How Relevant is Nuclear Deterrence Today?

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Abstract

The relevance of nuclear deterrence continues to be questioned in Western countries. However, there are good grounds to say that it continues to be a valid answer to the question of major conflict prevention as well as avoidance of proliferation and WMD use. Nuclear weapons have been effective war-prevention tools: alternative explanations are not satisfying. They have contributed to the reduction of proliferation risks. The costs of nuclear weapons and deterrence remain acceptable. Alternative options are not credible either technically or politically. Finally, nuclear deterrence is a legitimate answer to some of the 21st century's most pressing strategic challenges.

Resumo

Quão Relevante é Hoje a Dissuasão Nuclear?

A relevância da dissuasão nuclear continua a ser questionada nos países ocidentais. No entanto, existem boas razões para dizer que esta continua a ser uma resposta válida à questão de prevenção de grandes conflitos assim como de prevenção da proliferação e uso de Armas de Destruição em Massa (ADM). As armas nucleares têm sido ferramentas eficazes de prevenção de guerras: explicações alternativas não são satisfatórias. Acresce que estas contribuíram para a redução dos riscos de proliferação. Os custos das armas nucleares e a sua dissuasão continua a ser aceitável e as opções alternativas não são nem tecnicamente nem politicamente credíveis. Por fim, a dissuasão nuclear continua a ser uma resposta válida para alguns dos desafios estratégicos mais prementes do século XXI.

In Russia, China, India, Pakistan, North Korea or Israel, the relevance of nuclear deterrence is hardly questioned. However, in Western countries, nuclear deterrence has been the target of criticism on strategic, legal and moral grounds since 1945. In the past decade, the renewed debate on nuclear disarmament has been accompanied by an increase in such criticism. Efforts led by four US statesmen, or the more radical Global Zero movement, as well as various diplomatic initiatives, have been accompanied by a flurry of new, serious academic studies questioning the legitimacy of nuclear weapons. More than ever, nuclear deterrence is attacked by many, both on the Left and on the Right. To the traditional arguments related to the credibility of nuclear deterrence are now added two other factors. First, nuclear weapons, it is argued, have limited value vis-à-vis proliferation and terrorism, and such risks bolster the case for nuclear disarmament. Second, alternatives such as high-precision conventional means and missile defense are said to now be much more effective than they were in the past. This paper refutes these arguments on the grounds that nuclear deterrence has proven to be an effective war prevention instrument, that it is cost-effective, and that today's challenges confirm its relevance.

Nuclear Weapons Have Been Effective War-Prevention Tools

It is by definition impossible to prove that deterrence has worked, and correlation is not causality. But History gives us solid arguments in support of the positive role played by nuclear weapons, especially since our database now covers seven decades.

Firstly, no major power conflict has taken place in 70 years. The role of nuclear deterrence to explain this historical anomaly has been highlighted by leading historians and authors such as John Lewis Gaddis, Kenneth Waltz, and Michael Quinlan. No comparable period of time has ever existed in the history of States. There were two dozen conflicts among major powers in the equivalent amount of time following the Treaties of Westphalia (1648), and several after the Vienna Congress (1815).[1]

Secondly, there has never been a direct military conflict between two nuclear States. Beyond this mere observation, two studies have shown that the possession of nuclear weapons by two countries significantly reduced the likelihood of war between them (Pasley, 2008; Rauchhaus, 2009). Events in Asia since 1949 provide an interesting test case. China and India fought a war in 1962, but have refrained from resorting to arms against each other ever since. There were three India-Pakistan wars (1962, 1965 and 1971) before both countries became nuclear; but since the late 1980s (when the two countries acquired a minimum nuclear capability), none of the two has launched any significant air or land operations against the other.

1 First Russian-Turkish War (1828-1829), War of Crimea (1853-1856), Austro-Prussian War (1856), French-Prussian War (1870-1871), Second Russian-Turkish War (1877-1878).

Thirdly, no nuclear-armed country has ever been invaded. This proposition too can be tested by the evolution of regional crises. Israel was invaded in 1948, on the day of its independence. But in 1973, Arab States deliberately limited their operations to disputed territories (the Sinai and the Golan Heights). It is thus incorrect to take the example of the Yom Kippur war as a "proof" of the failure of nuclear deterrence. Likewise, India refrained from penetrating Pakistani territory at the occasion of the crises of 1990, 1999, 2002 and 2008, whereas it had done so in 1965 and 1971. Another example is sometimes mistakenly counted as a failure of nuclear deterrence: the Falklands War (1982). But this was a British Dependent Territory for which nothing indicated that it was covered by nuclear deterrence.

