

CHAPTER 2

“DESTRUCTION ASSURÉE”: THE ORIGINS AND DEVELOPMENT OF FRENCH NUCLEAR STRATEGY, 1945-1981¹

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INTRODUCTION: AN EVENING IN PARIS

On the evening of April 2, 1956, around 9 p.m., a short young French air force colonel with a hawkish face entered the Hôtel Lapérouse carrying about 20 kilos of secret NATO documents.² He was to brief a key figure of French political life, a former premier who was expected to return soon to power. The topic was the North Atlantic Treaty Organization (NATO) strategy of massive retaliation.³ The briefing had been suggested by the colonel's boss, the deputy Supreme Allied Commander Allied Forces Europe (SACEUR), U.S. Air Force (USAF) General Lauris Norstad. General Charles de Gaulle and Colonel Pierre-Marie Gallois talked nuclear strategy for hours. At the end of the conversation, around 2 a.m., de Gaulle thanked his interlocutor and promised that he would take good care of his career. The results would go beyond what General Norstad had anticipated. France ended up setting up an independent nuclear force against the will of the United States and completely at odds with NATO strategy.

The purpose of this chapter is to analyze the origins of France's nuclear strategy and its development, particularly insofar as it relates to the concept of assured destruction. It covers the years 1945 to 1981.⁴ It is useful to go as far back as the World War II to understand French thinking on nuclear policy, especially given the fact that the *Commissariat à l'énergie atomique* (CEA) was created in the immediate aftermath of the Hiroshima and Nagasaki bombings. Most of the basic concepts of French nuclear strategy emerged in the 1960s, but the strategy continued to develop in the 1970s, along with the setting up of the French triad. By the end of the 1970s, the main

concepts were fixed and would not significantly change. When the French deterrent force reached what seemed to be a certain level of comfort called sufficiency, French political leaders began referring to an assured destruction capability. More specifically, given the fact that the French president is the only relevant authority in these matters, the election of François Mitterrand in 1981, provides a convenient and symbolic endpoint.

The chapter shows that while French strategy was partly defined by experts such as Gallois, others factors were at least as important. The personal preferences of de Gaulle, the technical and financial means available to France, and the influence of U.S., United Kingdom (UK) and NATO were important factors. For these reasons, all things equal to the French version of assured destruction would end up being largely similar to that of the United States.

Section I outlines the origins of the French program and early thinking on nuclear policy. Section II describes the rationales for turning the original French nuclear effort into an operational and independent force. Sections III, IV, and V describe the basic concepts of French nuclear doctrine and their evolution. Section VI evaluates the implementation of the doctrine and its translation in operational terms in the first 2 decades that the French deterrent existed. Section VII assesses the relative importance and influence of various inputs on French strategy.

SECTION I. A PROGRAM WITHOUT A STRATEGY: DEVELOPMENT OF THE FRENCH NUCLEAR OPTION

At the time of the Gallois-de Gaulle meeting, France already had the basic tools it needed to go nuclear. The rudiments of a military nuclear program were gradually and discreetly put into place by the Fourth Republic's government, supported by a small set of highly motivated individuals.

French scientists had made key contributions to nuclear physics in the early 1930s, and had begun working on possible military applications of nuclear power in 1939.⁵ While their efforts were cut short by the French 1940 defeat, they were able to work with the pioneering allied team in Canada until the signature of the 1943 Québec cooperation agreements between the UK and the

United States (perceived as “atomic isolationism” by the Gaullists⁶). Excluded from the Manhattan project, French scientists nevertheless managed to meet de Gaulle in 1944 and brief him extensively. It was with a clear view to have a military option for France that de Gaulle created the CEA in October 1945.⁷

This was no more than an option, and the CEA’s goal was primarily civilian. In France, as in many other Western countries, atomic power was seen as embodying modernity.⁸ Not before the early 1950s did the idea of a French bomb begin to get serious attention. Among those who supported and lobbied for it, two key figures were Colonels Gallois and Ailleret, both supporters of de Gaulle. Pierre-Marie Gallois combined important professional positions (both at Supreme Headquarters Allied Powers Europe [SHAPE] and in the French military bureaucracy), political savvy (he became a military adviser to several key officials), and talent as a writer and public speaker. Charles Ailleret was the chief advocate of the importance of nuclear weapons within the armed forces and frequently spoke on how such weapons would transform the nature of war. He gave countless seminars, training programs, and exercises, as well as lectures and articles, particularly in the *Revue de la Défense Nationale*. He established good contacts with the political leadership. Other individuals who played an important lobbying role in favour of the nuclear option include Bertrand Goldschmidt and Pierre Guillaumat at the CEA, as well as Generals Paul Bergeron, Albert Buchalet, Jean Crépin, and Paul Ely. They were supported by politicians (Gaullists and others) such as Maurice Bourguès-Maunoury, Jacques Chaban-Delmas, Michel Debré, Félix Gaillard, Pierre Koenig, Pierre Mendès-France, Guy Mollet, Gaston Palewski, Antoine Pinay, and René Pleven.

Having given speeches and conferences about the atom bomb since 1950, Ailleret was asked by Army Chief of Staff General Blanc to head a new “Special Weapons Command”—no more than a nuclear, biological, and chemical (NBC) protection command at the beginning, but soon to become a real “nuclear think-tank.” The new command was created in January 1952. Ailleret immediately asked his staff to do a feasibility study on the production of nuclear weapons.⁹ That same year, London exploded its first atomic bomb, and it did not

go unnoticed. In July, a 5-year plan for the development of a French nuclear complex was passed by the Parliament. An amendment proposed by the Left to exclude any military use for the plutonium that would be created was rejected.¹⁰ Going nuclear was then an option to be retained—no more, no less. In 1953, CEA administrator Guillaumat approached Ailleret and proposed a connection between the Commissariat and the military to prepare for the day the political authorities would decide to build a French bomb.¹¹

In March of 1954, Defense Minister René Pleven, who had been made aware of the work conducted within the armed forces by Ailleret's team, stated during the annual parliamentary budget meeting that France should begin to think about having nuclear weapons, and that there was a need to train enough officers and engineers for such an endeavor. In October, a joint CEA-Ministry of Defense (MoD) committee in charge of military applications of the atom was created. In December, Premier Mendès-France held a special high-level meeting at the Quai d'Orsay on the topic; it was decided to create a true military applications division in the CEA, under the disguise of "Office of General Studies," and to fund it through the defense budget. The goal was to study the development of an atomic bomb and a nuclear-powered submarine. In May 1955, an inter-department protocol authorizing the transfer of funds from the military to the CEA was signed.

Still, no nuclear program had officially been launched. Experts estimated that the critical choices in a context of limited resources could wait until around 1958.¹² At that time, the French program was still virtual, technically comparable to those of other countries acquiring the assets necessary to cross the threshold if need be. The security rationales mattered, and many in the military were anxious to get nuclear weapons for defense purposes. But in 1954-55, international standing was a key consideration. There was a growing understanding within government circles that in the context of NATO's MC-48 strategy, which emphasized nuclear over conventional weapons, that true power, in particular within the Alliance, would only belong to those countries which possessed the bomb.¹³ As Mendès-France reportedly said, "if you do not have the Bomb you are nothing in international negotiations."¹⁴ These

ideas were supported by de Gaulle, then in political exile but closely following the French debates, and occasionally making known his support for a nuclear program.¹⁵

Under the leadership of Bouchaud, the CEA began setting up the technical facilities needed to produce nuclear weapons. In October 1956, Premier Mollet, who also had received a Gallois briefing, signed a long-term directive on nuclear policy that included the need to develop the country's nuclear infrastructure in order to gain allied support for a military program. The CEA was ordered to produce weapon-grade highly enriched uranium (HEU) and plutonium for possible future nuclear weapons. Studies were also commissioned for the development of a long-range bomber and of ballistic missiles. In December a committee in charge of military nuclear programs was created within the MoD. In 1957, the Special Weapons Command was made a joint body, and a Joint Nuclear Experiments Group was created. Ailleret went to set up a potential testing ground in the Sahara Desert. Political support for a national deterrent was gaining ground in the aftermath of the Suez crisis and of the Budapest repression in November 1956. Early warnings about U.S. vulnerability such as the first Soviet intercontinental ballistic missile (ICBM) test in August 1957 and the Sputnik launch in October 1957, reinforced this trend. Political barriers against the French bomb were falling one after the other. On April 11, 1958, France went one step closer to the threshold when a key defender of the nuclear program, Premier Gaillard, was ordered to make the technical preparations for a series of tests. The now-official military applications division of the CEA numbered 1,800 persons.

No military nuclear program had ever been launched, but France was on the verge of becoming a nuclear power. As one scholar noted, "France under the Fourth Republic would appear to represent the most striking example of minimal political leadership and maximum technocratic direction in the orientation of atomic policy."¹⁶

However, on the very eve of de Gaulle's return to power, two key policy orientations had yet to be taken formally: the decision to test, build, and sustain an *operational* deterrent; and the decision to have a fully *independent* deterrent, not only in terms of use, but also in terms of procurement, planning, and operations.¹⁷ The first decision

would be taken by de Gaulle. Without it, France might very well have remained a potential nuclear power with a recessed deterrent like India between 1974 and 1998. His role would be much more than just turning the ignition key. With de Gaulle, France's willingness to go nuclear became a goal of the State rather than the desire of a few men. The second decision was, of course, also de Gaulle's, and crystallized gradually in the years 1958-66 (see SECTION III).

SECTION II. RATIONALES FOR BUILDING AN INDEPENDENT FORCE DE FRAPPE

As suggested above, the original French motivations were merely the product of the dynamics of the nascent nuclear age, a time when the atom held seemingly unending benefits to a modern nation. The specificities of French nuclear policy developed only gradually, starting in the early to mid-1950s. They stemmed from a combination of strategic and political rationales fuelling each other. De Gaulle's personal contribution from May 1958 on would be to push existing rationales to their logical conclusions, and to transform existing incentives into actual policy. There would be, in the words of one historian, an "imperious convergence" between the general and the bomb: "The nuclear fire is consubstantial to State Gaullism."¹⁸

Although some authors explain France's program by prestige politics, there are good grounds to say that the realist explanation remains the most satisfying. It has been vindicated by recent testimonies and historical research.¹⁹ The main reasons for developing an operational, independent deterrent or *force de frappe* were, first, to endow France with a credible security guarantee and, second, to recover France's full sovereignty.²⁰ However, other motives, such as regaining major power status, and ensuring control over the military, also came into play.

Endowing France with a Credible Security Guarantee.

Among European powers, few countries felt as unsafe as France at the beginning of the second part of the century. The French territory had been invaded three times in a few decades, the last one

resulting in the humiliating 1940 defeat—an event that traumatized de Gaulle to the point of saying in 1943: “We must want the existence of France. Never again will it be self-evident.”²¹ He also resented that France had had to “beg” for allied support between 1940 and 1944.²² Thus in the 1950s, the perception of an emerging new major threat for the country’s existence—the Soviet Western Group of Forces was stationed close to French territory—made the need for a security guarantee very pressing.

Most NATO countries viewed the U.S. nuclear guarantee as a fairly credible one. France did not. That perception emerged in the critical period 1954-57. The United States did not come to help French forces at Dien Bien Phu (1954), nor did it support the Suez operation (1956).²³ Then Moscow demonstrated its ability to strike U.S. territory with ballistic missiles (1957), contributing to a major change in U.S. and NATO nuclear strategies, whereby a massive retaliation against Soviet cities thereafter would be seen only as a last resort option. French strategists had doubts about the principle of one nuclear country protecting another one. The heralded abandonment of the massive retaliation strategy was, from their point of view, the final nail in the coffin, and France refused to subscribe to the emerging NATO strategy of flexible response. This was officially adopted only after the withdrawal of Paris from the integrated military structure. For the Gaullist government, it amounted to the disappearance of the U.S. protection not only of France, but also of Europe as a whole.²⁴

De Gaulle inherited a certain distrust about the U.S. willingness to defend French territory. Sure enough, the Americans had come to defend France. But de Gaulle was inclined to see the half-empty part of the glass which was that the intervention of the United States in the two world wars had taken place only after its own interests were put at stake. Treaties providing for American and British security guarantees to France against Germany had been signed in June 1919, but were of no avail in 1939. De Gaulle remembered that, once engaged in Europe, Washington was mostly preoccupied with its own national interests. In the early days of 1945, the United States had been ready to abandon the city of Strasbourg. De Gaulle had to commit Free French forces and challenge Eisenhower to counter the U.S. decision.²⁵ He did not blame Washington for such an attitude. He thought that it was only natural that a country defends only

its national interests. And de Gaulle expressed an opinion shared widely in France when he stated in 1963 that “nobody in the world, in particular nobody in America, can say whether, where, how, to what extent the U.S. nuclear arms would be used to defend Europe.”²⁶ Nuclear weapons had changed the nature of alliances. One could not expect to be protected by a state which would engage its very survival in doing so.²⁷ He told Eisenhower that, given the emerging U.S. vulnerability, Washington would only engage in nuclear action if its territory faced a nuclear attack.²⁸

Recovering France’s Full Sovereignty.

The second main rationale was to ensure full peacetime sovereignty of France. Following the 1940 defeat, the country had been occupied for 4 years. The Suez crisis had made clear that the United States, as well as the Soviet Union, would not hesitate in limiting the freedom of action of smaller powers.

This second rationale had been an important point for the Fourth Republic’s politicians.²⁹ But nobody was as eager to emphasize sovereignty vis-à-vis the United States as de Gaulle. During the war, Washington’s preferred candidate as the leader of post-victory France had been his rival, General Giraud, who was seen as more flexible and sympathetic to U.S. views. And on the eve of the June 1944 Normandy landing, de Gaulle learned from Churchill that the United States planned to place France under an Allied Military Government of Occupied Territories (AMGOT) instead of ceding its control to the government-in-exile. De Gaulle had to fight hard. For him, the bomb was an instrument of self-determination, a means “to exist by ourselves and, in case of drama, to choose our direction by ourselves.”³⁰

The need to be able to independently defend French interests would become particularly acute for de Gaulle as he began shaping a formidable political agenda which would transform French international identity and strategic culture. The termination of colonization was to be accompanied by the promotion of détente with the Communist world and the reconciliation of European powers “from the Atlantic to the Urals.”³¹ French reliance on a U.S. nuclear protection to guarantee its security was seen as potentially

limiting the full exercise of France's sovereignty. "It is obvious that, for a country, there is no independence if it does not possess nuclear weapons, for, if it does not have them, he is forced to defer to another who has them for his security and, therefore, for his policies."³² As others before him, de Gaulle pushed this logic to the extremes, claiming that independence could not exist without nuclear weapons.³³

That same reasoning was applied to belonging to the NATO integrated military structure. De Gaulle believed that integration limited European political sovereignty. He also thought that in the new world of the 1960s, U.S. leadership was not as justified as it might have been in 1949. European countries had recovered from the war, and were beginning to develop institutional ties among themselves. The European Community had been created in 1957, the Communist world was not as monolithic as it had been in the past, and the Soviet experiment was judged a failure. Therefore, the bipolar order and the "condominium" over Europe were deemed obsolete. Most importantly, the U.S. monopoly on nuclear weapons had disappeared and America was now vulnerable, making the U.S. guarantee less credible.³⁴ France would commit forces if Europe was attacked. But de Gaulle emphasized a distinction between "the alliance, which is good, and integration, which is bad."³⁵ For those who opposed it, integration implied not only U.S. peacetime command of some French officers and troops—a major point of contention—but also potential U.S. pressures on the management of the French armed forces and undue foreign influence on French military culture. Most importantly, it created the perception that France was a subordinate to another nation, and that it could not or would not be able to defend itself independently if need be. For de Gaulle, the existence of the French deterrent entailed new responsibilities that were not compatible with what he called dependence on the United States.³⁶ He also thought that NATO did not fully acknowledge France's place.³⁷ Could France have become an independent nuclear power and stay in the integrated structure? On paper, perhaps yes. But de Gaulle thought that the adversary had to be absolutely convinced that France would independently decide to use nuclear weapons.³⁸ In any case, the logic of the Gaullist stance would have led France to keep its new weapons completely out of Alliance planning, a position

which would have been inconsistent with the logic of integration.³⁹ Thus not only was integration no longer *necessary*, not only was the withdrawal *possible*, but it was in fact *logical* and probably *imperative* from the French point of view. De Gaulle did not believe that a NATO Multilateral force, discussed in the mid-1960s, would allow Paris to retain truly independent control over its future nuclear force.⁴⁰ The withdrawal would be effective in 1967, once the constitution of the *Mirage-IV* bomber force was achieved.

The withdrawal of the NATO integrated structure and the birth of the French nuclear force were two faces of the same coin which was the need to regain national autonomy. This was obvious as early as September 1958. General Norstad (the same officer who had asked Gallois to brief de Gaulle in 1956, and who was now Supreme Allied Commander Europe [SACEUR]) was asked by the new French president whether there were U.S. nuclear weapons in France and what their role would be in NATO targeting plans. Norstad refused to answer, provoking the ire of de Gaulle, and thereby reinforcing de Gaulle's desire for an independent French deterrent.⁴¹ De Gaulle confirmed the authorization given by his predecessors to attribute U.S. nuclear warheads to French forces in Germany (*Honest John* missiles in 1960 or 1961, and bombs for *Mirage III* and F100 aircraft, as well as *Nike-Hercules* air defense missiles, in 1963⁴²). But in 1967, these arrangements were cancelled when France withdrew from the integrated NATO structure.

De Gaulle also sought to develop other tools of national independence vis-à-vis the United States. A national ballistic missile program was launched in 1959, once it became clear that French-U.S. cooperation would be impossible. These were complemented by other efforts such as national space and computing initiatives, monetary reform allowing for the creation of a strong currency (and turning reserve U.S. dollars into gold assets), and the constitution of a national oil "major." De Gaulle was aware of the benefits of the nuclear program for the energy industry and used it as a supplementary argument.⁴³ More generally, he thought that the nuclear effort "helped the scientific, technical and industrial development of the nation."⁴⁴

Regaining Full Major Power Status.

The narrower consideration of “prestige” mattered to an extent. And as stated above, like the United Kingdom, France needed a moral boost to come to terms with the end of colonial imperialism. It can be argued that France did not need the bomb to be acknowledged as a significant world player. Its permanent membership in the UN Security Council, and its particular position in NATO, would have been enough to ensure that the voice of Paris would be heard. But then again, the 1967 withdrawal was made possible only because France had become a nuclear power.

