### A "Nuclear Coup" ? France, the Algerian War and the April 1961 Nuclear Test

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# Draft of October 2, 2011

The strategic literature about the risk of nuclear proliferation and of nuclear terrorism sometimes mentions a little-known episode of French colonial history: a nuclear test that took place in April 1961 while four generals had mounted a coup in Algiers against the nascent Fifth Republic.

The first mentions of this episode in publications devoted to international security issues appear to have been a 1968 journal article by Donald Brennan, and Leonard Spector's pioneering book *Going Nuclear* (1987). To the best of this author's knowledge, no detailed analysis of the 1961 events has ever been published.<sup>2</sup>

Conventional wisdom – various citations of the episode appearing in the literature, mostly based on the two aforementioned accounts – has it that France decided to detonate the nuclear device rather than run the risk of having it captured by the rebel forces. At the same time, one of the foremost experts in the field of terrorism, Brian Jenkins, argued in a recent book that, based on conversations with former French officials, he has become convinced

<sup>&</sup>lt;sup>1</sup> The author is grateful to Marie-France Lathuile and Anne Pasquier for their assistance in researching for this paper.

<sup>&</sup>lt;sup>2</sup> Donald G. Brennan, "The Risks of Spreading Weapons: A Historical Case", Arms Control and Disarmament, vol. 1, 1968; and Leonard S. Spector, Going Nuclear, Cambridge, Ballinger Publishing Company, 1987, pp. 25-33.

that the story was bunk, and that experts should cease mentioning it as an example of the risks of nuclear terror.<sup>3</sup>

This paper seeks to reconstruct the 1961 events and the intentions of the various parties involved to the fullest possible extent. To that effect, it relies heavily on sources that have become available since the 1968 and 1987 studies were published. These include for instance: two books on the Algiers coup published in 2011 at the occasion of the fiftieth anniversary of the coup, one by historian Maurice Vaïsse and the other by journalist Pierre Abramovici; as well as two books on the history of the French nuclear program published a few years ago, one by analyst Jean-Damien Pô and the other by historian André Bendjebbar. It also relies on personal testimonies of key actors. Sources used in this paper also include information about the history of French nuclear testing made public (though publication or leaks) in France at the occasion of the 1995-1996 final series of tests and of recent controversies regarding the human and environmental effects of testing in Algeria. Finally,

<sup>&</sup>lt;sup>3</sup> "The rumor survived for decades, and I myself was guilty of repeating it until further inquiries with French officials, who had knowledge of these events, put the story in the category of 'never happened'" (Brian Jenkins, Will Terrorists Go Nuclear?, New York, Prometheus Books, 2008, p. 144). Jenkins bases this conviction on conversations with "former French intelligence officials" (Jenkins, op. cit., p. 388). It is not clear that such persons would have had a detailed knowledge of these events, since they happened fifty years ago and probably did not involve any intelligence official on the test site itself.

<sup>&</sup>lt;sup>4</sup> Maurice Vaïsse, Comment de Gaulle fit échouer le putsch d'Alger, Paris, André Versaille éditeur, 2011 ; Pierre Abramovici, Le putsch des généraux. De Gaulle contre l'armée, 1958-1961, Paris, Fayard, 2011; Jean-Damien Pô, Les moyens de la puissance. Les activités militaires du CEA (1945-2000), Paris, Ellipses, 2001 ; André Bendjebbar, Histoire secrète de la bombe atomique, Paris, Le Cherche Midi, 2000.

