



Bruno TERTRAIS

WHAT FUTURE FOR NUCLEAR DETERRENCE?

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SUMMARY

With the war in Ukraine, the issue of nuclear deterrence has made a dramatic comeback in Europe. Its principles and modes of operation remain valid. Deterrence is a simple psychological process, the rules of which in the nuclear field were gradually defined throughout the Cold War. Today's nuclear weapons possessors - China, France, India, Israel, North Korea, Pakistan, Russia, the United Kingdom and the United States - continue to abide by these rules as a whole, and deterrence has arguably contributed to the absence of direct military confrontation between these possessors.

Debates on the future of deterrence are no less legitimate in a changing geopolitical and technological context. Some of the questions raised by deterrence, such as its benefit/risk ratio or its morality, have existed since 1945. Others are more recent: is nuclear deterrence still relevant at a time when the balance of power is developing in new areas – outer space, cyberspace, etc. - and with new means? Can we still say that there is no real alternative to nuclear weapons? For France, maintaining a nuclear deterrent seems to be a reasonable choice, but keeping it up to date requires substantial investments in the coming decade. In addition, new questions arise for the country. What can be the new coordination of nuclear and conventional forces in the foreseeable European context? Can geographically distant threats (Asia) be covered solely by national deterrence? As the only nuclear state in the European Union, can or should France play a greater role in protecting its partners and allies? This study aims to contribute to this legitimate debate, which is vital in a democratic state, on the future of the French deterrent.

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Bruno TERTRAIS

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INTRODUCTION

On 27 February 2022, Europe was stunned and suddenly plunged into the atmosphere of the worst moments of the Cold War: in a chilling and very deliberately televised staging, Vladimir Putin had apparently just given the order to change the posture of his nuclear forces. In fact, this decision was misunderstood. No “heightened alert” was decided on that day - only an increase in personnel serving on the nuclear staffs. And, despite the sometimes disturbing rhetoric, Moscow always stuck to the official line: as long as the conflict remained in the conventional realm, the nuclear deterrent could only be brought into play in the event of an “existential” threat to the country. No worrying movement of nuclear forces has thus been observed. The Kremlin's actions in this area have thus remained, until now (October 2022), rather reasonable, thus contrasting with the extreme brutality of Russian military behaviour on Ukrainian territory.

The invasion of Ukraine did not signal the failure of nuclear deterrence, as that country was not covered by any nuclear umbrella. On the contrary, it confirmed that countries that are not protected by deterrence can suffer such a fate, while those that are protected by deterrence remain safe from a major, frontal military attack. The possession of nuclear weapons by NATO and Russia bounds the horizon of conflict between them: the West does not intervene in Ukraine; Moscow spares their territory.

The pro-nuclear disarmament movements, which had achieved undeniable diplomatic success with the adoption of a nuclear weapons ban treaty in 2017, seem singularly out of step with political and strategic realities. Of course, no nuclear-armed state intends to sign it (or any state protected by a nuclear umbrella). The nine countries that have nuclear weapons, whether within the framework of the Non-Proliferation Treaty (NPT) - China, France, Russia, the United Kingdom or the United States - or outside it - India, Israel, North Korea and Pakistan - are keeping their arsenals up to date, sometimes modernising them, or even developing them, as is the case in Asia, where strategic competition is in full swing, while in Europe the probable weakening of the Russian army suggests that nuclear weapons will become more important to the Kremlin in the future. It should also be remembered that, with the exception of South Africa at the time of the fall of the apartheid regime, no state that has developed this weapon on its own ever got rid of it.

The war in Ukraine may, however, raise questions about the relevance of deterrence as we knew it during the Cold War, in a world that is rediscovering what some call “nuclear grammar”. Can deterrence still be effective in a world of nine nuclear states - and perhaps more in the future - some of which seem increasingly inclined to demonstrate aggressively what we might call their “nuclear nationalism”? Can this deterrence work between a Donald Trump and a Kim Jong-un? And is the French posture still relevant in such a strategic universe? At the request of the *Fondation pour l'innovation politique*, this study, after recalling the bases and principles of deterrence, attempts to answer these questions.

I. WHAT IS DETERRENCE?

Deterrence is a psychological process: it involves convincing an actor to refrain from doing something. Based on one of the most basic emotions - fear of punishment - deterrence is as old as mankind, and is not unknown to animals. In the Bible, Yahweh addresses man in these terms: “*You may eat from every tree in the garden. But of the tree of the knowledge of good and evil you shall not eat of it, for in the day that you eat of it you shall die*”¹. Given what happened next, this could be said to be the first failure of deterrence (even if the punishment was not literally carried out).

1. Gen II:16-17 [trans. Jerusalem School of the Bible].

Deterrence differs from *persuasion* and *coercion*, which involve convincing an actor to do something: the former by inducement; the latter by compulsion: demanding peace, for example. Coercion can be applied through an ultimatum - such as the Potsdam Declaration, which threatened Japan with “*rapid and total destruction*” if it did not surrender unconditionally - or through the use of force - such as the bombing of Hiroshima and Nagasaki. It is also distinct from dissuasion, which consists in persuading an actor to do something without the use of force.

As Lawrence Freedman puts it, “*Deterrence can be a technique, doctrine and a state of mind. In all cases it is about setting boundaries for actions and establishing risks associated with crossing these boundaries*”². Its foundations therefore exist in all areas of human activity, including international relations. The threat of economic sanctions, for example, is a form of deterrence - which failed with Russia in the winter of 2021-2022.

Deterrence does not require fully rational actors. Rather, they must have a modicum of rationality, i.e. the ability to assess costs and benefits, even if erroneously. There must also be a “*sufficiently shared normative framework*”³. The philosophers of the 18th century developed this concept by emphasizing certainty and celerity of punishment (Cesare Beccaria) or clarity, predictability and proportionality (Jeremy Bentham)⁴. Contemporary criminology attests to the fact that the probability of response is fundamental - more so in relative terms than the severity of the punishment for transgression. This means that the reputation of the party seeking to deter, whether it is the police or a military adversary, is paramount. But deterrence also relies in part on fear. *Deterrence* comes from the Latin word *terrere*, which means “to frighten,” and it does not require the recipient to be perfectly rational and can even be reinforced when the sender does not appear to be perfectly rational. Richard Nixon called it the “*madman theory*” and Donald Trump also adopted such a posture.

In sum, deterrence is therefore more of an art than a science, and more like a game of poker than a game of chess.

1. Deterrence and security

In the field of security, deterrence aims to prevent an armed attack or other form of deliberate major aggression. NATO defines it as “*the convincing of a potential aggressor that the consequences of coercion or armed conflict*

2. Lawrence Freedman, *Deterrence*, Cambridge, Polity Press, 2004. p. 116.

3. *Ibid.*, p. 5.

4. See Julien Damon, “Cesare Beccaria. La certitude de la peine,” in *Ibid.*, 100 penseurs de la société, Presses Universitaires de France, 2016. See also Bertrand Guillarme, *Penser la peine*, Presses Universitaires de France, 2003.

would outweigh the potential gains. This requires the maintenance of a credible military capability and strategy with the clear political will to act”⁵. Deterrence as applied to the military domain was already illustrated in the texts of Thucydides. It is based on two elements: on the one hand, *capabilities* whose credibility can be demonstrated: platforms, launchers and weapons, as well as the necessary means such as command, control, communication and intelligence (C3I); on the other hand, a clear *will* to use them. Deterrence therefore requires *communication*: transparency about the forces, tests and exercises, speeches and texts, as well as specific messages in times of crisis. Past uses of force are also elements of deterrence and can build what political scientists call “reputation”. In sum, mere quantitative comparison of armies and arsenals is not necessarily an indicator of deterrence effectiveness and history is replete with weaker actors attacking stronger ones. Even the virtual certainty of defeat is not enough to deter a country from aggression, for example if the objective is to hurt the larger actor. And even less so when values such as honour are at stake (a classic example being Egypt's decision to attack Israel in 1973 but limiting itself to the occupied territories).