De Gaulle’s France quickly reaped the political benefits of resisting U.S. power and promoting an alternative universal model of democracy and self-determination. The independent French nuclear weapons program was perceived in the developing world as a symbol and an instrument of challenge to U.S. “hegemony.”⁴⁵

However, what really mattered for de Gaulle was to play a center stage part in the Cold War, that of European security. Here, it was not a matter of prestige, but of regaining full major power status in order to participate again in great power politics. He resented that France had not participated in the Yalta and Potsdam conferences.⁴⁶ De Gaulle could not stand the idea that the fate of the continent would be determined by Washington and Moscow. When he returned to power in 1958, he considered the bomb “a political means to allow him to sit at the Greats [powers’] table.”⁴⁷ For him, the Great Powers were the Soviet Union, the United States, and the United Kingdom. He wanted above all an equal role with his UK and U.S. partners in the Atlantic Alliance, and an end to the discrimination towards France imposed by the Québec agreements and the 1946 MacMahon Act (amended in 1958 to allow for U.S.-UK cooperation). This discrimination was for him particularly unacceptable, given France’s centrality in Alliance planning.⁴⁸ Breaking the Anglo-Saxon monopoly on nuclear weapons had been an obsession since the beginning.⁴⁹ It was inconceivable that France did not possess “the most powerful weapons of the day” and have mastery of a key scientific and industrial field.⁵⁰

Ensuring Control Over the Military.

A fourth and arguably less important factor was to ensure control over the military. This came more as an added benefit than as an initial incentive. As soon as he returned to power in 1958, de Gaulle made clear that the armed forces were to be entirely subordinated to the political authorities.⁵¹ But his relationship with the military took a turn for the worse. In 1961, a coup was averted. In 1962, the armed forces were ordered to withdraw from Algeria. Many in the armed forces would see de Gaulle as no less than a traitor. The *Organisation de l'Armée Secrète* (OAS) was at that time conducting a terrorism campaign that would target de Gaulle himself (the assassination attempt at Petit-Clamart). Revamping French strategy around the backbone of putting nuclear weapons under tight civilian control helped to ensure control of the military. This strategy was followed by China and later by India. This reaffirmation of *arma cedant togae* was symbolized by the facts that the President could directly order the engagement of nuclear forces and that, until 1981, he was reportedly the only person holding the authorization codes.⁵²

The armed forces themselves had little interest in an independent French deterrent. As an institution, the French armed forces were rather conservative, as military institutions often are. Most of the officers who wanted nuclear weapons wanted them simply because they were the most modern, up-to-date weapons in store—and they might as well be *American* nuclear weapons. Indeed, for the French commanders in the Western European Union (WEU) staff in the late 1940s, one of the primary rationales for creating a NATO integrated military structure was the prospect of availability of U.S. nuclear weapons.⁵³ From the onset, the French military had been among the most vocal proponents of the full nuclearization of the Alliance's defense strategy, and Paris argued strongly in favour of nuclear sharing.⁵⁴ There was a lot of frustration in national military circles about nuclear matters, which reportedly were managed within NATO "among Americans, with the British being treated as privileged allies."⁵⁵ Many supported the need to equalize the allies through the procurement of nuclear weapons. To be considered "militarily adult," France needed to procure such weapons.⁵⁶ Given

the evolution of NATO strategy, the possession of nuclear weapons was seen as imperative by the chiefs of staff.⁵⁷ However, for most of the French high command, an independent nuclear program meant diverting resources reducing conventional budgets and forces.⁵⁸ That was all the more true by the late 1950s. “What would the atom bomb bring us to pacify Algeria?,” asked a skeptic General Jouhaud in 1958.⁵⁹ But de Gaulle imposed on them both the withdrawal from Algeria and the bomb.⁶⁰ As a commentator put it, “France is the only nuclear power where the civilians have imposed the nuclear [choice] to the military.”⁶¹ At the extreme, if there was to be an independent nuclear program, it would need to be integrated within the Alliance.⁶² Later, when the military realized that getting the bomb and leaving the NATO integrated military structure—an unthinkable option for any self-respecting French officer at that time—were part of the same deal, their hostility would be even more acute.

Thus a paradox of French nuclear strategy is that it was, to a large extent, forged by a small coterie of military individuals against the will of the military as an institution.

SECTION III. FORGING THE DOCTRINE: “TEARING AN ARM OFF THE AGGRESSOR”⁶³

The Key Actors.

The key concepts underlying French nuclear doctrine developed during the 10 years from 1958-68. The early 1960s were especially important as the United States and NATO were moving towards flexible response. The intellectual breeding ground for French strategy was almost exclusively military, with one exception. Pierre-Marie Gallois and Charles Ailleret played critical roles because they combined technical expertise, strong determination, access to political authorities, and ability to write for both the military community and the public. Two other significant players were Generals André Beaufre, a respected high-ranking officer and retired analyst; and Lucien Poirier, a young colonel who later became a prolific writer with intellectual ambitions. The exception was Raymond Aron, a political scientist of the realist school and a

key intellectual figure in French security debates, particularly on the subject of nuclear policy. All continued to be influential throughout the 1970s, and both Gallois and Poirier were still writing in the late 1990s.⁶⁴

Others played significant roles in the construction of French nuclear culture, although they did not appear frequently in public debates, or appear close to political authorities. One name must be mentioned first: Admiral Raoul Castex, who as early as October 1945 published a seminal article which was the French equivalent of Bernard Brodie's *The Absolute Weapon*. This article may have influenced de Gaulle's decision to create the CEA.⁶⁵ The list also includes general officers Billotte, Buchalet, Catroux, Chassin, Crépin, Gerardot, Koenig, Philippon, Stehlin, and Valluy. These people worked inside the bureaucracy or through publications, though not all of them supported the Gaullist independent stance.

The French doctrine as it coalesced in the 1960s involved a concept of deterrence "of the strong by the weak." The doctrine was based on the logic of "proportionality to the stake of the conflict." Nuclear reprisals would take the form of massive retaliation, and were theoretically geared "*tous azimuts*."

The Key Concepts.

Deterrence of the Strong by the Weak. The logical foundation of French Cold War nuclear strategy was the concept of "deterrence of the strong by the weak" (*dissuasion du faible au fort*).⁶⁶ The idea was that deterrence was possible where one of the two parties is much smaller and less powerful than the other because of the equalizing power of the atom (*pouvoir égalisateur de l'atome*). Asymmetrical size and power did not matter. It was possible to deter a major country with much smaller nuclear forces than the adversary's. As de Gaulle stated in 1964:

Of course, the megatons that we could launch would not equal in number those that the Americans and Russians are able to unleash. But once unleashing a certain nuclear capability and as far as one's own defense is concerned, the proportion of respective means has no absolute value. In fact, since a man and a country can only die but once, deterrence exists as soon as one can mortally wound the potential aggressor and is fully resolved to do so, and [the aggressor] is well convinced of it.⁶⁷

This idea was included in the 1972 *White Paper*, which described nuclear weapons as an imperative for a small, low-populated country like France. At the same time, being only a medium power, it did not need an arsenal as big as those of major powers.⁶⁸

Gallois is often credited with inventing the concepts of “weak to strong” and “equalizing power.” He developed them in *Stratégie de l’âge nucléaire*,⁶⁹ but the intellectual background for these concepts clearly preceded him. Background materials are contained in the 1945 Castex article, in early UK writings about nuclear strategy, and in the dossier presented to the French political authorities in December 1954.⁷⁰ Ailleret alluded to these ideas in his seminal 1959 conferences.⁷¹ The contribution of Gallois (who was familiar with these sources and even says that reading the Castex article had been an epiphany for him) was to popularize the concepts in France, in particular in his late 1950s articles and his 1960 book.

Proportionality to the Stake of the Conflict. Another key concept in French thinking is “proportionality” which meant that deterrence of the strong by the weak can be assured as long as the weak can inflict on the aggressor damages that would be at least equivalent to the stake of the conflict. This was expressed in the phrase “proportionate deterrence.”⁷² Gallois theorized and developed it in his 1960 book.⁷³ De Gaulle endorsed the concept. In 1963, de Gaulle stated that deterrence was achieved as soon as the nuclear capability made an adversary realize that aggression was not worthwhile.⁷⁴ The next year, he confirmed that “deterrence is proportional to the stake.”⁷⁵

A consensus emerged among experts that, to achieve deterrence, the damage should actually be *superior* to the stake. As early as 1959, Aron mentioned “risks out of proportion with the benefits.”⁷⁶ Gallois, for his part, said in 1960: “The ‘quantity of destruction’ that the reprisal force represents when it reaches its objectives must at least cancel the benefits that the aggressor expected from his attack.”⁷⁷ The next year, he used an expression which became commonly used in French strategic language: “incommensurable.” It referred to the lack of comparison between widespread destruction by atomic weapons to what could be feared with conventional weapons.⁷⁸ In 1963, Beaufre suggested that the losses to be suffered by Moscow had to be “disproportionate with the possible gains” of the Soviet Union.⁷⁹

De Gaulle would sanction this adjustment in 1964 by mentioning “risks incommensurable with the benefit of conquering our soil.”⁸⁰ The *White Paper* stated that deterrence only applies if there is for the adversary “an immediate risk out of proportions with the stake of the conflict.”⁸¹ Thus proportionate deterrence had become, in fact, *disproportionate* deterrence, an idea that is very close to John Foster Dulles’s original expression of massive retaliation.⁸² It remained a basic tenet of French strategy.⁸³

A Mass Destruction Single Strike. The idea of threatening mass destruction in order to deter aggression came early in the development of French strategy. This seems to be the result of French exposure to U.S., UK, and NATO strategy in the 1950s, and that, as a small country, France could not afford limited war or flexible response-type strategies. As Gallois put it later, “France has nothing to cede that would not be herself.”⁸⁴ Once a nuclear nation, France held firmly to the strategy of massive retaliation and, while still in the integrated structure (1964-67), strongly opposed emerging steps within NATO away from that direction. The expression “massive retaliation” was frequently used in 1970s French rhetoric.⁸⁵ Apart from the fact that a single strike seemed consistent with a pure anti-cities concept, an additional justification for maintaining rigid strategic targeting plans was given by Poirier. For a small power, the “threat can only have deterrent value if the threatened party knows that he would experience the effects of one blow, without his losses being spaced out over time.”⁸⁶ If strategic nuclear war was to be managed, the weaker party would be at a disadvantage. The possibility that a massive strike on the Soviet Union would elicit an equally massive—and thus deadly—response on the national territory was considered and accepted. It was, however, also pointed out that Moscow might refrain from doing so on the grounds that “one does not destroy the prize.”⁸⁷

Any *nuclear* aggression on France would be considered strategic in nature simply because of the small size of the country, therefore implying a massive nuclear response.⁸⁸ This would be the case, in particular, if the adversary destroyed the intermediate range ballistic missiles (IRBMs) deployed on the Plateau d’Albion in South-Eastern France. Though located in a low population area, their neutralization

would entail such a massive strike that it would necessarily have a strategic effect on France. This theory sometimes known as the “attached goat” was developed *a posteriori*, since the IRBMs were initially developed as an interim measure before the introduction of fleet ballistic missile submarines [SSBNs].⁸⁹

But would it be the same in case of strictly conventional aggression? France’s version of massive retaliation initially seemed to mirror NATO’s MC-48 strategy, as reflected in the 1964 Ailleret articles and in de Gaulle’s instructions to the Defense Council the same year. An aggression would elicit “immediate” retaliation on Soviet soil, as well as in Germany “time permitting.”⁹⁰ But in private, de Gaulle refrained from assuring that conventional aggression against France would be met in the same way a nuclear one would.⁹¹ The solution to this classical deterrence problem was found through the development of a specific tactical nuclear weapons doctrine, which helped France to implement a strategic concept located somewhere between massive retaliation and flexible response. In 1969, Chief of Staff Fourquet confirmed that France rejected an “all or nothing” vision.⁹² That said, the concept *at the strategic level* was and would remain inflexible.

An All-Azimuths Strategy. A third important concept is *tous azimuts*, an artillery term expressing the idea that the nuclear force was not directed at any adversary in particular, but should be able to strike anywhere in the world.

Tous azimuts was a matter of principle based on the idea that, since nuclear systems were to have a long service life, it was impossible to determine who would be the adversary 20 years ahead, especially with the risks of further proliferation.⁹³ This idea has been long credited to Ailleret, but it is now known that de Gaulle himself was the originator of the concept.⁹⁴ As early as 1959, he told the French military cadets that “since it is theoretically possible for France to be destroyed from any point of the world, our force must be made to act anywhere on Earth.”⁹⁵ He used the expression *tous azimuts* at least as early as 1962 in private conversations and even toyed with the idea of using the bomb against Tunisia.⁹⁶ In 1965, he mentioned the ability “to launch projectiles . . . in any region of the world . . . and to do it, if need be, against any region of the world.”⁹⁷ In January 1967, he

wrote a personal instruction stating that by 1980 France should have a full-fledged intercontinental triad (including seven to eight SSBNs) armed with thermonuclear weapons and be able to strike any major power.⁹⁸ In July, he told the Council of Ministers: "Let's prepare ourselves for striking in any direction (*tirer dans tous les azimuts*) if France's life is at stake."⁹⁹

Ailleret was more than a mere spokesman. He elaborated on this concept in an interesting discourse on what would be termed today the "globalization of strategy." Nuclear proliferation, the possibility of rapid horizontal escalation of modern conflict, and the range of ballistic missiles justified a new approach. With de Gaulle's approval, Ailleret's article suggested that France needed "megaton-yield ballistic devices of global range," and to ultimately become a "space force."¹⁰⁰

For de Gaulle, *tous azimuts* also served broader political purposes. First, as he said at least once in private, nuclear force was useful "as much to deter an aggressor . . . as to deter an abusive protector."¹⁰¹ Second, *tous azimuts* may have been a way to emphasize *différence vis-à-vis* the United Kingdom and to avoid reducing the French force to a mere complement of the U.S. arsenal. Third, it was a concrete application of the Gaullist drive for going beyond the East/West face-off and promoting *détente*. Finally, it was meant to open the eyes of the armed forces to the fundamental novelty of nuclear weapons.¹⁰²

In any case, even if taken at face value, the concept was meant as a goal, not as an immediate force sizing criterion. It was a paradigm in the original sense of the term. As a part of French official policy, it was fairly short-lived. An ICBM program was judged too costly. And after de Gaulle, with the French nuclear program well-established, the need for strong national rhetoric to support an independent force was not as strong. Nevertheless, the leadership continued to pay tribute to this concept. The Warsaw Pact was rarely mentioned as the prime adversary in official public documents, and then, only implicitly.¹⁰³ As late as 1977, France still claimed that its SLBMs were capable of "covering the whole world."¹⁰⁴

SECTION IV: FORGING THE DOCTRINE: BALANCING INDEPENDENCE AND SOLIDARITY

The Debate on the Role of the French Deterrent in the Alliance.

The insertion of the French nuclear contribution in the Atlantic Alliance had a fuzzier approach. The nuclear force was to be a national one, but also one that protected European neighbours. The employment decision was to be strictly under Paris's control, but French authorities sought consultation and coordination with allies. Some considered the French force as a "trigger" that would force U.S. intervention. Most believed that the French force was contributing to the security of the West.

A National Deterrent. De Gaulle initially told the United States that he would be glad to buy U.S. nuclear weapons, provided that the weapons were solely under French control.¹⁰⁵ It is hard to tell whether de Gaulle was serious. It is possible that he did not believe that such an option was realistic if only because maintenance would have required U.S. assistance. In any case, deterrence was to be strictly national in terms of employment, along with the rest of France's defense policy. One of de Gaulle's most often quoted statements was in 1959: "The defense of France must be French."¹⁰⁶ In his colorful vocabulary, he stated that he wanted to be "unbearable on [his] own."¹⁰⁷ This expressed a consensus in France. Along with de Gaulle, Gallois thought that any deterrent which was not strictly national could not be credible: "Democracies can really practice the deterrence strategy only at the service of an absolutely vital cause."¹⁰⁸ Neither the nuclear risk, nor the nuclear decision, could be shared in any way.¹⁰⁹ For most French thinkers, extending U.S. and U.K. deterrence forces to their allies did not make sense, period. In addition, de Gaulle and Gallois did not believe that the U.S.-proposed Multilateral Force was compatible with an effective national nuclear deterrent.

A Force to Defend "Vital Interests"—Including Europe? Official policy was not as rigid as it seemed. The French force was designed to defend what was called the vital interests of France. This expression first appeared in Gallois's work and was sometimes used by de Gaulle.¹¹⁰ Vital interests included, but were not limited to, the metropolitan

territory, i.e., French territory in Europe. For political reasons, de Gaulle first publicly emphasized the purely national dimension of the French deterrent. But he and his successors made clear that the *force de frappe* was protecting Europe as well, and French nuclear weapons might be automatically used if Germany was threatened.¹¹¹ De Gaulle had argued to Kennedy that since “the Rhine [was] narrower than the Atlantic,” France felt “more intimately linked to the defense of Germany than America to [France’s defense].”¹¹² His secret instructions to the military chiefs in 1964 were clear: “France should feel threatened as soon as the territories of Federal Germany and Benelux would be violated.”¹¹³ The reasons were, first, that Europe was a small territory where the fate of countries were intertwined. Second, optimal military efficiency implied committing French forces far away from the French-German border. Prime Minister Pompidou told the Parliament that the French force “plays a full and automatic role for the benefit of Europe, the defense of which is inseparable from her own.”¹¹⁴ Chief of Defense Fourquet publicly stated that the French battle corps would normally have to be engaged as far as possible from the national borders, in close coordination with the Allies.¹¹⁵ The “approaches” of the country would be explicitly considered part of France’s vital interests, as stated in the 1972 *White Paper*.¹¹⁶ The exact scope of these interests was unclear. It was recognized that uncertainty on the nuclear threshold was a critical component of deterrence. Third, from the onset French leaders asserted that the country’s national deterrent helped the construction of Europe and, beyond that, was, in fact, a building block of a future European nuclear force.¹¹⁷

The Possibility of Consultation and Coordination with Allies. Contrary to some popular perceptions of French strategy, the use of the force in conjunction with allied nuclear assets was an option. As early as 1954, the government suggested that Alliance employment of nuclear weapons should be made at least “at Three” (Washington, London, Paris) if lack of time made NATO consultations impossible.¹¹⁸ De Gaulle went further by suggesting in his famous 1958 memorandum a tripartite directorate where the nuclear powers collectively ruled the Alliance, with a coordinated nuclear planning and decisionmaking mechanism.¹¹⁹ He discussed such options with Presidents Dwight Eisenhower and John Kennedy. The mechanism

de Gaulle envisioned would be created outside NATO and allow for consultations on nuclear use “anywhere in the world.”¹²⁰ De Gaulle knew he was “asking for the moon” in 1958, but nevertheless later confirmed in private that he was ready to “combine” French and allied strategies once his country had an operational deterrent.¹²¹ In the first multiyear defense plan, nuclear weapons were presented as a way for French forces to “cooperate more efficiently siding with allied forces, for the defense of the free world.”¹²² They would be built and used nationally, but “of course, without refusing cooperation, technical or strategic, if wished by our allies.”¹²³ It was thus possible to “conjugate the employment of these weapons with that of our allies’ same weapons in the framework of the common effort.”¹²⁴ Since French forces were still integrated, such options were perfectly feasible.¹²⁵ In 1964, Beaufre conceptualized this approach. He described a common nuclear planning mechanism, a coordinated “deterrent manoeuvre” in crisis time, and, if war broke out, a coordinated employment of nuclear forces.¹²⁶ The idea appeared less frequently after 1966, but resurfaced around 1968 at a time when the French force was indisputable and the affirmation of *différence* less politically necessary.¹²⁷