Fourthly, no country covered by a nuclear guarantee has ever been the target of a major State attack. Here again evidence is hard to give, but can be found *a contrario*. The United States refrained from invading Cuba in 1962, for instance, but did not hesitate in invading Grenada, Panama or Iraq. The Soviet Union invaded Hungary, Czechoslovakia and Afghanistan, but not a single US ally. China has refrained from invading Taiwan, which benefits from a US defense commitment. North Korea invaded its southern neighbor in 1950 after Washington had excluded it from its "defensive perimeter", but has refrained from doing so since Seoul has been covered with a nuclear guarantee. Neither South Vietnam nor Kuwait were under the US nuclear umbrella. Russia could afford to invade Georgia and Ukraine because these countries were not NATO members. A partial exception is the shelling of Yeongpyeong island (2011); but the limited character of the attack and its location (in a maritime area not recognized by Pyongyang as being part of South Korean territory) make it hard to count it as a major failure of extended deterrence.

Alternative Explanations Are Not Satisfying

Some have suggested alternative explanations which all rest, to some extent, on the idea that international society has undergone major transformations since 1945: the development of international institutions, the progress of democracy, the rise of global trade, etc., to which is often added the memories of the Second World War. Thus for authors such as John Mueller, nuclear weapons played only a marginal role in the preservation of peace (Mueller, 1989). The Soviet Union, it is also argued, was a status quo power in Europe which would not have taken the risk of a major war on the continent.

But such explanations are not satisfying. The rise of international trade from 1870 onwards did not prevent the First World War: Norman Angell's "Great Illusion" was a fallacy. The construction of a new global order based on the League of Nations did not prevent the Second. Kenneth Waltz reminds us that "in a conventional world even forceful and tragic lessons have proved to be exceedingly difficult for states to learn" (Waltz, 1990: 743). In the same vein, Elbridge Colby holds that such

cultural argumentation markedly overestimates the durability of historically contingent value systems while seriously downplaying the enduring centrality of competition, fear, uncertainty and power (Colby, 2013). Major powers have continued to use military force in deadly conflicts, especially in the two decades after 1945: "war fatigue" is a limited and rather recent phenomenon. As for democratization, it is obviously a red herring: during the Cold war, the risk of major war was between pro-Western (not all of them democratic until at least the late 1970s) and totalitarian regimes.

No one knows how a non-nuclear cold war would have unfolded in Europe. However, without nuclear weapons, Washington might have hesitated to guarantee the security in Europe ("no nukes, no troops"), and might have returned to isolationism; and without US protection, the temptation for Moscow to grab territory in Western Europe would have been stronger.[2] And as Michael Quinlan puts it, in order to claim that nuclear deterrence was key in the preservation of peace, one does not need to postulate a Soviet desire for expansionist aggression: it is enough to argue that "had armed conflict not been so manifestly intolerable the ebb and flow of friction might have managed with less caution, and a slide sooner or later into major war, on the pattern of 1914 or 1939, might have been less unlikely" (Quinlan, 2009: 28).

Alternative explanations might not even suffice to explain the absence of conflict among European countries: the integration process which began in 1957 and culminated with the creation of the European Union in 1991 might have been much more difficult without the US umbrella (Colby, 2013). Neither are they satisfying regarding regional powers. It is hard to believe that the political, economic and cultural factors mentioned above are enough to explain the absence of a major conventional war involving Israel, India or Pakistan since these countries have become nuclear powers.

Deterrence has limited the scope and intensity of conflict among the major States. If Cold War crises in Europe, as well as wars in Asia and the Middle East, did not turn into global conflicts, it is probably due largely to nuclear weapons. The fear of nuclear war and the precautions taken by decision-makers during the Cold war to reduce the risks of direct conflict have been made clear by a collective study that contradicts Mueller's thesis (Gaddis, Gordon, May and Rosenberg, 1999).[3]

One could go as far as saying that the international stability obtained thanks to nuclear deterrence (in its national and extended forms) has been a form of "global

2 On this, see James Schlesinger (1993). "The Impact of Nuclear Weapons on History". *The Washington Quarterly*, No. 4. Available at http://www.tandfonline.com/doi/abs/10.1080/01636609309477718?journalCode=rwaq20#.VFkBUzSG-Yg.