Non-nuclear deterrence is increasingly “multi-domain” or “cross-domain”, as rivalries and conflicts extend into new domains (cyberspace, outer space...). An attack in one domain may be a deterrent to aggression in another, or retribution for a past attack.

While deterrence is designed to prevent aggression, it can also be applied during conflict. Israel and its regional adversaries practice a living form of deterrence against non-state actors by establishing red lines, testing the adversary and re-establishing deterrence if necessary. This idea was introduced into the nuclear realm by American strategist Thomas Schelling in a 1961 article in which he argued that the use of nuclear weapons could serve primarily as a signalling device: “*Destroying the target is incidental to the message the detonation conveys to the Soviet leadership*”⁶. This is part of a negotiation process: adversaries communicate via the way they calibrate their use of nuclear weapons, ideally leaving room for negotiation.

Deterrence by denial consists in convincing the adversary that he will not be able to achieve his objectives by military means. This is done through the creation of obstacles (active and passive defences) or through the resilience of a state or society. Deterrence by denial can therefore be defined as a combination of defence and resilience. Nuclear weapons may come into play as an instrument of war-fighting, although no declared contemporary nuclear doctrine provides for such an option. Deterrence by retaliation, on

5. NATO *Glossary of Terms and Definitions*, Allied Administrative Paper AAP-06, 2019, p. 42, definition adopted in 1996, www.coemed.org/files/stanags/05_AAP/AAP-06_2019_EF.pdf.

6. Thomas C. Schelling, “Nuclear Strategy and the Berlin Crisis,” 5 July 1961, in U.S. Department of State, Office of the Historian, *Foreign Relations of the United States, 1961-1963*, vol. XIV, “Berlin Crisis, 1961-1962”, document 56, <https://history.state.gov/historicaldocuments/frus1961-63v14/d56>.

the other hand, involves convincing the adversary that the costs of aggression would outweigh the benefits. In this case, nuclear weapons come into play and add an element of terror. Retaliatory deterrence is the primary form of nuclear deterrence today, but military deterrence in general often involves both. The U.S. Department of Defense defines deterrence as “*the prevention of action by the existence of a credible threat of unacceptable counteraction and/or the belief that the cost of action outweighs the perceived benefits*”⁷.

“Central” deterrence is sometimes referred to as the face-off between two major adversaries, as opposed to “extended” deterrence, which refers to a three-player (or more) game in which a stronger country protects a weaker country - an ally or partner - from an adversary. This second mode is considered more difficult than the first because the stronger country must demonstrate to both the adversary and the protected state that it is willing to defend its ally as well as itself. This is done through declaratory policy, consultation mechanisms, physical presence - the protector's forces can serve as a “trip-wire” to ensure its intervention if its forces are attacked. One advantage of extended deterrence is “reassurance”: a state that believes it is protected by a credible deterrent will be less likely to engage in a nuclear programme. While extended deterrence is sometimes formalized in a treaty explicitly committing to the defence of an ally (NATO, Japan, South Korea, etc.), it can also exist de facto as a set of declarations and close relationships.

2. The nuclear dimension of deterrence

No one can be credited with inventing nuclear deterrence, although physicist Józef Rotblat (who later left the Manhattan Project) was, in the early 1940s, one of the first proponents of the “non-use” of the bomb to prevent war.

The advent of nuclear weapons is often described as causing a revolution in military and world affairs. Scholars and practitioners have debated its scope and speed. Until the 1960s, nuclear weapons were still sometimes considered instruments of warfighting. It seems fair to say that in the early 1960s ballistic missiles and thermonuclear weapons created an unprecedented combination of near-certainty, speed, and scale of response, to which radiation added an aura of terror. As Dr. Strangelove told the American president in Stanley Kubrick's film of the same name, “*Deterrence is the art of producing in the mind of the enemy the fear of attacking.*” With nuclear weapons, deterrence has become a strategy (involving planning) in which the fear of ultimate retaliation (often referred to as “unacceptable damage”) is central. Given that war between nuclear-weapon holders is now hardly conceivable, it would be more appropriate to say that deterrence has become an integral

7. United States Department of Defense, *DOD Dictionary of Military and Associated Terms*, December 2020, p. 63, <https://irp.fas.org/doddir/dod/dictionary.pdf>.

part of international politics. However, nuclear strategy assumes that, in a hypothetical nuclear war, policy would continue to operate through signals and attempt to “re-establish” or “restore” deterrence.

Another distinct feature of nuclear deterrence is that it is seen as relevant only between states, and this is true on both sides of the equation: the ultimate decision can only be made by a government, and the nuclear threat is only applicable to opposing state actors. The essence of nuclear deterrence is that it is a dialogue between heads of states and governments.

Nuclear deterrence covers attacks or aggression against the most vital interests. The declared threshold for first use or “nuclear threshold”, a form of red line, can be high (no first use of nuclear weapons), low (e.g. “if we are attacked”), qualified (“in the event of major aggression”, “in extreme circumstances of self-defence”, “when the existence of the state is threatened”, “to protect vital interests”) or left open. NATO's stated threshold is: “If the fundamental security of any of its members were to be threatened⁸.” These thresholds do not only refer to a traditional armed attack: several countries consider that a massive chemical, biological or cyberattack could threaten their vital interests.

Because the risks are so high in nuclear deterrence, vagueness prevents the adversary from being able to calculate the exact consequences of aggression (and thus from acting only below the threshold if necessary) and also allows the defender to retain some room for manoeuvre and freedom of action if deterrence fails. For the same reasons, although the promised response is sometimes specific (“the destruction of all your major cities”, for example), it is usually more vague (“swift and decisive”, “overwhelming and devastating” or “proportionate”). Any effective deterrence is a subtle mix of clarity and calculated ambiguity, but this is even truer in the case of nuclear deterrence.

However, such statements would not easily deter all cases of major aggression. An adversary could attempt to affect the defender's interests incrementally without appearing to cross the nuclear threshold at any particular time. This is true of all red lines, but the high stakes of nuclear weapon use make this notion particularly relevant.

Most states have restricted the circumstances in which they would use nuclear weapons to meet disarmament obligations, to support non-proliferation, or for moral reasons. At the extreme, this translates into a declared no-first-use doctrine such as that claimed by China, the Soviet Union in the 1980s, and India (with some reservations). A close but generally considered different statement is a hypothetical “sole purpose” statement: the only reason to

8. NATO, “Warsaw Summit Communiqué Issued by the Heads of State and Government Participating in the Meeting of the North Atlantic Council held in Warsaw on 8-9 July 2016,” 9 July 2016, §51 (www.nato.int/cps/en/natohq/official_texts_133169.htm).

possess nuclear weapons would be to deter nuclear use, even if pre-emption, for example (at least in some interpretations), was not excluded. The five NPT-recognized nuclear-weapon states have given formal “negative security assurances” that they would not use nuclear weapons against a non-nuclear-weapon state, sometimes with caveats to preserve their freedom of action. In 2010, both the United States and the United Kingdom had come close to adopting the sole purpose principle by strengthening their negative security assurances. The Biden administration had to abandon this, noting the unfavourable evolution of the strategic context.

II. NUCLEAR STRATEGY

1. Escalation and proportionality

The translation of nuclear deterrence into operational terms (doctrine, plans and capabilities) is the subject of nuclear strategy. This is one of the components of nuclear policy, the others being nuclear arms control and disarmament policy and nuclear non-proliferation policy.

Nuclear strategy focuses on three main problems: avoiding a major non-nuclear attack on its national territory or that of an ally by promising a nuclear response to an adversary who dares to do so; avoiding the use of nuclear weapons by the adversary in the event of a conflict, by threatening them with an at least equivalent nuclear response; averting a surprise nuclear attack against its nuclear forces or territory by considering the use of a preventive, pre-emptive or “damage limitation” strike, deploying missile defence, or promising a massive nuclear response.