A Contribution to the Overall Security of the West. Beyond the defense of European neighbours, the *force de frappe* was seen in France as an asset for the broader transatlantic community. Beaufre and Aron defended the idea of the national deterrent as a contribution to the overall security of the West. Due to the importance of French military forces for the defense of NATO, a France endowed with independently employed nuclear weapons implied an increased risk of nuclear escalation and thus a better overall Alliance deterrent (a “multilateral deterrent”). Also, according to Beaufre, the threat of early French use “benefited the West by bringing an element of doubt into enemy calculations rather than letting them rest solely on the ‘reasonable’ attitude of the United States.”¹²⁸ Beaufre, like Gallois, challenged U.S. Secretary of Defense Robert MacNamara’s arguments against European national nuclear forces, but in a positive and constructive way: “It is because the French force blurs the American game that it gives back the American game the atom of credibility that it lacked.”¹²⁹ For Beaufre, an alliance of nuclear

powers brought more deterrence power than a nuclear protectorate or even a “multilateral force.”¹³⁰

While dismissing the value of the Alliance per se, Gallois used similar arguments. He argued that, in a situation of approximate parity, the main adversary had to take into account the existence of a third nuclear power which created an “imbalance” detrimental to the management of the main adversarial relationship, since the smaller power could cripple the bigger one.¹³¹

De Gaulle adopted this logic.¹³² With Eisenhower he emphasized that an “additional deterrent” posed a problem for the Union of Soviet Socialist Republics (USSR).¹³³ He thought that the mere possibility that France would open nuclear fire to protect Germany could not fail but be taken into account by Moscow.¹³⁴ French nuclear weapons “introduce[d] in a dangerous world a new and powerful element of wisdom and circumspection.”¹³⁵ This was acknowledged by the 1972 *White Paper*: “Western Europe . . . cannot but indirectly benefit from French strategy which constitutes a stable and determining factor of security in Europe . . . national as it is, our nuclear deterrent force is an element that cannot but matter to the prevention of a crisis in Europe.”¹³⁶ Likewise, Chirac said in 1975 that the existence of French tactical nuclear weapons was a contribution to the security of Europe.¹³⁷

A “Trigger” to Force U.S. Intervention? One of the most original and hotly debated features of French nuclear thinking was the idea that France would be a possible detonator or trigger (*détonateur*, or sometimes *gâchette*) for the use of U.S. nuclear forces in defense of Europe if deterrence failed. Consistent with French strategy, the logic was that the United States would delay, if not refuse, the use of nuclear forces in case of a Soviet invasion. Initial nuclear use by France, however, would project the conflict into the nuclear realm. France’s deterrent force was thus equivalent to the primary stage of a thermonuclear weapon. As National Assembly member Alexandre Sanguinetti colorfully put it, this was about “forbidding to the Great [Powers] the delights of classical war on the European territory.”¹³⁸

This concept has been the subject of many misunderstandings and errors of interpretation that began with the origin of the concept. Many, including Gallois, have attributed the concept to Aron and Beaufre. Indeed, Aron described it in his 1964 book.¹³⁹ But he sees its

origins in U.S. perceptions. In fact, the idea was already present in the transatlantic debates of the late 1950s, and some Fourth Republic politicians toyed with it.¹⁴⁰ Gallois himself, who was one of the most vocal opponent of this idea, had discussed it at length in his 1960 *Stratégie de l'âge nucléaire*, suggesting that it justified the British program, thus not rejecting it entirely.¹⁴¹ At the time, Gavois was still a friend of Aron, who claimed later that he never embraced it.¹⁴² As per Beaufre, he completely repudiated the concept.¹⁴³

This misunderstanding stems partly from the fact that there are two possible interpretations of the concept. Aron and Beaufre did not see the *employment* of French nuclear weapons as a means to force the United States into using nuclear weapons for the defense of Europe. They saw the *existence* of French nuclear weapons as a contribution to overall Western deterrence, akin to the UK "second center of decision" theory. Beaufre also thought that "in crisis time, the existence of the third partner allows its powerful ally to intervene only in second position."¹⁴⁴ Thus their perspectives were the reverse of the "hard" trigger interpretation, it was *a priori* (deterrence) as opposed to *a posteriori* (use), and in some circumstances it was supposed to give the United States *more* freedom of action, not *less*.¹⁴⁵ Beaufre mentions one hypothetical situation that entails a less benign version of the concept. In a crisis between the weak and the strong, in a situation of strategic balance, the "powerful ally" would *have* to intervene in the crisis.¹⁴⁶

Another misunderstanding is about how far French policymakers actually embraced the concept. Prime Minister Debré, for instance, denied that it had any official value.¹⁴⁷ This must be strongly qualified. First, French leaders believed in the "soft" or Aron/Beaufre interpretation.¹⁴⁸ Second, testimonies have revealed that de Gaulle *did* subscribe to the "hard" interpretation of the concept, and referred to it many times in private.¹⁴⁹ "The Alliance does not oblige [the United States] to be at our sides immediately, with all their might and all their weapons. That is why our atomic force is necessary. It is a triggering and driving force. It's the starter."¹⁵⁰ He once used words nearly identical to those of Gallois: "They have understood that we now have the finger on the trigger . . . We are becoming as redoubtable as a man walking in an ammunitions depot with a lighter. . . . Of course, if he lights it up, he'll be the first to blow. But

he will also blow all those around.”¹⁵¹ Giscard referred at least twice to de Gaulle’s belief in the trigger concept.¹⁵²

De Gaulle also specifically justified the existence of tactical nuclear weapons by this function.¹⁵³ The views expressed by Chief of Defense Fourquet in 1969, are in tune with this interpretation and refer to the “driving effect” (*effet d’entraînement*) on the Alliance that the massive use of French tactical nuclear weapons (TNW) would have close to the battle lines.¹⁵⁴ They were reaffirmed by the Army Chief of Staff in 1975, when he stated that the role of TNW was not only to pose a problem to the adversary but also to force the Allies to renounce flexible response, to the goal of true deterrence: massive retaliation.¹⁵⁵

Differences between the French and British Approaches.

Overall, this contribution to the security of Europe and the Atlantic Alliance may sound close to the UK position. There are many similarities between the French and UK nuclear philosophies. The importance of nuclear weapons for international prestige and the fear of being relegated to second-rank allies if London did not have its own nuclear weapons were discussed in UK government circles after the war. The need to be a major power again after the trauma of Suez, was present in the UK debates of the 1950s.¹⁵⁶ Common doctrinal tenets include the “proportionality” and “intolerable damage” concepts. Lesser known is the UK’s endorsement of its potential ability to do enough damage to the Soviet Union to create an imbalance in the U.S.-Soviet face-off, which would be a factor in deterrence.¹⁵⁷

However, at least three features distinguished France’s nuclear program as it developed after 1958, from that of the United Kingdom. Where the British emphasized Alliance security and solidarity, the French emphasized national independence. De Gaulle rarely justified the French bomb with the “second center of decision” argument. As stated above, he did not view the emerging *force de frappe* as having an exclusively national focus. He could foresee, like some of his predecessors, a situation where French nuclear forces would be combined with those of the United Kingdom and the United States. On this point, he was in tune with the views of Beaufre, who was

enthusiastic about the “second center” argument.¹⁵⁸ But for French political leaders in the 1960s and 1970s, Alliance solidarity was never a prime rationale for the French bomb, in their public discourse, or policymaking. UK forces were “by default” integrated in a NATO context, and, conceptually, a strictly national use would have been an exception. By contrast, the default position of the French forces was a national use, and only if necessary and feasible would coordination have taken place. A paradox here is that the “second center” argument was more valid for France, a country probably deemed by the Soviet leadership to be more independent than the United Kingdom.

Where the British emphasized independence of the authority to use the weapons, the French emphasized independence *in toto*, including operations and procurement once it was evident that no U.S.-French cooperation was possible in mutually acceptable terms.¹⁵⁹ In the absence of Alliance reform post-1967, it was inconceivable that French nuclear weapons would be formally coordinated with U.S. and UK weapons through formal NATO procedures. De Gaulle thought that the British model did not allow for a truly independent use of nuclear weapons.¹⁶⁰ Sir Michael Quinlan argued that there are two forms of independence in the nuclear arena. One is the British model, based on independent authority of use. The other is the French model, based on maximal independence in all dimensions from procurement to operations. In this respect, independence is not unlike the two traditional designs of classical gardens; *à la française* and *à l'anglaise*.

Finally, where the British emphasized the importance of being a nuclear power in order to influence U.S. policy, the French emphasized the importance of being a nuclear power to *avoid* being influenced by U.S. policy. Thus, while adopting the same basic rationale that going nuclear would change each country's relationship with the United States, the political justifications offered by the two European countries were exact opposites.

Evolutions of Official Thinking after the Gaullist Years.

In the 1970s, things evolved somewhat differently from what early French thinkers and officials envisioned. *Tous azimuts* was less

frequently mentioned in official statements.¹⁶¹ The trigger concept in its pure form fell from grace. While consultation was not excluded, the coordination option was discarded and engulfed by the U.S.-French rift of the mid-1960s.¹⁶² French leaders consistently referred to the “independence of decision” insofar as the employment of strategic nuclear forces was concerned. Consultation and perhaps coordination for the employment of *tactical* nuclear forces in Europe was still an option, but one that was rarely mentioned publicly.¹⁶³ However, three features remained.

One was the idea that French nuclear forces protected more than the national territory. This concept was further expounded by Prime Minister Chirac in 1975 (“We cannot content ourselves with ‘sanctuarizing’ our own territory.”¹⁶⁴) Under Giscard, the idea of participating directly to the forward defense of Europe was clearly accepted, and in 1976, Chief of Defense Staff Méry went as far as using the expression “enlarged sanctuarization,” which was the closest France ever came to declaring an explicit extended deterrent posture, with the exception of the 1963 offer.¹⁶⁵ In 1977, Prime Minister Barre explained, as de Gaulle and Pompidou had before him, that due to France’s geographical position, the fate of nearby countries would immediately affect her in case of war. According to him, France would be directly affected by aggression in Europe. Therefore, her vital interests had to include “neighboring and allied territories.”¹⁶⁶ In 1980, Giscard confirmed that if the time came to think about the employment of tactical nuclear weapons, France would take into account the fact that it was “directly concerned with the security of neighboring European States.”¹⁶⁷ And Barre stated even more clearly that aggression against “our vital interests in Europe” would trigger massive retaliation.¹⁶⁸

The second feature that remained was the idea that French nuclear forces made a significant contribution to the overall security of NATO, notably by adding a margin of uncertainty in the eyes of Soviet planners. As is well-known, this was recognized at the 1974 Ottawa North Atlantic Council meeting, where 16 allies declared that the French and UK independent nuclear forces contributed to the “overall strengthening of the deterrence of the Alliance.”¹⁶⁹

The third feature was the related idea that the existence of French nuclear forces was enough to create an imbalance detrimental to the bipolar order, but beneficial to overall deterrence. Méry said in 1977

that the “damage that we could cause to either superpower would immediately place it in such a situation of imbalance regarding the other superpower that it is doubtful that either could afford to tolerate suffering that damage at any time.”¹⁷⁰ Barre said at the same time that “the amount of damage we can cause is . . . sufficient in itself and even more, concerning the great nuclear powers, because of the decisive imbalance that it could introduce in their contest among equals (*duel paritaire*).”¹⁷¹

SECTION V: FORGING THE DOCTRINE: TACTICAL NUCLEAR WEAPONS OR THE CRUX OF THE MATTER

As in the United States and the United Kingdom, in France the role of TNW was the object of much controversy during the Cold War, and their official function evolved significantly over the years. In fact, as in the NATO context, the role of TNW was at the core of the French nuclear strategy debate, both in terms of how the use of nuclear weapons was conceived, and in terms of their role for the security of Europe.

A War-Fighting Tool?

De Gaulle’s initial views on TNW appeared simple. In 1961, he wanted France “to get atomic projectiles, strategic and tactical.” A decision in principle for the procurement of TNW was made in 1963.¹⁷² In 1964, he made it clear to his military staff that the French counteroffensive in a European war would be “all means included, with all classical and atomic fire support.”¹⁷³ TNW were apparently a war-fighting tool, a bonus with no particular importance (although he thought that the use of TNW in Europe would necessarily lead to a strategic exchange, and envisioned the concept of a nuclear “warning shot” as early as 1964¹⁷⁴). After the withdrawal from the NATO integrated structure, many in the French leadership saw the procurement of tactical nuclear weaponry as a necessity, in order to replace U.S. weapons previously at the disposal of French ground and air forces and to avoid lacking a military tool that all other European armies had.¹⁷⁵ The armed forces were, of course, interested.¹⁷⁶ While mindful of the fact that France’s fissile material stocks were limited,

de Gaulle agreed to the development of a significant TNW program. He was keen to give a boost to the post-Algeria Army's morale.¹⁷⁷ But for him, true deterrence resided in strategic weapons, and at that time he did not think that TNW reinforced deterrence.¹⁷⁸

Meanwhile, the government defended the idea that TNW were a complement to strategic deterrence and were not to be seen as a war-fighting device. One rationale was to deter the possibility of an attack designed to annihilate the French battle corps.¹⁷⁹

De Gaulle's last statements on the subject show that he attached considerably greater importance to these weapons, perhaps because of NATO's adoption of flexible response in 1968. Privately he went as far as telling General de Boissieu, soon to be Army Chief of Staff, and also his stepson:

For, from the time when the 1st Army and the tactical air forces will have tactical atomic [weaponry], the Alliance will not be able to envision our manoeuvre forces only with their conventional means. You will have to let [them] know that you envision counterattacking with the support of our tactical nuclear forces. Thus if the allied high command needs this only strategic reserve in Europe, it will have to decide employing its nuclear fires beforehand or at the same time. Believe me, tactical atomic [weaponry] is an essential component of our defense system. If one day you have to choose, due to lack of credits, between strategic and tactical atomic [weaponry], choose the latter, for it is better to perfect what is happening before the Apocalypse than the Apocalypse itself.¹⁸⁰

The emphasis on the "trigger" function is certainly one of the reasons why he attached great importance to the political control of TNW use.¹⁸¹ Such statements confirm that France was not necessarily ready to conduct immediate strategic reprisals in case of Soviet aggression in Europe, and that the first French use of nuclear weapons would have been with *tactical*, not strategic. Of course, one cannot exclude the possibility that de Gaulle was trying to please the Army by overstating the role of these weapons. But then again, since these views were translated into operational guidance, they represented official policy.

Attempts to Define a Specific TNW Doctrine.

The emerging TNW doctrine was fuzzy, to say the least. In 1968, Defense Minister Messmer emphasized their nuclear nature but also

stated that, since classical forces would be equipped with them, there would be less and less difference between conventional and nuclear weapons.¹⁸² In the planning staff, Poirier described the *endowment* of the First Army (the bulk of the French land forces) with TNW as a tool to “test” the enemy’s intentions, forcing the enemy to increase the means he engaged in battle. He also discussed their *use* as a possible “warning shot” to the attacking Soviet forces if Moscow attacked French lines and approached the national borders.¹⁸³ However, in a famous 1969 speech, Chief of Defense Staff Fourquet distanced himself from the Poirier concept. He emphasized the importance of TNW to fight the Soviet armies. Their use would be a *second* test of enemy intentions, conducted with “maximum efficiency,” and manifest France’s will to resist. In contrast, Poirier wanted a strictly political use of these weapons to avoid a conventional battle.¹⁸⁴ The *White Paper* was in-between these two approaches. It referred to the original test concept, that TNW would be used if the enemy could not be “contained,” thus letting him “know that if his military pressure were to continue, the recourse to strategic nuclear weapons would be ineluctable.”¹⁸⁵

After de Gaulle, the doctrine zigzagged for several years. Confusion reigned. Emphasis on war-fighting, then gave way to the primacy of the political function of TNW. In the early 1970s, there was a flexible response temptation. Pompidou hinted at least once to TNW giving France the means of a “flexible response (*réponse flexible*).”¹⁸⁶ Also, Giscard and Chirac emphasized the specific deterrent role of TNW for contingencies where the threat of a strategic response was not credible, and the “more nuanced” strategy that would result from the possession of these weapons, which helped avoiding the “all or nothing” dilemma.¹⁸⁷

In the mid-1970s, French political leaders consistently referred to a dual role of “deterrence” and “war-fighting” (*bataille*).¹⁸⁸ Deterrence encapsulated the test function. In 1975, Chirac described at length the Poirier test function. The endowment of the French 1st Army (the bulk of France’s land defense forces, based on conscription) with *Pluton* missiles was meant to dissipate all ambiguities in the adversary’s mind if he underestimated Paris’s resolve. The message to Soviet forces approaching the 1st Army lines was both “you are entering the domain of nuclear combat” and “you are not going to

fight French forces: you are going to fight a country." It was meant to make it clear that engaging the 1st Army meant engaging a nuclear France. But the *Pluton* was also described as a war-fighting weapon. This marked a departure from the Poirier warning shot.¹⁸⁹ Giscard emphasized the term "battle" in his defense policy speeches, and referred to nuclear weapons as the "most advanced" weapons. He once said the employment of TNW was akin to that of—*horresco referens*—an "artillery."¹⁹⁰ He clearly separated TNW from strategic deterrence and referred to them as a means of "protection."¹⁹¹ At that time the warning shot concept was twisted in a way that gave the impression that it had as much military as political value. Fourquet's successor, General Maurin, mentioned the use of TNW as a "halting strike" (*coup d'arrêt*). Halting provided a pause in the enemy's aggression and gave him a chance to reconsider his plans, a concept close to NATO's guidelines for initial nuclear use.¹⁹² Meanwhile, the trigger concept had not disappeared. A few days after leaving his Army Chief of Staff post, Boissieu, faithful to the memory of his stepfather, reiterated publicly and forcefully the role of TNW as a trigger of Alliance nuclear escalation, and as a way to force NATO into going back to "real" deterrence.¹⁹³

The 5-year defense plan adopted in 1976 contained these ambiguities and did not clarify them, saying that the presence of TNW in the battle corps added to both their deterrence and warfighting abilities. But the plan also stated that the use of TNW would set the record straight vis-à-vis an adversary who had misjudged the frontier of French vital interests or its determination to defend them.¹⁹⁴

A Political Tool: Emergence of the "Final Warning" Concept.