<sup>&</sup>lt;sup>5</sup> These include in particular Yves Rocard, Mémoires sans concessions, Paris, Grasset, 1988, and Pierre Billaud, "Souvenirs d'un pionnier de l'armement nucléaire français", <a href="http://pbillaud.fr">http://pbillaud.fr</a>, 2009, as well as personal communications between Pierre Billaud and the author. Rocard was in charge of the CEA's scientific programs. Billaud was a CEA military engineer in charge of coordinating the conception of the French device. He was adjoint technique (technical deputy) at the Département des techniques nouvelles (department of new techniques); on the day of the test, he was the chief CEA representative in Reggan.

they include information provided to the author by the French Atomic Energy Commission (Commissariat à l'Energie Atomique, CEA).<sup>6</sup>

The paper will in particular address two sets of questions. One is about the timing of the April 1961 test. Was it in any way affected by the ongoing political events in Algeria? If yes, what did the French authorities seek in altering that timing? Another set of questions relates to the assessment of the actual risks that existed during the coup. Was there ever a real risk of the device passing under the control of the rebels? If yes, could they have used it in any way?

As will be seen, what happened during those days in Algeria is complex and supports a more subtle interpretation than either the traditional version of the story or the more recent Jenkins debunking of it – neither of which can be considered as an appropriate summary of the events.

The goal of this paper is to draw lessons for possible future contingencies where a nuclear-capable country is threatened from inside and the control nuclear materials or weapons may be at risk. More broadly, the paper passes judgment on whether or not this episode is worth giving as an example of the risk of nuclear terrorism.

#### The Context

When general Charles de Gaulle arrived in power in May 1958, he inherited two legacies of the Fourth Republic (1945-1958): one was the rebellion in the French departments of Algeria, which was worsening; and the other was France's burgeoning nuclear program,

<sup>&</sup>lt;sup>6</sup> A request for examination of some French classified archives has been put by this author. The final version of this paper may thus be affected by the contents of these documents if they are made available.

which was coming to fruition. In the last days of the Fourth Republic (on April 11), a nuclear test had been scheduled for 1960 by Chairman of the Council [of Ministers] Félix Gaillard.

The two issues rapidly became connected. De Gaulle sought both to transform France's nominal nuclear capability into a full-fledged operational nuclear force, and to solve the Algerian question one way or the other in order to pursue an ambition foreign policy agenda: he knew that the only way to do this would be to change the territory's status.

But these orientations put him on a collision course with a large segment of the French military. Many did not want France to withdraw from Algeria; and most were not interested in an independent nuclear deterrent.<sup>7</sup>

Of these two issues, Algeria in early 1961 was certainly the most important to the eyes of the French armed forces. About 480,000 French military personnel – mostly conscripts – were stationed there to take part in the campaign launched in 1957 to "pacify" the territory in light of growing unrest, rebellion and terrorism.

In September 1958, 96% of Algerian voters had said "yes" to the adoption of the new French constitution. However, a call to boycott the vote had been issued by the Algerian National Liberation Front ("Front de Libération Nationale"). De Gaulle did not believe that the full integration of Arab and Berber populations into France was sustainable on the long-run. In September 1959, he stated that three paths were open to Algeria: full independence, full integration, or – his obvious preference – an "association" with the French Republic.

<sup>&</sup>lt;sup>7</sup> See Bruno Tertrais, "'Destruction Assurée': The Origins and Development of French Nuclear Strategy, 1958-1981" in Henry D. Sokolski (ed.), Getting MAD: Nuclear Mutual Assured Destruction, Its Origins and Practice, Carlisle, Strategic Studies Institute, 2004, p. 62.

Even though he had not declared support for independence, de Gaulle probably knew all too well that, having now made clear that he did not favor the status quo, he faced the possibility of a military action against him – by the same group of officers who had helped him return to power. In May 1958, a short-lived coup in Algiers (today often referred to as the "putsch d'Alger"), partly manipulated by the Gaullists (who emphasized the possibility of a coup in Paris itself, a scenario which was indeed very much in the cards and entitled "operation Resurrection"), had led to the downfall of the Fourth Republic and to the return of de Gaulle to power. At that time, the military believed that he would ensure that France would hold on to its North African territories – not mistakenly, since de Gaulle had not come to power with a clear picture of the Algerian endgame.

In the months following his return to power, de Gaulle removed the leaders of the May 1958 movement – generals Edmond Jouhaud and Edouard Salan – from their positions in Algiers.

