” as it is in the framework of the deterrence ideology—demonstrates a remarkable frame of mind (an occupational disease?): four alternative scenarios are envisaged, two of which are viewed as, in some sense, “successful”, including the one resulting in a full nuclear annihilation having the dubious merit to be symmetrical hence more universal (and, by the way, demonstrating a catastrophic failure of deterrence).

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