
Nuclear Technologies and Exterminism

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A couple of years ago a book was published with the challenging title, *Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change*.¹ It tried to explain the mass inattention described in its subtitle. There is room to write another, perhaps even more striking, book called *Don't Even Think About It: Why Our Brains Are Wired To Ignore What a Nuclear War Could Do To Us*.

The mainstream press does not try very hard or very regularly to attract attention to this nuclear sword of Damocles. Taking up the theme of Edward Thompson's 'Notes on Exterminism, the Last Stage of Civilization',² an *Arena* editorial written nearly four decades ago noted the way in which we have pushed the reality of nuclear war aside:

In Australia space and the remoteness of the outer reaches of our continent accentuate the invisibility of the installations of nuclear war. But there is a deeper invisibility; one which joins us to the peoples of other 'advanced' countries in an incapacity to see the gathering future of which we are collective authors

1 G. Marshall, *Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change*, London, Bloomsbury, 2014.

2 E. P. Thompson, 'Notes on Exterminism, the Last Stage of Civilization', *New Left Review*, no. 121, 1980, pp. 3–31.

— things which from another perspective would speak to us through every artefact and institution of our high technology society.³

Arena and its subsequent stablemates *Arena Journal* and *Arena Magazine* have nothing to apologize for here, given their regular reminders and updates over the years about these two possible ways — nuclear or climatic — to cripple or exterminate civilization.⁴ In nuclear matters, writers in *Arena's* publications have consistently opposed Australian export of uranium ore, whether feeding the stockpiles of mass-destruction weapons or to fuel the needs of power-station reactors, with their own dangers and delusory 'advantages'.⁵ Even novelists such as Patrick White have written in *Arena's* pages of their deep disillusion and hope:

Facing the uranium issue honestly is what may save Australia and set an example to the world. It may give us back our 'Dreaming', our faith: as the Aborigines see it, in soul and country and spiritual life; and for the whites of the Western world, our faith in one another. From murdering the Aborigines after our takeover of this continent, then initiating them in alcohol, and passing on venereal diseases and tuberculosis, we have now dispensed the deadlier disease which comes from the lust for uranium money.⁶

The push for uranium sales has been a long, sorry history of depressing continuity. But over the years since the first nuclear bombs devastated Hiroshima and Nagasaki, the threat to humanity they represented has now changed in significant ways that deserve to be appreciated. On the one hand, nuclear-armed governments (nine of them, as of the time of writing) have not neglected the stockpiles they find at their disposal; on the other, research studies have pinned down more precisely the likely effects of their use, whether in part or in full. Each of these developments is worth attention. As John Hinkson has written in a relatively recent volume of *Arena Journal*, technologies, including destructive technologies such as the bomb, have come to be seen as the solutions to prior social problems:

The importance of technology to *Homo sapiens* can hardly be

3 G. Sharp, 'Which Spectre Is Haunting Europe?', *Arena*, no. 57, 1981, p. 2.

4 My own contributions, in addition to the writings of many others, include A. Roberts, 'Nuclear Winter or Prague Spring?', *Arena*, no. 69, 1984, pp. 31–38.

5 H. Allen, 'Against Waking the Rainbow Serpent', *Arena*, no. 59, 1981, pp. 25–42.

6 P. White, 'In this World of Hypocrisy and Cynicism...', *Arena*, no. 68, 1984, pp. 7–13.

overstated. Nevertheless, the technological revolution that has unfolded in stages since the Second World War stands in its own right — from nuclear power and the chemical revolution to cybernetics in all of its varieties, including computerization and the digital revolution more generally. The expression of the digital revolution in the transformation of mass communications has had profound effects. More radical again has been its entry into the production process, and even more so the prospect of the transformation of all of nature, including human nature, via such technical interventions as the genome revolution. These examples ... mark contemporary society off from the past.⁷

To understand the consequences of technological developments in the nuclear arena, we need to recall some elementary facts about why and how nuclear bombs explode. Not that these odd facts signify much in and of themselves — it is rather that they lead us to some phenomena in social anthropology that might be called ‘The Reprehensible Behaviour of Some Leaders in Modern Societies’. On the way, some misleading ideas will need to be discarded — for example, the myth that what happened to Hiroshima or Nagasaki gives us a good guide to the potential effects of today’s nuclear stockpiles. To believe this would be to overlook the technological care that leaders have agreed to lavish on those stockpiles.

But to appreciate the depth of that concern, some data on bomb behaviour needs to be looked at beforehand. Recall first how it is that uranium and related substances can be turned into a bomb. It is not that these details about what they do are so fascinating, but they are of value in letting us understand what some of our leaders have done, and are still doing. So here are some bomb secrets, which of course are not really secret at all...

It is possible, by methods now well known, to extract from the ore a form of uranium that, if suitably treated, can split up and give out a lot of energy as it splits. If you want to say how much energy, as compared to the merely ‘chemical’ energy released when a match is lit or TNT is exploded, then it is best to work in units of energy about a million times bigger than those suited to ‘chemical’ events.