Escalation is the most important concept in nuclear strategy. The term can refer to a *process* (deliberate or inadvertent) or a *strategy* (the gradual imposition of increased levels of violence). Because nuclear escalation is a particularly risky undertaking, the interaction between two nuclear-weapon states has been likened to a game of chicken and often referred to as “brinkmanship”. The goal of escalation would be to end the conflict with the lowest possible level of violence through initial use, and also to signal a willingness to resort to further use - possibly at later stages - if necessary. Initial use could be a simple demonstration shot, an explosion aimed at exploiting the high-altitude electromagnetic pulse (HA-EMP) or a limited number of strikes on military targets⁹.

9. HA-EMP is an induced effect of a high-altitude nuclear weapon explosion. It is the emission of radiation that affects electronic components, communications, etc., both on the ground and in space.

A limited or selective (as opposed to major or massive) strike could be launched by any means. Some argue that the use of a ballistic missile carrying a low-yield weapon could confuse the adversary, since such means - especially when launched from a submarine - are generally reserved for massive strikes; this hypothetical issue is called the “discrimination” problem. Proponents of such an option emphasize its speed, accuracy, and high probability of detonation on the target, which would enhance deterrence; they also suggest that no major adversary could mistake a single incoming missile for a massive strike, and that it is highly unlikely that the recipient would respond with a major strike without first assessing the consequences.

Vertical escalation can take several forms: hitting more targets, a different type of target (moving from military to economic targets, for example), or in a different location (moving from a foreign theatre to the adversary's country). Horizontal escalation refers to the opening of a new theatre of conflict, even at the same level of applied violence.

Escalation is, by definition, asymmetric. Seeking “escalation dominance” generally means being able to up the ante after each opponent's move in a way that would be perceived as credible by the opponent, thereby defeating them. But if deterrence fails, more subtle escalation management would revolve around the notions of *bargaining* and *intra-war deterrence*. Inspired by the theorists of the 1960s, this school of thought advocated restraint in the use of nuclear weapons, in order to give the adversary a way out or at least to avoid a rapid rise to extremes. The idea was to move from a cliff edge strategy to a gentle slope strategy. One way to do this would be to match the opponent's move (destroying five air bases in response to the destruction of five air bases, for example). Such a response would indicate a desire to keep the level of violence as low as possible. On the other hand, the fear of uncontrolled escalation is also part of the essence of nuclear deterrence: escalation must be possible, but not certain; this is what Thomas Schelling called “*the threat that leaves something to chance*”¹⁰.

The purpose of escalation would be, at least in Western doctrines, fundamentally political. Since the 1970s at least, any idea of using nuclear weapons as purely combat instruments has disappeared from stated doctrines. Any military effect that the use of nuclear weapons might have would be contingent on the achievement of a political objective: the restoration of deterrence and the end of conflict.

Another problem is deterring a first strike (which would not necessarily be the first use of nuclear weapons in a conflict), aimed at disarming the adversary or at least degrading its offensive potential (“damage limitation”).

10. Thomas C. Schelling, “The Threat That Leaves Something to Chance,” Rand Limited Document, Rand Corporation, 10 August 1959, www.rand.org/pubs/historical_documents/HDA1631-1.html.

It could be carried out either out of the blue (preventive strike) or hot if there is a fear that the adversary would go first (pre-emptive strike). This risk can be prevented by warning measures or by presenting the adversary with difficult planning challenges such as dispersion, redundancy, hardening and camouflage, or by missile defence. The search for second-strike capabilities, via ballistic missile submarines (SSBN), for example, is a direct consequence of this problem.

Proportionality is another key concept: a proportionate threat may be sought for reasons of credibility, be they legal or ethical, or to ensure better control of escalation should the threat be carried out. It can be applied in two different ways: the threatened response may be proportionate to the *aggression* (see the discussion of law and ethics below), but nuclear strategy is often based on the threat of damage proportionate to the *stakes* of the conflict, which may ultimately be the very existence of the country in the event of aggression by a nuclear-armed adversary.

No one knows how a nuclear conflict would develop, and anticipations - acting on the basis of hypothetical future action by the adversary - would play a major role in the dynamics of escalation. Despite theoretical conceptions in the 1960s that envisaged the possibility of a gradual, even protracted, escalation to extremes (Herman Kahn's scale had no fewer than forty-four possible rungs), experts who have examined possible firebreaks have generally identified only two: the first use of nuclear weapons in a conflict, and the first nuclear strike on the adversary's territory.

2. Two visions of deterrence

There are two competing visions of nuclear deterrence, corresponding to an analytical distinction between an easy and a difficult vision. The first emphasizes the manipulation of risk through uncertainty, bargaining with the adversary and fear of uncontrolled escalation. It suggests that deterrence is stable when both sides are confident in their ability to retaliate (credibility being more important than the balance of power). Game theory can be used as a supporting tool¹¹.

Among the analysts who have suggested that a relatively small number of weapons, combined with a simple strategy, is sufficient to deter, are American experts Thomas Schelling, Bernard Brodie, Kenneth Waltz and Robert Jervis. They argue that nuclear weapons have a significant effect on the risk of conventional attack and that a protected second-strike capability is the key

11. Game theory is a field of mathematics that aims to help decision-making by modelling the interaction of agents. American strategists in the 1960s applied it to the nuclear field by attempting to model the likely reaction of an adversary to a particular initiative.

to stability. The conditions for deterrence may be the mere existence of such a capability, making retaliation *possible*, although most experts argue that it should be *assured*, preferably from both sides. Since the ability to destroy opposing forces is not necessary, such models have been called finite or *minimal* deterrence. The expression Mutually Assured Destruction (MAD) - a catch-all term ironically proposed by Donald Brennan in 1969 - is often associated with the simple deterrence model but refers to a specific issue, namely the condition of strategic stability. It reflects the idea that an assured and massive retaliatory capability on both sides is the keystone of that stability. Many, such as U.S. Secretary of Defense Robert McNamara after his tenure, have come to regard MAD as “*the foundation of deterrence*”¹². However, contrary to popular belief, MAD as a *deliberate* strategy has never been fully embraced by either Washington or Moscow

The other, more pessimistic school emphasizes the need for strong offensive and defensive capabilities, and the ability of the defensive side to control - and, if possible, dominate - the escalation at every stage. It places great importance on the balance of power and sees stability as a difficult goal to achieve. The pessimists believe that deterrence requires a complex strategy and a higher-level and more diverse arsenal. Proponents of this view include American experts Herman Kahn, Albert Wohlstetter, Colin Gray and Keith Payne. Its most symbolic expression is Albert Wohlstetter's oft-quoted assessment that the balance of terror is “*delicate*”¹³. Territories and forces must not be vulnerable, except to create incentives for pre-emption on both sides. Forces must be dispersed or protected and missile defence may be necessary. This school of thought also places importance on the existence of a wide range of options for managing and even dominating escalation. From this perspective, MAD, if relevant, requires serious effort. To use an analogy with fundamental physics, let us call it the strong version of MAD, as opposed to the weak version described above.

However, most analysts of both schools recognize the need for a secure retaliatory force, as well as non-massive (selective or limited) nuclear planning options.

12. Quoted in John T. Correll, “The Making of MAD,” airforcemag.com, 27 July 2018, www.airforcemag.com/article/the-making-of-mad/.

13. See Albert Wohlstetter, “The Delicate Balance of Terror,” Papers P-1472, Rand Corporation, 1958 (www.rand.org/pubs/papers/P1472.html).

III. DEBATING DETERRENCE

Since 1945, governments, planners and experts in nuclear-weapon states have been grappling with a number of key questions to which there are no easy answers.

1. Is nuclear deterrence ethical? Is it legal?

Deterrence is a mechanism for preventing war, allowing Lawrence Freedman to assert that "*there is no dishonour in deterrence*"¹⁴. Opponents of nuclear deterrence argue that the use of this terrible weapon cannot be compatible with international law. The *jus ad bellum*, which defines the criteria for the legality of the use of force ("entry into war"), establishes that defence is legal (self-defence) if it is proportional to the armed attack and necessary to respond to it. *Jus in bello* or international humanitarian law (IHL) prohibits attacks on the civilian population and civilian objects, as well as "unnecessary suffering". Proponents of nuclear deterrence believe that the basic principles of international law can be maintained provided that certain planning guidelines are followed. In its 1996 advisory opinion, the International Court of Justice held that "*there is in neither customary nor conventional law any comprehensive and universal prohibition of the threat or use of nuclear weapons as such*"¹⁵ and that it could not "*conclude definitively that the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence in which the very survival of a State would be at stake*"¹⁶. Furthermore, the Court stated that it "*does not intend to pronounce here upon the practice known as the 'policy of deterrence'*"¹⁷. Since the nuclear-weapon holders have not signed the treaty, the nuclear-weapon ban treaty will not create any new legal obligations for them, especially since they are likely to act as what legal scholars refer to as "persistent objectors".

