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# The Quirks of Nuclear Deterrence

Andrew Brown and Lorna Arnold

## Abstract

From 1945 to 1949 the USA was the world's only nuclear power. Although the nuclear arsenal was overestimated both in terms of size and readiness by the US military in its war plans, atom bombs came to be seen as the essential counter to conventional Soviet forces. The USSR constructed its own bombs in turn, and for decades the analysis of nuclear deterrence was almost exclusively concerned with the two superpowers. In the twenty-first century, the nuclear world no longer displays that mirror-image symmetry and can now be viewed as unipolar, regional, multipolar or stateless. Nuclear deterrence that seemed such an established technical reality during the Cold War should be recognized as a psychological construct that depends on threat perception and cultural attitudes, as well as the values, rationality and strength of political leaders who themselves have to mediate between groups with vested economic or military interests. As the number of nuclear weapons states increases, the logic of nuclear deterrence becomes less obvious and it should not be casually invoked as a general security factor without regard to a specific context. Nuclear weapons have become emblems of geopolitical power under the guise of deterrence. We argue that nuclear deterrence is meaningless against extremist terrorists. Our survey of its quirks leads us to believe that nuclear deterrence is a far less foolproof and reliable global security mechanism than many assume.

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Deterrence is ubiquitous in the natural world, where potential preys employ a variety of defences against would-be predators. Charles Darwin and Alfred Wallace corresponded about the question of repellent defences, such as spines, stings and toxins, and noted that they are usually conspicuous to convince a predator that attack will be costly.<sup>1</sup> The shaping of deterrent responses by natural selection takes thousands of generations, during which time prey and predator co-evolve from no fixed starting point. The process is not purposive, resulting from a random mutation in the genes of an individual organism, but it depends on prior adaptations that have been successful. For the individual animal or plant, the emergence of a novel deterrent is a highly risky event since it may not be instantly recognized by a potential predator.<sup>2</sup>

The advent of nuclear deterrence, by contrast, marked a sudden, deliberate departure in defence planning, developing in earnest after the Soviets exploded their first nuclear device in 1949. It is unprecedented in terms of the scale of the existential risk to human populations posed by its failure. It depends on physical weapons, even the controlled testing of which caused worldwide public alarm, and presents statesmen with international conundrums as well as sometimes placing them at odds with their



own militaries, for example. The historical evasions, missteps, subtleties and shifts – quirks – of nuclear deterrence were the complex products of human psychology, their significance magnified by the destructive power of the weapons themselves.

### Early history

When Otto Frisch and Rudolf Peierls, two refugee physicists from Europe working in Birmingham, wrote their revolutionary memorandum on the construction and implications of an atom bomb in the spring of 1940, they pointed out that such a weapon, if exploded on a city, would kill large numbers of civilians and give rise to widespread radioactive contamination. Thinking ‘this may make it unsuitable as a weapon for use by this country’, they worried that all the technical data available to them were available to their ex-colleagues in Germany. Since there would be no defence against its effects, Frisch and Peierls suggested that ‘the most effective reply would be a counter-threat with a similar bomb. Therefore, it seems to us important [they wrote] to start production as soon as possible, even if it is not intended to use the bomb as a means of attack.’<sup>3</sup> So at the outset, at a time when a German invasion seemed imminent, the rationale for Britain to become a nuclear power was grounded in the notion of deterrence – even if the Nazis were successful in developing an atom bomb, they would not dare use it confronted with the prospect of retaliation with a British bomb. By the time the Maud Report appeared in the summer of 1941,<sup>4</sup> setting out a path to constructing a bomb from enriched uranium, the clear objective was to produce an offensive weapon of great destructive power – there was no mention of deterrence. Reasons can be advanced for the change in emphasis: Churchill had come to power and the national mood was more bellicose after many months under siege.

The Maud Report rather than the Frisch–Peierls memorandum informed the Manhattan Project, and although scientists such as Niels Bohr warned of the risks of a future nuclear arms race, their influence on policy makers declined as military considerations became paramount. After his first visit to Los Alamos at the end of 1943, Bohr was convinced that traditional international diplomacy would not be adequate to address the unfolding nuclear problem, and thought a new level of mutual confidence between nations needed to be forged because, in his eyes, the bomb could become a threat to the security of all mankind. He tried unsuccessfully to convince the top British and American statesmen to prepare for a secure post-war world by informing the Soviets about the atomic bomb before there could be any question of using it.<sup>5</sup> The Manhattan Project scientists working in Chicago who wrote the Franck Report in June 1945 echoed Bohr’s fears when they warned: ‘if no efficient international agreement is achieved, the race for nuclear armaments will be on in earnest not later than the morning after our first demonstration of the existence of nuclear weapons’.<sup>6</sup> Truman cryptically mentioned the existence of an atomic weapon to Stalin at the Potsdam Conference in July 1945. Stalin, who had already been informed of its development through spies such as John Cairncross and Klaus Fuchs, castigated Lavrenty Beria (the NKVD chief supervising the Soviet

atomic programme) for leaving him in a position of weakness at the conference and ordered an increased atomic effort immediately.<sup>7</sup> By the end of August 1945, a crash programme was underway in the Soviet Union.<sup>8</sup>

Truman's overriding goal at Potsdam was to bring about the immediate end to the war in the Pacific against a cruel, fanatical enemy with the minimum loss of American lives, but his stubborn insistence on Japan's unconditional surrender and the subsequent bombings of Hiroshima and Nagasaki remain potent controversies.<sup>9</sup> The British physicist and Nobel laureate, Patrick Blackett, caused uproar when he first suggested that 'the dropping of the atomic bombs was not so much the last military act of the second World War, as the first major operation of the cold diplomatic war with Russia'.<sup>10</sup> Unless the bombings had been intended as an unmistakable signal of American power to the Soviets at a time when the Red Army was poised to attack Japanese forces in Manchuria, Blackett thought their use was 'a supreme diplomatic blunder'. The bombs were not deterrents to the Japanese since they had neither prior knowledge of their existence nor notice of their intended use.