On September 16, 1959, he alluded for the first time to the possibility of "self-determination" for Algeria. In January 1960, a short-lived insurrection ("semaine des barricades") led by opponents to de Gaulle's policy took place in Algiers and Paris. It was trigged by the recall to France of general Massu, another leader of the 1958 movement. In March, general Maurice Challe, who had been appointed by de Gaulle as the head of all French forces in Algeria in December 1958, was replaced. In December, massive demonstrations in favor of independence took place throughout Algeria. De Gaulle began

<sup>&</sup>lt;sup>8</sup> Allocution by general de Gaulle, Paris, 16 September 1959.

<sup>&</sup>lt;sup>9</sup> During this episode, one of De Gaulle's ministers suggested, half-jokingly it seems, to use the first French device (which was to be tested in Reggan a few days later) against the insurgents in Algiers. Alistair Horne, A Savage War of Peace. Algeria 1954-1962, revised edition, London, Papermac, 1987, pp. 365-366.

referring to the hypothetical possibility of an "Algerian Republic". On January 8, 1961, 75% of the French approved by referendum the self-determination of the Algerian territories. In April, De Gaulle mentioned for the first time the possibility of "a sovereign Algerian State". This statement and others finally convinced those among the French military that sought to oppose Algerian independence that the dice was cast. General Challe took the leadership of a military conspiracy to stop the political process leading to Algerian independence.

Meanwhile, Algeria had been chosen as early as July 1957 as the location for the first French nuclear tests, due to the existence of large inhabited regions in the south of the territory with geologically favorable conditions. A 108,000 square kilometers inhabited zone was designated as military grounds and named Sahara Center for Military Experiments (Centre Saharien d'Expérimentations Militaires, CSEM). Starting in October 1957, the French Atomic Energy Commission (Commissariat à l'énergie atomique, CEA) and the armed forces built the necessary facilities near Reggan, a small town of about 8,000 inhabitants, between 1957 and 1959. The base and testing grounds were placed under military command. Up to 10,000 civilian and military personnel were stationed in and around Reggan.

The French testing site had complex command arrangements:

- The CSEM was in charge of the site itself, which comprised four locations: offices in Reggan; technical facilities, housing and logistics at the "base-vie" 15 kilometers from

<sup>&</sup>lt;sup>10</sup> Speech by general de Gaulle, Paris, 4 November 1960.

<sup>&</sup>lt;sup>11</sup> Press conference by general de Gaulle, Paris, 11 April 1961.

<sup>&</sup>lt;sup>12</sup> The base command and the command of the 11<sup>th</sup> regiment of military engineers were located in the town of Reggan.

<sup>&</sup>lt;sup>13</sup> Ministère de la défense, Délégation à l'information et à la Communication de la Défense, Dossier de présentation des essais nucléaires et leur suivi au Sahara, January 2007, p. 1.

the town; the Hamoudia observation and command post some 35 kilometers from the "base-vie"; and the "ground zero" area another 15 kilometers away) It was headed by a colonel, and reported for operational purposes to the Paris-based Joint Special Weapons Command (Commandement Interarmées des Armes Spéciales, CIAS), a ministry of defense structure. However, for territorial defense and law and order maintenance, it reported to the Sahara area command. 15

The tests themselves was the responsibility of a unit called the Operational Group of Nuclear Experiment (Groupement Opérationnel des Expérimentations Nucléaires, GOEN), which included both military and civilian experts. Led by a general who was also the head of the CIAS, this separate and temporary unit reported both to the ministry of defense and to the CEA. It included a joint dedicated military force, the 621<sup>st</sup> Special Weapons Group (Groupe d'Armes Spéciales), which regrouped all military personnel assigned to the GOEN. There was a dedicated communication link between the GOEN and the CIAS headquarters.

None of these two units reported directly to Algiers, upon which they were only dependent for their supplies.

# The Event

The coup

<sup>&</sup>lt;sup>14</sup> The Joint Special Weapons Command had been created in 1951 by general Charles Ailleret to oversee the development of the French nuclear program.