3 See also John G. Hines, Ellis Mishulovich and John F. Shull (eds.) (1995). *Soviet Intentions 1965-1985*. McLean: The BDM Corporation.

common good". All non-nuclear weapons States benefitted from it during the past 70 years – even though some of them suffered from the indirect conflicts made possible by the stability-instability paradox. Without it, for instance, it is dubious that Asia would have known the peace and stability that allowed for its massive transformation and development, leading to hundreds of millions of human beings being lifted out of poverty. Nuclear weapons may even have hastened the end of the Cold war, by giving confidence to Soviet leaders that the country's survival would be assured even after the loss of the Eastern European *glacis*.

Nuclear Deterrence Also Contributed to the Reduction of Proliferation Risks

No nuclear-endowed country has ever been the victim of a chemical or biological attack. Here, the history of modern Middle Eastern wars is instructive. Egypt had used chemical weapons against Yemen (1962-1967), but failed to do so against Israel in 1967 and 1973. Likewise, Iraq had done the same in its war against Iran (1980-1988), but only fired conventional missiles at Israel during the First Gulf War (1991).

Security guarantees ("nuclear umbrellas") have limited the risk of nuclear proliferation. The role of such guarantees in the prevention of proliferation seems to be well-established.[4] In Europe, from the late 1940s through the 1960s, several countries were tempted to develop nuclear programs, and then gave up in no small part due to the US commitment to defend its NATO allies, including by nuclear means: this was the case for Norway and Germany, but also Sweden. In Asia, the US nuclear umbrella has permitted a dampening of the nuclear temptation in Japan, South Korea and Australia. Of course, the existence of a nuclear guarantee is not always "necessary" or "sufficient" to prevent a State from going nuclear (see the case of France). Still, extended nuclear deterrence has proven to be one of the best non-proliferation measures ever devised.

The Costs of Deterrence Remain Acceptable

Of course, the benefits of nuclear deterrence have to be measured in relation to its actual or potential costs.

Some authors have claimed that crises and low-intensity conflicts have multiplied due to the existence of nuclear deterrence. What has been called the "stability-instability paradox" by Glenn Snyder is a reality. But the number of international conflicts had slowly been declining since 1945. And – leaving Korea and Vietnam aside

4 See Bruno Tertrais (2011a). "Security Assurances and the Future of Proliferation" in James J. Wirtz and Peter Lavoy (eds.), *Over the Horizon Proliferation Threats*. Stanford: Stanford University Press, and Bruno Tertrais (2011b). *Security Guarantees and Nuclear Non-Proliferation*. Notes de la FRS, No. 14/11, Fondation pour la Recherche Stratégique, 10 August. Available at http://www.frstrategie.org/barreFRS/publications/notes/2011/201114.pdf.

if one was to claim that such wars were by-products of nuclear deterrence – was not that a relatively small price to pay for the prevention of major power conflict? It is not incorrect to state that the possession of nuclear weapons may encourage proliferation: for instance, Pakistan became nuclear mostly because India did; the Indian program was largely motivated by that of China; Beijing wanted nuclear weapons because Washington and Moscow did, etc. But apart from the fact that the number of actual nuclear countries has always remained rather low, the history of nuclear programs – in particular those of the past 20 years – shows that conventional superiority is a much greater incentive to pursue nuclear weapons. Thus paradoxically a world in which Western countries would not have nuclear weapons anymore might be – if disarmament had not been accompanied by much stricter international controls – a world in which proliferation might have much stronger chances to develop. Another potential cost of nuclear deterrence is the risk of miscalculation or accident. The risk of accidental nuclear war was the subject of numerous reflections and studies during the Cold war. More recently, a school of thought embodied by the works of Scott Sagan and Bruce Blair has put the emphasis on the risks inherent to complex systems and organizations such as those which manage nuclear weapons (Sagan, 1993).

It remains a fact, however, that no nuclear explosion has taken place in 70 years (other than nuclear tests), and that, for what is publicly known, there not been either an accidental or unauthorized launch, a weapon stolen, or a serious weapon accident. The procedures that guarantee safety and security were simple if not rudimentary during the Cold war, but they are much more robust and effective today in Western countries, and for what is publicly known, rather elaborate in most other nuclear-armed countries. No system is infallible, and there may very well be one day a major nuclear incident; but the probability that such an incident would lead to the actual detonation of a nuclear weapon seems to be vanishingly small. Likewise, the probability of nuclear terrorism seems to be vastly exaggerated.

