The Pugwash Conferences have brought together experienced scientists and policy practitioners since 1957 to find ways of reducing dangers posed by the development of nuclear weapons. During the Cold War interactions within the Pugwash movement produced inputs into the policies of the five NPT nuclear-weapon states (NWS). The award in 1995 of a Nobel Peace Prize was recognition for the movement’s contribution. British Pugwash welcomes this enquiry as both important and timely, since recent years have seen a deterioration in the outlook for nuclear arms control and disarmament and the emergence of technologies that have the potential to destabilise the nuclear-based strategic order.

My evidence is based on open-source information. I do not have access to classified information.

Nuclear risk

1. What is your evaluation of the current level of risk that nuclear weapons, of any type, could be used?

I judge the current level of risk of intentional use to be low. Only nine states possess nuclear weapons. Their decision-makers have shown themselves to be aware of the risk to their own survival that using nuclear weapons against another nuclear-armed state, or a state allied to a nuclear possessor-state, would create. There are shared assumptions and mutual understandings between most of the possessor-states; those are a source of strategic stability. Breaking what is often referred to as a nuclear taboo would not only risk devastating retaliation but, in the event of survival, would entail exorbitant reputational and economic costs. However, the risk of accidental use remains significant; and the emergence of certain technologies (see below) is increasing the potential for miscalculation to lead to use, by threatening some of the assumptions and understandings that have underpinned strategic stability.

The risk of an increase in the number of possessor-states is lower than 20 years ago. International inspectors eliminated an Iraqi nuclear weapon programme during the 1990s. Iran, judged by the International Atomic Energy Agency (IAEA) to have conducted research into the design and assembly of nuclear devices over several years up to 2003, has pledged never to acquire nuclear weapons and has been complying with an agreement that restricts uranium enrichment till 2031. Libya declared an embryonic uranium enrichment programme to US and UK intelligence officers during 2003, and then surrendered all related equipment to the United States, as well as a blueprint for a primitive nuclear device. In 2007 Israel destroyed a Syrian building which it suspected of housing a nuclear research reactor well-suited to plutonium production; curiously, a subsequent IAEA inspection found no trace of reactor-grade graphite at the site. Argentina, Brazil, South Africa and Taiwan have shown no sign of reconsidering past decisions to break off pursuit of or renounce the nuclear weapon option. Advocates of the option exist in Japan, South Korea
and Saudi Arabia, but none of these states has made a meaningful move in that direction, and all three are clients of the United States, which would not wish them to do so. The only states that have not adhered to the NPT, or have withdrawn from it, are Israel, India, Pakistan and the DPRK, four of the nine possessor-states, the other five being the recognised NWS. Nuclear-weapon free zones cover Latin America, Africa, Central Asia, South East Asia and the Pacific.

The risk of a non-state actor using one or more nuclear weapons is somewhat higher. Such actors would not be deterred from using nuclear weapons by the taboo or cost/benefit calculations that deter the nine possessor-states. However, since 2001 acquiring nuclear devices or fissile material by theft has become harder, as a result of a general tightening of nuclear security. To date very few instances of the trafficking of fissile materials have been recorded (by contrast with a higher number of recorded instances involving radioactive materials, useable in a dirty bomb).

The NPT

2. Ahead of the 2020 Review Conference of the Nuclear Non-Proliferation Treaty (NPT), what are the biggest challenges facing global nuclear diplomacy? a. To what extent do states still view the NPT as relevant? b. What are the prospects for other components of the nuclear non-proliferation regime, such as the Comprehensive Nuclear-Test-Ban-Treaty (CTBT)? c. How important are these agreements to the wider rules-based international order? d. To what extent does the existence of three nuclear armed states outside the NPT (India, Israel and Pakistan) destabilise the overall regime? e. What prospects are there for a Middle East WMD free zone?

Members of the Non-Aligned Movement (NAM) and some Western states (e.g. Austria, Ireland, Sweden, New Zealand) judge the five NWS (USA, UK, France, Russia, China) to have failed to honour many of their 2000 and 2010 NPT review conference commitments relating to Article VI of the treaty. The resulting anger and disappointment fuelled support for the conclusion of a Nuclear Ban Treaty (NBT) in 2017. But these states have not turned their backs on the NPT. They want the NBT to complement, not replace the NPT. They recognise that their cause benefits from the near-universality of the NPT, its legally binding nature, its verification provisions, its recognition of the right of all parties to use nuclear energy for peaceful purposes, and the mutual confidence it has come to generate. Their interest is still in using the NPT implementation review process to apply as much pressure as possible on the five NWS in connection with the undertakings specified in Article VI.

This loose collection of states regrets the possessor status and non-adherence to the NPT of Israel, India, Pakistan and the DPRK. But only for some of them is the absence of universality as high a priority as non-implementation of Article VI, and for that smaller group, led by Egypt, the burning issue is Israel, not India, Pakistan or the DPRK. Since 1995 this smaller group has focussed its efforts on the idea of a Middle East WMD-free zone. They have been and remain deeply frustrated that this goal has proved elusive, thanks largely to opposition from
the United States, on behalf of Israel. There is currently no reason to think that the United States will be any less opposed to progress towards a Middle East zone before or at the next review conference in 2020.

