Recent research suggests that the use of even a relatively modest number of nuclear weapons will impact upon the totality of our world’s natural systems, leading to global famine and other economic effects that would also affect the state launching the attack. It would not require any nuclear detonations on or near the territory of a state for its civilization to be destroyed. This has profound implications for the doctrine of nuclear deterrence.

The Oxford English Dictionary defines “to deter” as “to discourage and turn aside or restrain by fear”; by extension, nuclear deterrence involves discouraging, turning aside or restraining potential adversaries through a complex system of signals, capability and intent, involving the possession and threatened use of nuclear weapons, nuclear posture, exercises, political statements and proxy actions. For nuclear weapons to deter effectively, practitioners such as Michael Quinlan, a leading architect of the UK and NATO’s modern nuclear posture, say that the threat to use nuclear weapons has to be credible. In other words, an adversary has to believe in your will to consider use of nuclear weapons in any given set of circumstances

Quinlan and his peers believe that a stable balance of terror is achieved because neither side would rationally upset the status quo for fear of a nuclear escalation from the other. But for this effect to be achieved both sides need to believe the other is willing to risk the consequences of the use of nuclear use because the alternative is worse. From this the concept of an “escalation ladder” emerges, where states are deterred from escalating for fear of things getting out of control because an adversary has less interest in containing the crisis.

It is, however, in the field of nuclear weapons that the definition of “deterrent” is most regularly abused. Nuclear delivery systems are often called “deterrents” (e.g., “the UK’s Trident submarine nuclear deterrent system”), as if the quality of deterrence is locked up in the essence of the system. The implication is that, by virtue of the weapon system being so terrifying in its destructive impact, it is highly effective in delivering a deterrent effect. But this is simply wrong. Deterrence, as the OED definition above makes clear, exists in the mind of the Other. It does not fall within the province of physics, engineering, or even political economy, but purely of psychology.

Thus there are nuclear weapons systems (such as NATO’s “shared” B61 nuclear gravity bombs, based on the soil of five European allies), that don’t deter anyone, and non-nuclear systems (such as a window sticker that reads “Protected by Ace Security”) which deter perfectly.

The problems with nuclear deterrence are more than definitional, however. Following the revelatory work on nuclear winter by atmospheric scientists Alan Robock, Brian Toon and their colleagues (most recently in <https://www.nature.com/articles/s43016-022-00573-0>), there is no credible scenario, or set of scenarios, by which a nuclear-armed state could safely deter an adversary without raising the spectre of the end of global civilization and/or the deaths of (at a minimum) hundreds of millions of people through starvation and other side effects of nuclear winter.

This changes the already unstable calculation at the heart of nuclear deterrence. If the use of nuclear weapons triggers a series of physical effects that are independent of any response from an adversary the degree of self-deterrence rises substantially, and the credibility of the nuclear deterrent is weakened, beyond breaking point. If nuclear weapons are essentially tools of mass suicide their capacity to deter vanishes.

The dramatically lower ceiling for nuclear winter which Robock and company have revealed removes any scope for attempting limited nuclear war; we don’t know where the threshold lives, exactly, and any conflict that brings us close to that tipping point must now be avoided. There is no nuclear escalation ladder, there is no valid theory of “escalation dominance”, there is no credible range of scenarios in which nuclear deterrence can be seen as a stable and positive contributor to peace.

Perversely, the threat of nuclear winter may actually encourage a small-scale nuclear attack by an actor who perceives that his or her opponent will avoid retaliation in order to prevent nuclear winter.

Stripped of its deterrent justification, the existence of thousands of nuclear weapons can now only be seen for what it always has been: An existential threat to human civilisation, waiting for bad luck, imperfect intelligence and/or irrational actors to rain down the cold and the dark upon us all.