As far as deterrence itself is concerned, it would be wrong to calculate its inherent risks as one does for complex technological systems: it primarily rests on human reasoning – which itself is far from being infallible, but as Robert Jervis says, it does not take a lot of rationality for deterrence to work (Jervis, 1979).

To claim that "we have been lucky so far", as have many analysts and politicians, is either metaphorical or unverifiable. By contrast, as explained below, statistical studies have shown that the possession of nuclear weapons significantly reduced the probability of war among two countries. Kenneth Waltz does not exaggerate when he claims that "the probability of major war among states having nuclear weapons approaches zero" (Waltz, 1990: 740).

Nuclear pessimism has a long lineage of authors who have been proven wrong. In 1960, C. P. Snow wrote that if a dozen new countries were to build nuclear weapons,

the risk of a nuclear explosion in the next decade would be a "mathematical certainty"(Snow, 1961: 255-262). In 1973, Fred Iklé, one of the most brilliant American minds of the Cold war, who could not see any other explanation for non-use than mere luck, predicted that nuclear deterrence would probably fail before the end of the 20th century (Iklé, 1973: 267-285). There is no reason to take seriously the allegedly scientific previsions made over the past few years, such as that of Martin Hellman (1% risk of failure per year) or that made by the Scientific American magazine (one chance out of 30 for the current decade) (Hellman, 2008; Matson and Pavlus, 2010).

The risk of escalation has to exist if deterrence is to be operative. But if one sets aside the Cuban Missile Crisis (1962) for the Soviet Union and perhaps, to some extent, the Yom Kippur War (1973) for Israel, there does not seem to be any example when nuclear weapons have been really "close" to being employed: neither in Korea (1950), nor at Dien-Bien-Phu (1954), nor in the Formosa Straits (1954-1955 and 1957-1958); neither during the second Berlin crisis (1961), nor during the battle of Khe Sanh (1968), the Ussuri river crisis (1969), the US/North Korea tensions (1969), the "madman" nuclear alert (1969) or the South Asia war (1971). Likewise for the *Able Archer* incident (1983), the Gulf War (1991), or the South Asian crises of 1990, 1999 and 2002. To envision the possible use of nuclear weapons, discuss it with one's advisers, seriously consider it if the crisis was to worsen, possibly make it known publicly (and/or put forces on a higher state of alert), have it planned by military staffs is one thing. To have "the finger on the button" and be on the verge of ordering a nuclear strike is quite another. We will never know if nuclear weapons would have been used if one of these crises had further escalated. But they showed that with very few exceptions, the highest political authorities – of various types of regimes and personality – have been extraordinarily prudent regarding their use.[5]

Most exercises and wargames showed that possessors of nuclear weapons were extraordinarily reluctant to engage in massive nuclear strikes. George Quester, one of the most subtle American analysts of deterrence theory, considers, for instance – after a rigorous analysis of the early days of the Cold war – that ethical motivations were paramount to explain the absence of any US nuclear use when it was in a situation of monopoly (Quester, 2000). Hence the idea of a "nuclear taboo" proposed by Nina Tannenwald for the United States or that of a "tradition of non-use" suggested by T. V. Paul for nuclear-armed countries in general (Tannenwald, 2007 ; Paul, 2009). It is not an exaggeration to claim that the nuclear terror message

5 Henry Kissinger has claimed: "I can't even think of a single occasion when we took measures that were moving consciously toward nuclear war". "Address by Henry A. Kissinger" in George P. Shultz, Sidney D. Drell and James E. Goodby (eds.) (2011), *Deterrence: Its Past and Future*. Stanford: Hoover University Press, p. 66.

conveyed by popular culture (novels, movies, cartoons, documentaries, photographs…) played a role in the consolidation of this taboo.