In 1946 the United States presented an atomic energy plan to the United Nations that called for the international control of all potentially 'dangerous activities', from the mining of uranium to the manufacture of bombs, with certain punishment for any states that 'violated their solemn agreements not to develop or use atomic energy for destructive purposes'.<sup>11</sup> Once such a treaty was in place with the necessary safeguards, the United States would destroy the world's only stockpile of atomic bombs (except perhaps for a small number that would be kept by the UN to punish any state caught cheating). The Soviets countered with a proposal calling for the immediate abolition of atomic weapons worldwide, with no provision for international verification. Both sides found the other's terms unacceptable, and the failure to reach any agreement acted as a spur to the nuclear arms race. The Truman administration became concerned about the risk of further Soviet expansion and saw the atom bomb as the great equalizer to be set against the numerical superiority of the Red Army. It is not surprising that President Truman became 'visibly disturbed' when briefed by the Chairman of the Atomic Energy Commission, David Lilienthal, in April 1947 that there were only a dozen plutonium cores and no bombs assembled ready for immediate use.<sup>12</sup> Yet the previous month, Secretary of War Robert Patterson had informed the Army Chief of Staff, General Eisenhower, that the USA 'was already following a policy that assumes the unrestricted employment of atomic energy as a weapon'.<sup>13</sup> BROILER (a war plan circulated by the US Joint Chiefs of Staff [JCS] in August 1947) called for the Strategic Air Command (SAC) to target 'key government and control facilities' in Soviet cities with atom bombs in response to any future large-scale Soviet invasion of Europe or Asia.<sup>14</sup> A subsequent emergency plan, HALFMOON, drawn up in May 1948 when the JCS feared the imminent outbreak of hostilities with the USSR, called for the entire stockpile of atom bombs (then about 50 in number) to be dropped on 20 Soviet cities to cause the 'immediate paralysis of at least 50 percent of Soviet industry'.<sup>15</sup> As the Berlin airlift gathered momentum that summer, Secretary of Defense James Forrestal, with the backing of several senior officers, pressed for custody of all complete atom bombs to be given

to the military instead of the civilian Atomic Energy Commission. His proposal was rejected by Truman, who said it was 'no time to be juggling an atom bomb around'.<sup>16</sup>

During the four years of the American nuclear monopoly, the A-bomb was not regarded by most in Washington as a means of deterrence but as the absolute or winning weapon.<sup>17</sup> It was also a period when the USSR, reeling from horrendous war losses, was especially vulnerable to a nuclear attack from the USA, and Stalin's crash development of an A-bomb was justifiable in principle, if not in its use of prisoners of war and brutal working conditions.<sup>18</sup> On leaving the White House in January 1953 Truman made an astounding statement to the press, demonstrating that even by the end of his presidency he had not accepted the notion of nuclear deterrence. 'I am not convinced Russia has the bomb', he said. 'I am not convinced the Russians have achieved the know-how to put the complicated mechanism together to make an A-bomb work.'<sup>19</sup> Over the next few years, both sides developed thermonuclear weapons and the means to deliver them over long distances, eventually giving rise to the state of Mutually Assured Destruction. Under MAD, the use of nuclear weapons was deterred by the knowledge that first use by either superpower would be repaid with a devastating second strike in retaliation.

### Evolution of deterrence

One dictionary definition of 'deter' is 'to discourage and turn aside or restrain by fear'.<sup>20</sup> The derivation from the Latin *terrere* (to frighten), a root it shares with terror, suggests that deterrence is a severe kind of disincentive, not just gentle persuasion or reasoned argument. As reflected in its etymology, deterrence is based on fear. Apart from the visual signs noted by nineteenth-century biologists, there are biochemical correlates of deterrence. Alarm pheromones are volatile substances secreted by animals in threatening situations that instil fear in close-by members of the same species and tend to provoke freezing, attack or dispersal. These pheromones are widely conserved through evolution, although not yet chemically isolated for mammals. A specific receptor organ has recently been identified at the tip of the nose in mice and a homologous structure is present in humans.<sup>21</sup> While humans may not smell fear to the same extent as other animals, it is still the emotion that drives deterrent behaviour.

Organized violence against other groups has been a constant feature of human life since prehistoric eras.<sup>22</sup> Humans have also displayed deterrent behaviours from earliest times – building fortified enclosures, for example, as they advanced from hunter-gatherer to agricultural societies about 10,000 years ago. The greatest change in warfare as a result of industrialization, apart from its increased scale, has been the capability to kill from a great distance rather than in close combat. So effective deterrence can no longer be a response to immediate danger, and human cognitive and language skills allow us to process indirect, remote or imagined threats. The old Latin tag *Si vis pacem, para bellum* ('If you wish for peace prepare for war') remains the most economical rationale for modern defence policies, even those resulting in

colossal arms races. In contrast to deterrent signals employed by animals that may remain useful and stable over many generations, the ability of humans to invent new weapons short-circuits the process and one system of deterrence may quickly give way to another. Human deterrent postures may also evolve as a result of theoretical analysis rather than from direct experience.