<sup>&</sup>lt;sup>15</sup> Pierre Denis, L'armée française au Sahara, Paris, L'Harmattan, 1991, p. 236.

The rebellion began during the night of Friday-Saturday, 21-22 April 1961. The leaders were Challe, his predecessor in Algeria general Raoul Salan, as well as generals Edmond Jouhaud and André Zeller. They could count on the support from the onset of at least six regiments of the French armed forces. <sup>16</sup> By Saturday, April 22 in the morning, Algiers was fully in the hands of the rebels, who made a radio proclamation announcing their success, and sent the loyalist leaders to the South of the territory. <sup>17</sup> By then, Challe and his acolytes could count on the support of about 25,000 military personnel. <sup>18</sup> Paris became awash with rumors of an imminent military action against the metropolitan territory. <sup>19</sup>

This sequence of events happened just as the Reggan base was preparing for the fourth French nuclear test. Codenamed "Gerboise verte" ("Green jerboa"), this explosion of a fourth plutonium fission device ("R1") was planned to be the last atmospheric test in the Sahara before moving on to subterranean tests in a different location in Algeria.

There is evidence (see below) that the rebels were fully aware of the upcoming test and sought to exploit the circumstances to their benefit. But was the timing of Gerboise verte affected by the political events? And if yes, what did the French authorities seek in altering the timing of the test?

There is no doubt that the detonation of the R1 device had been organized well in advance.

One source mentions a March 3 press article which announced the fourth French nuclear

<sup>&</sup>lt;sup>16</sup> Abramovici, op. cit., p. 196; Vaïsse, op. cit., p. 151.

<sup>&</sup>lt;sup>17</sup> The Algiers officials were sent under guard to In Salah, about 300 kilometers from Reggan.

<sup>&</sup>lt;sup>18</sup> Vaïsse, op. cit., p. 72.

<sup>&</sup>lt;sup>19</sup> Direct action against Paris was indeed planned, but this part of the coup had been neutralized by the French authorities as early as the 22nd in the morning.

test "probably for April".<sup>20</sup> At the occasion of the test an exercise had been planned as early as February.<sup>21</sup> The idea was to benefit from the test to study the conditions of fighting in a nuclear environment. (The previous test of 27 December 1960 had also involved such an exercise.) According to the CEA, the "operation order" for the test had been given on March 30; it stipulated that the test would take place on or after April 24; but the date had later been changed to May 1 since the technical preparation of the device needed more time.<sup>22</sup> Another source mentions that the test had indeed been planned for early May.<sup>23</sup>

The events in Reggan (Saturday, April 22 to Monday, April 24))

According to Abramovici, news of the coup reached Reggan on Saturday, April 22 around 0900. At the same time, de Gaulle met with his Prime Minister Michel Debré. After the meeting, he reportedly decided to move forward the date of the test. Apparently, believing

<sup>&</sup>lt;sup>20</sup> Quoted in Bendjebbar, op. cit., p. 326. This is consistent with Vaïsse's book, which states that the test had been "planned for a long time" (Vaïsse, op. cit., p. 78).

<sup>&</sup>lt;sup>21</sup> Various testimonies refer to the name of the exercise as "Hippocampe vert" (Green seahorse). Official documents do not use this name and mention two distinct operations: the "Garigliano" offensive maneuver and the "Bir-Hakeim" defensive maneuver. One armored squadron (reinforced by one armored platoon), one reconnaissance squadron, and one mechanized company were to participate. See Rapport sur les essais nucléaires français 1960-1996, Tome I: La genèse de l'organisation et les expérimentations au Sahara (CSEM et CEMO), p. 229-235. (This text is a classified report leaked in 2010.) This "Groupement des essais tactiques" (Tactical Tests Group) had been formed in 15 February and represented a total of 424 soldiers (Pierre Denis, L'armée française au Sahara, Paris, L'Harmattan, 1991, p. 238). At least 195 soldiers had been called from Germany to participate in the event. The date February is also given by a soldier who participated in the exercise (Christophe Labbé & Olivia Recasens, "Le secret des irradiés du Sahara", Le Point, 2 August 2002). The episode has given rise to a controversy about the possible exposure of French troops to dangerous levels of radiation. The story was first been made public by Vincent Jauvert, "Sahara: les cobayes de 'Gerboise verte'", Le Nouvel Observateur, 5-11 February 1998.