Consideration of the Egypt-led group’s demands has eaten into the time available for consideration of nuclear disarmament and nuclear non-proliferation at preparatory and review conferences since 1995. It has diminished the productivity of the review process. In 2005 and 2015 it contributed to review conferences failing to agree final documents. It is therefore regrettable that the United States sees fit to shield Israel from peer group pressure to form a Middle East WMD-free zone.

The CTBT opened for signature in 1996. It still has not entered into force. But a moratorium on nuclear testing has been observed since 1996 by all states other than India and Pakistan (both tested in 1998) and the DPRK (six tests since 2005). A treaty requirement that 44 specified states ratify the CTBT as a precondition for its entry into force has proved to be extremely problematic. The US Senate rejected a ratification request in 1999. Since then no US administration has thought it timely to re-submit the request. Several of the other states that have still to ratify (China, the DPRK, India, Pakistan, Israel, Egypt, Iran) have said that they will take a cue from the United States. There is no reason to expect an improvement in the outlook in the foreseeable future. This is serious but not disastrous. The NPT community has become accustomed to the situation and is resigned to it as long as members of the community continue to observe the testing moratorium.

Another important element of the nuclear non-proliferation regime is the Nuclear Suppliers Group (NSG). For many years the NSG has been a source of tension within the NPT community. NAM members and some non-NAM members view the NSG bias towards dual-use nuclear technology denial as inconsistent with Article IV of the NPT. (Article IV does not bind NPT parties possessing nuclear technologies to transfer those technologies to other parties but contains an undertaking to facilitate transfers.) They also stress NPT parties’ sovereign right to make use of all nuclear technologies as long as the use is peaceful, and the right is exercised in conformity with the NPT’s non-proliferation provisions. This tension is unlikely to pose an existential threat to the NPT, but it presents an ongoing challenge for nuclear diplomacy.

IAEA safeguards are also an important element of the regime. The standard safeguards agreement, which NPT parties conclude with the IAEA to comply with an Article III undertaking, enables the IAEA to verify that all declared nuclear materials have been accounted for and that none has been diverted to non-declared uses. A voluntary protocol to that agreement, known as the Additional Protocol, enables the IAEA, usually after several years of gathering information, inspecting locations, and analysing data, to achieve confidence as to the absence of undeclared materials or activities in a given state. So far 132 NPT parties have signed and ratified Additional Protocols. A few nuclear-energy-using NPT parties (e.g. Brazil) have yet to do so, 21 years after the Additional Protocol was agreed. They intimate that they are loath to take on an additional non-
proliferation commitment in the absence of adequate implementation of Article VI undertakings by the five NWS.

The NPT regime is sometimes described as one of the pillars of the post-war international rules-based order. That description rests on a perception that the NPT has proved to be more effective than anticipated when it was under negotiation, in the mid-60s. It has helped to limit the number of states possessing nuclear weapons; thereby it has contributed to a reduced risk of nuclear annihilation. This contribution is all the more valuable for the fact that many more non-Western states than 50 years ago would now have the resources, and could easily acquire the know-how, to make nuclear weapons.

It is possible to imagine that recent and future technological developments will reduce the appeal of nuclear weapon systems by making them more vulnerable to surprise or disruptive attacks, and that new technologies may even offer an alternative basis for strategic deterrence. In the meantime, however, the contribution of the NPT’s non-proliferation provisions to global security is such that its nurture is essential. This means that the United States, United Kingdom and France cannot afford to be complacent. They must try much harder to demonstrate their commitment to their part of the non-proliferation/disarmament bargain on which the NPT rests. Experience suggests that Russia and China will cooperate.

The United States

3. To what extent will the United States’ withdrawal from the Iran nuclear deal, as well as US efforts to achieve the denuclearisation of the Korean Peninsula, affect the wider nuclear non-proliferation regime?

US withdrawal from the July 2015 nuclear agreement with Iran (JCPOA), leading to US violation of UN Security Council resolution 2231, is unlikely to have a significant effect on Western or NAM support for the nuclear non-proliferation regime. This is merely the latest in a fairly long list of US policies and practices that have disillusioned the NPT community. NPT parties have become accustomed to supporting the regime despite a US proclivity for double standards and bending rules when they judge it expedient or politically attractive to do so. Their 40-year toleration of Israeli nuclear weapons, and their more recent push for Indian admission to the NSG are examples of irresponsible US behaviour.