What future for nuclear deterrence?

14. Lawrence Freedman, "Introduction", in Frans Osinga and Tim Sweijs (eds.), *Deterrence in the 21st Century - Insights from Theory and Practice*, Breda, Asser Press, 2021, p. 2, <https://link.springer.com/content/pdf/10.1007/978-94-6265-419-8.pdf>.

15. International Court of Justice [ICJ], "Legality of the Threat or Use of Nuclear Weapons", 8 July 1996, Advisory Opinion, [1996] ECR 266 [www.icj-cij.org/public/files/case-related/95/095-19960708-ADV-01-00-EN.pdf].

16. *Ibid.*

17. *Ibid.*, p. 254.

2. Should the scope of nuclear deterrence be reduced to the response to a nuclear attack?

All five NPT nuclear-weapon states have provided “negative security assurances” that reduce the scope of nuclear deterrence in some way, with the aim of promoting non-proliferation. One of the longest-standing controversies over deterrence concerns these guarantees. Proponents argue that the threat of nuclear use in response to a non-nuclear attack - conventional, chemical, biological, cyber, etc. - is not credible, not necessary, is immoral, or seeks to raise the nuclear threshold for ethical or strategic purposes, arguing that emphasizing the utility of nuclear weapons may encourage their proliferation. Opponents point out that in the event of conflict, adversaries do not trust the no-first-use concept, that it could be changed in seconds, that it could encourage non-nuclear aggression, and that it is detrimental to extended deterrence, especially if allies oppose it. Some also make a distinction between declaratory and action policy. Variations on the no-first-use principle include a proposed ban on the first use of weapons of mass destruction, a no-first-use with caveats (India since 2003, the United States between 2010 and 2018) or a “sole purpose” declaration that could leave room for pre-emptive strike.

3. Is nuclear deterrence effective?

According to Oscar Wilde, “*beauty is in the eye of the beholder*”. The same is true of deterrence. Ultimately, only the recipient of deterrent threats can decide whether they are effective. As the UK Ministry of Defence put it, “*any actor may choose its posture, but cannot choose their reputation*”¹⁸. Some have suggested that “*it is doubtful that there is a single leader in the United States who would unleash nuclear fire to save a Baltic country from defeat if attacked by Russia [and that] the same is true of the leaders of France or the United Kingdom*”¹⁹. Yet, apart from the fact that the answer is surely not so obvious, this statement is hardly relevant, because in deterrence, only the opponent's perception matters. Deterrence can thus be seen as “*an act of faith*”²⁰, but its proponents claim that there is evidence of its effectiveness. Quantitative evidence includes the absence, since 1945, of any war between major powers (a historical exception for which alternative explanations are, in their view, unsatisfactory), of any major war between nuclear-armed

18. UK Ministry of Defence, *Deterrence: the Defence Contribution*, Joint Doctrine Note 1/19, 2019, p. 23, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860499/20190204-doctrine_uk_deterrence_jdn_1_19.pdf.

19. Jean-Marie Guéhenno, “Il est urgent qu'Emmanuel Macron lance une réflexion sur les leçons de la guerre en Ukraine”, *Le Monde*, 30 August 2022
(restricted access: www.lemonde.fr/idees/article/2022/08/30/jean-marie-guehenno-il-est-urgent-qu-emmanuel-macron-lance-une-reflexion-sur-les-lecons-de-la-guerre-en-ukraine_6139475_3232.html).

20. The expression was suggested to the author by a former commander of the French nuclear forces.

countries, and of any major military attack against nuclear-armed or protected countries. Qualitative evidence includes records and testimonies that show that nuclear weapons have induced a sense of caution in the minds of leaders, affecting their calculus about going to war against a nuclear-armed or nuclear-protected nation. This ranges from Nikita Khrushchev's memoirs to the testimony of Egyptian or Iraqi officials. It has been suggested that Ronald Reagan's brutal handling of the U.S. air traffic controllers' strike earned him a reputation as a decisive leader who would not hesitate to use nuclear weapons. Lawrence Freedman argued that "*deterrence has worked better in practice than in theory*"²¹. Nevertheless, records and testimony show that there were many misunderstandings between Washington and Moscow, each convinced that the other could have attacked. Not only did the Soviet Union fear American aggression, but it was concerned for its own people, despite what American analysts thought. It also practiced mirror-imaging: as a centralized country, the Soviets believed that the destruction of Washington could inflict a fatal blow to the country. However, even today, we can see that Russia, China, Pakistan or North Korea generally respect the rules of deterrence: they have never attacked a nuclear state or a state protected by a nuclear state in a frontal and massive manner.

4. What would happen if deterrence failed?

Deterrence is not foolproof. It can fail because of a miscalculation by one of the parties, especially in times of crisis. If that were the case, would it still be necessary to cross that threshold? Some think it would be pointless. Others point out that deterrence could be "restored" by such use. Herman Kahn argued that "*the nuclear threshold is not so weak that a single use of nuclear weapons would make anyone careless about crossing it a second time*"²². Those who believe in "intra-war bargaining" think that escalation can be controlled. Others believe that, like the game of chicken, it is simply too dangerous and risky. Ultimately, the answer is "maybe," and this uncertainty is at the heart of nuclear strategy. Nuclear escalation would in any case be a contest of wills.

5. Is it worth it?

Assuming that nuclear deterrence is effective, what about its risks? This is a reasonable question, with two different dimensions. As with any policy, it is a question of assessing such risks. Some argue that the short-term benefit of

21. Lawrence Freedman, "Framing strategic deterrence. Old certainties, new ambiguities," *The RUSI Journal*, vol. 154, no 4, August 2009, p. 50, www.tandfonline.com/doi/pdf/10.1080/03071840903216452?needAccess=true.

22. H. Kahn, *On Escalation. Metaphors and Scenarios* [1965], Transaction Publishers, 2010, pp. 97-98.

detering a war between great powers is not sufficient to justify the long-term risk of a nuclear war that would pose existential risks to human civilization and the climate. Others point out that the benefits of deterrence are so great that a small risk is worth taking. Driving is one of the most dangerous things we do on a daily basis, yet many parents take their children on long road trips. A related issue is the magnitude of the risk posed by the failure to deter. Although there have been many incidents since 1945, are these warnings that deterrence is likely to fail or evidence of the robustness of deterrence and its associated mechanisms? There is little evidence that the world has often come close to nuclear war or that luck is a *necessary* assumption to explain the absence of accidental or unauthorized detonation, or deliberate use, since 1945 (missile defence has often been justified by the need to protect against accidental or unauthorized use).

6. What about the cost/benefit balance?

The possession of nuclear weapons can entail different kinds of costs. First, adversaries may respond by developing their own weapons, as what happened during the Cold War, when the United States and the Soviet Union accumulated tens of thousands of weapons. This is generally referred to as the “arms race,” although not everyone agrees with this term. Nuclear weapons can be more cost-effective in the sense that they can protect vital interests at a lower cost than conventional weapons. Second, another category is strategic costs. Nuclear weapons can drive small-scale aggression or low-level skirmishes (as well as proxy wars), to a potentially dangerous point. This has been called the “stability/instability paradox”. Fear of war may have moderated the behaviour of the superpowers, holding Washington and Moscow back in major crises, but at the same time encouraged them to take dangerous initiatives. It may have encouraged fear, hubris and misperceptions.

Finally, some authors have even argued that nuclear weapons may have perpetuated the Cold War. They may have *facilitated* détente and peaceful coexistence, but they made real peace *more difficult*, and they prolonged the life of communism.