As for the risk of "inadvertent" nuclear war, this is hardly a credible scenario. Multiple false alarms took place during the Cold war. But contrary to what some journalists and novelists may believe, there is no reason to think that a US or Russian president has ever been close to launching nuclear weapons due to a mere alert. One example frequently cited is that of the 1995 Norwegian sounding rocket launch; the Russian early warning system, at that time in very poor condition, had signaled that it might be a missile. President Yeltsin had been summoned, and the nuclear "briefcase" had reportedly been presented to him. It is possible and even likely that Russia has a "launch-on-warning" posture. But can one seriously believe that Moscow would have launched a nuclear attack (against whom?) just because an unknown object had been launched from Norway, and even before it was ascertained whether the object was going to reach Russian territory (which was not the case)? As for the Cold war false alarms – there were several in the United States in the 1980s, including because of software glitches – they never led a US President to envision a nuclear strike. In the United States, an alert regarding a possible nuclear attack has to be confirmed by two different types of sensors; a threat assessment conference then would decide if political authorities should be contacted.

Likewise, the risk of an "accidental" (non-deliberate) or "unauthorized" strike is considerably exaggerated by disarmament activists. In most if not all countries, to be launched, nuclear forces have to receive a series of complex instructions with multiple verifications. As recalled by a former commander of USSTRATCOM, General Chilton, US missiles are not on a "hair-trigger alert" posture: they are "in the holster" (Grossman, 2009). The nuclear forces of the five NPT-recognized Nuclear-Weapon States have been detargeted, and Asian nuclear warheads are reportedly separated from their launchers. Such procedures have been devised partly so that catastrophist fiction scenarios – which were, it should be said, much more credible until at least the 1960s – could not materialize. Serious incidents regarding the custody of nuclear forces have been reported, but none that ever posed the gravest risk. An American author has interestingly suggested that since 1945, the tens of thousands of persons that have had the charge, at one level or another, of nuclear weapons "must have taken much greater care than is taken in any other situation involving human agents and complex mechanical systems" (Caplow, 2010: 38).

Alternatives to Nuclear Deterrence Are Not Credible

Furthermore, costs and risks associated with nuclear deterrence have to be measured in comparison with possible alternatives. But alleged possible substitutes lack credibility.

As is well-known, conventional deterrence has a long record of failure – in fact, as long as civilization itself. As former UK Prime Minister Margaret Thatcher once reportedly said, there is a monument to its failures in every French village.[6] The *threat* of conventional bombing is not enough to make an adversary desist when the stakes are extreme or vital: even when they are more limited, the crises of the past 20 years – Iraq in 1991, Serbia in 1999, Afghanistan in 2001, Iraq again in 2003 – have shown that it does not always lead adversaries to change their strategic calculus. The reasons are well-known. Besides the intrinsically frightening character of nuclear weapons, due to radioactivity, these weapons have important specific characteristics.

There is still today a large difference – at least an order of magnitude – between conventional and nuclear yields. According to open literature, the smallest known nuclear weapons yields are measured in hundreds of tons of equivalent-TNT (300 tons for the lowest yield of the US B-61 bomb), whereas the most powerful conventional bombs, which were tested during the past decade, are measured at the maximum in tens of tons of equivalent-TNT (a little over 10 tons for the US Massive Ordnance Air Blast, perhaps twice for the equivalent Russian device). For this reason, conventional weapons cost much more for an equivalent effect. Going back to conventional deterrence, even assuming that such deterrence was credible for the defense of vital interests, would be a return to the logic of big battalions. It is far from certain that Western countries – with the possible exception of the United States – would have the means or the political will for the arms races that would probably follow. This difference in yields is particularly relevant when one attempts to maintain a second-strike capability: other things being equal, an SSBN fleet endowed with conventional missiles would be extraordinarily costly. Even more than its nuclear counterpart, conventional strategy relies on the threat of targeted strikes on key assets and centers of gravity. Such a logic places extraordinary demands on intelligence and C3. The amount of energy expended by nuclear weapons makes them "forgiving" (less demanding in these respects). Conventional means today still cannot credibly threaten two particular categories of targets. The most important one consists of hardened targets. Just to give an example: in 1999, NATO failed to disable Pristina's military airport (Ripley, 1999). As the former director of a US nuclear lab reminds us, "some targets are simply too hard to be destroyed by anything less than a nuclear explosion" (Younger, 2009: 122).