While Bernard Brodie, an influential analyst at the RAND Corporation, and his colleagues<sup>23</sup> predicted that atomic weapons would become the ultimate force in international politics, since the prospect of national destruction through nuclear retaliation would preclude a general attack on a nuclear power, the explosion of the first Soviet device, Joe-1, in 1949 suddenly brought nuclear deterrence into prominence. The first explicit formulation was the Eisenhower administration's 'New Look' in 1953 that elevated the threat of massive retaliation with nuclear weapons to the central tenet of US defence policy. The president wanted 'greater emphasis than formerly on the deterrent and destructive power of improved nuclear weapons':<sup>24</sup> he assumed that the United States would never start a major war of its own volition, but if attacked would not be constrained from replying in kind. While nuclear weapons would be automatically employed in the case of a surprise atomic attack on the USA or Western Europe, the deployment of tactical nuclear weapons in a more limited war must be approved first by the Commander-in-Chief, who would need to take into account the risks of nuclear retaliation by the enemy and the escalation of hostilities, as well as the likely effects on US allies.<sup>25</sup>

A second wave of nuclear deterrence, beyond the control of the two superpowers who were anxious to stabilize their own nuclear standoff, formed in Asia about a decade later. China, alerted by American nuclear posturing during the Korean War,<sup>26</sup> succeeded after some initial Soviet assistance in testing their first nuclear device in 1964. Two years earlier, China and India fought a small war over a disputed border in the Himalayas that resulted in military humiliation for India's army. Prime Minister Nehru, whose public stance was always to decry the immorality of weapons of mass destruction even though he tacitly understood that the major atomic research programme he actively supported potentially offered India a shortcut to atom bombs, still resisted public calls for a change in India's non-nuclear stance.<sup>27</sup> Following Nehru's death and the Chinese test in 1964, there was not an instant change in policy, but a period marked by ambiguity during which India watched with growing alarm an alliance developing between China and Pakistan. There was a studied refusal to sign the Nuclear Non-Proliferation Treaty in 1968 and then 'a peaceful nuclear explosion experiment' in May 1974, which Prime Minister Indira Gandhi sought to downplay as 'normal research and study' while she, Nehru's daughter, continued to disavow nuclear weapons in the family tradition.<sup>28</sup>

Pakistan, having been powerless to prevent India's involvement in the civil war that resulted in the secession of Bangladesh in 1971 and suspicious of India's pursuit of nuclear weapons, decided in 1972 that the acquisition of nuclear weapons was an urgent necessity for its security.<sup>29</sup> The new president, Zulfikar Ali Bhutto – who as an opposition MP in the 1960s had memorably declared, 'If India developed an atomic bomb, we too will develop one even if we have to eat grass or leaves or to remain

hungry because there is no conventional alternative to [the] atomic bomb'<sup>30</sup> – was now in a position to act decisively on his long-held convictions. After he was deposed by a coup in 1977, Pakistan's senior military leaders doggedly overcame technological and international pressures to bring the project to a successful conclusion in 1998.

### Models of nuclear deterrence

The narrow theory of deterrence implies that the deterrer (A) facing a perceived threat of attack from actor (B) seeks to alter B's plans by promising certain retaliation resulting in such damage to B that it will heavily outweigh any potential gains from the original aggression. For B to alter the assessment of its interests and refrain from aggression, B has to receive and understand A's signal of retaliatory intent, believe that A would in fact deliver the punishment advertised, and calculate that the costs of aggression against A are prohibitive. If A fails to define its commitment to preserving what appears to be under threat or fails to communicate that resolve in a credible manner to B, it may be said that deterrence was not properly established. If A's warnings to B are clear and understood but B attacks anyway, deterrence failed. As with contraception, one can never be sure when deterrence has worked, only when it has not.

The introduction of a nuclear dimension into deterrence did not alter its basic logic or pitfalls, but did of course increase the stakes immeasurably. Both sides in the Cold War accepted that their antagonism was going to be, as Eisenhower said, for the 'long haul', so the need was for sustained rather than immediate deterrence. By the time of the 'New Look', the USSR had developed a prototype H-bomb and was expected to have the means to deliver it against the USA within the next few years. There was no effective defence against the devastating effects of nuclear weapons – a feature that made them especially feared as components of a surprise attack. Yet the strategy of 'massive retaliation' against any communist incursion was soon recognized to be implausible since it would result in such disproportionate responses, and the 'New Look' was modified to allow for a range of means of retaliation, culminating in the use of nuclear weapons.<sup>31</sup> But the increasing Soviet nuclear stockpile and its improved means of aerial delivery meant that any US ability to dominate was temporary. The best outcome would seem to be a form of stalemate where neither side dared risk general war – a hope for nuclear deterrence that Churchill memorably invoked in his last speech to the House of Commons, suggesting that 'by a process of sublime irony ... safety will be the sturdy child of terror, and survival the twin brother of annihilation'.<sup>32</sup> Writing at about the same time, the military historian Basil Liddell Hart disagreed,<sup>33</sup> noting that the H-bomb 'is not the answer to the Western peoples' dream of full and final insurance of their security' because to the extent that it reduced the likelihood of all-out war and limited escalation, 'it *increases* the possibilities of "limited war" pursued by indirect and widespread local aggression' – guerrilla campaigns or insurgencies cannot be deterred by nuclear weapons.