Beginning in 1976 the political function of TNW and its link with strategic weapons was increasingly emphasized, especially with the emergence of the concept of "final warning." In 1976 Méry said that TNW would be used *primarily* to indicate a change in nature of the conflict.¹⁹⁵ In 1977 Barre referred to TNW as being first, weapons of deterrence, and if deterrence failed, being secondarily weapons that provided a "last and solemn appropriate warning, before the

Apocalypse.”¹⁹⁶ Elements of war-fighting had disappeared from the doctrine, and the nuclear nature of TNW was increasingly emphasized over its tactical character. The “final warning” would be the defining rationale for French TNW. This was not exactly the warning shot envisioned by Poirier because the policy continued to emphasize the need for a significant military effect of TNW use. Nor was it a mere imitation of NATO doctrine. There could only be *one* warning, and the idea of “restoring deterrence” was, at the time, emphatically rejected in the official rhetoric.¹⁹⁷

SECTION VI: OUTCOME: ASSURED DESTRUCTION A LA FRANÇAISE

How far were these concepts translated into actual nuclear force posture and targeting? The first French nuclear test, dubbed *Gerboise Bleue* and supervised by General Ailleret, was a success.¹⁹⁸ In December 1960, a plan to develop a bomber and submarine force armed with fission and thermonuclear weapons was voted by the Parliament. A 36 *Mirage-IV* nuclear bomber force was set up between 1964 and 1966. The production of ballistic missiles went fast. Based on preliminary studies and tests conducted during the Fourth Republic, the space and ballistic program initiated in 1960 came to fruition in 1964. After some difficulties, the first thermonuclear test was done in 1968. Initially just an interim solution before the sea-based leg matured, 18 ground-based missiles were deployed in 1971-72.¹⁹⁹ The first fleet ballistic missile submarine (SSBN) went on alert in 1972. Thus less than 15 years after de Gaulle’s return to power, France became the third country to develop an operational triad of strategic nuclear forces.

The Definition and Evolution of French Targeting Doctrine.

As a nuclear power, France came of age later than its Anglo-Saxon allies. Its initial reflections about targeting were less influenced by air power debates and the experience of World War II than these reflections had been in the United Kingdom.²⁰⁰

The French debate on the best way to implement “proportionality to the stake of the conflict” targeting had two starting points. First

was the consensus on targeting cities. For many such as Gallois, the anti-cities strategy was deterrence in its purest form. Flexibility and counterforce were degradations of the very essence of deterrence, and the art of military operations was meaningless when applied to nuclear weapons.²⁰¹ Gallois also used classical arguments such as the mobility of adverse forces, and the risk of striking empty silos.²⁰² Most experts believed that targeting cities was the only way to ensure damage of sufficient scope to deter the adversary. The U.S. debates on the credibility of massive countercities strikes were deemed not applicable to small European countries whose very survival were at stake in an East-West conflict.²⁰³ In the United Kingdom, such arguments were apparently not as powerful. Early UK targeting debates, within Royal Air Force circles, focused on targeting Soviet air bases.²⁰⁴

The second starting point was the so-called “equivalence” concept. In a war with the Soviet Union, the stake would be no less than the existence of France itself. So, the damage sought had to be *equivalent to the destruction of France* in demographic, economic, or even geographic terms. The genesis of this idea is hard to retrace. Some early French works on nuclear strategy mentioned it.²⁰⁵ De Gaulle endorsed it. He told the Council of Ministers in January 1963 that the nuclear force made it possible “to kill as many Russians as there are French” thus bringing the “certainty that they would not attack.”²⁰⁶ The *White Paper* alluded to it indirectly when it suggested that France, being only a medium power, did not need an arsenal equivalent to that of the great powers. The concept continued to appear episodically over the years, in particular in the writings of Gallois²⁰⁷ and was mentioned by Giscard after leaving office: “French nuclear forces have been calculated to permit reaching a population of the adversary of the same order as that of our own country. If France were destroyed, our adversary would lose the equivalent of France.”²⁰⁸

However, public discourse and expert analysis on targeting strategies remained rather vague, if not confusing. Populations *per se*, cities, Soviet “potential,” “economic function,” “resources,” “vital centers,” or “vital works” were referred to alternatively.²⁰⁹ One reason was that many in France placed a higher value on the psychological than on the physical underpinnings of deterrence. De Gaulle said

at the end of his 1956 meeting with Gallois that a French deterrent only needed to “tear an arm” of the aggressor.²¹⁰ He enjoyed such vague expressions as “frightful destructions,” “deadly wound,” “destruction beyond repair” or “frightful wounds.”²¹¹ In his 1960 book, Gallois emphasized the need to target the “demographic system” of the adversary but also interchangeably referred to population and cities’ targeting as the most potent and cost-effective deterrent and suggested “frightful reprisals.”²¹² For him, the goal was to “break the political and social structure” of the adverse country.²¹³

Two points are clear. First, historical evidence shows that, contrary to popular beliefs, French leaders, from the onset, were interested in targeting the Soviet economy as much as its population. In 1961, de Gaulle mentioned the planned French ability to threaten “about 65 percent of the Soviet potential” by 1965.²¹⁴ His instructions given in December of that year were to “inflict to the Soviet Union a notable reduction, that is, about 50 percent, of its economic function.”²¹⁵ In private conversations, he also alluded to the fact that a French strike would destroy many “kombinats, dams, and power plants.”²¹⁶ In 1962, he said that France would soon be able to kill “20 million” and mentioned the goal of threatening 25-50 percent of the adversary’s population.²¹⁷ The next year, he referred to the potential of killing “40 to 50 million” by 1971.²¹⁸ These were private statements. Publicly, he just mentioned the “sombre and terrible capacity [of the French force] to destroy in a few instants millions and millions of people.”²¹⁹ For his part, Prime minister Messmer referred to cities as being both “demographic and industrial targets.”²²⁰ A decade later, Prime minister Barre referred to “the major urban concentrations of an adverse nation, where the greatest share of its demographic and economic power is concentrated.”²²¹

Second, it is possible to say that the original targeting guidance focused on 20-40 cities. “It is probable that a few tens of projectiles or thermonuclear warheads” would be enough, said Gallois.²²² He regularly mentioned about 30 cities as targets.²²³ In 1961, de Gaulle mentioned the planned French ability to “destroy 20 Russian cities” by 1962.²²⁴ Such a number corresponded to early U.S. and UK strategic planning.²²⁵ But it may also have been derived from a calculation

based on the “equivalence” concept, since it was predicted that about 30 thermonuclear weapons could destroy France.²²⁶ De Gaulle referred several times to Moscow, Leningrad, Odessa, and Kiev as prime targets.²²⁷ An example of early French nuclear planning might include six to seven bombs on Moscow, two to three on each major city, and one on a dozen other significant Western Soviet cities.

By the mid-1970s, under Valéry Giscard d’Estaing, the first post-Gaullist President, some attention was apparently given to a diversification of targets. As a result, targeting policy may have become “less demographic, more economic.” The 1977-82 Defense Plan contained no explicit reference to cities. Strategic targeting was described as “the annihilation of vital targets.”²²⁸ Open sources offered a variety of rationales for a shift in targeting. One was the fear that Moscow would develop large-scale civil defense and anti-ballistic programs to ensure, directly or indirectly, the protection of the Soviet population. In March 1977, Chief of Staff Méry remarked that some key economic assets were located in low-population zones, which implied that alternative targeting policies were possible.²²⁹ This was not an isolated trial balloon. Other MoD officials publicly hinted at such a shift for the same reason, and emphasized the difference between anti-cities and anti-demographic targeting.²³⁰ A major parliamentary report issued in 1980 suggested the same rationale, and added others: the fact that the Soviet leadership would not necessarily be deterred by threats against its population, and the bonus added by a strategy that made economic recovery difficult.²³¹ Clearly such ideas were being widely debated in policy circles. A final rationale—stated *a posteriori*—was based on ethical grounds. Giscard said that, when in office, he refused to give targeting instructions in the form of a percentage of the Soviet population. His guidance was “the destruction of 40 percent of Soviet economic capabilities before the Urals, and the disorganization of the country’s leadership apparatus.”²³²

There is little evidence of the extent to which this orientation translated into operational planning. In fact, Giscard continued to refer to demographic targeting after he left office. One unconfirmed source said he asked the Joint Staff in March 1980 to “submit to his approval diversified objectives that would not exclusively concern big agglomerations, but be directed at targets such as

military installations, centers of economic activity, and perhaps secondary cities.”²³³ One thing is clear. By 1980, official references to demographic targeting per se had disappeared, replaced by the mention of “cities” and “the economy” of the aggressor.²³⁴

All in all, the best overall characterization of French targeting philosophy at that time might be “no-counterforce,” since the option to target Soviet nuclear forces was consistently opposed by French officials. Such an option was judged not efficient (the Gallois arguments), not faithful to the principles of deterrence (a “warfighting strategy” according to Barre) or inapplicable to France because, for geographical reasons, any major war in Europe engaged its vital interests.²³⁵

Thermonuclear Weapons, Multiple Independent Reentry Vehicles (MIRV), and the Road to “Sufficiency.”

In the mid-1970s, megaton-yield warheads were introduced simultaneously on the ground leg (the S3 IRBM) and on the sea leg (the M20 sea launched ballistic missiles [SLBM]) of the French triad. This change, combined with the entry into service of additional SSBNs, led to a dramatic increase in France’s total explosive nuclear yield (20 Mt in 1974, 84 Mt in 1981). There were hints at a threshold being crossed.²³⁶

France had sought thermonuclear warheads since 1960, in particular to have the same means as its allies. But the deployment of the new systems was also part of an acquisition strategy designed to evade Soviet defenses, notably through hardening and penetration aids. The TN61 warhead deployed in the late 1970s was the first French warhead that fully took into account Soviet defenses. The need to penetrate such defenses was a prime rationale for the development of MIRV loading, with a considerable increase of the number of warheads.²³⁷

The MIRV program may be evidence that Moscow was a key objective. Being both the capital and the most populated of Soviet cities, it was a lucrative target. One boatload of 96 MIRVed warheads was judged sufficient to degrade Soviet defenses.²³⁸ However, what the UK called the “Moscow criterion” may not have been as central for Paris as it was for London. France had a larger force than its

neighbor, and its “mini-triad” symbolized that it considered itself a “mini-superpower.” Remaining the third nuclear power was important for political leaders in the 1970s. France was able to inflict massive damage to the adversary, not necessarily focusing on the capital as the United Kingdom might have done in its national targeting plans. And the efforts to evade defenses may have been designed to counter possible future Soviet defenses beyond the Moscow region.

The notion of “unbearable” or “intolerable” damage to the Soviet Union, out of proportion with the stake of a conflict, became the main factor in defining the level of the French nuclear arsenal. The idea of bringing destruction that was considered unbearable by the adversary was already present in the 1960s speeches of political leaders.²³⁹ Poirier introduced the expression “intolerable damage” in France in 1972.²⁴⁰ In 1981, the expression became “unbearable damage.”²⁴¹

The required quantity and quality of weaponry for such a goal would be called “sufficiency.” This captured two ideas. One was a rejection of overkill. It was a Gallic version of finite or minimum deterrence. As stated above, de Gaulle said that “since a man and a country can only die but once, deterrence exists as soon as one can mortally wound the potential aggressor.”²⁴² The other idea was a rejection of parity.²⁴³ This, too, was linked with the notion of proportionality but in a different way. Parity was rejected on several accounts. France had no counterforce strategy and thus did not need to take into account the force levels of the adversary. It was not a major power and thus did not need parity for political reasons. Finally, it did not have the means to develop an arsenal as important as the U.S. or Soviet ones.²⁴⁴ As de Gaulle had stated in 1962: “We do not have the ambition to make a force as powerful as those of the Americans or the Soviets, but a force proportionate to our means, our needs, and our size.” A few months later, he said: “The question is not to raise ourselves at the same level as the others. The question is to represent a reprisals capability sufficient to have [the adversary] renounce to his aggression.”²⁴⁵ Such a vocabulary was widely used in the early 1970s. Poirier referred to a “necessary but sufficient” level of weaponry.²⁴⁶ President Pompidou used a similar vocabulary.²⁴⁷ “Sufficiency” came into use later in the decade.²⁴⁸

“Unbearable” Damage?

Was the strategy credible? A firm answer to this question would require a thorough historical research of Soviet perceptions of French Cold War policies. One thing that can be tested, however, is the coherence of intentions and capabilities.

Platforms	Nominal payload	System range	Total operationally available warheads (max.) / Yield ²⁴⁹	Total yield
1967				
36 Mirage-IVA	1x AN21 bomb	~3,000 km ²⁵⁰	36 AN21 (60 kt)	2.16 Mt
36			36	2.16 Mt
1974				
36 Mirage-IVA 18 IRBM silos 2-3 SSBNs	1x AN22 bomb 1x S2 IRBM 16x M1/M2 SLBM	~3,000 km 3,000 km 2,500/3,000 km	36 AN22 (60 kt) 18 MR31 (150 kt) 32 MR41 (500 kt)	2.16 Mt 2.7 Mt 16 Mt
56-57			86	20.86 Mt
1981				
36 Mirage-IVA 18 IRBM silos 4-5 SSBNs	1x AN22 bomb 1x S3 IRBM 16x M20 SLBM	~3,000 km 3,500 km 3,000+ km	36 AN22 (60 kt) 18 TN61 (1 Mt) 64 TN60/61 (1Mt)	2.16 Mt 18 Mt 64 Mt
58-59			118	84.16 Mt

Table 1. Evolution of French Strategic Nuclear Forces.

Calculating the exact effects of a massive nuclear strike is no small feat, and involves many debatable assumptions. For U.S. Defense Secretary MacNamara’s team, destroying only 30 percent of the Soviet population and 75 percent of its industry required no less than about 400 megaton-equivalent (MTE).²⁵¹ And in 1966, to destroy 22.5 percent of the Soviet population and 52.4 percent of its industrial production reportedly meant destroying 100 cities.²⁵² France at that time, with its 36 *Mirage-4s* armed with *circa.* 60-kt weapons, was obviously unable of producing such results. Assuming about 30 aircraft dropped their bombs, they would inflict damage on up to 30 cities. By 1970, according to Poirier, France had the capacity of killing

only 14-18 millions Soviets with a 50 percent probability of success.²⁵³ However, additional data and more optimistic calculations provided in 1974 by a U.S. analyst allows for a different perspective.²⁵⁴

Number of cities Needed	Population	Percent of Total Population	Percent of Urban Population	Percent of Industry	Number of 1-Megaton Warheads
10 main	21 million	8.8%	15.7%	25%	31
30 main- Western part	33 million	13.8%	24.5%	25-40%	57
30 main	37 million	15.4%	27.3%	25-40%	~60
50 main	46 million	19.1%	33.8%	40-50%	85

Table 2.

From these numbers several conclusions can be inferred. First, whatever the deterrent power of French nuclear weapons up until the late 1970s, they did *not* fulfill the objectives stated by the political authorities. Second, by 1980-81, with 82 one-megaton warheads on line (plus 36 bombs), the situation changed dramatically. By that time, France was *fulfilling the "equivalence" criterion* and was able to threaten the rough equivalent of its population. This met de Gaulle's 1961-62 criteria of being able to target half of the Russian population.²⁵⁶ In fact, the French came very close to meeting MacNamara's assured destruction criteria in their latest and least ambitious variant, assuming it was able to target the 50 main Soviet cities.²⁵⁷ This last point warrants further historical research. It may be just a coincidence, it may also be a direct imitation of U.S. strategy, or it may be the product of identical judgements made by France and the United States on what would have been "unacceptable" to the Soviet Union whatever the stake of the conflict.

SECTION VII: ASSESSMENT: THE ORIGINS OF FRENCH NUCLEAR STRATEGY

The five experts identified above played a role in forging the French strategy, but their reputation in France and abroad is overvalued. In contrast, the importance of other inputs (U.S. and

UK in particular), is underestimated. Other key factors in designing French strategy include de Gaulle's personal preferences and the financial and technical resources available.

The Diverse Impact of French Thinkers.

The Overvalued Role of Gallois. Pierre-Marie Gallois (the only air force officer among the group) was, of course, a key element. He had numerous personal meetings with many top French officials, including de Gaulle and Premiers Mendès-France and Mollet.²⁵⁸ He undoubtedly made an impact on political decisionmaking by helping to build a consensus on developing nuclear weapons. Also, some concepts that can be attributed to Gallois made their way into the French strategic culture. One is the idea that deterrence should and could only be national. As stated in the 1972 *White Paper*, "the nuclear risk cannot be shared."²⁵⁹ Another is the more elaborate concept which states that the existence of a small nuclear force could create a situation detrimental to the Soviet Union in its face-off with the United States. Gallois may also have been the first author to introduce the expressions "vital interests" and "sanctuary." While the latter faded from the official vocabulary, the former became a central feature of the doctrine.²⁶⁰

But Gallois does not deserve his reputation as the father of French nuclear doctrine. *Stratégie de l'âge nucléaire*, published in 1960, has often been considered the textbook of French strategy. While this book was important in popularizing the emerging nuclear policy debates, only a few lines in it are devoted to the possibility of an independent French bomb. Although de Gaulle reportedly read and approved many of his publications, the two generals, who were of different generations, never developed a close personal relationship.²⁶¹

Gallois' ideas were, in fact, a caricature of French thinking. Whereas de Gaulle thought that nuclear weapons and integration were incompatible, Gallois suggested that nuclear weapons and alliances were incompatible. MacNamara thought that small independent nuclear forces were "prone to obsolescence, and lacking in credibility."²⁶² Gallois, in essence, reversed the argument, saying that nuclear weapons made alliances obsolete and not credible in

a time of mutual vulnerability.²⁶³ He derided the planned NATO Multilateral Force by calling it the “multilateral farce.” He carried all his arguments to the extreme. For him, the concept of “imbalance” was a possible justification of nuclear proliferation. An early proponent of the “more may be better” thesis, he was invited to Baghdad to give lectures.²⁶⁴ Whereas Ailleret thought that flexible response was not applicable to the European continent, Gallois was of the opinion that the doctrine just did not make sense.²⁶⁵ Whereas de Gaulle left himself a margin of manoeuvre in case of a strictly conventional attack, Gallois thought that massive reprisals should be automatic. For him, there was no flexibility, refinement, or significant role for conventional forces: “all or nothing.”²⁶⁶ Deterrence was a pure contest of wills between two nations, the ultimate exercise in brinkmanship. For him, what mattered the most in the deterrence calculus was that even though the probability of massive retaliation by the weak might be small, the penalty was so huge that this small probability was enough to guarantee that the strong would not attack. As one commentator later put it, “Gallois preferred retaliation so automatic that no unfriendly nation would dare be provocative, but even a small risk of retaliation might be sufficient.”²⁶⁷

It should thus come as no surprise that Gallois ended up disagreeing strongly with many features of French strategy as it developed and matured. These included the “trigger” concept, the notion that the French force could protect more than just the national territory, and the development of a specific tactical nuclear weapons doctrine. Thus the only concepts that are truly original in French nuclear thinking were precisely the ones that were the most adamantly opposed by Gallois.