IV. WHAT FUTURE FOR DETERRENCE?

1. The future of nuclear weapons

Historically, it can be said that nuclear weapons have limited or bounded the horizon of major conflicts while giving their holders a strategic advantage. Any holder of a nuclear weapon extends a “nuclear shadow”. The U.S. Department of Defense, for example, stated that “*the United States uses its nuclear deterrent every day to maintain peace around the globe. The U.S. nuclear deterrent underwrites every U.S. military operation*”²³. This is an observation that many actors would share. Studies also assert that “*nuclear actors are more likely to prevail when facing a non-nuclear state*”²⁴.

Certainly, a nuclear-armed state can take advantage of its freedom of action to advance nefarious projects. This is what the French expert Jean-Louis Gergorin called, in the early 1990s, “*aggressive sanctuarization*”, allowing for example limited provocations or land grabs in neighbouring countries²⁵. When applied to both sides, this approach is related to the stability/instability paradox described above, though the effect works both ways. A key role of Western nuclear weapons today is to neutralize pressure and blackmail others in times of crisis, what might be called *counter-deterrence* (a role that China itself attributed to its nuclear force in the 1960s). The aim is to neutralize future threats from Moscow, Beijing or Pyongyang. In any case, nuclear coercion and blackmail are difficult. The idea that nuclear weapons help coerce adversaries (or allies) remains a contested claim. “*Our analysis of nineteen historical cases demonstrated that nuclear coercion rarely works at all,*” said two American researchers²⁶.

Extended deterrence has specific advantages. It is generally considered to reduce the risk of nuclear proliferation: protected allies and partners are reassured and thus less tempted to embark on their own nuclear programmes. The impact of nuclear weapons possession on alliances is not a one-way street. Prior to the advent of the NPT, Washington initially opposed proliferation within NATO, arguing that it would weaken Alliance solidarity and complicate crisis management. Subsequently, the United States fought back and the NATO Council recognised in 1974 that the independent deterrents of the United Kingdom and France contributed to the Alliance's overall deterrence.

23. Office of the Deputy Assistant Secretary of Defense for Nuclear Matters-ODASD(NM), *Nuclear Matters Handbook 2020*, p. 1, <https://man.fas.org/eprint/nmh2020.pdf>.

24. Kyle Beardsley and Victor Asal, “Winning with the Bomb”, *The Journal of Conflict Resolution*, vol. 53, no 2, April 2009, p. 278.

25. See Jean-Louis Gergorin, “Quelles nouvelles menaces, quelles ripostes, quelle dissuasion”, *Revue Défense nationale (RDN)*, no 532, June 1992, p. 43-49.

26. Todd S. Sechser and Matthew Fuhrmann, *Nuclear Weapons and Coercive Diplomacy*, Cambridge University Press, 2017, p. 239.

Finally, the possession of nuclear weapons also brings responsibilities: as officially recognized nuclear powers under the NPT, non-nuclear-weapon states (NNWS) have a special role to play in promoting nuclear disarmament and non-proliferation.

On the other hand, nuclear weapons frequently remain associated with power, and retain an aura that is unparalleled in international relations - what some call prestige and others call status (although certain programmes can also negatively transform a country's image). They can project an image of self-sufficiency, sovereignty and autonomy. One talks and acts differently when confronted with a nuclear weapon holder. Furthermore, when associated with “nuclear sharing” (as is the case with NATO), nuclear weapons can be a symbol of alliance and a means of sharing risks and responsibilities.

Nuclear weapons can also have domestic benefits. A nuclear programme can help consolidate political leadership and possibly ensure the survival of not only the country but also the regime. It can also contribute to the subordination of the military, as has happened in France or India (although some argue that the opposite has happened in Pakistan). It can lead to “rallying around the flag”, including for international adventurism. The expression “nuclear nationalism” comes to mind when trying to describe the policies of certain countries. Finally, an atomic programme entails significant budgetary costs but can also generate technological and industrial spin-offs.

Nuclear weapons have, to a large extent, structured international relations, not least because of the coincidence of NPT nuclear-weapon state status and permanent membership of the UN Security Council (even though the conclusion of the UN Charter predates the Trinity test of 16 July 1945 by several days). This is the basis for what some would call a “nuclear order”, an order that has been challenged by countries developing nuclear weapons outside the NPT framework or seeking to reform the Security Council.

In the Northern Hemisphere, where all the current possessor states are located, nuclear weapons have probably consolidated the Westphalian system of nation-states. They have also contributed to a perceived “globalization of major risks” (the range of intercontinental missiles and the potential global impact of a nuclear exchange). However, despite the risks and costs, couldn't nuclear deterrence be considered a form of global public good? If one assumes that the “*obsolescence of major war*” (John Mueller) is largely due to the existence of nuclear weapons, it can hardly be said that they have played no role in the prosperity and development of most nations since 1945. Indeed, it is hardly an exaggeration to suggest that the success of the European project was made possible by the existence of the U.S. nuclear umbrella. The existence of nuclear weapons has forced the great powers to sit down and talk to one another. The dangers of nuclear

war have contributed to an awareness of the need for dialogue. Nuclear weapons may have actually accelerated the end of the Cold War, giving the Soviet leadership confidence that the country's survival would be assured even after the loss of the East European glacis.

All this confirms that the role of nuclear weapons is fundamentally political. But whether nuclear deterrence is the most effective war-prevention mechanism (as well as a kind of insurance against the failure of the “democratic peace”) or the most dangerous and unethical instrument ever devised by human beings will remain a matter of intense debate. Proponents and opponents will continue to disagree about the costs and benefits of maintaining nuclear weapons. The weight of value judgments on both sides leaves little chance of reconciling views.

2. The future of deterrence

Today, deterrence is the dominant strategic function of nuclear weapons, and the doctrines of their use have been largely delegitimized: no state regards these weapons as benign military assets. Despite their blustering, neither Vladimir Putin, Kim Jong-un nor Donald Trump has ever given any sign of being close to pressing the button. Contrary to what certain comments may imply, the announced development of low-yield weapons (an arbitrary notion, by the way: where does “low” begin?) by Pakistan or North Korea is not a novelty, and until proven otherwise is, for the states that do it, it remains part of the logic of deterrence.

Nearly twenty years ago, in his acceptance speech for the Nobel Prize in Economics, Thomas Schelling expressed surprise that nuclear weapons had not been used since 1945. The tradition of non-use, while not unshakeable, seems solid. But does the passage of time since Nagasaki make the use of nuclear weapons less and less likely? Does it affect what an adversary would consider unacceptable damage? Or do we run the risk of forgetting, especially in the absence of visible tests, the formidable power of nuclear weapons, making nuclear use, over time, more likely?

A related question is whether nuclear deterrence is becoming more difficult. There are more nuclear-armed actors today (nine) than at the end of the Cold War (six). This growing nuclear multipolarity is generally seen as making deterrence more problematic: multi-party deterrence could be a game of poker at best, a game of Russian roulette at worst. This is especially true given that nuclear postures in Asia are evolving rapidly but are not yet mature enough for the actors involved to have secure second-strike capabilities. The rise of missile defence could make the offensive/defensive calculus more complex. Some analysts warn that the technology could make

non-nuclear counterattacks much more feasible than in the past. Others fear the risk of inadvertent nuclear war due to the increasing vulnerability of command, control and communication systems to non-nuclear attack. New avenues of escalation have been opened up by the development of accurate long-range conventional missiles, the increased use of grey zone and hybrid warfare tactics by many actors, and the rapid development of the cyberspace and space domains. This is commonly referred to as integrated or strategic deterrence, taking into account the full range of possible instruments of coercion from economic sanctions to nuclear weapons, as well as resilience which can contribute to deterrence by interdiction. The war in Ukraine was a laboratory for this. Moreover, in this form of deterrence, the actor reserves the possibility of horizontal escalation: aggression in one area can be countered by retaliation in another.