While Churchill trusted his political instinct to prophesy the nuclear future, the US Air Force (USAF) turned to social scientists at the RAND Corporation to

analyse their strategic needs. Their early writings reinforced the USAF's view that nuclear weapons were essentially offensive in nature and conferred an enormous advantage to an aggressor mounting a surprise attack. At a time when there was a preponderance of US nuclear forces, that clear superiority was believed sufficient to keep any Soviet expansion in check. By 1958 the imbalance had been eroded and Albert Wohlstetter, a leading systems analyst at RAND, wrote an article whose title alone – 'The Delicate Balance of Terror'<sup>34</sup> – served to challenge Churchill's notion that the mere possession of thermonuclear weapons by the West and the Soviets could result in a sturdy or stable peace. Wohlstetter suggested that the key consideration was not which superpower held the offensive advantage (which had been the primary mindset of the early arms race), but that deterrence relied on 'a capability to strike second' – not an automatic or easy accomplishment. A similar perspective on nuclear deterrence was taken by Thomas Schelling, an economist associated with RAND:

There is a difference between a balance of terror in which *either* side has the capacity to obliterate the other, and one in which *both* sides have the capacity no matter who strikes first. It is not the 'balance' – the sheer equality or symmetry in the situation – that constitutes 'mutual deterrence'; it is the *stability* of the balance.<sup>35</sup>

The preservation of second strike capability by making nuclear installations invulnerable to a first strike, coupled with a stable balance of terror that avoided sudden provocations (minimizing the need for strategic readjustment) underpinned nuclear policy throughout the last three decades of the Cold War and beyond.

The theories of nuclear deterrence proposed by Wohlstetter, Schelling and their colleagues represent a formal body of work that was not replicated in any other country. Their output was hugely influential with decision makers in Washington and yet it was very much a product of its time and place – reductionist, quasi-quantitative and stressing the rationality of the decision makers rather than their organizational cultures, personalities or motivations. In an attempt to break down complex strategies into manageable elements, the RAND analysts made free use of game theory and employed allegories such as the 'Prisoner's Dilemma' with its well-defined, limited outcomes to model the process of nuclear deterrence. In a bipolar world this model of a pair of antagonists had some appeal, even though any decision about nuclear weapons deployment would be a collective one involving various hierarchies. The game theory approach did at least emphasize the interdependence of the adversaries. The strategic analysis was pursued in a moral climate lacking any sense of proportionality, as exemplified by US Defense Secretary Robert McNamara, who characterized an 'assured destruction' level of retaliation as killing 20–25 per cent of the Soviet population and vaporizing 50 per cent of its industrial base – a capability when matched by the Soviets that became incorporated into 'stable' nuclear deterrence as Mutually Assured Destruction.<sup>36</sup> Whatever the logic of nuclear deterrence, it still depends on demonstrably preserving and institutionalizing the atavistic human emotion of revenge.

One condition that became accepted as necessary to preserve the stability of deterrence was that nuclear retaliation by either side was guaranteed to be



effective – so the second strike forces on both sides had to be invulnerable. Technological developments could place this invulnerability in doubt, while international treaties could reinforce it. The Anti-Ballistic Missile Treaty of 1972 was an example, reflecting the risk that ‘development and testing of air- or spaced-based antiballistic missile systems would reduce each side’s confidence in its retaliatory capability, erode stability, and undermine incentive to limit strategic offensive forces’.<sup>37</sup>

MacGeorge Bundy, who served as National Security Adviser when McNamara was at the Pentagon and also helped to shape the conduct of the Vietnam War, came to a very different conclusion about the nuclear force necessary for deterrence. A few years after leaving the Johnson administration, Bundy wrote critically of US policy and its intellectual foundations:

Think-tank analysts can set levels of ‘acceptable’ damage well up in the tens of millions of lives. They can assume that the loss of dozens of great cities is somehow a real choice for sane men. They are in an unreal world. In the real world of real political leaders – whether here or in the Soviet Union – a decision that would bring even one hydrogen bomb on one city of one’s country would be recognized in advance as a catastrophic blunder; ten bombs on ten cities would be a disaster beyond history; and a hundred bombs on a hundred cities are unthinkable.<sup>38</sup>

Bundy instead favoured what has become known as ‘Minimum Deterrence’ (MD) whereby the credible retaliatory threat of ‘even a few nuclear detonations in populated areas provides ample deterrence’.<sup>39</sup> It is an elastic and imprecise concept which appeals to many nuclear abolitionists as a step in the right direction. Since the end of the Cold War, substantial reductions in the stockpiles of the USA and Russia have given credence to the notion of MD, although it remains to be seen how low they will go. As Payne has observed, the case for MD, ‘unbound as it is by time or context’, is based on ‘virtually no evidence’.<sup>40</sup> Despite its lack of rigorous definition, Lewis points out that both China and India have constructed their nuclear defence policies on MD and have committed to no-first-use.<sup>41</sup> A recent controversial analysis suggested that the United States ‘stands on the verge of attaining nuclear primacy’<sup>42</sup> – an ability to destroy the long-range nuclear arsenals of Russia or China with a first strike – which if true could have profound effects on the global nuclear status quo.

During the Cold War, the main nuclear rivalry was between two enormous states, who at the outset did not have the capability to deliver attacks on each other directly from their homelands. The nuclear world now has more pronounced regional tensions in areas such as the Indian subcontinent and the Middle East, where deep-seated and bitter enmities between densely populated, neighbouring states dominate the political landscapes.