The Underappreciated Contribution of Beaufre. What of the other four major intellectual players—Ailleret, Poirier, Aron and Beaufre? Charles Ailleret played a very important role. He was a key lobbyist for the French nuclear program. He clearly understood the value of nuclear weapons for strategic bombing, for operations on the battlefield, and for deterrence. He was among those who persuaded de Gaulle to build tactical nuclear weapons. He was also a key operator in the nuclear program, from his days as head of the Army’s Special Weapons Command, to his responsibilities for the preparation of the first nuclear tests and his tenure of head of the

armed forces after 1962. But he did not have any significant input in the definition of the key concepts of French strategic nuclear doctrine apart, perhaps, for his early use of the expression “vital works” of the aggressor as prime targets.

Lucien Poirier was a significant operator and particularly valuable in the internal formalization of French doctrine through his writings. Many of his articles were co-authored with Ministry of Defense (MoD) colleagues between 1966 and 1968.²⁶⁸ The conclusions of these documents were reportedly approved by de Gaulle.²⁶⁹ His “test” and “warning shot” dual rationale for tactical nuclear weapons were included in the 1972 *White Paper*. But the “warning shot” had been envisioned by de Gaulle at least as early as 1964, and the French TNW doctrine evolved in a way that Poirier did not approve, in that it eventually emphasized the need to achieve effective military results. More generally, his influence was a bit overvalued because of his prolific and intellectually ambitious writings.²⁷⁰

Raymond Aron was of two minds concerning France’s nuclear effort. He saw it as a means to force the United States into sharing nuclear technology and having a meaningful dialogue with them on strategic issues. He viewed it as a possible prelude to a European deterrent, as well as an insurance policy against “the imprevisibility of the diplomatic future.”²⁷¹ He also recognized that it could be in some respects a contribution to Alliance security. But he became the most vocal opponent of the emerging French doctrine. Originally a close friend of Gallois, he later called him the “world champion of dogmatism” and his theses a “logical delirium.”²⁷² Opposing the withdrawal from the integrated military structure, he argued that a small deterrent force such as France’s was vulnerable, and would not be able to inflict sufficient damage to be credible.²⁷³ He derided other arguments, such as political influence, in favour of a French bomb.²⁷⁴ Aron had a critical role in intellectual and political debates, and contributed immensely to the formation of French strategic culture. He brought to the table his excellent knowledge and understanding of the U.S. strategic concepts. But he did not play an important part in constituting French official doctrine.

Finally, André Beaufre may be the most under-appreciated intellectual contributor to the formation of the doctrine. He was initially isolated from the Gaullist camp represented by Ailleret.

During the war, he was the main military aide to General Giraud, de Gaulle's rival. Later he was the herald of the pro-NATO faction in the armed forces, along with other generals such as Valluy and Stehlin. Thus, his vision was much closer to that of Aron, though the two never collaborated directly. But his views on several issues, such as the potential of tactical nuclear weapons and the contribution of French nuclear weapons to Alliance security, provided a strong intellectual backbone to de Gaulle's policy. As head of an inter-allied tactical studies group (a competitor to Gallois's New Approach Group [NAG]), he gave a key briefing to the French Chiefs of Staff in November 1954.²⁷⁵ He emphasized the importance of the link between tactical and strategic nuclear forces, and how the link served to avoid a situation where neutralization at the strategic level made conventional conflict possible. "It is indispensable that [the classical] level be made inseparable (*complètement solidaire*) from the nuclear level through the threat of tactical atomic weapons use. It is only at that price that nuclear deterrence can be fully efficient on the classical level."²⁷⁶ The primacy he gave to the hypothesis of "multilateral deterrence"—the idea that French doctrine was credible only in the context of a broader Alliance vs. USSR context—was shared by political leaders. Authors such as Poirier and officials such as Méry agreed that in a hypothetical bilateral face-off with Moscow, the *dissuasion du faible au fort* might not be operative.²⁷⁷ As a NATO staff officer, a member of the MoD's Policy planning staff, and later as the founder of the first French military think tank (the French Institute for Strategic Studies), he had the opportunity to weigh in on the formation of the national doctrine.²⁷⁸ And, as a master of formal models and conceptualization, he was an inspiration for later experts such as Poirier.

The Importance of U.S., UK, and NATO Inputs.

There was undoubtedly "something French" in the nature of the strategy constructed in the early 1960s. The strategy's logical consistency, simplicity, conceptual elegance, and its refusal to focus on technicalities reflected the French character.²⁷⁹ However, the French nuclear mythology does not do justice to the importance of

UK and U.S. inputs to the origins of French strategy. Indeed, it can be said that the French massive retaliation doctrine was to a large extent inherited from Allied thinking.

This should not come as a surprise. The UK government's adoption of a national massive retaliation strategy attracted attention in the early years of the French program.²⁸⁰ In *Stratégie de l'âge nucléaire*, Gallois describes at length the British deterrent and implicitly tells his French readers that Paris could adopt the same posture. In 1963 he acknowledged that the UK example was a "model" for France.²⁸¹ Indeed, deterrence of the strong by the weak and its logical implications were implicit in UK doctrine as early as 1957-1958.²⁸²

Most importantly, the French military thinkers all had NATO experience and numerous interactions with allied experts, in particular with the RAND Corporation, then the intellectual breeding ground of U.S. nuclear strategy. Beaufre held several NATO positions, including deputy-Chief of Staff at Supreme Headquarters Allied Powers Europe (SHAPE), and French representative to NATO's Standing Group. In 1952-53, he pioneered studies about early and massive use of tactical nuclear weapons.²⁸³ Gallois was one of the authors of MC-48. As one of the four so-called "hot colonels" forming the NAG, he helped design NATO's version of massive retaliation in 1953-54.²⁸⁴ The French liked the 1950s NATO strategy so much that they stuck to it, at least in spirit. The *disproportionate* deterrence concept was probably a direct import from U.S. strategy as described in John Foster Dulles's seminal 1954 article. Ten years later in 1964, as NATO rethought its strategy under U.S. pressure, Ailleret published two articles of quasi-official value. These articles emphasized early strategic and tactical use of nuclear weapons, akin to the "sword and shield" NATO conception which had been abandoned.²⁸⁵

Other allied inputs to French strategy included the concept of "unbearable" or "unacceptable" damage. The former expression was included in the UK *White Paper* of 1962, and the later was used by the U.S. Government in the early 1960s.²⁸⁶ Another borrowed concept was "sufficiency." The rejection of superiority was mentioned in UK documents from 1952 onwards.²⁸⁷ The term sufficiency was introduced by the Nixon administration in 1969. As mentioned above,

there is a troubling coincidence between the French “sufficiency” level and the U.S. criteria for “assured destruction” (a term later used by French leaders). Finally, one suspects that the later French debates about the diversification of strategic targets were influenced by the same debates that took place under the Nixon and Ford administrations.

U.S., UK, and NATO inputs to French nuclear culture have yet to be fully acknowledged by experts and policymakers on both sides of the Atlantic, especially in Paris where they remain today, to a large extent, the repressed memories of the French nuclear education.

The Importance of De Gaulle’s Personal Preferences and Pragmatism.

French strategy was, above all, de Gaulle’s strategy. The General was an important provider of ideas, such as *tous azimuts*. On the French contribution to the security of NATO and Europe, his personal positions were radically different from those of Gallois. A strong believer in the value of the Atlantic Alliance, he was ready to coordinate the use of “his” forces with those of London and Washington, and thought that “American nuclear weapons . . . remain the essential guarantee of world peace.”²⁸⁸ The Gallois and Poirier conceptions of a pure national deterrent were not his, neither would they be his successors.”²⁸⁹ Until at least the mid-1960s, he mused about a strategy of graduated strategic response.²⁹⁰ He approved the development of TNW as a tool for a more flexible strategy than the one described in 1964 by Ailleret (who was ready to renounce such weapons in order to build ICBMs²⁹¹). He rarely used the word “sanctuary,” with its rigid connotations.

As an analyst put it: “[Gallois’s] ‘absolutist’ thinking should not be confounded with de Gaulle’s, more pragmatic, more flexible, more ambiguous too. De Gaulle did not refute solidarity with the members of the Atlantic Alliance, nor conventional forces, supported by tactical nuclear weaponry, nor the notion of battle.”²⁹² In fact, one could say that de Gaulle made a *synthesis* between the Gallois-Poirier “pure-national deterrence” model and the Beaufre-Aron “flexible-transatlantic deterrence” model, while at the same time adding his own ideas such as *tous azimuts*.

De Gaulle's pragmatism and open-mindedness is also reflected in the fact that he did not seem to mind French strategy being determined to a large extent by the means available. What mattered to him was that the basic tools were there, and that there was a political will to use them.²⁹³ Doctrinal and technical refinements were of secondary importance. In the words of a leading French historian, "De Gaulle was only distantly interested in the theoretical aspects of deterrence strategy. A pragmatic before all, he considered in any case that a strategic doctrine could only be built from means. . . ." ²⁹⁴ In 1960, he told the Defense Council: "the force de frappe is a political weapon, technical precision is not essential."²⁹⁵ This was in line with his thinking on military strategy. As early as 1944, he said: "May French military thought resist the old attraction of preconceived thinking, of absolutism and dogmatism!"²⁹⁶ The "thank you" notes he wrote to the experts who respectfully sent their works to the Elysée were particularly revealing. To Aron he wrote: "I know that there is no respite for theologians." To Beaufre he wrote a more serious and less dismissive formula: "[I]n these matters, there is no worthwhile practice other than to depend on men and on circumstances."²⁹⁷ This did not mean that he was a supporter of "existential deterrence." His insistence on the ability to threaten a given portion of the Soviet State or population gives little room for such an interpretation. Nevertheless, the political dimension of deterrence was always given primacy over the operational dimension. As he half-jokingly said once about the upcoming *Mirage-IV* force, "[W]e don't have fighter aircraft, we have fear-inducing aircraft."²⁹⁸ He believed that as soon as it existed, the French bomb, despite its limited destructive power, would have *some* impact on the adversary's intentions.²⁹⁹

The Importance of Resources.

This therefore implied that the strategy would be strongly influenced by the financial and technical means available. Although naturally inclined to define specific concepts, those de Gaulle called the theologians did not necessarily mind this constraint. Gallois referred often to the importance of the "strategy of the means."³⁰⁰ After all, small countries such as the UK or France *had* to have the most cost-effective strategy.³⁰¹ But many French experts, especially

after de Gaulle, sought to enshrine the national nuclear doctrine in a rigid and elaborate theoretical framework, an approach not in line with the way the founder of the Fifth Republic thought about policies in general, and about nuclear policy in particular.

The targeting debate and the evolution of French forces is particularly telling about the relationship between concepts and resources, and reveals the importance of the “strategy of the means” as a driving factor in French Cold War nuclear strategy.

The Western or European part of the USSR comprised most of Soviet demographic, economic and political power. The 3,000 km range of France’s aircraft and missiles was adapted to this fact. However, the development of longer-range systems were also much costlier. Notwithstanding the fact that *tous azimuts* was perhaps as much a political point as a well-thought strategy, its actual implementation would have been very difficult. The 8,000 km ICBM program that was considered and defended by Ailleret as the true *tous azimuts* weapon was judged too expensive, especially in the post-May 1968 budgetary situation.³⁰²

Likewise, lack of intelligence, low accuracy, and the relative paucity of fissile materials drove France, as other nuclear powers before and after her, towards what was viewed as the most cost-efficient targeting strategy. In 1963, Messmer said that targeting cities was the only option that made sense given France’s means.³⁰³ Barre referred to the French strategy 14 years later as being, *inter alia*, “the less costly” option.³⁰⁴ In 1980, he stated that even if it wished to have a counterforce strategy, “France, a medium-sized nation with limited resources, cannot pretend seeking parity with the two great nuclear powers. The only way which is opened to us is that of the current strategy.”³⁰⁵

Nuclear weapons soon became a justification for avoiding major expenses in other fields, such as classical forces and defenses. France, like other European allies, refused to augment classical forces to a point where they could resist a conventional invasion of Europe.³⁰⁶ France never considered missile defense for herself. Such refusal was consistent with its strong rejection of civil defenses, to which the French were adamantly opposed. They thought such defenses might be seen in the eyes of the adversary as a “weak” posture signalling

a lack of faith by French leaders in the validity of their deterrent. However, the rejection of defenses can also be partially explained by France's inability, from a budgetary point of view, to modernize its nuclear forces, build an antiballistic missile (ABM) system, and build numerous fallout shelters. Since there was a strong belief among French elites in the value and efficiency of nuclear deterrence, budgetary concerns were probably not a dominant factor, but they no doubt played a part.³⁰⁷

Is the same logic applicable to the possible shift in targeting policy described above? In the late 1970s, the introduction of MIRVed systems was planned and scheduled for circa 1985. French thinkers and officials knew that the foreseeable increase in the number of warheads, as well as perhaps a better CEP, gave additional flexibility in targeting. Moreover, it was clear from U.S. calculations that an increase in warheads was better spent on industrial than on population targets; the efficiency curve was much steeper. Giscard claimed that the range of the future M4 missile was defined because of his new targeting instructions, but also that the new targeting guidance had been "proposed" to him by the military staff.³⁰⁸ One source says that he "notified" the Joint Staff in March 1980 to have new plans prepared that would be adapted to the introduction of MIRV.³⁰⁹ This point thus remains unclear.

CONCLUSIONS:

FRENCH STRATEGY IN A HISTORICAL PERSPECTIVE

A Resilient but Adaptable Doctrine.

Up to 1981, French nuclear doctrine remained remarkably faithful to its basic tenets as defined by de Gaulle: a small, "sufficient" deterrent force independently operated and targeted, which would only defend France's vital interests. The concept was that, if Moscow unmistakably signalled its intention to conquer France, struck the country with nuclear weapons, or crippled the French State as an organized entity, Paris would launch a single massive retaliatory strike on key Soviet cities, causing superior damage to the stake that it represented.

This resiliency stemmed from several factors. One was the simplicity and logical consistency of the French strategy. Another was certainly the relative paucity of means available, which to a large extent saved France from debates such as counterforce vs. countervalue, or offense vs. defense. A third was probably the hesitation of French presidents to fundamentally alter the heritage of de Gaulle, who remained an inescapable reference for most French politicians.

At the same time, by 1981 the doctrine had become more focused than the Gaullist approach (by getting rid of *tous azimuts*), and more flexible than what the leading French strategists wanted (by suggesting that it would contribute to the overall security of Europe, by introducing TNW as a tool of deterrence, and by broadening the range of targets). Also, the numbers and explosive power of the force had dramatically increased, making it more credible than in 1967.

France adopted many allied concepts, but also developed some of its own. There were always two distinct dynamics in this regard. One was a process of *imitation* of allied concepts, either through the introduction of exogenous ideas or through a logical process identical to evolutions in other countries' thinking (including the adaptation of strategies to means available). Another, which came along with France's more autonomous stance and the Alliance's own evolution, was "dissociation." Dissociation applied to the maintenance of a strategy discarded by NATO, to the apparent abandonment of the "consultation-coordination" option, and to the affirmation of some original concepts (*tous azimuts*, *détonateur*, *chèvre au piquet*, *ultime avertissement*).

Can it be said, as some have argued, that opposition to flexible response had only a political purpose, and that in fact France ended up having a strategy very close to that of the Alliance?³¹⁰ This seems an exaggeration. There were sound conceptual bases for the country to endorse a massive retaliation strategy. Although French strategy was more flexible than it was in the beginning, there remained irreconcilable differences with U.S. and NATO concepts. France refused to consider strategic counterforce options, the massive use of tactical nuclear weapons in a "direct defense" scenario, or any kind of follow-one use of TNW. The "final warning" concept exemplified a compromise between massive retaliation and flexible response.

A “Minimum Assured Destruction” Capability.

How relevant is the French example to the history of MAD? The expression “mutual assured destruction” was never part of French official nuclear rhetoric.³¹¹ The “mutual” part was, of course, not relevant to a “deterrence of the strong by the weak” posture. And, in practice, there was no conceivable contingency where France would be alone in facing the Soviet Union with the rest of the Alliance as spectators. But France’s nuclear history nevertheless brings interesting insights for the broader history of the massive retaliation and assured destruction concepts. As seen above, far from being a truly original creation, the initial French doctrine was largely inherited from U.S., UK, and NATO doctrines of the 1950s, including the Dulles 1954 concept. Later, the expression “massive retaliation” itself was occasionally used.

Interestingly, France also seems to have been inspired later by MacNamara’s brief flirtation with a pure assured destruction strategy, and it is possible that U.S. calculations on the requirements of such a strategy had an impact on French debates on “sufficiency.” French experts and leaders were quite conscious of the importance of a second-strike asset, and a SSBN program had been in the works since 1960. Given the small size of the French territory, other options had too many drawbacks.³¹² In 1973, President Pompidou referred to the emerging “assured second strike” capability of France.³¹³ By the late 1970s political and military leaders hinted in public speeches that a threshold was being crossed. In 1980, Barre stated explicitly that France had reached “a deterrence capability making it able to prevent major aggression.”³¹⁴ Indeed, in 1981 the fifth SSBN entered service, which allowed up to three boats to be on patrol at all times. It also allowed launching on generated alert, in a second-strike situation, up to 64 warheads (four loads of single-warhead missiles).³¹⁵ At the same time, the French deterrent’s total yield was considerably increased with the introduction of thermonuclear weapons of megaton yield. Such capabilities allowed for the targeting of about 50 cities, representing about 20 percent of Soviet population (46 million people, the rough equivalent of France), and 40-50 percent of Soviet industry. These percentages were similar to MacNamara’s

1968 criteria for assured destruction. That may be what allowed Prime Minister Barre to state that “France has achieved a deterrence capability allowing her to prevent a major aggression,” which he described as the ability to threaten the adversary with “the assured destruction of a notable part of his cities and his economy.”³¹⁶ In other words, France had achieved what could be called a “minimum assured destruction” capability.

ENDNOTES - CHAPTER 2

1. Some of the most thorough analyses of French strategy have been conducted by foreign experts such as Philip Gordon, Beatrice Heuser, Lothar Ruehl, Diego Ruiz Palmer, and David Yost. On the early French nuclear program, the works of Wilfrid Kohl and Lawrence Scheinman, as well as the Norris, Burrows & Fieldhouse Nuclear Weapons Databook Vol. V, are useful sources. Since the late 1980s, important scholarly work has been conducted in France on the nation’s defense policy and nuclear program, in particular by Frédéric Bozo, Samy Cohen, Marcel Duval, Dominique Mongin, Georges-Henri Soutou, and Maurice Vaïsse. Also, new insights on Gaullist thinking have been provided by the writings of Jean Lacouture and Alain Peyrefitte. The works of these authors were particularly useful in researching for this chapter. The author would also like to thank Sir Michael Quinlan and Dr. David Yost for their thoughtful comments on an earlier draft of this chapter.