But when, exactly, does the uranium split? What does it mean to ‘treat it suitably’? Answer: have it hit by a neutron, a kind of

⁷ J. Hinkson, ‘Why Do We Place Our Hope in Technology?: A Secular Faith?’, *Arena Journal*, no. 41/42, 2013/2014, pp. 59–92.

particle, of which over a hundred also occur within the uranium itself. This last is a crucial point: it means that, after the uranium splits, it can emit one or more of those neutrons inside it — which can then go on to hit and split other uranium atoms, which likewise give out more neutrons when they split, and so on. It is obvious why this is called a ‘chain reaction’. Within a very short time interval, a vast number of bits of uranium will have split and given out their energy, which will quickly add up to a very large total indeed.

The energy given out by its core of explosive will mostly convert into heat, so that the temperatures nearby soar into the millions of degrees, while expanding gases push hard against the bomb casing and anything else around. But almost at once a problem arises: these temperatures and forces go to work on bits of the bomb itself, sending them flying, scattering them in all directions — mostly a long way from where a neutron could reach that bit and split it.

The result? The bomb just described, once it starts to explode, will send most of its own explosive core flying before a neutron has had a chance to hit it. In fact, nearly 99 per cent of its charge will go unused. Hard as it may be to believe, the thousands who died at Hiroshima, the hundreds of buildings turned into rubble — the death of a city — was the work of a mere 1 per cent or so of the explosive cargo that single bomb carried.

To understand what happened next, we have to imagine the mentality of someone who puts to one side the horrors of that Hiroshima bombardment, or perhaps is not very conscious of them anyway. To such a person (imagine an Eichmann, perhaps, just obeying orders), the situation presents itself as merely a technical problem. The explosive uranium is a valuable resource. Used in such a way it is being wasted, so it needs to be handled more efficiently. Seen thus as a technical problem, the solution is obvious: find an additive that produces its own neutrons and mix it in with the explosive filling. Those extra neutrons mean a bit more uranium hit, a bit more energy released, and a bit less wastage. It was not hard to find additives like that, and we can assume that they are now in use by all the nuclear-armed powers where necessary.

This has turned out to be just one step, usually the first, in what has been delicately termed the ‘modernization process’. We will consider later whether it deserves a less euphemistic name. But it is worth looking first at what the nuclear-armed powers were *supposed* to be doing over the decades this process has already taken, and what they were *actually* doing over this period. Go back to the

time when there were only five nuclear-armed states: the United States, the USSR (now Russia), the United Kingdom, France and China. Each agreed, as did many other nations, to the Treaty on the Non-proliferation of Nuclear Weapons (NPT), which came into force in 1970. Article VI of the NPT required the signatories to pursue 'negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament'. Let me repeat the key words: 'effective measures relating ... to nuclear disarmament'. Effectiveness needs to be judged by results. How do things stand three decades later? Among the estimated quantities of nuclear weapons (totalling 16,300) held in 2014 by the nine nuclear-armed powers, two stand out from the rest: Russia with 8000 and the United States with 7300. Thus between them they hold 94 per cent of the weapons total, against a mere 6 per cent left to all others.⁸

This is a far cry from the disarmament they had committed themselves to. Instead, they built up their stock of weapons and generally amplified the weapons' average power of destruction, confirming their capacity to exterminate most life on the planet (otherwise known as 'modernized capacity'). Noting the massive and often repellent products that came out over the years from this continuous modernization process, we perhaps see to where the energy and attention needed for nuclear disarmament was in fact diverted. To appreciate what the modernization program means in the real world, we need to drop the vague technological fiction that it comprises just a series of 'technical problems' and smart solutions.

Take for example the case mentioned above, when an additive is mixed with the explosive filling, so that more of the filling is hit by a neutron and so adds its splitting energy to the total. This simple change means more bomb energy — more 'yield', in the bombers' jargon — which means more heat, higher temperatures, greater pressures. Thus, compared to a bomb lacking the additive, the 'modernized' bomb will spread higher temperatures and destructive pressures over a wider area; it will kill more people, maim more of the survivors, and destroy more of the buildings and utilities essential to life.

Who is responsible for this surge in lethality? Intellectually trained scientists need to take part of the blame. For all the technical

8 H. M. Kristensen and R. S. Norris, 'Worldwide Deployments of Nuclear Weapons', *Bulletin of the Atomic Scientists*, vol. 70, no. 5, 2014, p. 97.

distance they bring to the task, for all their personal ethics,⁹ they must take some responsibility. However, it will hardly ever be a technician or scientist — even one inventing a new device — who commands a nation to modernize its nuclear weaponry. Churchill was expressing a typical politician's attitude when he said that such brainy people should be 'on tap but never on top'. The budgetary costs alone will require approval from on high, often from the highest levels of national leadership. And that is where the responsibility must ultimately be sheeted home: to us, the people who vote in politicians who allow the modernization to become prioritized.