#### Limitations of nuclear deterrence

Even prior to the ‘New Look’, there had been two interesting hints of the limits of nuclear deterrence. One was the Berlin crisis of 1948, when Andrei Gromyko (then



Soviet Deputy Foreign Minister) believed Stalin was not worried about escalation to a wider war because he 'reckoned that the American administration was not run by frivolous people who would start a nuclear war over such a situation'.<sup>43</sup> The second was a clearer failure during the Korean War. Acting on the advice of the Joint Chiefs of Staff and the State Department, Truman arranged for B-29 bombers complete with all atomic paraphernalia except the bombs' fissionable cores to be transferred to the UK and Guam. The perceived political advantages of these transfers included demonstrating serious resolve to the British allies, deterring the Peoples' Republic of China and the USSR from escalating the war, and if deterrence failed, expediting the possibility of nuclear attacks on their territories.<sup>44</sup> A few weeks after this overt nuclear manoeuvre, tens of thousands of Chinese soldiers poured over the Yalu River to fight alongside their comrades from North Korea. The Chinese leadership interpreted the presence of American troops on the northern part of the Korean peninsula and naval build-up in the Straits of Formosa (Taiwan) as an indication that the invasion of mainland China would be next. Faced with that prospect, Mao Zedong was willing to countenance all-out war despite its likely horrendous cost.

The challenge to deterrence posed by any loss of credibility in the United States' nuclear arsenal was paradoxically made apparent by former President Truman's bewildering statement, doubting the Soviets possessed an atomic bomb. Gordon Dean, then chairman of the AEC, remarked at a National Security Council meeting that 'he dreaded to think what might happen' if Stalin publicly announced a similar underestimate of American atomic strength. He felt it would be:

utterly tragic if ... the Soviet Government and people were left with the impression that the United States did not have a very great atomic capability, since they might then feel that they could move against us with comparative impunity.<sup>45</sup>

Eisenhower, in his State of the Union message on 2 February 1953, took care to emphasize that 'we have incontrovertible proof that Soviet Russia possesses atomic weapons'<sup>46</sup> and was always mindful of projecting America's nuclear strength.

We have briefly mentioned some of the pitfalls that can result in the non-establishment of deterrence or its failure between two actors. During the Cold War, nuclear deterrence was essentially an arrangement between two antagonists,<sup>47</sup> and while that pair still retains more than 90 per cent of the world's nuclear weapons (even after recent reductions), the remaining few per cent shared by the United Kingdom, France, China, Israel, India, Pakistan and even North Korea are potentially dangerous enough to merit consideration. Each state has its own history, cultural values and loci of political power that will shape its nuclear policy making and war plans. States are not governed exclusively by well-informed, rational and prudent leaders. Even in the United States, with its constitutionally mandated civilian control of the military, there are multiple organizations involved in gathering intelligence and deciding nuclear posture. The chain of command responsible for maintaining that posture may be well defined, but there is still room for error in its routines. In June 2008 Defense Secretary Robert Gates fired the Secretary of the USAF and the Air

Force Chief of Staff for not preventing the 'gradual erosion of nuclear standards'<sup>48</sup> which had resulted, most egregiously, in a B-52 flying across the country with six Cruise missiles on its wings, each unintentionally armed with a nuclear warhead. The USAF is a large hierarchical organization, and if tasks left over from the Cold War, such as maintaining officers in command bunkers ready to launch thousands of nuclear-tipped missiles in the event of deterrence failure, do not seem highly relevant to its current priorities, there will be a tendency to neglect the performance of those functions. More recently there was the collision of British and French nuclear submarines on patrol in the Atlantic<sup>49</sup> to remind us that nuclear weapons are tangible pieces of equipment that are subject to control mishaps, usually as a result of human error overriding supposedly inviolable safeguards.

Deterrence involves changing the intentions of an opponent. There is a tendency to assume that an opponent thinks in the same way as you and will behave responsibly when confronted with a damaging threat of retaliation. But responsibility implies that the opponent possesses at least some of your fundamental human values. In the Cuban missile crisis, Khrushchev ultimately proved to share Kennedy's judgement of the catastrophic consequences of a nuclear exchange, but, according to the Soviet leader, both Castro and Mao Zedong would have launched a nuclear attack on the USA regardless of the terrible retaliation that would have followed for their countries.<sup>50</sup> Mao referred to nuclear weapons as 'paper tigers' and seemed to believe that China's enormous population meant that it would always triumph after a nuclear war with a smaller country. Totalitarian dictators do not adhere to the doctrine of 'just war' that sees war as a last resort to achieve a morally defensible goal, where the level of harm is limited as far as possible in the pursuit of victory, and, above all, the deliberate killing of non-combatants is avoided. Yet if nuclear deterrence fails, even the leader of a democracy might well find the principles of the just war too restrictive. A former head of the US National Security Agency, General William Odom, characterized the choice facing a US president under or after a nuclear attack as 'releasing 70–80 per cent of our nuclear megatonnage in one orgasmic whump, or just sitting there and saying: "Don't do anything, and we will just take the incoming blow."' <sup>51</sup> In a BBC radio interview 40 years after he held responsibility as Minister of Defence, Dennis Healey claimed that he would not have issued the order to retaliate with a submarine-launched nuclear weapon in the aftermath of a devastating nuclear attack on the United Kingdom 'because most of the people you kill would be innocent civilians'.<sup>52</sup>

### The geopolitics of nuclear deterrence

While the Cold War was the dominant event of what is termed the first nuclear age, it ended 20 years ago and the dangerous uncertainties of the present world are necessarily less well understood. To some national leaders there is an intrinsic advantage to possessing nuclear weapons that is customarily justified under the rubric of 'deterrence', but is more free-floating and less explicit than the standoff between adversaries who have been engaged in wars in the past or may be contemplating war

in the future. The reinforcement of national prestige is an invariable, if unspoken, objective, in addition to protecting undefined 'vital security interests'.