2. See Université de Franche-Comté/Institut Charles de Gaulle, *L’aventure de la bombe: De Gaulle et la dissuasion nucléaire 1958-1969*, Paris: Plon, 1985; Pierre-Marie Gallois, *Le sablier du siècle: mémoires*, Lausanne: L’Âge d’homme, 1999, pp. 370-373; and Dominique Mongin, *La bombe atomique française 1945-1958*, Brussels: Bruylant, 1997, p. 418.

3. The MC-48 document, committing NATO to the defense of Europe through the early and massive use of nuclear weapons, had been endorsed by the North Atlantic Council (NAC) on December 17, 1954.

4. For a broader perspective, see Chapter 7 by David Yost in this volume.

5. Artificial radioactivity was discovered by Frédéric and Irène Joliot-Curie in 1934. The possibility of atomic reaction was demonstrated by Frédéric Joliot-Curie and his staff in 1939.

6. Geoffroy de Courcel in *L’aventure de la bombe*, p. 16.

7. See Alain Peyrefitte, *C’était de Gaulle*, Paris: Gallimard, 2002, p. 1,313.

8. On this point, see Mongin. The idea of nuclear power as embodying modernity would remain present in Gaullist French rhetoric; even by 1976, President Giscard d’Estaing would refer to the need for France to always have the “most advanced” weapons, hinting that it was one of the prime rationales for the

French bomb. See Valéry Giscard d'Estaing, speech to the IHEDN, June 1, 1976, text reproduced in *Revue de la défense nationale* [hereafter: RDN], July 1976, p. 12.

9. Charles Ailleret, *L'aventure atomique française, Comment naquit la force de frappe*, Paris: Grasset, 1968, pp. 96.

10. Some argued against what amounted for them to unilateral disarmament, others did not want France to give up nuclear weapons at the time others were building the bomb. The amendment was defeated 518/100.

11. Ailleret, *L'aventure atomique française*, pp. 124-141.

12. See Marcel Duval and Dominique Mongin, *Histoire des forces nucléaires françaises depuis 1945*, Paris: Presses Universitaires de France, 1993, p. 32.

13. An August 1954 note by the Head of the "Services des Pactes" of the Ministry of Foreign Affairs stated that: "The direction of strategy will from now on, increasingly, belong to the powers possessing the atomic weapon. . . . It is essential that France undertakes an atomic military program. Otherwise, its security will be entirely assured by the Anglo-Saxons," quoted in Georges-Henri Soutou, "La politique nucléaire de Mendès-France," *Relations Internationales*, Vol. 59, Fall 1989, p. 320. In September 1954, General Georges Catroux told the Defense Council: "There will be States which have the atomic bomb, which won't use it among themselves. There will be States which do not have the atomic bomb and they will be the nuclear battlefield," quoted in Soutou, p. 321. A note in the dossier presented to the December 1954 Cabinet meeting stated that "no country will . . . be able, in the near future, to claim true political independence if it does not possess atomic weapons," quoted in Soutou, p. 326.

14. As reported by Bertrand Goldschmidt in Mongin, p. 333.

15. "By lack of atomic weaponry, of which we have left the monopoly to others, our forces, expensive as they are, do not constitute a [coherent] whole, and as a result they are relegated to being mere auxiliaries. . . . France too needs to be an atomic power," Press conference, April 7, 1954, in Charles de Gaulle, *Discours & Messages*, Vol. II, Paris: Plon, 1970, p. 607.

16. Lawrence Scheinman, *Atomic Energy Policy in France Under The Fourth Republic*, Princeton: Princeton University Press, 1965, p. 213.

17. In a December 1954 note, the Political Director of the Ministry of Foreign Affairs made clear that the French preference at that time for the use of nuclear weapons in the defense of Europe would have been a joint decision "at Three" for a collective use of American, British, and French arsenals. See Soutou, p. 322. Note also that there was talk in government circles of a European nuclear force as early as 1954, and that there was a plan in 1957 to jointly develop nuclear weapons with Italy and Germany (the so-called "FIG" project). Also, for some such as Premier Plevin, a national nuclear force might have been a compensation for the integration of French forces into the planned European Defense Community (EDC).

18. Jean Lacouture, *De Gaulle, III: Le souverain, 1959-1970*, Paris: Seuil, 1986, p. 452.

19. Scott Sagan has used the French experience as exemplifying his “norms” model, making the French program essentially a product of symbolic politics and a quest for “grandeur.” Scott D. Sagan, “Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb,” *International Security*, Vol. 21, No. 3, Winter 1996-1997, pp. 76-80. However, his dismissal of the security arguments is not convincing. In support of his thesis, Sagan argues first that France made “the two most critical decisions initiating the weapons program” before the Suez crisis. But the decisions taken before the end of 1956 had not put France on an irreversible course towards an operational nuclear weapons program. Second, Sagan uses the British example to argue that the outcome of the Suez crisis would have been the same for a nuclear France. But the UK nuclear force was still in its infancy, about 15 bombs, and was closely integrated to that of the United States. And Suez just confirmed the doubts many had about the U.S. alliance, which would be reinforced by the 1957 events. Third, Sagan dismisses French belief that the U.S. guarantee was unreliable on the grounds that other European nations gave up the nuclear option, and that the United States had come to save France in 1944. This argument is curious in that it discusses perceptions, which are not challengeable provided that they are documented. Also, while Sagan emphasizes the United States entering the war in 1941, the French view was that the country had been defeated and occupied for 3 years, and that only when Washington saw that its own interests were at stake, did it decide to go to war. Finally, among the countries which had been occupied in the Second World War, only France had the budgetary and technical means to embark in a nuclear program.

20. This expression *force de frappe* was used until 1960, when Prime minister Debré made *force de dissuasion* the official expression. Lacouture, p. 465.

21. De Gaulle to Maurice Schumann, quoted in Pierre Messmer & Alain Larcen, *Les écrits militaires du général de Gaulle*, Paris: Presses Universitaires de France, 1985, p. 201. The 1940 trauma was also a significant motivation for the Fourth Republic’s politicians. See André Bendjebbar, *Histoire secrète de la bombe atomique française*, Paris: Le Cherche-Midi éditeur, 2000, p. 182; and Mongin, p. 410. Felix Gaillard’s first reaction when hearing the news about the first test was that France had finally “overcome” the 1940 defeat, quoted in Bendjebbar, p. 290; de Gaulle himself, attending a test in the Pacific, also used the word “resurrection,” as reported by Peyrefitte, pp. 1,352-1,353.

22. Lacouture, p. 466. De Gaulle would emphasize the fact that twice in the past decades, “the Americans have waited 3 years before deciding to land [in Europe],” quoted in Lacouture, p. 707. This point would be reiterated to Eisenhower in 1959. See Charles de Gaulle, *Mémoires d’espoir. Le Renouveau*, Paris: Gallimard, 2000, p. 1,068.

23. On the impact of Suez, see Bendjebbar, pp. 224, 228.

24. On this point, see Frédéric Bozo, *Deux stratégies pour l’Europe; De Gaulle*,

les Etats-Unis et l'Alliance atlantique, 1958-1969, Paris: Plon/Fondation Charles de Gaulle, 1996, pp. 124-127.

25. See Peyrefitte, p. 349.

26. Press conference at the Elysée Palace, January 14, 1963, in Charles de Gaulle, *Discours & Messages*, Vol. IV, Paris: Plon, 1970, p. 73.

27. As reported by Peyrefitte, p. 707.

You see, for a long time, one could count on the automaticity of alliances, because they were totally committing the existence of a nation. Today, atomic warfare puts all commitments into question. Can you imagine a U.S. President taking the risk of condemning to death tens of millions of Americans in application of an alliance treaty?

28. See Lacouture, pp. 352-353.

29. See Bendjebbar; and Mongin. Some in the government community also developed the interesting argument according to which the possession of nuclear weapons would deter foreign intervention in French overseas possessions, see Mongin, p. 416.

30. As reported by Peyrefitte, p. 1,408.

31. The exact causal relationship here is complex. To some extent, for instance, the decolonization of Algeria made the bomb possible by freeing additional defense resources.

32. Speech at the Ecole militaire, February 15, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 85. He also referred twice to the "strategic, and therefore political, dependence" of European non-nuclear nations vis-à-vis the United States in his press conference at the Elysée Palace on July 23, 1964, in *ibid.*, p. 231.

33. On this point, see Philip Gordon, *A Certain Idea of France. French Security Policy and the Gaullist Legacy*, Princeton: Princeton University Press, 1993, p. 42.

34. Press conference at the Elysée Palace, July 29, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 124.

35. Quoted in Bendjebbar, p. 302.

36. Press conference at the Elysée Palace, July 23, 1964, in de Gaulle, *Discours & Messages*, Vol. IV, pp. 226-227.

37. De Gaulle, *Mémoires d'espoir*, p. 1,063.

38. *Ibid.*, p. 1,067.

39. "We were part [of the Alliance], of course, as long as we did not have our bombs. But from the time we have them, and they are not part of NATO, we are essentially no longer in NATO," as reported by Peyrefitte, p. 648. Also: ". . . one does not integrate atomic forces," *ibid.*, p. 1,397.

40. See Peyrefitte, pp. 389-390.

41. This infuriated de Gaulle to the point of telling Norstad, who was personally sympathetic to French views: "Please tell your government that it is the last time that France accepts such an answer on this subject!" See Lacouture, p. 465; and Duval, p. 69.

42. There was reportedly a French right of veto on the use of these warheads, Duval, p. 70.

43. Speech in Lyon, September 28, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 137; and Peyrefitte, p. 715.

44. Press conference at the Elysée Palace, July 23, 1964, in de Gaulle, *Discours & Messages*, Vol. IV, p. 229. This idea inherited from the 1950s still imprinted Gaullist thinking.

45. See Paul Balta, "Dix ans de politique étrangère," *RDN*, May 1968, p. 817.

46. See Peyrefitte, p. 1,408.

47. General Alfred Buchalet, "Les premières étapes, 1955-1960," in *L'aventure de la bombe*, p. 52.

48. See Bozo, pp. 30-31. France did get some initial help from Washington in the form of a small stock of enriched uranium for propulsion research. Reportedly, the sale was authorized in 1959 on the grounds that, according to the U.S. Navy, France was unable to build nuclear propulsion reactors anyway. See Jacques Chevallier, "La genèse de la force de dissuasion nucléaire française," in Vaïsse, ed., *Armement et Vème République*, p. 286.

49. The same reasoning would later be applied to thermonuclear weapons: de Gaulle thought it was indispensable that France had the same means as the other nuclear powers. See Peyrefitte, pp. 1,325-1,388.

50. See radio/TV speech of April 19, 1963, in De Gaulle, *Discours & Messages*, Vol. IV, p. 96; and speech in Lyon in *ibid.*, p. 137.

51. Samy Cohen, *La défaite des généraux. Le pouvoir politique et l'armée sous la Vème République*, Paris: Fayard, 1994, pp. 50-51.

52. Samy Cohen, "France, Civil-Military Relations, and Nuclear Weapons," *Security Studies*, Vol. 4, No. 1, Autumn 1994, pp. 153-179, especially p. 161. De Gaulle justified the direct election of the President of the Republic by the authority to use nuclear weapons, see Peyrefitte, p. 1,359; and Pierre Messmer, "Notre politique militaire," *RDN*, May 1963, p. 760.

53. See André Beaufre, *NATO and Europe*, New York: Vintage Books, 1966, p. 25.

54. Stt Marc Trachtenberg, "La formation du système de défense occidental: les Etats-Unis, la France et MC-48," in Maurice Vaïsse, Pierre Mélandri, and Frédéric Bozo, eds., *La France et l'OTAN, 1949-1996*, Brussels: Complexe, 1996, pp. 115-127.

55. General François Valentin in *L'aventure de la bombe*, p. 270.

56. Beaufre, quoted in Mongin, p. 263. See also the 1954 testimony of General Catroux in Soutou, p. 321.
57. See Mongin, p. 251.
58. In the public debate, a rare exception was General Paul Gerardot, who argued in favour of "an efficient reprisals system specific to our country and freed from any servitude." See "Plaidoyer pour l'attaque," *RDN*, March 1956, pp. 285-305.
59. Quoted in Cohen, *La défaite des généraux*, p. 84.
60. There is another link between the two issues: the reduction in conventional forces following the withdrawal from Algeria allowed for a greater share of the defense budget to be devoted to the nuclear program.
61. Cohen, *La défaite des généraux*, p. 84.
62. See Gallois, *Le sablier du siècle*, p. 371.
63. The expression was used by de Gaulle at the end of his 1956 conversation with Gallois, see Introduction.
64. When Valéry Giscard d'Estaing was elected president in 1974, he invited Aron, Beaufre, and Gallois for lunch to inform him about nuclear strategy, Aron, *Mémoires*, pp. 566-567.
65. Raoul Castex, "Aperçus sur la bombe atomique," *RDN*, October 1945, pp. 466-473. The causal link with de Gaulle's decision is suggested by Lacouture, p. 453. The general admired and respected Castex, and the decision was taken a few days after the publication of the article.
66. France's bomb was also a means for what could be called "persuasion of the strong by the weak." "The possession of some nuclear weaponry will constitute one of the only means to have independence and sovereignty of the country respected by a stronger party," Pierre-Marie Gallois, "L'affaire de Berlin ou la peur d'une ombre," *La Nef*, No. 27, Avril 1959, p. 28. De Gaulle suggested that only after Israel got the bomb did the United States commit itself to guarantee its borders. See Peyrefitte, p. 707.
67. Press conference of July 23, 1964, at the Elysée Palace, in de Gaulle, *Discours & Messages*, Vol. IV, p. 233.
68. Ministère de la Défense, *Livre blanc sur la défense nationale*, Vol. I, 1972. Interestingly, the expression "deterrence of the strong by the weak" was not widely used by officials. A rare exception is general Fourquet in 1969.
69. See Pierre-Marie Gallois, *Stratégie de L'âge Nucléaire*, Paris: Calmann-Lévy, 1960, pp. 3-4.
70. Castex: "The weak nation, as much as the strong nation, will possess atomic weapons, in lower quantities probably, but these considerations of numbers do not matter much for weapons which have such a great individual power," p. 467. 1954 dossier: ". . . the threat of destruction that such devices entails must be enough to

deter an aggressor, even [if he is] much more powerful,” quoted in Soutou, p. 24.

71. See Lucien Poirier, *Des Stratégies Nucléaires*, Brussels: Complexe, 1988, p. 298.

72. This expression originally had a slightly broader meaning. It was used by UK and U.S. authors in the 1950s to describe concepts of “flexibility” and “adaptation” of nuclear reprisals to the value of the stake defended.

73. “The force de frappe can be made proportional to the value of the stake that it represents,” Gallois, *Stratégie de l’âge nucléaire*, p. 184.

74. As reported by Peyrefitte, p. 350.

75. *Ibid.*, p. 368.

76. Aron, quoting his November 16, 1959, article in Raymond Aron, *Mémoires: 50 ans de réflexion politique*, Paris: Julliard, 1983, p. 429.

77. Gallois, *Stratégie de l’âge nucléaire*, p. 189.

78. Pierre-Marie Gallois, “La logique de l’ère nucléaire et ses incidences sur l’OTAN,” in Claude Delmas, Maurice Faure, Général Gallois, and Général Carpentier, *L’avenir de l’alliance atlantique*, Paris: Berger-Levrault, 1961, pp. 144-145.

79. André Beaufre, *Introduction à la stratégie*, Paris: Armand Colin, 1963, chapter 3.

80. As reported by Peyrefitte, p. 710. He stated again in 1966 that “the risk that an adversary would run would be incommensurably superior to the stake that we would represent for him,” *ibid.*, p. 1,359. A more official statement was “damage incommensurable with the aggressor’s benefits,” Charles Ailleret, conference at the IHEDN, December 19, 1967, quoted in Ruehl, p. 214.

81. *Livre blanc sur la défense*, Vol. I.

82. Dulles said that deterrence “requires that a potential aggressor be left in no doubt that he would be certain to suffer from damage outweighing any possible gain from aggression. . . . a potential aggressor should know in advance that he can and will be made to suffer for his aggression more than he can possibly gain by it. . . . a prospective attacker is not likely to invade if he believes the probable hurt will outbalance the probable gain,” John Foster Dulles, “Policies for Security and Peace,” *Foreign Affairs*, Vol. 32, No. 3, April 1954, pp. 357-359.

83. “An almost unprecedented disparity between what an aggressor stands to gain and what he risks losing as result of his aggression,” Giscard d’Estaing, speech to the IHEDN, June 1, 1976, p. 13; “. . . the damage would be incommensurable with the profit the aggressor could hope from his action,” Raymond Barre, speech to the IHEDN, September 11, 1980, text reproduced as “La politique de défense de la France,” RDN, November 1980, p. 12.

84. Gallois, *Le sablier du siècle*, p. 402.

85. See Michel Fourquet, Conference to the IHEDN, March 1969; *Livre blanc*

sur la défense, Vol. I; and Guy Méry, "Une armée pour quoi faire et comment?" RDN, June 1976, p. 17.

86. Poirier, *Des stratégies nucléaires*, p. 192.

87. See, for instance, de Gaulle as reported by Peyrefitte, p. 710.

88. *Livre blanc sur la défense*, Vol. I; Valéry Giscard d'Estaing, press conference of June 1980 quoted in Duval, p. 60; and Barre, "La politique de défense de la France," p. 17. Giscard thought that the French deterrent applied only to threats of nuclear attacks and of invasion and was an early proponent of "negative security assurances." See his press conference of October 24, 1974, text reproduced in Assemblée nationale, Rapport d'information déposé en application de l'article 145 du Règlement par la Commission de la défense nationale et des forces armées sur l'état et la modernisation des forces nucléaires françaises, et présenté par M. Raymond Tourrain, Député, No. 1730, May 1980, p. 23. In 1977 the government confirmed that France rejected "no-first-use," Raymond Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," RDN, July-August 1977, p. 9.

89. The expression "attached goat" (*chèvre au piquet*), referred to the strategy used by shepherds to attract and ambush wild animals such as wolves. The theory is described in the 1972 *White Paper*.

90. Quoted in Bozo, p. 130.

91. See Peyrefitte, pp. 710-711.

92. "... one can think of a number of circumstances in which the alternative of 'all or nothing' would make our posture less realistic and less credible . . . we have already rejected the 'all or nothing' solution," Fourquet.

93. "None of the countries possessing [nuclear] weapons will give them up. On the contrary, others will get them sooner or later. The Bomb will disseminate. This is inevitable. Danger can come from anywhere. Do you hear me? Anywhere! We must get ready to strike at any point of the compass, tous azimuts," as reported by Peyrefitte, p. 708.