Writing in *The Bulletin of the Atomic Scientists*, Kristensen and Norris have made another point: that there is no intrinsic reason why this search for technical improvement should ever stop. They see this never-ending process as associated with the apparent loss of concern for disarmament: 'post-Cold War reductions of nuclear weapons have slowed. Meanwhile, the nuclear nations have undertaken ambitious nuclear weapon modernization programs that threaten to prolong the nuclear era indefinitely'.¹⁰

For the 'first step' mentioned above (packing an additive in), we have seen how only the flimsiest knowledge of bomb processes is needed to increase the bombs' potential for inflicting human suffering. This transparency need not hold good for every action classified as a step in modernization, but the principle of avoiding any 'waste' of nuclear explosive will generally still apply on average and achieve a similar result. Since the design aim of a nuclear weapon is to maximize the destruction of people and what they have built, while using its explosive filling as economically as possible, a move towards greater efficiency cannot neglect these goals. We will not go far wrong if, whenever we see the word 'modernize' in a nuclear-weapon context, we replace it with the phrase 'make the weapons more reliable, deadlier and more destructive'.

There is a hint in the word 'modernization' that the new standards aimed at have already been achieved elsewhere in the world, so that 'our' side is lagging behind. This can be, and not infrequently is, a plain lie. If the lie is believed it helps to justify the

9 This becomes even more complicated in relation to second-order destabilizations of the nuclear stalemate. See H. Dewitt, 'A Scientist Reflects on Star Wars', *Arena*, no. 75, 1986, pp. 124–38.

10 Kristensen and Norris, 'Worldwide Deployments of Nuclear Weapons', p. 97.

incremental process as a whole. By comparison, however, when the devices proposed are blatantly new it would at first glance appear logical that the need for significant shifts in technological capacity cannot be concealed very well by stowing them behind a curtain labelled 'modernization'.

Nevertheless, an attempt to do exactly this — to hide a massive change of this kind — was made in 2013 by the Obama administration when it planned to spend about US\$10 billion on a life-extension program for B61 bombers and US\$1 billion on adding controllable tail fins to the bombs:

Under the plan, nearly 200 B61 gravity bombs [bombs that fall under their own weight] stockpiled in Belgium, the Netherlands, Germany, Italy and Turkey would be given new tail fins that would turn them into guided weapons that could be delivered by stealth F35 fighter-bombers. 'This will be a significant upgrade of the US nuclear capability in Europe', said Hans Kristensen, a nuclear weapons expert at the Federation of Nuclear Scientists. 'It flies directly in the face of the pledges Obama made in 2010 that he would not deploy new weapons'.¹¹

To explain Kristensen's remark about pledges, see the Executive Summary of the US Nuclear Posture Review of 2010, in which the United States undertook that 'Life Extension Programs (LEPs) will use only nuclear components based on previously tested designs, and will not support new military missions or provide for new military capabilities'. Note the phrase 'Life Extension Programs'. These have nothing to do with the aim we might naively expect — to prolong the life of a human being. They concern themselves only with extending the life of bombs.

Looking at just two notable turns in the history of nuclear weapons, we can see that a disquieting amount of deception has been practised, along with what must be called callousness towards the people a nuclear exchange would affect. In the 1950s, no one took care to explain to these people how that simple additive would worsen their possible fate, since a given mass of explosive would now kill and maim more people than before. In 2013, the Obama administration did not in its turn stress the effects its plans would make possible. Close to 200 nuclear bombs were to mutate into

11 J. Borger, 'US Accused of Nuclear U-turn', *The Guardian*, 21 April 2013.

guided missiles. They would then be fit for drone-like assassinations, or pinpoint attacks on targets of greatest impact, such as the densest population centres, dams, or nuclear power stations.

The threat of nuclear exchange is there as long as the stockpiles exist, and in fact set to increase, whether through addition to the numbers of nuclear-armed nations or terrorist groups ('proliferation'), or from the uncontrolled expansion (perhaps presented as 'modernization') of existing stockpiles. The global context is hardly reassuring. It so happens that we live in a world where a new nuclear-armed megapower, China, is asserting itself, just as the older one, the United States, shows reluctance to surrender any of its global power. Even more ominously, perhaps, a fearful Pakistan sees its major threat arising from a giant and antagonistic neighbour — India — and both hold nuclear weapons.

It would be good if our world leaders had significant, reassuring accomplishments to show as the fruit of over sixty years of negotiations, oratory and impassioned pleas, but the reality is different. We continue to live under the threat of exterminism. Consider for example a little sobering arithmetic. If you ask Google to estimate the number of cities in the world today, it will of course give answers that depend on how you define a 'city'. If you take the not unreasonable figure of a population over 150,000, Google estimates that the world contains just under 3000 such cities. If we look back at *The Bulletin's* table of nuclear stockpiles, simple division tells us that Russia could drop a couple of weapons on each city in the world and still have a thousand or two left — and the same is true for the United States.

After sixty-plus years of negotiation and stalling, we are still expected to live alongside the means to definitively destroy civilization. We do not seem terribly worried by this. But we should be, and we should be letting our leaders know about it. Even if we look only at their nuclear history, that is enough to prove that we have trusted them too much.