An early example of this expansive take on nuclear deterrence came in 1947 from Foreign Secretary Ernest Bevin, who seemed to place as much weight on restraining an American ally as on deterring a Russian foe when making the case for an independent British atomic weapons programme. He argued: 'We could not afford to acquiesce in an American monopoly of this new development.'<sup>53</sup> Once Great Britain exploded her first fission device in 1952, France was left as the only permanent member of the UN Security Council without atom bombs. Prime Minister Pierre Mendès-France felt acutely inferior in his dealings with the other three Security Council 'gangsters' (as he characterized the UK, the USA and the USSR) in New York,<sup>54</sup> and this lack of status more than France's entanglement in colonial wars led to the initiation of her secret nuclear programme.<sup>55</sup> During the late 1950s, the United States and the United Kingdom signed a Mutual Defence Agreement,<sup>56</sup> greatly deepening nuclear cooperation between the two nations, while the Soviets gave direct assistance to the Chinese nuclear weapon project<sup>57</sup> and the French contracted to build the Dimona reactor in Israel.<sup>58</sup> Calculations of national interest at the time underpinned all these international nuclear collaborations. If the political climate changes drastically, the consequences of past nuclear decisions may endure and be unwelcome.

States possessing nuclear weapons may be viewed as members of an oligopoly, who are neither in absolute competition with one another nor in complete cooperation. They share some common interests but in the view of many non-nuclear weapons states (NNWS), those nuclear weapons states (NWS) that have signed the Nuclear Non-Proliferation Treaty (NPT) have found it expedient to do so without feeling any real compunction to move towards elimination of their nuclear arsenals as required by Article VI. The NWS may take comfort in the fact that a nuclear weapons state has never been directly attacked by a non-nuclear weapons state and the retention of their nuclear arsenals helps to guarantee their security in the world. But their continued reliance on nuclear weapons as an all-purpose deterrent encourages other states to consider the advantages that might be associated with, if not the possession of weapons themselves, at least the technological ability to manufacture fissile materials so that they are at the nuclear threshold.

Like the situation five decades ago, the world seems on the verge of a dozen more nations acquiring nuclear weapons. If nuclear deterrence in the Cold War was a match between two chess grandmasters employing deliberate moves, in the second nuclear age, play is underway simultaneously on several boards – and it is not always clear who the teams are or when extra boards will be added. In this competition the United States also represents many non-nuclear states, ranging from Japan and Taiwan to members of NATO. It promises them protection as a reward for not developing their own nuclear weapons. Such arrangements ultimately require the USA to be prepared to punish another nuclear power (inviting its retaliation) in return for an attack on a third non-nuclear state.<sup>59</sup> So one first-use triggers another, and the logic of nuclear deterrence leads us to unthinkable outcomes. The shelter of nuclear umbrellas repudiates a policy of no-first-use. The continued presence of US tactical nuclear weapons (which may be

ten times more powerful than the first generation of atomic bombs) in countries like Belgium, Germany, Italy and Turkey seems anachronistic, especially since nuclear weapons were returned from the frontline states of Belarus, Kazakhstan and the Ukraine to Russia after the breakup of the USSR. Are local nuclear warheads really the glue that holds the NATO alliance together, or could European security requirements be met by sufficient conventional forces and explicit defence agreements?

There are similar concerns in East Asia. Japan, while opposed to nuclear weapons in principle, has relied on the US nuclear umbrella and has not sought any change in the status quo for 50 years, not wanting to weaken the aura of nuclear deterrence. Japan's new Foreign Minister Katsuya Okada is an advocate of a 'no-first-use' policy, although he is opposed by some in his own ministry. He has highlighted the inconsistency of Japan's long-standing moral objection to nuclear weapons while relying on American preparedness to use them on Japan's behalf. In a controversial interview just before coming to office in 2009, Okada said 'We do not necessarily need a nuclear umbrella against the nuclear threat of North Korea. I think conventional weapons are enough to deal with it.'<sup>60</sup>

In contrast to the United States and Soviet Union placing their nuclear weapons in allied countries or occupied territories, China has quietly followed a policy of facilitating nuclear weapons development in other countries to further its own strategic purposes. It has supplied nuclear and missile technology to Pakistan, and continued to do so even after signing the NPT in 1993 in order to tip the regional balance of power against India.<sup>61</sup> While the United States may not have had the influence necessary to prevent Pakistan's military leadership from achieving their nuclear ambition, any attempts at blocking the programme were undermined by the higher diplomatic need to maintain relations with Pakistan in order to resist the Soviet occupation of Afghanistan.<sup>62</sup> The 2006 US–India agreement on civilian nuclear cooperation, while ostensibly restricted to the peaceful use of atomic energy, can be viewed as an attempt to thwart China's South Asia strategy and to bolster India as a regional power. By allowing India to import uranium for use in her civilian reactors, the arrangement frees up indigenous uranium for use in her military reactors, which remain outside any international safeguards.<sup>63</sup>

In the past few years China has signed long-term deals to import oil and natural gas from Iran, which has enormous reserves of both. Iran is eager to join the Shanghai Cooperation Organization (SCO), an alliance dominated by China and Russia, which would reinforce Iran's traditional links to Central Asia and the Far East. Iran's full membership would seal the control of the Caspian Sea energy resources, estimated to comprise at least 20 per cent of the world's total oil reserves and 45 per cent of its natural gas, and leave the United States and the West facing 'an OPEC with [nuclear] bombs'.<sup>64</sup> An enlarged SCO including Iran would severely impact US interests in the Middle East and Central Asia. Beijing and Moscow can afford to make their own careful assessments of the fractious nature of Iran's leadership and the political costs involved, before deciding the terms they would be prepared to offer Iran. In the meantime, they can exert diplomatic influence with regard to Iran's nuclear development as they choose, without having to worry about fretful domestic public opinions.