<sup>&</sup>lt;sup>22</sup> CEA document communicated to the author.

<sup>&</sup>lt;sup>23</sup> Abramovici, op. cit., p. 307.

that the coup would last no more than three days, he planned to have the test taking place on Monday 24.<sup>24</sup> (If so, this means he did not seek to influence the coup itself.)

A CEA document confirms that on that day (April 22), proceeding with the test "as soon as possible" was indeed considered (and perhaps decided, thought this is not clear from the document). The same document states that the next day (April 23), order was given to Thiry to proceed with the test. In the evening, a telegram was sent to French ambassador in Morocco requesting him to notify king Hassan of the imminence of the test, and clearly referring implicitly to the ongoing coup. 27

However, two contradictory orders were sent to Reggan.<sup>28</sup> One was given by Paris, ordering that the device be tested. It was possibly a telegram signed by de Gaulle himself.<sup>29</sup> (Standard procedure was that a green light was given by the Elysée, and that the Reggan authorities decided on the exact day of the test.<sup>30</sup>) But another was given by Challe from Algiers, apparently warned of the impending test by the NOTAM (Notice to Airmen) delivered by

<sup>&</sup>lt;sup>24</sup> Abramovici, op. cit., p. 307. (Abramovici mistakenly mentions the date as April 21 instead of April 22.) Another version has Pierre Messmer, the then-Defense Minister, ordering to "maintain the planned date", without asking for De Gaulle's authorization. See the personal testimony of Messmer in the report of a roundtable held in June 1992: Nuclear History program/Groupe d'études français d'histoire de l'armement nucléaire, Les experimentations nucléaires françaises, Paris, Institut d'histoire des relations internationals contemporaines, Paris, 1993, p. 110.

<sup>&</sup>lt;sup>25</sup> Thiry only had the authority to determine the time of the test, not its date (though he could also postpone it). See Rapport sur les essais nucléaires français 1960-1996, op. cit. However, perhaps Thiry had been given the authority to choose the date due the exceptional nature of the circumstances.

<sup>&</sup>lt;sup>26</sup> CEA document communicated to the author.

<sup>&</sup>lt;sup>27</sup> Text quoted in Vaïsse, op. cit., p. 178.

<sup>&</sup>lt;sup>28</sup> Pô, op. cit., pp. 139-140.

<sup>&</sup>lt;sup>29</sup> Bendiebbar, op. cit., p. 329.

<sup>&</sup>lt;sup>30</sup> Personal communication by Pierre Billaud to the author, 16 September 2011.

Paris, requesting that the test be delayed.<sup>31</sup> According to a key witness, professor Yves Rocard, one of the "fathers" of the French program, Challe called general Jean Thiry, the commander of the CIAS/GOEN, who knew him well – they were both fellow air force generals – and told him: "Refrain from detonating your little bomb, keep it for us, it will always be useful".<sup>32</sup>

The CSEM and GOEN personnel were culturally inclined to be faithful to de Gaulle, since their mission was the nuclear program.<sup>33</sup> But Thiry was hesitant about which party to support. His exact mindset is difficult to assess. Some claim that he initially decided to side with the rebels before changing his mind twenty-four hours later. Others state that he was impressed with Challe's order but that, in his phone conversation with Challe, remained deliberately vague and uncommitted about his intentions.<sup>34</sup>

There are conflicting accounts on when exactly the final order to test was given by Thiry: was it on the 22<sup>nd</sup>, on the 23<sup>rd</sup> or on the 24<sup>th</sup>? Abramovici's source claims that on 22<sup>nd</sup> at 1130, after having conferred with the civilian engineers and consulted the weather experts, Thiry ordered the test to take place on the 24<sup>th</sup>. But this is inconsistent both with the CEA document – which, as seen above, states that an order to Thiry was given on the 23<sup>rd</sup> to test on or after the 24<sup>th</sup> – and with Abramovici's own claim later in the book – according to which

<sup>&</sup>lt;sup>31</sup> Jacques Fauvet & Jean Planchais, La fronde des généraux, Paris, Arthaud, 1961, p. 145. The NOTAM explanation (a plausible one) is given by Pierre Billaud (Billaud, op. cit.).