This does not mean that alternatives have been found to nuclear weapons, which remain unique, not only in their effects but also in the aura of terror that surrounds them. Computer weapons, for example, do not offer the same guarantees in terms of the probability of predictable, massive and almost immediate effects on property and populations at an acceptable cost. But this diversifies the deterrence options for non-vital issues and the possibilities of response to adversary actions. At the same time, the rise of information warfare and disinformation, particularly through social networks, could make crisis management even more difficult. It remains to be seen whether these developments will fundamentally affect the strategic calculus and dynamics of nuclear escalation.

V. FRANCE AND NUCLEAR WEAPONS

Since the end of the 1960s, France has possessed an independent nuclear deterrent force. This force has become one of the foundations of the country's defence policy and, beyond that, of its political identity: it embodies France's freedom of action vis-à-vis the outside world. All successive presidents have taken up the main elements of the deterrence policy, each adding his own touch to the edifice, according to the evolution of the international and strategic context.

France is a medium or second-rank nuclear power. It has a stockpile of some three hundred weapons in total, which is probably - the figures are not all public - a little less than China and a little more than the United Kingdom. This is enough to be taken seriously by any potential adversary,

but it is far from the still huge arsenals - several thousand weapons - of Russia and the United States, and therefore not very concerned by the problem of disarmament, even though it claims to comply with the NPT by adopting a logic of “sufficiency” which has led it to reduce its arsenal on several occasions.

These weapons are carried by missiles fired from submarines and bombers. France has four nuclear-powered ballistic missile submarines in its *Force océanique stratégique* (FOST) based on the Ile Longue peninsula near Brest. Each of the three constantly available ships - a fourth is always in overhaul - can be equipped with sixteen M51 missiles, carrying a variable number of nuclear warheads. In addition, the Rafale fighter-bombers of the *Forces aériennes stratégiques* (FAS) – of which two squadrons have a nuclear role – can each carry an improved medium-range air-to-ground missile (ASMPA), equipped with a single weapon. The characteristics of these two forces make them highly complementary to each other in technical, operational and strategic terms. Moreover, if necessary, an airborne nuclear force can be generated and embarked by the aircraft carrier.

Three principles govern the French deterrent force:

- *permanence*: deterrence is exercised continuously, including in peacetime. This translates into the presence of at least one, if not two, SSBNs patrolling the oceans. This vessel alone can carry out a nuclear strike at any time that could cause massive damage to any potential adversary. The FAS mission is also continuous;

- *sufficiency*: the idea is to limit French nuclear means to what is strictly necessary. France has never equipped itself with counterforce means, for example (intended to destroy opposing nuclear forces). It also gave up developing the neutron bomb, which has less explosive power and inflicts damage by radiation, with little radioactive fallout. By the end of the Cold War, it had dismantled its ground-to-ground missiles, believing them to be less useful than in the past. It was also the first to dismantle its nuclear test sites and fissile material production facilities;

- *flexibility*: in a changing geostrategic environment, flexibility consists first of all in being able to adapt the deterrent to the context: the country concerned, the balance of forces, etc. For a long time now, the range of options open to the President of the Republic has not been limited to the threat of destroying enemy cities: the objectives can be specific, military or economic. Flexibility also means adapting the tool of deterrence to the technological and military context. One of the most important issues is being able to permanently ensure that the forces would penetrate or saturate the adversary's anti-missile and anti-aircraft defences, which requires significant investments.

Only the President of the Republic can initiate a nuclear strike. Procedures exist to ensure that s/he could do so at any time – and that only s/he could do so. The first concern, of course, is to be able to guarantee the country's survival by deterring any potential adversary from attacking our very existence. The war in Ukraine reminded those who had doubted it that the possibility of a major military aggression on our continent has not disappeared. But if France has equipped itself with a nuclear deterrent, it is also to guarantee its freedom of action, just like the only two other Western countries, the United States and the United Kingdom, whose political and military influence and responsibilities were - and still are - on a global scale. This guarantee must first come into play vis-à-vis an adversary. This could be called “counter-deterrence”, i.e. being able to neutralise the deterrent of an opposing country, which would seek to prevent us from intervening in its region, or to support an ally. This can be used against Russia, China or any other state. But it also works, albeit in a different way, vis-à-vis an ally - which is, in effect, the United States. In fact, the very first justification for building an independent nuclear force was to affirm to Washington that France did not want to depend on anyone when its survival could be challenged by an adversary. This logic has been one of the foundations of French foreign policy since 1960. Thus, would it not have been more difficult to actively and frontally oppose the United States over its intervention in Iraq if France had been in a situation of strategic dependence on that country?

A more recent function is to contribute to the security of allied countries. Since 1974 (through the Ottawa communiqué), NATO has recognized that the independent forces of the United Kingdom and France contribute to the “*overall security of the Alliance*”. The idea is that these forces complicate the calculation of an adversary, who has to reckon with three decision-making centres and not just one. More recently, France has been increasingly clear that its deterrence also protects its European neighbours: their freedom and existence are increasingly seen as a vital national interest. In general, France's deterrence lends credibility to the defence commitments it has made under multilateral or bilateral treaties.

In fact, the possession of a deterrent force contributes to the influence of the country's foreign policy: it reinforces the image of a power, and therefore of an independent diplomacy. This function is perhaps even more useful since France returned to NATO's military structure in 2009, more than forty years after having left it.

The fact remains that nuclear deterrence is central to France's modern political identity. This is true externally, as we have just seen, but it is also true internally, insofar as - as is not very known - one of the reasons why General de Gaulle insisted that the President of the Fifth Republic be elected

by direct universal suffrage was precisely the possession of an independent nuclear force. This ensured that he and his successors would have the popular legitimacy to engage in nuclear fire and thus be perceived by a potential adversary.

All this comes at a relatively bearable cost to the French economy: the deterrent force represents an annual expenditure of some 5 to 6 billion euros, or a little over 20% of defence spending and 10% of the total budget. It is more expensive than the British deterrent, but the British deterrent is far more dependent on foreign sources. On the other hand, French nuclear programmes have a significant impact on other areas of the defence industry: the need for innovation, reliability and safety contributes to the improvement of many technologies for military use.

While the French deterrent force remains legitimately associated with the name of General de Gaulle, it should not be forgotten that the French nuclear military programme was launched by the leaders of the Fourth Republic. At the time, however, there was no question of a totally independent force: rather, the aim was to give France the same means as the United States and the United Kingdom. The government was convinced at the time that it would not be possible to remain a major military power without atomic weapons. Without General de Gaulle, however, it is not certain that France would have had a fully operational nuclear force – which required the mobilization of significant funds.

Although General de Gaulle laid the foundations of the nuclear force, it was only during the double seven-year term of François Mitterrand (1981-1995) that the maturation of the French deterrent was completed, with three solid components (land, air, sea) and a well-defined doctrine. This doctrine was originally largely inspired by the “massive retaliation” (named after the nickname given to the Dulles doctrine, the 1953 U.S. nuclear doctrine) adopted by the United States and the United Kingdom in the 1950s. The adoption of this posture by the British had attracted the attention of French strategists, first and foremost colonel Pierre Gallois. It was based on the idea that the weak (France) could deter the strong (the Soviet Union). France also borrowed from the Americans and the British the notion of “unacceptable damage” as a key criterion of what the deterrent force should be able to do. Under François Mitterrand, the doctrine was consolidated around three key notions:

- Nuclear deterrence protects only the vital interests of the country. The definition of these interests is somewhat vague and is left to the discretion of the President of the Republic, but it is generally considered that the territory, population and sovereignty of France constitute the core of these interests.

Deterrence would be capable of operating regardless of the means employed by the adversary - in other words, nuclear force is not only intended to prevent a nuclear attack;

- In the event that an adversary misunderstands the definition of these vital interests or appears to be approaching the threshold of these interests, France reserves the right to deliver a nuclear warning, i.e. a one-off strike (by means of one or more weapons), probably on a military target, intended to convince the adversary to cease its aggression and thus re-establish deterrence;

- As an ultimate guarantee, the deterrent force must be able to inflict unacceptable damage on the opposing territory, at least equivalent to, if not greater than, what would be at stake in the conflict; this remains the case in all circumstances, i.e. even after an adversary's first opposing nuclear strike on French soil.