### Rogue states and nuclear terrorists

Despite being created in their tens of thousands, nuclear weapons have not been detonated in anger since the end of World War Two. After such a long period of military abstinence, one might expect their political utility to be diminishing and indeed among mature democracies it probably is. Yet the acquisition of nuclear weapons has taken on a particular attraction for corrupt, despotic, ruling cliques determined to remain in power. North Korea and Iran are the two most prominent examples, both of which have received illicit transfers of nuclear technology from Pakistan and both of which could very well disseminate fissile material and perhaps even nuclear weapons to violent, destabilizing, third parties.

In the twenty-first century, the new challenge to the concept of symmetrical nuclear deterrence comes from international terrorists supplied either unwittingly as a result of theft from an established nuclear power or intentionally by rogue states. While chemical or biological weapons might be more easily obtained by terrorists, since their manufacture does not require enormous industrial plants, the final report of the 9/11 Commission concluded 'Al Qaeda has tried to acquire or make nuclear weapons for at least 10 years ... and continues to pursue its strategic goal of obtaining a nuclear capability.'<sup>65</sup> There have been shadowy contacts between Al Qaeda and nuclear experts from Pakistan, including a meeting with Osama bin Laden who has called the procurement of weapons of mass destruction 'a religious duty'.<sup>66</sup> While President Pervez Musharraf has played down these interactions and suggested that men in caves cannot construct atom bombs, the acquisition of high-grade fissile material remains the greatest challenge in confronting would-be nuclear terrorists. After the collapse of the Soviet Union the problem of 'loose nukes' (weapons-usable material stored in insecure facilities) became apparent; corrupt nuclear officials, A. Q. Khan in Pakistan being the most infamous, represent another potential source of supply to terrorists. The construction of a gun-type device is relatively straightforward given about 25 kg of highly enriched uranium, especially if those assembling it are indifferent to being hoist by their own petard. Even a crude plutonium bomb is feasible at the hands of some competent but fanatical engineers and metallurgists, given adequate machinery and designs. A terrorist organization does not have to replicate the Manhattan Project and produce a technically perfect explosion – a plutonium bomb that fizzles would cause a huge explosion with devastating economic and environmental consequences in a large city and inevitably provoke a major military reaction.<sup>67</sup>

Terrorists need not have any achievable goals – their actions do not have to be carefully weighed in terms of political utility. The indiscriminate sowing of fear becomes a satisfactory substitute for their fantasies. The opportunity to explode a single nuclear device would maximize the level of terror because one detonation no doubt would prompt warnings of more to follow. Even if it is beyond terrorists to defeat a mature state, they can disrupt its way of life and force its political leaders into ill-considered responses. Terrorists prefer loose networks to ordered hierarchies, and it is often not clear who is in strategic command. The seemingly endless supply of homicidal, self-destructive bombers gives the impression that all terrorists are indifferent to their own fates, and indeed by their own martyrdom inspire others to

follow suit. It is characteristic of subversive forces to disperse not clump together to provide a target; many modern terrorist movements are transnational, linked through some extreme strain of Islam. So terrorists lack the rationality, command structure and values necessary to be deterred. They also present no large targets for retaliation so that a national nuclear response to a painful, isolated, terrorist nuclear attack is not fitting.<sup>68</sup> While the technically difficult task of forensic identification of the state origin of the fissile material used in a terrorist bomb may serve some purpose in terms of planning military retaliation, it will not be accepted as true by those nations next to the guilty state or by substantial numbers of the terrorists' co-religionists around the world. Although we agree that international efforts to confront and contain violent jihadists are likely to persist for decades, we do not expect nuclear deterrence to play a prominent role as it did in the Cold War.<sup>69</sup> We do regard the need to deny any supply of fissile materials or nuclear weapons to terrorist groups as an absolute imperative, and the proliferation of nuclear capability under weak safeguards is a grave danger.

#### The future of nuclear deterrence?

Nuclear deterrence exists when a state antagonistic towards a nuclear power abandons its aggressive intent because it is fearful of provoking a devastating retaliatory attack in which nuclear weapons will be used. The process of deterrence is complex and applies to a specific conflict and time. Nuclear weapons embody a threat of mass destruction and indiscriminate slaughter by blast, radiation and vaporizing heat: they are not synonymous with deterrence. We believe that the history of US nuclear decision making during 1945–49 makes the distinction clear.

President Obama's April 2009 speech in Prague<sup>70</sup> signalled his strong intention to move away from established nuclear strategy, pledging to 'reduce the role of nuclear weapons' and 'to put an end to Cold War thinking'. In the year prior to Obama's speech, both the United States and Russia indulged in nuclear deterrence rhetoric reminiscent of the Cold War. President Bush's National Security Advisor, Stephen Hadley, speaking at Stanford University, stated: 'the United States has made clear for many years that it reserves the right to respond with overwhelming force to the use of WMD against the United States, our people, our forces and our friends and allies'.<sup>71</sup> Neither 'friends' nor 'WMD' were defined. In January 2008 the Russian Chief of the General Staff, General Yury Baluyevsky, threatened that Russia would use force to protect its territory and allies 'including on a preventative basis, including the use of nuclear weapons'.<sup>72</sup> The Prague Treaty or new START,<sup>73</sup> providing it is ratified by the Russian Duma and the US Senate, will permit on-site inspections and data exchanges for both countries' nuclear weapons facilities in an effort to foster 'mutual trust, openness, predictability and cooperation'. In negotiating the April 2010 agreement, the two sides agreed to differ over the contentious possibility of the US installing a ballistic missile defence system in Eastern Europe. The Russians made a unilateral statement that such a system could invalidate the treaty and lead them to withdraw, but this represented a moderation of their previous warnings that it would be a potential target for nuclear attack.