Another category is deeply buried targets. In order to neutralize a buried installation (by coupling effect), a conventional weapon would need to penetrate much more deeply than a nuclear one, and in many cases much beyond what is feasible

6 No source was found for this alleged statement, which was reportedly pronounced at a NATO Heads of States and Governments summit (possibly in 1990) but may also be apocryphal.

today.[7] Of course, using nuclear weapons to destroy such installations would pose a well-known problem: fallout could be massive in case of shallow penetration, which could make a political leader hesitate. But let us recall once again that this is about deterrence, not use (the challenge being to persuade the opposing leader that we would not be self-deterred by such a prospect).

The other essential characteristics of nuclear weapons are political. A massive and sustained bombing campaign could, in many scenarios, have a physical effect equivalent to several nuclear weapons. However, as stated above, it is far from obvious that Western public opinion would bear the conduct of such a prolonged campaign, the unfolding of which would be visible 24/7 on television and the Internet. As was seen on several occasions recently – Kosovo, Afghanistan, Iraq, Southern Lebanon, Gaza, Libya… – the media and publics get impatient very quickly, demand fast results and are shocked by collateral damage and targeting errors. (In a major war, domestic sensitivity to collateral damage inflicted to the adversary's population would certainly be limited. But this would play out at the global level, potentially affecting the political context of the war.) And that is without taking into account possible asymmetrical reprisals (terrorism, cyber-attacks…) which could be conducted by an adversary. A conflict can be winnable in theory, but not in practice; and even in situations of obvious conventional superiority, the outcome is never guaranteed. As stated by Kenneth Waltz, "so complex is the fighting of wars with conventional weapons that their outcomes have been extremely difficult to predict" (Waltz, 1990: 734). Once again, other things being equal, nuclear weapons give the political authorities the quasi-certainty of massive but targeted destruction.

Could the threat of a massive regime change operation be enough to make an adverse leader think twice about major aggression or the use of WMDs? This is unlikely. The difficulties of the US-led coalition in Iraq have probably devalued the threat of regime change for at least a generation.

These two specific features of nuclear weapons have clear deterrence benefits.

It is unlikely that technological evolutions on the horizon will make this argumentation obsolete. Peacetime Western superiority is global, not necessarily local. Conventional forces remain time-consuming to mobilize and deploy, and their use often leads to protracted and bloody wars. From a technical standpoint, Elbridge Colby compares the substitution of nuclear weapons by conventional ones to an asymptote curve: to threaten the kinds of targets mentioned above, the difficulties

7 See Christopher Ford (2010). "Conventional 'Replacement' of Nuclear Weapons". New Paradigms Forum, 19 December; and Elbridge A. Colby (2011). "Why We Should Study Developing Nuclear Earth Penetrators - And Why They Are Actually Stabilizing". *Foreign Policy Research Institute*, May. Available at http://www.fpri.org/docs/media/201105.colby_.nuclear.pdf.

become exponential (Colby, 2010). Future long-range precision strike weapons will not alter this. In 2004, a Defense Science Board task force concluded that the United States would not have, by 2030, an intelligence, surveillance and reconnaissance architecture commensurate with the ambitions of the Prompt Global Strike program (Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, 2004). It is for these reasons that, from the point of view of a former commander of USSTRATCOM, such means cannot replace nuclear weapons even by "ten-for-one" (Chilton, 2010: 25).

Many arguments opposed to the idea of conventional weapons as substitutes for nuclear ones can also be applied to missile defense.

Missile defense can play many useful roles. It reinforces the freedom of action of political leaders, acts as a "deterrent by denial", covers cases where nuclear deterrence does not apply, and can be a damage limitation instrument. But deterrence by denial can never be as powerful as deterrence by retaliation: from the aggressor's point of view, the potential costs of the former are nothing compared with those of the latter. And the damage limitation role of missile defense cannot be applied today to massive threats – nor will it be in the foreseeable future. The cost-effectiveness of missile defense remains questionable. The United States spent more than 150 billion dollars over the past 30 years on missile defense, and continues to spend about 10 billion a year. In concrete terms, this investment has given it 30 Ground-Based Interceptors (an ability to intercept no more than 15 relatively primitive ICBMs), as well as about 100 SM-3 and 30 THAAD interceptors. It is clear that even if it were desirable, the complete protection of such a large territory as the United States by non-nuclear means would remain out of reach.

Finally, even assuming the total coverage of one's territory by defensive modes (anti-aircraft, anti-ballistic- and cruise missiles) in front of a major threat, something that today can only be achieved at a reasonable cost for very small territories such as Israel's, such defenses would not take into account non-traditional modes of employment of nuclear weapons such as terrorism.