<sup>&</sup>lt;sup>32</sup> Rocard, op. cit., p. 322. Both Challe and Thiry were Air Force generals.

<sup>&</sup>lt;sup>33</sup> Jean Bellec, "Vie au Sahara", <u>www.kerleo.net</u>. Bellec was an engineer stationed in Reggan as a conscript at the time of the test.

<sup>&</sup>lt;sup>34</sup> According to Rocard, he told Challe: "Yes, yes, we'll see". Rocard, op. cit., p. 232.

<sup>&</sup>lt;sup>35</sup> Abramovici, op. cit., pp. 306-308. The book mentions April 21, but the rest of the paragraph suggests that he means April 22.

the final order was given only on the 24<sup>th</sup>. This third version is more likely. Indeed, another source, based on the recollection of a key witness, has Thiry "probably in the morning of the 24<sup>th</sup>" deciding to proceed with the test on the 25<sup>th36</sup>.

The weather was a non-trivial consideration in Thiry's final decision: the temperature was rising on the site – this part of Sahara is one of the hottest places in the world – and the measurement instruments were becoming unreliable. There was a risk that the test would be rendered scientifically useless. <sup>37</sup> To ensure the best optical measurements, and also because of the heat, French atmospheric tests in the Sahara had to be conducted at dawn (the four tests all took place between 6 and 7 am), and technical preparations no doubt took at least several hours. This meant that absent a decision the day before, another twenty-four hours would be lost.

But there is little doubt that political considerations were a key factor. Jean Viard, the director of the technical team, feared that the device could have been used by Algiers as a bargaining chip against Paris.<sup>38</sup> He as well as other CEA personnel on the site urged Thiry to proceed with the test.<sup>39</sup> And Pierre Billaud recounts that the Elysée intervened twice to hasten the test, obviously, according to him, for political reasons.<sup>40</sup> (In normal times only one "green light" was needed from the Elysée).

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<sup>&</sup>lt;sup>36</sup> Bendjebbar, op. cit., p. 329. Billaud's own account is that he and Viard went to see Thiry "around the 23<sup>rd</sup>" in order to convince him to go ahead (Billaud, op. cit.).

<sup>&</sup>lt;sup>37</sup> Bendjebbar, op . cit., p. 328. Billaud's account mentions the risk of a "complete paralysis of the instruments" (Billaud, op. cit.).

<sup>&</sup>lt;sup>38</sup> Pierre Billaud's testimony quoted in Bendjebbar, op. cit., p. 329; Billaud, op. cit.; Bellec, op. cit.

<sup>&</sup>lt;sup>39</sup> Ibid.; and personal communication of Pierre Billaud to the author, 15 September 2011.

<sup>&</sup>lt;sup>40</sup> Personal communication with the author, 16 September 2011.

The atmosphere at the base during those days is described by various testimonies as "changing", "uncertain" or "turbulent". On the 22<sup>nd</sup>, news reports had given the impression that most of Northern Algeria had passed under the control of the rebels. <sup>41</sup> A reflection of the uncertainty reigning on the site is that bulletins delivered to base personnel quoted both the statements provided by Algiers and those sent by Paris. <sup>42</sup> Some time on the 22<sup>nd</sup> or the 23<sup>rd</sup>, it was learned that general Gustave Mentré, commander of the French forces in the Sahara region, had sided with the rebels. His Algiers-based command issued orders to the effect that all units in the region – thus including the CSEM – obey Challe's orders. <sup>43</sup>

In addition, there were doubts about the loyalty of the on-site military units, and some of them "more or less openly advertised their sympathy with the rebellion". <sup>44</sup> It was rumored on the base that some of them had been relocated to the Sahara because of their sympathy for the cause of "Algérie française". <sup>45</sup> A total of 424 soldiers had been sent to Reggan for a military exercise to take place during the test. <sup>46</sup> Colonel Celerier, the head of the CSEM, decided to have the armored forces stationed for long duration under the desert sun under the disguise of an exercise.