President Mitterrand's successors naturally added their piece to the edifice, taking into account the evolution of the political, strategic and technological context. Jacques Chirac (President from 1995 to 2007) removed the medium-range ground-to-ground missiles from the Albion plateau and put an end to any distinction between tactical and strategic weapons. Since then, it has been considered that any use of nuclear weapons would necessarily have a strategic character, in that it would profoundly transform the nature of a conflict. Jacques Chirac also diversified French nuclear doctrine, varying the nature of possible targets to the point where it could no longer be described as "counter-cities" or "anti-demographic" (i.e., to imply that French planning was aimed exclusively at cities and populations). The possibility of targeting the political, economic and military power centres of a regional adversary was opened up, as was the possibility of exercising the ultimate warning by means of high-altitude fire (to affect the adversary's electronic systems or even paralyse a state). These decisions were accompanied by a major transformation of the French nuclear complex (an end to tests and a switch to simulation) and by the diversification of nuclear warheads in order to give the President the maximum number of possible options in times of crisis. During his term of office as President of the Republic between 2007 and 2012, Nicolas Sarkozy took advantage of the entry into service of a new, more modern air-to-ground missile (ASPMA) to reduce the airborne nuclear component by one third under the principle of sufficiency. He also sought to affirm the conformity of deterrence with international law by proclaiming that the opening of nuclear fire could only be done in "*extreme circumstances of self-defence*". His successor François Hollande (2012-2017) suggested that the targets of nuclear force would henceforth be exclusively the adversary's centres of power. Since 2017, President Emmanuel Macron, for his part, has resolutely confirmed, even amplified, the European dimension of deterrence: if Paris does not exercise "extended deterrence" in the American sense of the

term, France nonetheless believes that its vital interests are now inseparable from those of its neighbours. In 2020, without much success, it proposed deepening the European dialogue on nuclear deterrence. His commitment to deterrence is not in doubt: it is well known that at the beginning of the war in Ukraine, he ordered a third SSBN to be put to sea (when usually no more than two are at sea), which had not happened since the end of the Cold War.

VI. THE FRENCH DETERRENT: PRECONCEIVED IDEAS AND QUESTIONS

A few preconceived ideas are frequently found in the French debate.

- *“Deterrence for France is a question of international prestige”*. If, until the 1970s, the possession of a nuclear force was indeed associated in the country with a certain prestige, this has long since ceased to be the case - notably because of fears of nuclear proliferation. French leaders no longer use this vocabulary. It should also be remembered that there is no direct link between the status of nuclear power and that of permanent membership of the United Nations Security Council. The five countries concerned (China, France, Russia, the United Kingdom and the United States) had this status before becoming nuclear powers. And Paris has long supported reform of the Council.

- *“France has a specific approach to nuclear deterrence.”* This idea ignores several important points. As we have seen above, many elements of the French doctrine are imported from the Anglo-Saxon world. Conversely, Washington and London have adopted French ideas, such as the term “vital interests” and the idea that in modern times any use of nuclear weapons would necessarily have a strategic purpose. The three allied nuclear powers agree on the main doctrinal principles, mentioned in NATO's public statements and documents. There remain two points of difference: the concept of a final warning, which is by definition non-renewable, whereas our allies prefer to keep, at least on paper, a certain flexibility in escalation in case of failure of deterrence; and France's non-participation in NATO's integrated nuclear bodies.

- *“France cannot imagine any other deterrent than nuclear.”* It is true that France has always distrusted conventional deterrence as an alternative to nuclear deterrence. However, it has endorsed a global concept of deterrence in certain official documents such as the 1972 White Papers on defence (*“the overall deterrent effect of our military policy”*²⁷) or the 2008 one (*“all*

27. *Livre blanc sur la défense nationale*, Ministère de la Défense, tome I, June 1972, p. 17 ([www.defense-et-republique.org/1Fichiers/defense textes/1972_00_00_LB_V1.pdf](http://www.defense-et-republique.org/1Fichiers/defense%20textes/1972_00_00_LB_V1.pdf)).

*capabilities and resources, human and technological, military and civilian, contribute to deterring potential adversaries from attacking France's security*²⁸), or even official NATO texts.

- *"France is not transparent about its deterrent force."* This criticism is highly exaggerated. For a long time, France was even the only nuclear power to publicly give an order of magnitude on its entire arsenal. The budget of the CEA-DAM (*Commissariat à l'énergie atomique-Direction des applications militaires*) is public, which is not the case for all foreign counterparts. The exercises conducted by the FAS are deliberately visible because they contribute to the demonstration of deterrence. French nuclear installations, including military bases, have been widely open to visits. On the other hand, one may regret the absence of a substantial official document bringing together all the unclassified political and technical elements.

- *"The deterrence budget is immune to cuts."* It is true that deterrence spending is subject to special political treatment in France: all decisions in this area are directly controlled by the President of the Republic. But this budget has undergone many downward adjustments since the end of the Cold War: after 1991, it decreased in relative value (its proportion in the defence budget decreased), then in absolute value (its proportion was maintained but the defence budget decreased). It is only since the mid-2010s that nuclear spending has increased again, as France is entering a new cycle of renovating its nuclear force, with in particular the construction of a third generation of SSBNs due to enter service in the early 2030s. In the 2019-2023 military programming law, deterrence is thus endowed with 25 billion euros (an average of 5 billion euros per year). Its budget for 2022 has seen a sharp increase in budgetary authorisations (6.2 billion euros) which is explained by the transition to the third increment of the M51 missile (M51.3) in 2025.

- *"The weight of deterrence in the defence budget prevents the modernisation of conventional means."* The idea of competition between conventional and nuclear means is popular, especially in the armed forces. However, it is questionable. First of all, it should be remembered that deterrence is supposed to promote France's freedom of military action: conventional forces are backed up by this deterrence. Moreover, the importance of deterrence for France guarantees capabilities developed to protect nuclear deterrence that are sheltered from the budget cuts available for conventional operations. These include nuclear attack submarines (which, incidentally, would not exist without the nuclear propulsion skills developed for deterrence), anti-submarine frigates, maritime patrol aircraft, refuelling aircraft, etc. Finally, it can be said that, from the point of view of technical and human performance, the requirements of nuclear power are pulling up the whole defence apparatus and its industry.

28. *Défense et Sécurité nationale. Le Livre blanc*, Odile Jacob/ La Documentation française, 2008, p. 65 (http://archives.livreblancdefenseetsecurite.gouv.fr/2008/IMG/pdf/livre_blanc_tome1_partie1.pdf).

In the short and medium term, the sustainability of the French nuclear deterrent seems assured. The hardening of the international balance of power is likely to encourage France to be cautious rather than to disarm. This is all the more true since movements in favour of the abolition of nuclear weapons have always been rather weak in France and no party or high-ranking politician calls for unilateral disarmament.

Nevertheless, some questions remain open:

- What exactly does the idea, mentioned by the President of the Republic in 2020, according to which “*our defence strategy is a coherent whole: conventional forces and nuclear forces continuously support each other*”²⁹ mean? It can be said that the duality of means (airborne in particular) introduces a welcome ambivalence into deterrence. FAS exercises are demonstrations of conventional and nuclear capability. The presence of *Rafales* in the Baltic skies or on Emirati territory is that of a nuclear power. Operation Hamilton against Syria in 2018 was a true demonstration of nuclear raid capability, Russian anti-aircraft defences included. It should also be remembered that this duality could imply trade-offs in times of serious crisis: at what point should *Rafales* and SSNs be reserved for the possible exercise of deterrence? Finally, imagining a situation in which the role of conventional forces would be to delay, through battle, the attack on the country's vital interests and the testing of the adversary's intentions - in other words, the main scenario of the Cold War - requires a hefty dose of imagination. In what specific contemporary scenario would France alone “*take the risk of a situation where conventional defeat could only be avoided at the cost of nuclear escalation*”³⁰? And if it were committed to its allies on the margins of Europe, would the attrition of its battle corps really be a threat to vital interests, so far from the national territory? In such circumstances, would the threat of opening nuclear fire be credible to the adversary?