The Continued Usefulness of Nuclear Deterrence

Even admitting that nuclear deterrence was effective when we faced a major threat, could it still be as useful in today's strategic context?

The fact that most threats are now more limited does not mean that nuclear deterrence is irrelevant. Vital interests may be threatened in a more limited fashion than was the case during the Cold war. In the sense of nuclear deterrence, "vital" is broader than "survival".

Without nuclear deterrence, Western powers would be much more reluctant to intervene against a nuclear-armed adversary to defend their political or strategic interests, or even to protect populations. Imagine that Libya had completed its

nuclear program: would NATO have intervened to prevent a carnage in Benghazi without the insurance that they would be protected against Libyan nuclear coercion or blackmail? Of course, it is far from being certain that the Alliance would have intervened if Libya had had nuclear weapons (some member States would certainly have opposed a NATO operation); but the point here is that the possession of nuclear weapons as a "counter-deterrent" reinforces the chances of intervention to defend strategic or humanitarian goals.

As for deterrence vis-à-vis major powers, a word of caution is in order. Even those who claim that the possibility of a new major threat in the coming two decades is close to nil have to admit that today's partners can become tomorrow's enemies in much less time than that. Libya is, to some extent, a case in point. So is Russia.

The potential adversaries of Western countries may have value systems different from ours, and exercising credible deterrence *vis-à-vis* them would not be easy. But there is no reason to believe that they are "irrational". Iraq, Iran, Pakistan, North Korea and China have shown that they perfectly understood the logic of deterrence through the threat of retaliation. Most of the regimes that are possible objects of Western nuclear deterrence (Iran, China, North Korea…) have shown throughout their history that they could, just as the Soviet Union had during the Second World War, bear a very high number of civilian casualties during a conflict. In dealing with such regimes, threatening centers of power is not only a moral choice: it is also a rational one.

Regarding the chemical or biological threat that may be posed by regional powers, the experience of the First Gulf War seems to validate the idea that nuclear deterrence can play a useful role. Several countries, including France, the United States and India, explicitly consider that a biological attack, in particular, would entail the risk of nuclear retaliation.

Nuclear weapons also play a residual role to prevent a State from using terrorist means to attack vital interests (such as, precisely, an act of nuclear terrorism). Such a role has been publicly stated by the United States, France and the United Kingdom.

Finally, the nuclear horizon continues to affect the relationships among great powers. It prevents crises among them from becoming direct military conflicts. Russia would probably not have invaded Georgia and Ukraine had these country been covered by a nuclear guarantee. Washington, for its part, might have been tempted to undertake a stronger military reaction had Russia not been a nuclear power.

It is sometimes said that public opinion would not accept the use of nuclear weapons and that Western leaders would be under immense pressure during a major crisis to avoid using them – to the point that they would be self-deterred. The argument is not without merits, but it meets three objections. First, one should not

underestimate the reactions of Western publics to a mass attack – witness Pearl Harbor or 9/11. Second, a nuclear response could be executed in a very short amount of time, and thus once decided would not be subject to public pressure, in contrast with a conventional bombing campaign. Third, what Western analysts believe ultimately does not matter: what matters, of course, is what the adversary believes (though he may believe that "we would not dare").
Finally, extended deterrence remains fully relevant to limit proliferation risks: the demand for security guarantees is as strong in North-East Asia, and stronger in the Middle East, than it was during the Cold war.

The Enduring Legitimacy of Nuclear Deterrence
One can also claim that the very legitimacy of nuclear deterrence has been bolstered in the past 20 years – or, at the very least, that the evolutions of the political and strategic context have not delegitimized it.
From the point of view of customary law, the legality of the possession of nuclear weapons can be said to have been confirmed by the unanimous extension for an indefinite duration of the NPT (1995), by the vote of resolution 984 (1995) of the UN Security Council on security assurances, and by the conclusion of several new treaties establishing nuclear-weapon-free-zones, with protocols to be ratified by the Nuclear Weapons States.
The fact that all the new nuclear-armed nations have adopted – at least rhetorically – doctrines of deterrence, and the continuation of nuclear restraint (the absence of any operational use), have also reinforced the taboo or tradition of non-use which exists regarding nuclear weapons.
An acute regional nuclear crisis would certainly lead to an immediate intervention of major powers – as was seen in 1990, 1999 and 2002 in South Asia – or even, had nuclear weapons been used, to military action to "quench the nuclear fire". Again, the risk of fast escalation to the extremes is never zero: but it is weaker than it was in the past.
Technological progress with regard to accuracy and intelligence collection (as well as MIRVing) has led to the adoption in Western countries, of more discriminate targeting strategies, and to the abandonment of their most powerful, "city-busting" weapons. Such countries, which also benefit from conventional superiority in relation to most of their adversaries, were also able to give up for good the temptation of seeing nuclear weapons as a means to compensate for conventional imbalances, and thus associated nuclear deterrence with "extreme circumstances of self-defense" (an expression used by the 1996 ICJ advisory opinion). The development of missile defenses reinforces that trend.
At the same time, drilling machines have become cheaper and more efficient: the burial of sensitive installations, which can be much more easily threatened by