Nearly 50 years ago Patrick Blackett, reviewing Wohlstetter's 'The Delicate Balance of Deterrence', wrote:

I have not the slightest doubt that the main danger today is not from the rational act of responsible statesmen, but is due to essentially irrational acts of irresponsible, frightened, humiliated, revengeful or just mad people – or perhaps, more likely still, from the confused actions of well-meaning people overwhelmed by complex circumstances beyond their mental or moral ceiling.<sup>74</sup>

We believe that while it is impossible to make accurate predictions about the international power rivalries of the twenty-first century, Blackett's strictures on the fallibilities of humans under stress will remain pertinent. The prospect of overpopulation combined with unrealistic expectations in a world experiencing food and water shortages and climate change do not augur well for collective security. Of course, many argue that despite some near misses, no nuclear weapons have been employed in warfare since 1945 and they have served to prevent major conflict. But when the potential consequences of accidental or irresponsible use are so cataclysmic in terms of human casualties, disruptions of world trade and communications and environmental damage, the chances of such use must be kept as close to zero as possible, continuously.<sup>75</sup> If the risks rise above some irreducible minimum, nuclear deterrents transform into weapons of mass destruction. The venerable Thomas Schelling, reviewing many of the near misses in his 2005 Nobel Prize lecture, made the point that a taboo has arisen against their use that reflects a shared revulsion against their unique nature, and this taboo is as significant as formal international agreements such as the NPT.<sup>76</sup> He hoped that even terrorists who managed to acquire a nuclear weapon would see an appeal in exploiting it to wield influence rather than 'expending it in a purely destructive act'. We would prefer to put our trust in a maximum effort to secure the existing stocks of highly enriched uranium and plutonium worldwide to prevent them from falling into the hands of terrorists and criminals.<sup>77</sup> The nuclear security summit convened in Washington in April 2010 had this precise aim.

If one subscribes to the notion that nuclear weapons and their delivery systems are just 'strategic nuclear deterrents' and not usable weapons, it is difficult to see why they should not be permitted to any nation that wants them – the more deterrence in the world the better.<sup>78</sup> India and Pakistan, neither of whom ever signed the NPT, clearly emerged as nuclear powers after the end of the Cold War. In 1999 they fought the sharp Kargil War in Kashmir, amid great international concern that it could escalate into a nuclear conflict. The consequences for the two nations, whose densely populated cities are only hundreds of miles apart, would be appalling – without considering how China, Russia and the USA might react. The war ended suddenly, and senior military officers from both sides now believe the nuclear threat was salutary – a success in so far as nuclear weapons prevented further escalation. Yet it appears that the Pakistani military had started to prepare their nuclear-capable missiles for use without the knowledge of Prime Minister Nawaz Sharif. In 2001 the Inter-Services Intelligence contacted the Taliban about hiding some Pakistani nuclear weapons in



Afghanistan.<sup>79</sup> If Iran acquires a nuclear bomb, will it be under the control of the mullahs, the president or the Revolutionary Guards? Again Blackett was prescient on the dangers of proliferation:

Clearly, the more nuclear weapons there are in the world, the more nations which possess them, the more will all defence systems become inextricably bound up with nuclear weapons, so that the number of fingers on nuclear triggers will grow and with it the danger of accidental or irresponsible nuclear war.<sup>80</sup>

The number of nuclear weapons states held remarkably stable for 30 years after the NPT was signed in 1968. With a loss of international trust in the treaty, there is the risk of a quite rapid expansion in that number. Nuclear deterrence may perhaps have worked between the two superpowers in the Cold War, but there is precious little historical evidence that it prevented 'sub-nuclear' wars. The calculus of deterrence would seem to become impossibly complex as the number of nuclear weapons states increases and the notion of an established nuclear taboo may be the most helpful and hopeful concept for political leaders to hang on to. Even the strongest social taboos (as against cannibalism) may be broken by psychopaths or by rational people in extreme circumstances, but it would help to reinforce the nuclear taboo and improve the atmosphere for international dialogue if Russia, the USA, the UK and France would join China, India and Pakistan in pledging unequivocally to no-first-use of nuclear weapons – something which they have declined to do repeatedly for the past half-century. Israel, which has maintained a completely opaque nuclear posture for the past 40 years,<sup>81</sup> should make the same commitment. The chance of this happening in the foreseeable future is remote indeed. Even under Obama's leadership, the 2010 US nuclear posture review<sup>82</sup> did not commit the superpower to no-first-use. While professing that the fundamental role of US nuclear weapons, which will continue as long as nuclear weapons exist, is 'to deter nuclear attack on the United States, our allies and partners', it seeks to strengthen the 'negative security assurance' that the US 'will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the NPT and in compliance with their nuclear non-proliferation obligations'. By comparison, Israel is a tiny country in a hostile neighbourhood whose Prime Minister Benjamin Netanyahu has repeatedly warned: 'It's 1938 and Iran is Germany.' An opinion poll of the Israeli public showed that two-thirds believed Iran would use nuclear weapons against them if and when they became available<sup>83</sup> – in other words, they place little faith in nuclear deterrence.

The effectiveness, extravagance and risks of nuclear deterrence need to be carefully reassessed, because, unlike deterrence in the animal kingdom, it contains the seeds of species destruction rather than promoting individual preservation. Whenever a state decides to acquire or renew nuclear weapons in the name of deterrence, it feeds nuclear proliferation. In the future, just as in the past six decades, nuclear deterrence with all its quirks – errors, misunderstandings, misperceptions, deliberate ambiguities and deceptions – will confront regional and global security with potentially catastrophic risks.

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