- How much will France have to invest to guarantee the deterrent effectiveness of its nuclear force? It must constantly adapt to adversary defences by investing in cutting-edge technologies, in particular hypersonic speed, which will be a feature of France's future ASN4G air-breathing missile, or in the acoustic discretion of its SSBNs. It will also have to continue to protect its command and communication systems against any cyber intrusion. Will these adaptations still be accessible at a reasonable cost?

- To what extent should France take into account, in its capabilities and planning, potential distant threats (China, North Korea), in order to counter

29. Speech by President Emmanuel Macron on the strategy of defence and deterrence to the trainees of the 27th class of the War College, elysee.fr, 7 February 2020

[www.elysee.fr/emmanuel-macron/2020/02/07/discours-du-president-emmanuel-macron-sur-la-strategie-de-defense-et-de-dissuasion-devant-les-stagiaires-de-la-27eme-promotion-de-lecole-de-guerre].

30. Jean-Marie Guéhenno, art. cit.

blackmail or an attempt at coercion by these countries? Is it necessary to be able to exert unacceptable damage on these countries autonomously, whatever the circumstances? Should the FAS, which have demonstrated over the past ten years their ability to conduct operations at a great distance from the metropolitan territory, play a role in this?

- Is the transparency of our technical and operational capabilities sufficient to guarantee deterrence? Although it had publicly and clearly described the characteristics of its forces in 1994, France has not said much about the adaptations made in the 1990s and 2000s (diversification of energies, mix of weapons carried by the M51 missiles, possibility of split firing by SSBNs, etc.), with the aim of diversifying its planning options and thus strengthening deterrence and the President's freedom of action. Do our potential adversaries know about them?

- What would be the consequences for the French deterrent of a breach of the transatlantic contract – in the event of the return to the White House of a personality of the likes of Donald Trump? There is no room today for a European deterrent, but if the context were to change, would France be ready to give a formal nuclear guarantee to those of its neighbours and allies who would want it? And would potential adversaries find it credible?

- Will the volume of the French arsenal have to be re-evaluated in view of the evolution of the strategic and technological context? This is what the British did in 2021, particularly in view of the development of anti-aircraft and anti-ballistic defences, as well as the simultaneous stiffening of Russian and Chinese policies (a possible lowering of the Russian nuclear threshold would not, however, have any reason to have mechanical consequences on the volume of this arsenal). Such a reassessment could also be opportune to give credibility to French nuclear protection vis-à-vis its European allies - even if there is no mechanical link between the volume of weapons and the credibility of nuclear protection. No external answer can be given to this question: first, because the parameters of sufficiency are multiple (and some of them highly classified); second, because this sufficiency remains fundamentally dependent on the personal choices of the President of the Republic. The fact remains that, having had an arsenal of less than 300 weapons for the past fifteen years, France would be forced to adjust its public language in the event of the hypothesis envisaged.

What recommendations can be concluded from this?

1. The relationship between conventional and nuclear forces needs to be clarified. Moreover, France should not refrain from recalling that it recognizes (and practices) other forms of deterrence, while continuing to stress that nuclear deterrence is a particular and unique one.

2. On the one hand, there is probably no need to significantly change the French doctrine. It is simple and flexible enough to adapt to changing circumstances. On the other hand, one could imagine no longer qualifying the nuclear warning as “final” (as Nicolas Sarkozy did) in order to maximise the President's freedom of action - which would have the additional advantage of better synchronising our doctrine with that of our allies - but would such a change be understood? On the other hand, to suggest that nuclear deterrence should be reserved for preventing the sole nuclear threat would be singularly out of step with the evolution of the contemporary context (and would have no impact on the dynamics of disarmament or non-proliferation).
3. Instead of waiting for its partners to initiate the discussion, France should immediately engage in a discreet bilateral dialogue with their allies who may be interested in a form of “complementary guarantee”, particularly given the risks of a break in the transatlantic contract.
4. The evolution of contemporary nuclear risks, in particular the constant strategic rapprochement between Russia and China, makes it appropriate to intensify official nuclear consultations between the three capitals (London, Paris and Washington) and to establish, if it does not already exist, a highly secure communication link between them.
5. Paris would undoubtedly have more to gain than to lose by communicating more clearly than it does today about the adaptations made to its nuclear capabilities over the past two decades.
6. France should consider publishing a substantial official document bringing together all the public elements relating to the French deterrence policy and arsenal, translated into the five official languages of the United Nations. This communication effort would also have virtues at the national level, because the significant budgetary effort that will be made in the coming years to prepare the French deterrent to the challenges of the 21st century must be justified to the public; those involved in the deterrent and those who are interested in it in one way or another - including in industrial circles - must be convinced of the authorities' determination to maintain the French nuclear effort.


CONCLUSION

The war in Ukraine has reminded us that nuclear dangers are still present. But it also confirmed that states with nuclear deterrent forces are formidable adversaries that cannot be easily confronted. One can argue endlessly, as some experts do, about whether we are living in a second, third or even fourth nuclear age. It seems more useful to be aware, as the end of the first nuclear century (2045) begins to take shape, of the durability of the fundamental elements of deterrence, despite the profound changes in the political, strategic and technological context since the first nuclear explosion in the Alamogordo desert on 16 July 1945, while remaining aware of the intrinsic fragility of the international nuclear order. This order is based on three elements: the limitation of the number of states possessing the ultimate weapon, the coincidence of the status of a nuclear-weapon state and that of a permanent member of the UN Security Council, and the tradition of non-use. This last point is by far the most important. Despite its very low probability, a third use of nuclear weapons would truly usher in a second nuclear age, and no one can say what it would look like.

In the meantime, there is no evidence that any other military instrument can fully be a substitute for nuclear deterrence. No other technology in sight offers the same combination of instantaneous destruction, as formidable and predictable on a large scale. It is hard to see how, for example, the “space deterrence” (from and to space) advocated by some French politicians, notably Jean-Luc Mélenchon, could cover a country's vital interests in such a credible way, not to mention the phenomenal cost of such a reorientation (which, incidentally, would run counter to all of France's efforts to limit the militarization of outer space)³¹.

This does not end legitimate questions about the moral acceptability of relying on nuclear deterrence in the long term. What may be considered a valid trade-off between the presumed risks and costs as a temporary measure may not be satisfactory *ad vitam*.

31. See Jean-Luc Mélenchon and Bastien Lachaud, “La garantie de la dissuasion nucléaire n'est-elle pas déjà contournée par les moyens techniques contemporains?”, *Le Monde*, 11 January 2022 [https://www.lemonde.fr/idees/article/2022/01/11/jean-luc-melenchon-et-bastien-lachaud-le-desarmement-nucleaire-global-doit-rester-un-objectif-imperatif_6108957_3232.html].



Bruno TERTRAIS

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WHAT FUTURE FOR NUCLEAR DETERRENCE?

By Bruno TERTRAIS

With the war in Ukraine, the issue of nuclear deterrence has made a dramatic comeback in Europe. Its principles and modes of operation remain valid. Deterrence is a simple psychological process, the rules of which in the nuclear field were gradually defined throughout the Cold War. Today's nuclear weapons possessors - China, France, India, Israel, North Korea, Pakistan, Russia, the United Kingdom and the United States - continue to abide by these rules as a whole, and deterrence has arguably contributed to the absence of direct military confrontation between these possessors.

Debates on the future of deterrence are no less legitimate in a changing geopolitical and technological context. Some of the questions raised by deterrence, such as its benefit/risk ratio or its morality, have existed since 1945. Others are more recent: is nuclear deterrence still relevant at a time when the balance of power is developing in new areas – outer space, cyberspace, etc. - and with new means? Can we still say that there is no real alternative to nuclear weapons? For France, maintaining a nuclear deterrent seems to be a reasonable choice, but keeping it up to date requires substantial investments in the coming decade. In addition, new questions arise for the country. What can be the new coordination of nuclear and conventional forces in the foreseeable European context? Can geographically distant threats (Asia) be covered solely by national deterrence? As the only nuclear state in the European Union, can or should France play a greater role in protecting its partners and allies? This study aims to contribute to this legitimate debate, which is vital in a democratic state, on the future of the French deterrent.

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