94. See the testimonies of General Bourgue and Alain Larcan in *L'aventure de la bombe*, pp. 201-202.

95. Conference of November 3, 1959, Untitled document, Fondation Charles de Gaulle.

96. See Peyrefitte, pp. 299-300, 708. The hypothesis of a nuclear strike against the Tunisian port of Bizerte was mentioned in 1963, *ibid.*, pp. 420, 708-709. In December 1966, he said: "The Germans, the Algerians and the Tunisians need to know that if they wanted to create us trouble, we could easily crush them," *ibid.*, p. 1,389. The reference to Germany may appear shocking coming from de Gaulle, who had fostered the reconciliation between the two countries; but he was in fact mindful about German national culture and said many times that Bonn should not get the bomb. See, for instance, *ibid.*, p. 1,356.

97. Speech to the Coët-Quidan military school, February 16, 1965, in De Gaulle, *Discours & Messages*, Vol. IV, p. 345.

98. This important and still classified document is quoted in Lacouture, pp. 477-478.

99. Quoted in Pierre Pascallon, "La dissuasion nucléaire française à l'heure du comité stratégique et de la nouvelle loi de programmation militaire," in Pierre Pascallon, ed., *Quel avenir pour la dissuasion nucléaire française?* Brussels: Bruylant, 1996, p. 261.

100. Charles Ailleret, "Défense 'dirigée' ou défense 'tous azimuts'," RDN, December 1967, pp. 1,924-1,932.

101. As reported by Peyrefitte, p. 299.

102. See Lacouture, p. 477.

103. Such implicit references to an "enemy from the East" include the Fourquet 1969 speech and the 1977-1982 Defense Plan.

104. Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 12.

105. De Gaulle, *Mémoires d'espoir*, p. 1,063. In 1959, the option to acquire nuclear systems from another country was still officially considered. See Charles de Gaulle, speech at the Ecole militaire, November 3, 1959, reproduced in Dominique David, *La politique de défense de la France*, Textes et documents, Paris: FEDN, 1989, p. 73.

106. De Gaulle, speech at the Ecole militaire, November 3, 1959, p. 71.

107. Quoted in Lacouture, p. 353.

108. Gallois, *Stratégie de l'âge nucléaire*, p. 197.

109. The *White Paper* would reaffirm that flexible response was at best a second-best solution, and at worse an illusion. But this was not meant to be a criticism: it was "the natural order of things, since deterrence is exclusively national." There was, however, an element of dissociation in the *White Paper* vis-à-vis the absolutist Gallois thinking: the mention that "presently" the nuclear risk could not be shared, perhaps opening the way for a future integrated Europe. *Livre blanc sur la défense*, Vol. I.

110. "In fact, because national unanimity could only be made when facing a grave threat, the domain of efficacy of the deterrence strategy is more generally limited to the defense of the vital interests of the country that practices this strategy," Gallois, *Stratégie de l'âge nucléaire*, p. 210; also *ibid.*, p. 218; for De Gaulle, see Peyrefitte, p. 618.

111. "But due to the mere fact that it is a European force, the 'French' atomic force will in any case be employed automatically for the defense of Europe, as this defense means the same as the defense of France. It could not be imagined in any way that Germany was attacked by Russia, without France being lost simultaneously," conversation with a German official, July 1964, quoted in Heuser, p. 155. He proposed to Adenauer a formal nuclear security guarantee in 1963. On this point, see, for instance, Peyrefitte, p. 710. A scholar has noted that this proposal was not mentioned in the German record of the meeting, see

Georges-Henri Soutou, *L'Alliance incertaine*, Paris: Fayard, 1996, p. 274. However, this was not mere posturing. In private, de Gaulle said: "But it will protect them automatically! In a much better way than the American force [does]! For the simple reason that we are Europeans and the Americans are not. The American interest to not let Europe be destroyed is minuscule as compared to ours. If Europe is invaded, we are toast." As reported by Peyrefitte, p. 653. See also p. 858.

112. Quoted in Vincent Jauvert, *L'Amérique contre de Gaulle. Histoire secrète, 1961-1969*, Paris: Seuil, 2000, p. 29.

113. Quoted in Jacques Isnard, "Le grand déballage nucléaire," *Le Monde*, February 4, 1997.

114. "M. Pompidou: 'La force de dissuasion française joue automatiquement au bénéfice de l'Europe'," *Le Monde*, December 3, 1964.

115. Fourquet.

116. "France lives in a web of interests which exceeds her frontiers. . . . Our vital interests are located on our territory and on its approaches," *Livre blanc sur la défense*, Vol. I.

117. See Gordon, pp. 44-47.

118. See Soutou, p. 322.

119. See the text of the September 1958 memorandum to the UK and the U.S. Governments in Bozo, pp. 262-263. According to Gallois, the Taiwan Straits crisis, where the use of nuclear weapons had been considered, was reportedly a triggering factor in de Gaulle's proposal, Gallois, *Le sablier du siècle*, p. 466.

120. Eisenhower meeting: de Gaulle, *Mémoires d'espoir*, p. 1,068. The quote is from de Gaulle's meeting with Kennedy in 1961 and is mentioned in Jauvert, pp. 30-31.

121. See Peyrefitte, p. 360.

122. Loi de programme No. 60-1305 du 8 décembre 1960 relative à certains équipements militaires, 1960-1964, text reproduced in Tourrain, p. 141.

123. Press conference at the Elysée palace, January 14, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 76. Coordination was welcome "in particular in wartime," Peyrefitte, p. 372.

124. Speech at the Ecole militaire, de Gaulle, *Discours & Messages*, Vol. IV, p. 83.

125. The 1965 military program law still affirmed that the action of French forces, conventional and nuclear, would be "in principle conjugated with those of our allies," quoted in Ruehl, p. 211.

126. Beaufre, *Dissuasion et stratégie*, p. 188. In his next book, he referred to an "interallied coordination of national deterrent strategies during peacetime." Beaufre, *NATO and Europe*, chapter 5, and p. 188.

127. See Bozo, pp. 201-202.

128. Beaufre, *NATO and Europe*, p. 70.

129. André Beaufre, conference to the IHEDN, 1968, reproduced in Charles Zorgbibe, *Textes de stratégie nucléaire*, Paris: Presses Universitaires de France, 1993, p. 17.

130. Beaufre, *Dissuasion et stratégie*, pp. 101, 108. He was, however, wary of nuclear proliferation. See p. 108.

131. Gallois thought that the Soviet Union would not run the risk “of losing about thirty urban concentrations, tens of ports installations and other military targets, putting itself in a position of inferiority vis-à-vis the United States or China, spectators of the conflict,” in *L’aventure de la bombe*, p. 205.

132. See Peyrefitte, p. 710.

133. Quoted in Lacouture, p. 353.

134. See Peyrefitte, p. 710.

135. Press conference at the Elysée Palace, July 23, 1964, in de Gaulle, *Discours & Messages*, Vol. IV, p. 233.

136. *Livre blanc sur la défense*, Vol. I.

137. Jacques Chirac, speech at the camp de Mailly, February 10, 1975, text reproduced as “Au sujet des armes nucléaires tactiques françaises,” RDN, May 1975, p. 12.

138. Debate of December 3, 1964, quoted in Ruehl, p. 193.

139. “The threat, though not explicit, of using the French atomic force as a detonator is its sole conceivable deterrence function within the framework of the present Atlantic organization.” Raymond Aron, *Le grand débat. Initiation à la stratégie atomique*, Paris: Calmann-Lévy, 1963, p. 156. On Gallois’ perceptions, see *Le sablier du siècle*, pp. 389-390.

140. Such as Félix Gaillard, according to Lacouture, p. 471.

141. Gallois, *Stratégie de l’âge nucléaire*, pp. 185-189. He writes that due to the emerging vulnerability of the U.S. territory, “It is thus not certain that the small atomic arsenal of less wealthy peoples may effectively play the role of a fuse leading to the explosion of the powder keg of the Greats”; but he also acknowledges that it could be “an ‘accelerator’ in the march towards the great trial.”

142. “I did not really believe at that time in the idea, then common, of the ‘trigger’ . . .,” Aron, *Mémoires*, p. 430.

143. He does so in a dismissive footnote: “. . . the simplifying theory of the ‘trigger’ does not even deserve a discussion. Nobody wants to trigger a nuclear conflict.” André Beaufre, *Dissuasion et stratégie*, Paris: Armand Colin, 1964, p. 94.

144. Beaufre, *Dissuasion et stratégie*, p. 94.

145. In some circumstances only—for Beaufre also acknowledged that, overall,

“the existence of a third partner limits in some respects the freedom of action of the two others,” Beaufre, *Dissuasion et stratégie*, p. 94.

146. *Ibid.*, p. 92.

147. See Michel Debré, “La France et sa défense,” RDN, January 1972, pp. 6-8. Scholars who rejected de Gaulle’s belief in the concept include Lacouture, p. 471.

148. Georges Pompidou, National Assembly debate of December 2, 1964, quoted in Ruehl, p. 192.

149. See Peyrefitte, pp. 433, 638.

150. As reported by *Ibid.*, p. 638.

151. *Ibid.*, p. 353.

152. Giscard’s testimony is slightly ambiguous, and it is difficult to tell whether it supports the “hard” or “soft” interpretation: “be useful as a trigger in case the United States hesitated in employing their own strategic nuclear means to deter the Soviets to invade Europe,” Giscard d’Estaing, *Le pouvoir et la vie*, p. 192; and “be able ourselves to decide on a nuclear action that would constrain the United States if they hesitated to bring into play the superiority they had at the time vis-à-vis the USSR in nuclear matters,” Interview in *Le Figaro*, December 12, 1983, p. 6. David Yost has suggested an in-between interpretation which corresponds to one of the Beaufre hypotheses: in a crisis, the threat or use of French nuclear weapons would force “a U.S. involvement bringing about termination of the conflict on terms acceptable to the West.” David S. Yost, *France’s Deterrent Posture and Security in Europe. Part II: Strategic and Arms Control Implications*, Adelphi Paper No. 195, London: International Institute for Strategic Studies, Winter 1984-85, p. 18.

153. He reportedly told Army Chief of Staff general de Boissieu in 1970 the following:

From the time when the 1st Army and the tactical air forces will have tactical atomic [weaponry], the Alliance will not be able to envision our manoeuvre forces only with their conventional means. You will have to let them know that you envision to counterattack with the support of our tactical nuclear forces. Thus if the allied high command needs this only strategic reserve in Europe, it will have to decide employing its nuclear fires beforehand or at the same time.

This important statement was first publicly quoted by defense minister André Giraud in *Discours aux Assises du Mouvement européen*, October 11, 1987, text reproduced in David, p. 292.

154. Fourquet.

155. See below, part V.

156. In 1951, Lord Cherwell, adviser to Winston Churchill on nuclear matters, wrote him: “If we are unable to make bombs ourselves and have to rely entirely on the United States army for this vital weapon, we shall sink to the rank of a second-

class nation, only permitted to supply auxiliary troops, like the native levies who were allowed small arms but not artillery." Quoted in Margaret Gowing, *Independence and Deterrence. Britain and Atomic Energy 1945-1952, Vol. I: Policy-Making*, New-York: St. Martin's 1974, p. 407. On Suez, see Lawrence Freedman, "British Nuclear Targeting," in Ball & Richelson, p. 114.

157. This would be acknowledged by London in 1980, see the contribution by Michael Quinlan in this volume; and also Heuser, p. 77.

158. Beaufre, *Dissuasion et stratégie*, pp. 85-116. He justified the multiplicity of nuclear decision centers by the deterrent effect of the addition of "several methods of deterrence." André Beaufre, "The sharing of nuclear responsibilities: a problem in need of solution," *International Affairs*, Vol. 31, No. 3, July 1965, p. 416.

159. After 1957, the French position was that it would only accept U.S. ballistic missiles on the national territory if they were under a formal "dual-key" system and if Washington was willing to help Paris build its own deterrent through cooperation agreements similar to those existing with London. When he returned to power in 1958, de Gaulle sought U.S. technological help for the French nuclear efforts, and cooperation options were discussed in various forms until 1966. But French insistence on maximum national control and U.S. political or military resistances prevented the emergence of mutually acceptable solutions. In particular, in 1962, Paris refused a U.S. offer to endow France with *Polaris* SLBMs, suspecting that it was an attempt to put the nascent French force under U.S. tutelage. Paris later bought 12 KC-135 aircraft and supercomputers to the United States. Although U.S. Ambassador to France James Gavin supported it, it is not clear whether the sale of KC-135, the principle of which was discussed as early as 1962, was formally approved by the U.S. Government. Some sources say that the USAF was favourable to the sale because it allowed it to buy from Boeing the number of aircraft it had promised to buy. See Vaïsse, ed., *Armement et Vème République*, p. 222. On these issues, see in particular Bozo.

160. See Peyrefitte, pp. 428-429.

161. An exception is Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 11.

162. On this, see Yost, *France's Deterrent Posture*, Vol. II, pp. 15-16.

163. Here again the exception is Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 14. Bruno Tertrais, "La coopération militaire depuis 1969: la France, l'OTAN, et la Question Nucléaire" in Bozo, Mélandri & Vaïsse, eds., pp. 621-623.

164. Chirac, "Au sujet des armes nucléaires tactiques françaises," p. 12.

165. General Guy Méry, Conference at the IHEDN, March 15, 1976, reproduced as "Une armée pour quoi faire et comment?" RDN, June 1976, p. 15.

166. Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 14.

167. Valéry Giscard d'Estaing, press conference of June 26, 1980, text

reproduced in Tourrain, p. 38.

168. Barre, "La politique de défense de la France," p. 12.

169. Declaration on Atlantic Relations approved by the North Atlantic Council, June 19, 1974, para. 6.

170. Guy Méry, "Conférence," *Défense*, No. 9, May 1977, p. 19.

171. Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 10. See also his September 1980 speech.

172. Quoted in Cohen, *La défaite des généraux*, p. 104.

173. Testimony of General Valentin in *L'aventure de la bombe*, p. 191.

174. See his February 15, 1963, speech in p. 86. His 1964 declarations about the possibility of a warning shot are reported by Peyrefitte, p. 711.

175. This argument was used in particular by Defense Minister Messmer; see Peyrefitte, p. 1,374.

176. The 1967 Ailleret-Lemnitzer agreements included a provision for U.S. nuclear support to French conventional forces, but that applied only in case the French forces joined the common defense and the nuclear threshold had been crossed.

177. See Peyrefitte, pp. 1,376, 1,379.

178. *Ibid.*, pp. 1,378-1,379.

179. Press conference by Pierre Messmer, October 24, 1966, quoted in Vaïsse, ed., *Armement & Vème République*, p. 185.

180. Jacques Chevallier, "La genèse de la force nucléaire de dissuasion française," in Vaïsse, ed., *Armement & Vème République*, p. 284. Chevallier says that the letter is dated 1968. A slightly different, but entirely consistent, version of de Gaulle's instructions was provided by Boissieu himself on 30 November 1989, referring to a meeting that took place in April 1970:

Your priority mission is to have the [Pluton] launchers built and to put into service the tactical atomic [weaponry]. Because, from the day the land forces, that is the First Army, will have tactical atomic [weaponry] at its disposal, it is the whole First Army and FATAAC apparatus . . . which will participate in the nuclear deterrent. . . . Tactical atomic [weaponry] is so essential for us French that, when we will later have to choose between perfecting tactical atomic [weaponry] or strategic atomic [weaponry], here again we will probably have to choose tactical atomic [weaponry], for what's the use of perfecting apocalypse, Vol. It is better to place efforts on what would happen beforehand . . ."

Quoted in Cohen, *La défaite des généraux*, p. 108.

181. Lacouture, p. 484.

182. Pierre Messmer, "L'atome, cause et moyen d'une politique militaire

autonome," RDN, March 1968, pp. 395-402.

183. See Poirier, "Dissuasion et puissances moyennes," pp. 107-108; and *Des stratégies nucléaires*, p. 325. This meant, for Poirier, that French forces could not be committed in significant quantities to the forward defense of Europe.

184. Fourquet.

185. *Livre blanc sur la défense*, Vol. I.

186. Press conference of September 27, 1973, text reproduced in Tourrain, p. 21. It is clear from the text that he meant escaping from an "all or nothing" dilemma rather than adopt NATO's strategy.

187. See, in particular, Chirac, "Au sujet des armes nucléaires tactiques françaises," p. 15. He also mentions that one reason why France had to have TNW is simply that others had such weapons.

188. See, in particular, Giscard d'Estaing, speech of June 1, 1976, p. 15. On these debates, see *inter alia*, Duval, pp. 74-87.

189. Chirac, "Au sujet des armes nucléaires tactiques françaises."

190. Interview on Antenne-2 TV channel, November 12, 1975, quoted in Tourrain, p. 28.

191. Interview on TF-1 TV channel, May 5, 1976, quoted in Tourrain, p. 30.

192. "Entretien avec le général Maurin, chef d'état-major des armées," RDN, Vol. 30, No. 7, July 1974, pp. 15-17.

193. "Entretien avec le général de Boissieu," RDN, July 1975, p. 26.

194. Rapport sur la programmation des dépenses militaires et des équipements des forces armées pour la période 1977-1982, text reproduced in David, p. 195.

195. Méry, "Une armée pour quoi faire et comment?," p. 17.

196. Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 13.

197. *Ibid.*, p. 14. The idea to "restore deterrence" was seen at the time as symbolizing a "war-fighting strategy." In the same speech, Barre also makes a rare reference to the possibility of TNW being deployed with overseas projection forces.

198. The "M1" device had been tested in the morning of February 13, 1960, in the Sahara desert near Reggan, Algeria, and gave a yield of 60-70 kilotons, as expected.

199. There is a debate on de Gaulle's view of these systems. Some testimonies suggest that he attached no particular importance to the Albion missiles, see Peyrefitte, p. 1,378. Others suggest that he thought that France being a continental power, it had to be also defended by visible land-based systems for the French to feel secure, see the testimony by his aide de camp in *L'aventure de la Bombe*, p. 237. In any case, their value as a complement to the SSBNs was quickly acknowledged.