nuclear weapons than by conventional ones (with the caveats mentioned above), seems to be a long-term trend.

The argument according to which, in the early 21st century, a political leader would not dare to use a nuclear weapon due to public pressure – especially in a society where information is widely and immediately disseminated – can actually be turned on its head. As stated above, a nuclear strike would be almost instantaneous and thus less subject to opinion pressure than a conventional bombing campaign would be; and, again, we should not underestimate the possibility that our publics would be the first to cry for blood. As for the fear of being dragged in front of an international court, one can doubt that it would weigh heavily on a leader whose country has just been the target of a massive or horrendous aggression (besides the fact that he or she would probably remain legally immune in his or her own country).

In short, many of the arguments traditionally used to challenge the legitimacy of nuclear deterrence tend to increasingly lose their credibility: deterrence is less and less about threatening cities; the characteristics of modern weapons would make their use less indiscriminate than in the past; the risk of escalation to the extremes is lower than it used to be; one can better defend against a nuclear attack; and indirect conflicts are less numerous than in the past.

Other arguments can bolster the domestic legitimacy of nuclear deterrence policies. First, in the past 20 years the decrease in nuclear arsenals has been accompanied by a continuation of economic growth: thus the percentage of national wealth devoted to nuclear deterrence is lower – at least for Western countries and Russia – than it was 30 or 40 years ago. Second, for countries which are ageing (which will soon be the case for a majority of nuclear weapons possessors), or in which the demand for social protection will increasingly weigh on national budgets, it will be possible to present nuclear deterrence as a relatively low-cost form of national security insurance. The argument according to which decreasing defense budgets should imply a transfer of nuclear expenses to conventional forces (often heard in Europe) could be reversed: without going back to the Cold war logic of nuclear weapons as a means to compensate for conventional deficiencies, it could be claimed that societies that, in the long run, may lose some of their abilities to intervene around the world to defend their interests will need at least to have the capacity to protect their core vital interests at all times.

Final Remarks

Nuclear deterrence is comparable what Winston Churchill said about democracy: the worst possible war-prevention instrument with the exception of all the others. It could be considered a temporary, but effective, as well as legally and morally acceptable way to prevent war among major powers, or aggression against their allies, until democratic peace comes.

That said, the enduring acceptability of nuclear deterrence should not be considered a given. It is a fact that political, intellectual and religious elites tend to be less immediately convinced of its relevance today. Uncontrolled nuclear proliferation would lead many officials and analysts – it is already the case in the United States – to consider that its risks outweigh its benefits. *A fortiori* should a major nuclear event occur such as a severe nuclear crisis, an act of terrorism or a deadly accident: such an event could have such a psychological effect that it might lead, *volens nolens*, to a generalized move towards abolition. It is also to be noted that in the longer run, the continuation of nuclear arsenal reductions might lead to the temptation of going back to the targeting of cities – thus raising anew some old ethical dilemmas.

Likewise for its efficiency. For instance, today potential adversaries of Western countries – which often consider the latter as being "weak" – might be less convinced of their determination to defend themselves than the Soviet Union probably was.

Thus in the coming decades, nuclear weapons will only be able to play a major role in the preservation of global peace and security if political leaders pay attention to factors that could affect the acceptability and effectiveness of deterrence. This is especially the case since the images of Hiroshima and those of atmospheric testing are beginning to fade from collective memory. It is not impossible that nuclear weapons may lose, over time, their terrifying character; the ultimate paradox of the nuclear taboo would be that it ends up generating its own destruction.

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