US efforts to achieve the denuclearisation of the Korean peninsula will do little to redress negative perceptions of the United States. NPT parties support the goal of denuclearisation and recognise both a regional and a global interest in eliminating DPRK nuclear weapon capabilities. But there is a view that the United States contributed to North Korean nuclearisation by failing to implement the 1994 Agreed Framework in a timely way, and by mishandling a 2002 discovery that the DPRK had been seeking uranium enrichment technology from A Q Khan – and possibly by a decades-long failure to convert the 1953 Korean armistice into a peace agreement. To the extent that the United States has partial responsibility for creating the problem, it is seen as fitting that the United States should exert itself to solve the problem.
Nuclear Arms Control

4. To what extent and why are existing nuclear arms control agreements being challenged, particularly the Intermediate-Range Nuclear Forces Treaty (INF) and the New Strategic Arms Reduction Treaty (New START), and what prospect is there for further such agreements? What prospects are there of progress in negotiating a Fissile Material Cut-Off Treaty (FMCT)?

At the time of writing, leaving aside the CTBT (see above) and the JCPOA, only the INF treaty is being challenged. The Americans insist that a Russian violation has taken place but will not make available for joint analysis the data which leads them to that conclusion. The Russians insist no violation has taken place but will not lay on a demonstration of the 9M729 system to persuade the Americans that they are telling the truth. The obvious inference is that on both sides powerful influences on decision-making want the treaty to lapse. A reason for this may be a wish for a free hand to deploy ground-launched intermediate-range missiles in the Far Eastern theatre, to balance Chinese deployment of such systems.

At this point it is hard to be sure of the outlook for an extension of new START for five years from early 2021, or for the negotiation of a successor strategic nuclear arms limitation treaty. Prospects for new START extension appear to be poor, but President Trump’s impulsive nature could produce a sudden change of outlook. Factors inducing pessimism include a marked deterioration in US/Russian relations since 2012; an accompanying demonization of President Putin; a paucity of “strategic dialogue” between the United States and Russia; Russian concern over NATO ballistic missile defence deployments in Romania and Poland and a US threat to deploy offensive weapons in outer space; reciprocal INF non-compliance allegations (but see above: it may suit both sides to do away with this treaty); US pursuit of “full spectrum dominance”; and an emphasis in the December 2017 US National Security Strategy on “competitive diplomacy”, “backed by lethal force”, to “maintain a favourable balance of power”, globally and regionally.

Whether or not new START is extended, appetite for a further strategic nuclear arms limitation treaty may emerge in the course of the 2020’s. If it does, official Russian statements have suggested that Russia will want France and the United Kingdom – and possibly other possessor-states - to contribute to a global reduction. US and Russian stocks of non-strategic nuclear weapons (air- and sea-launched intermediate-range systems, and tactical systems, including some 150 US nuclear bombs stationed in Europe) and NATO dual-key arrangements may also prove more problematic than in past strategic nuclear negotiations.

Meanwhile a revitalising of the US/Russian strategic dialogue ought to be urged, irrespective of displeasing Russian behaviour, not least since potentially destabilising weapon systems are appearing on the horizon.

Nuclear modernisation programmes
5. What effect will nuclear renewal programmes have on the nuclear non-proliferation and disarmament regime? To what extent could technological developments—including in missile capabilities, warhead strength, and verification—undermine existing non-proliferation and arms control agreements?

The United States and Russia can undertake renewal of their existing triad of strategic nuclear weapon systems in ways that respect the present and any future nuclear arms control regime. At present this seems to be what the United States and Russia have in mind. But the signal that modernisation and renewal, on which all five NWS are embarked in one form or another, sends to NPT non-nuclear-weapon states (NNWS) is deplorable. It suggests that the five NWS are indifferent to the NWS side of the NPT bargain. It proclaims a belief that nuclear weapons are not just a desirable but an indispensable component of a sound security policy. It is therefore inconceivable that modernisation/renewal will strengthen the global nuclear non-proliferation regime; all too conceivable that it is feeding NNWS resentment, frustration and anger; and possible that the NWS will live to regret this.

It is becoming apparent that certain technological developments have the potential to affect some of the calculations, assumptions and mutual understandings that underpin New START. It is possible to imagine their having a similar effect on any strategic nuclear arms agreements. Evolving underwater drone and sonar technologies have the potential to put strategic missile submarines at risk. Hypersonic boost-glide missiles have the potential to deliver a successful surprise attack on early-warning systems and ground-based strategic nuclear systems. Quantum computing has the potential to reduce confidence in nuclear weapon command and control systems. Developments in the application of artificial intelligence have the potential to complicate decision-making on nuclear weapon use.

New technologies

6. To what extent will technological developments, both directly relating to nuclear weapons and in the wider defence and security sphere, affect nuclear diplomacy?

Nuclear diplomacy will have to cope with the above factors in the event of their apparent potential to threaten the very basis of “mutually assured destruction” and strategic stability, as currently conceived, being realised. Minimising the risk of a global catastrophe will hang on whether the five NWS can build on existing understandings. One option could be to explore whether any emerging technologies have the potential to offer a basis for a form of strategic deterrence that is less humankind-threatening than nuclear-weapon-based strategic deterrence. Can new technologies be not only a threat to the nuclear order but also an opportunity to move away from it?

Received 14 January 2019