200. On early UK debates, see Heuser, p. 66s.

201. Pierre-Marie Gallois, "Puissance et limitation des armes de la dissuasion," *Le Monde*, Février 14-15, 1960.
202. Pierre-Marie Gallois, "Les sophismes de M. MacNamara et le départ du général Norstad," RDN, October 1962, pp. 1,454-1,471.
203. See, for instance, Beaufre, *Introduction à la stratégie*, chapter 3.
204. See the contribution by Michael Quinlan in Chapter 9.
205. Gallois refers to General Pierre Stehlin, "L'adaptation de l'instrument de la défense à la révolution technique," *Revue militaire générale*, Février 1959, Gallois, *Stratégie de l'âge nucléaire*, p. 229.
206. As reported by Peyrefitte, p. 366.
207. ". . . with 0.4 percent of the atomic potential of the Soviet Union, France could 'raze an habitat' equivalent to hers," Pierre-Marie Gallois, "La dissuasion du faible au fort" in *L'aventure de la bombe*, p. 169; and "To be efficient, the destruction capabilities of our nuclear force must be equivalent to the 'value of France' (équilibrer la 'valeur France')," in *L'aventure de la bombe*, p. 205.
208. Interview of President Giscard d'Estaing in *Le Figaro*, December 12, 1983, p. 6.
209. The naval expression "vital works" appeared frequently. First employed by Ailleret in his 1959 lectures, Poirier, *Des stratégies nucléaires*, p. 298. It was used by Gallois, *Stratégie de l'âge nucléaire*, p. 182, p. 193; and by de Gaulle, radio/TV speech of April 19, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 96; *Mémoires d'espoir*, p. 1,067. Aron used it in *Le grand débat*, p. 124. It appeared as late as 1980 in some semi-official publications, Guy Lewin, "L'avenir des forces nucléaires françaises," RDN, May 1980, pp. 17-18. Beaufre used "anti-resources," *Dissuasion et stratégie*, p. 37, an equivalent of "counter-value."
210. Quoted in Gallois, "La dissuasion du faible au fort," p. 170.
211. "Frightful destructions," press conference at the Elysée Palace, January 14, 1963, in de Gaulle, p. 72-74; and radio/TV speech of April 19, 1963 in *ibid.*, p. 95. "Deadly wound," press conference of July 23, 1964, at the Elysée Palace, in *ibid.*, p. 233. "Destructions beyond repair," 1967 instruction Lacouture, p. 478; "Frightful wounds," de Gaulle, *Mémoires d'espoir*, p. 1,057.
212. Gallois, *Stratégie de l'âge nucléaire*, pp. 170-175.
213. *Ibid.*, p. 174.
214. Quoted in Hervé Alphand, *L'étonnement d'être. Journal, 1939-1973*, Paris: Fayard, 1977, p. 368.
215. General François Maurin, "La mise en place opérationnelle de la triade stratégique, Mirage IV, SSBS Albion, SNLE, et des chaînes de contrôle," in *L'aventure de la Bombe*, pp. 228-229.
216. As reported by Peyrefitte, p. 710.

217. "20 million," as reported by Peyrefitte, p. 179. "One-fourth or half of the Russians," *ibid.*, p. 299. "One-half of the Russians," *ibid.*, p. 345.
218. As reported by Peyrefitte, p. 350. In 1964, he claimed that around 1971-1972 that capability would be "80 million Russians," *ibid.*, p. 654.
219. Press conference at the Elysée Palace, January 14, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 72-74; and press conference at the Elysée Palace, July 23, 1964, in *ibid.*, p. 233.
220. Messmer, "Notre politique militaire," p. 747.
221. Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 10. See also Général Maurin, "Entretien avec le général Maurin, chef d'état-major des armées," RDN, July 1974, p. 13: "a notable part of his industrial and demographic potential."
222. Gallois, *Stratégie de l'âge nucléaire*, p. 174.
223. *Ibid.*, p. 205, in which he also adds "tens" of other targets; and FEDN/ Université de Paris I, *L'arme nucléaire et ses vecteurs. Stratégie, armes, parades*, Paris, 1989, p. 374, in which he refers to "20, 30, 40" cities.
224. Quoted in Alphand, p. 368.
225. The optimum targeting set recommended by a JCS Advisory Group in October 1945 was 20 urban Soviet targets, see Barton J. Bernstein, "Eclipsed by Hiroshima and Nagasaki: Early Thinking about Tactical Nuclear Weapons," *International Security*, Vol. 15, No. 4, 1991, p. 171. UK planning in the late 1950s was 30-40 cities; see Heuser, pp. 67, 73; and the contribution by Michael Quinlan in this volume.
226. On this point, see Aron, *Le grand débat*, pp. 115-117.
227. See a conversation with Adenauer reported in Bendjebbar, p. 307, in which he adds Stalingrad; and Peyrefitte, p. 654, in which he adds "the biggest cities."
228. Loi de programmation 1977-1982, in David, p. 194.
229. Méry, "Conférence," p. 20.
230. On these debates, see David Yost, "French Nuclear Targeting," in Desmond Ball & Jeffrey Richelson, eds., *Strategic Nuclear Targeting, Cornell Studies in Security Affairs*, Ithaca, NY: Cornell University Press, p. 132.
231. Tourrain, p. 206.
232. Valéry Giscard d'Estaing, *Le pouvoir et la vie (II). L'affrontement*, Evreux: Compagnie 12, 1991, p. 180.
233. Marc Theleri, *Initiation à la force de frappe française 1945-2010*, Paris: Stock, 1997, p. 233.
234. Barre, "La politique de défense de la France," pp. 17, 12. Gallois asserted several times in the 1980s that France targeted some military facilities on Soviet territory, see above; however, he never included Soviet nuclear forces in such

assertions.

235. Barre, "La politique de défense de la France," p. 17.

236. See, for instance, interview of Giscard d'Estaing on FR-3 TV channel, March 22, 1979, text reproduced in Tourrain, p. 36. In another TV interview in February 1980, Giscard revealed that French forces totalled 20 Mt in 1974, 75 Mt in 1980, and would total 90 Mt in 1985, making it the "third nuclear power."

237. Such developments were called for by the 1972 *White Paper*. In 1976, Méry referred to Soviet defenses as the main rationale for the coming shift to MIRVed warheads, Méry, "Une armée pour quoi faire et comment?," p. 21. In 1977, Barre stated that in order to counter Soviet defenses France would have to "quadruple" the capacity of the French deterrent, Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 10. The program would lead to the introduction of the MIRVed M4 SLBM in 1985.

238. Jacques Chevallier, "Histoire de la Direction des applications militaires du CEA," in 40° anniversaire de la DAM, Commissariat à l'énergie atomique, 1998, p. 22.

239. See Pompidou's speech to the National Assembly in December 1964, Ruehl, p. 192.

240. See Lucien Poirier, "Dissuasion et Puissance Moyenne," RDN, March 1972, text reproduced in David, pp. 97-110, where he mentions the need for an "intolerable damage capability."

241. "Intervention du Ministre de la Défense," M. Robert Galley à l'IHEDN, Paris, February 3, 1981, text reproduced as "La politique militaire de la France," RDN, March 1981, p. 18.

242. Press conference of July 23, 1964, at the Elysée Palace, de Gaulle, *Discours & Messages*, Vol. IV, p. 233; Bendjebbar, p. 307; and de Gaulle, *Mémoires d'espoir*, p. 1,069.

243. "Our objective is not parity, but sufficiency." Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 10.

244. This last point was acknowledged in the 1972 *White Paper*.

245. As reported by Peyrefitte, p. 350.

246. Poirier, "Dissuasion et puissances moyennes," p. 104.

247. See Pompidou's December 1973 conference, Theleri, p. 327.

248. See, for instance, Guy Méry, "Conférence prononcée par le général Méry," RDN, May 1978, p. 29.

249. Yields mentioned are the most commonly found number in open sources. The yield of the AN22 was 80 kt according to a 1970 parliamentary report, see Ruehl, p. 306, and "nearly 100 kt" according to the 1972 *White Paper*. A CEA source, Chevallier, p. 16, gives 55 kt for the AN21 and 115 kt for the MR31. For a

detailed overview of French nuclear warheads, see Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, *Nuclear Weapons Databook, Vol. V: British, French and Chinese Nuclear Weapons*, Boulder: Westview Press, 1994.

250. The 3,000 km range is frequently found in the open literature. The *Mirage-IV* was designed to fly at supersonic speed half of the distance. The original 1956 requirement had specified a total range of 2,650 km, but that distance was “doubled” in 1959, see Claude Carlier, “La genèse du système d’arme stratégique piloté *Mirage-IV*, 1956-1964,” in Vaisse, ed., *Armement & Vème République*, pp. 206-222. The *Mirage-IV* needed one, if not two, in-flight refuellings to reach Soviet targets by using northeastern or southeastern flight plans to avoid over-flying Warsaw Pact countries; hence the use of additional *Mirage-IVs* as refuelling stations and the acquisition in 1962 of 12 KC-135 aircraft. The maximum “useful” range was planned to be 4,800 km with in-flight refuelling, according to Messmer in 1963, Ruehl, p. 187. The operational range probably took into account that, in many scenarios, bombers were not expected to return to their home bases. Counting on the fact that these bases “would have been atomized, by definition,” de Gaulle hypothesized that they would land “in Sweden or Turkey”—Peyrefitte, p. 368.

251. Alain C. Enthoven and K. Wayne Smith, *How Much is Enough? Shaping the Defense Program, 1961-1969*, New-York: Harper & Row, 1971, p. 207.

252. U.S. DoD numbers Ball, Vol. I, p. 33.

253. According to Poirier, *Des Stratégies Nucléaires*, p. 297.

254. Most data from Geoffrey Kemp, *Nuclear Forces for Medium Powers. Part 1: Targets and Weapons Systems*, Adelphi Paper No. 106, London: IISS, Fall 1974, p. 5; and *Nuclear Forces for Medium Powers. Parts II and III: Strategic Requirements and Options*, Adelphi Paper No. 107, London: IISS, Fall 1974, p. 5, p. 9. The number of required warheads takes into account the loss of a number of warheads due to reliability problems and interception successes. Calculations for 30 cities in the Western part of the Soviet Union are based on data provided by Kemp, Vol. II-III, pp. 23-25. Note that his calculations are based on the assumption of an average of a 5 psi overpressure, thus not allowing for the complete destruction of industrial installations. Also, the total of the main USSR cities include one or two cities such as Tashkent which may not have been accessible to French SSBNs patrolling in the Atlantic.

255. Kemp, Vol. I, p. 5; 50 percent in Kemp, Vol. II-III, p. 5.

256. The Soviet population, 208 million in 1959, was 241 million in 1970. Thus one-fourth to one-half of the Russian population corresponded roughly to 30-60 million in 1970. Arguably, when de Gaulle said “Russia,” he often meant “the Soviet Union.” In this hypothesis, France would probably still have been able to target about one-fourth of the Soviet population when adding about 30 air-delivered 60 kt bombs.

257. MacNamara’s criteria were 25-33 percent of the Soviet population and

about 66 percent of its industrial capacity, 1965; revised to 20-25 percent and 50-66 percent, 1967; and again in 1968 to 20-25 percent and 50 percent. See Ball, p. 14; and Kemp, Vol. I, p. 25.

258. Gallois met with Premier Mollet in March 1956. He argues that his intervention was critical for the acceleration of the nuclear program, see *Le sablier du siècle*, pp. 362-365.

259. *Livre blanc sur la défense*, Vol. I. The sentence began with “presently,” leaving the door open to a future different perspective in light of European integration.

260. For vital interests, see above; for sanctuary, see Pierre-Marie Gallois, “Deux budgets militaires, une politique de sécurité,” RDN, June 1962, pp. 937-953.

261. After the 1956 meeting, Gallois met with de Gaulle only once, in 1963. The President wanted to hear Gallois’s views on the emergence of China as a nuclear power.

262. The quote is from Robert MacNamara’s Ann Arbor address of June 16, 1962.

263. He expounded the argument in Pierre-Marie Gallois, *Les paradoxes de la paix*, Paris: Presses du temps présent, 1967.

264. See Gallois, *Stratégie de l’âge nucléaire*, pp. 231-234. To be fair, his views on the subject have sometimes been exaggerated: he did acknowledge that some countries would see their nuclear deterrent as a mean to blackmail and coerce others.

265. Charles Ailleret, “Opinion sur la théorie stratégique de la flexible response,” RDN, August-September 1964, p. 1,328.

266. Gallois, *Le sablier du siècle*, p. 402.

267. Lawrence Freedman, *The Evolution of Nuclear Strategy*, Studies in International Security No. 20, London: MacMillan, 1981, p. 315.

268. Poirier was a lieutenant-colonel at the Policy planning staff of the MoD, along with general Beaufre and civilian analyst Gaston Bouthoul, under the supervision of military engineer Hugues de l’Estoile. With his colleagues, he framed the French concept in a document reportedly entitled “Logical study of a conceivable strategic model for France. Confrontation of the model with some concrete cases.” Also known as “document 952” and dated March 15, 1966, it is still classified, but its contents have been made public by Poirier through conferences and writings. See Poirier, *Des stratégies nucléaires*, p. 325.

269. See Lacouture, p. 472.

270. On this, see, for instance, Cohen, *La défaite des généraux*, pp. 96-97.

271. Aron, *Le grand débat*, p. 133.

272. *Ibid.*, p. 12, the reference to Gallois being obvious, p. 136. Gallois later

accused Aron of being paid by the CIA, Gallois, *Le sablier du siècle*, p. 164.

273. See his preface to Gallois, *Stratégie de l'âge nucléaire*, pp. v-vi; and Aron, *Le grand débat*, pp. 115-156. Aron, however, credited de Gaulle for being able to convey the impression that he *would* use the nuclear force, *ibid.*, p. 122, and thus he was not completely out of tune with the Gallois argument, according to which the psychological factor of deterrence was the most critical.

274. Aron, *Le grand débat*, pp. 126-127.

275. See Mongin, pp. 254s.

276. Beaufre, *Dissuasion et stratégie*, p. 66.

277. On this point, see David Yost, *France's Deterrent Posture and Security in Europe, Part I: Capabilities and Doctrine*, Adelphi Paper No. 194, IISS, Winter 1984-1985, p. 39.

278. Beaufre also may be the author of the expression "non-use," *non-emploi*, i.e., "non-warfighting," which was to become later a keyword in French nuclear discourse.

279. See Bruno Colson, "La culture stratégique française," *Stratégique*, No. 53, 1992, pp. 27-60.

280. Critical public documents describing this strategy include the 1952 *Global Strategy Paper*, and the 1957 *White Paper*. See Heuser, pp. 93s.

281. Pierre-Marie Gallois, "The raison d'être of French defense policy," *International Affairs*, Vol. 39, No. 4, October 1963, p. 497. See also *ibid.*, "Deux budgets militaires, une politique de sécurité." On the influence of British thinking on American, French and NATO strategies, see Beatrice Heuser, *NATO, Britain, France and the FRG. Nuclear Strategies and Forces for Europe, 1949-2000*, London: MacMillan Press, 1997.

282. See Heuser, p. 73.

283. Beaufre, *NATO and Europe*, pp. 51, 54. Gallois claims that the Beaufre group, like many other allied efforts, just added nuclear weapons with conventional strategy without taking into account the revolutionary potential of these weapons, Gallois, *Le sablier du siècle*, p. 315.

284. The group also was comprised of U.S. Colonels Goodpaster and Richardson and UK Colonel MacDonald. It functioned from September 1953 to late 1956.

285. Charles Ailleret, "Unité fondamentale des armements nucléaires et conventionnels," RDN, April 1964, pp. 565-577; and Charles Ailleret, "Opinion sur la théorie stratégique de la 'flexible response'," RDN, August-September 1964, in particular, p. 1334s.

286. For instance, "maintaining a clear and convincing capability to inflict unacceptable damage on an attacker," in Senate Armed Services Committee, Military Procurement Authorization, Fiscal Year 1966, Washington, DC: U.S. Government Printing Office, 1965, p. 43. MacNamara also referred from 1962 on

to “intolerable punishment.” See, for instance, Statement of Secretary of Defense Robert S. MacNamara before the House Armed Services Committee on the Fiscal Year 1966-1970 Defense Program and 1966 Defense Budget, February 18, 1965, p. 39. References taken from Desmond Ball, *Targeting for Strategic Deterrence*, Adelphi Paper No. 185, London: IISS, 1983, p. 14.

287. See the contribution by Michael Quinlan, Chapter 9.

288. Press conference at the Elysée Palace, January 14, 1963, in de Gaulle, *Discours & Messages*, Vol. IV, p. 73.

289. Gallois saw the emerging French doctrine as heresy because he saw it as an alibi to maintain important conventional forces. See Pierre-Marie Gallois, *L'adieu aux armées*, Paris: Albin Michel, 1976, chapter 7: “La dérive.” He despised the “test” idea and would be no less severe for the later “final warning” concept, described as “childish” and “dangerous,” Gallois, *Le sablier du siècle*, pp. 402-408. Poirier, for his part, disdained the 1969 Fourquet concept of engaging a conventional battle with the option to use TNW for military efficiency and as a second “test.” He described it as intellectually sloppy, a drift from his intellectually elegant 1968 model, see Poirier, *Des Stratégies Nucléaires*, p. 326.

290. See Lacouture, p. 473; and Peyrefitte, p. 354, in which he imagines a scenario where the Soviet union threatened to bomb Marseilles, and France replied by threatening to bomb Odessa.

291. See Ruehl, p. 223.

292. Cohen, *La défaite des généraux*, p. 95.

293. This is acknowledged in particular by Pierre Messmer, *Mémoires*, Paris: Albin Michel, 1992.

294. Maurice Vaïsse, “Historique du concept français de dissuasion nucléaire 1945-1994,” in Pierre Pascallon, ed., *Quel avenir pour la dissuasion nucléaire française?*, Brussels: Bruylant, 1996, p. 5.

295. Quoted in Bendjebbar, p. 324.

296. Charles de Gaulle, *Le fil de l'épée*, Paris: Union générale d'éditions, 1962, p. 142.

297. Both quoted in Bozo, p. 121.

298. “Des avions d'épouvante,” 1963 statement Claude Carlier, “La genèse du système d'arme stratégique piloté Mirage IV, 1956-1964,” in Vaïsse, ed., *Armement et Vème République*, p. 214.

299. See Press conference at the Elysée Palace, p. 74.

300. See Gallois, “Puissance et limitation des armes de la dissuasion.”

301. See, for instance, Gallois, *Stratégie de l'âge nucléaire*, pp. 180-183; and Beaufre, *Introduction à la stratégie*, Paris: Hachette, 1998, p. 111.

302. Arguably, the choice was between the ICBM and two more SSBNs, see

Ruehl, pp. 225-226, 303-305; and one should also note that the programme was definitely abandoned only in 1969 after de Gaulle left power. The point here is that a context of budgetary restrictions contributed to the choice made.

303. Messmer, "Notre politique militaire," p. 747.

304. Barre, "Discours prononcé au camp de Mailly le 18 juin 1977," p. 10.

305. Barre, "La politique de défense de la France," p. 17.

306. See, for instance, Fourquet.

307. For a discussion of this point, see the contribution of David Yost in Chapter 7.

308. Giscard d'Estaing, *Le pouvoir et la vie*, p. 180.

309. Theleri, p. 233.

310. An idea suggested by Lothar Ruehl, p. 233.

311. A rare exception is its use by Giscard in his memoirs, *Le pouvoir et la vie*, p. 210.

312. See Messmer, "Notre politique militaire."

313. Georges Pompidou, press conference, December 1973, in Theleri, p. 327.

314. Barre, "La politique de défense de la France," p. 15.

315. Two SSBNs at 100 percent of the time, three at 75 percent, and four in crisis time, if needed.

316. Barre, "La politique de défense de la France," pp. 17, 12.