<sup>&</sup>lt;sup>41</sup> Abramovici, op . cit., p. 308.

<sup>&</sup>lt;sup>42</sup> Bellec, op. cit.

<sup>&</sup>lt;sup>43</sup> In January 1961, the Sahara Joint Command (Commandement Interarmées au Sahara) had been relocated from Algiers to Reggan, but the decision had not yet been implemented.

<sup>&</sup>lt;sup>44</sup> Abramovici, op. cit., pp. 307-308; and Billaud, op. cit.

<sup>&</sup>lt;sup>45</sup> Bellec, op. cit.

<sup>&</sup>lt;sup>46</sup> Denis, op. cit., p. 238.

On Monday 24, Celerier still feared an action by the armored units; according to Abramovici, this consideration was paramount in the decision to test as quickly as possible.<sup>47</sup> Still, a CEA document states that the final choice of the 25<sup>th</sup> was based on the grounds that favorable weather conditions (this probably meant that the wind direction were appropriate) were forecasted for that day.<sup>48</sup>

Early in the afternoon of the 24<sup>th</sup>, soldiers participating in the exercise were ordered to take their positions near the ground zero site near Hamoudia.<sup>49</sup> In the evening, the base personnel was informed that the test would take place the next morning.<sup>50</sup>

In an episode that reminds more of a Mel Brooks parody than of a James Bond movie, when it came to transporting the device to the tower some 50 kilometers away, Jean Viard decided to have the heavily guarded official convoy leaving without anything on board, while a CEA engineer, Pierre Thierry, transported the physics package in his modest 2CV ("deux chevaux") car. <sup>51</sup>

But the weather conditions then took a bad turn, with sand winds blowing all over the testing grounds.<sup>52</sup>

<sup>&</sup>lt;sup>47</sup> Abramovici, op. cit., pp. 307-308.

<sup>&</sup>lt;sup>48</sup> CEA document communicated to the author.

<sup>&</sup>lt;sup>49</sup> Testimony of Jean-Francis Rommès, "Le peloton Patton sous Gerboise verte", <u>www.moruroa.org</u>.

<sup>&</sup>lt;sup>50</sup> Testimony of a soldier quoted in Larbi Benchiha, L'Algérie, de Gaulle, et la Bombe, television documentary, 2010.

<sup>&</sup>lt;sup>51</sup> This episode is mentioned in the testimony of a CEA engineer, Claude Ayçoberry quoted in Pô, op. cit., pp. 139-140. The 2CV was a popular Citröen car, initially produced in 1948 with a view to encourage the transition of the French peasantry to modern vehicles. A different account states that the package was delivered in one of the utility 2CV that belonged to the military. Abramovici, op. cit., p. 308.

<sup>&</sup>lt;sup>52</sup> An official 2001 report blandly states that the weather conditions "were not conducive to a proper exploitation of the data". Rapport sur les incidences environnementales et sanitaires des essais nucléaires

The test (Tuesday, April 25)

At 0300 on the 25<sup>th</sup>, communications with Algiers were cut off in order to ensure that the news of the test would be announced by Paris and not by the rebels.<sup>53</sup>

At 0605, the device was detonated. The test was immediately made public by Paris through a bland government communiqué which made no reference to the most particular circumstances under which it was done.<sup>54</sup>

In Algiers, the Sahara command of general Mentré continued to send telexes to his troops urging them to support the coup. <sup>55</sup> But that same morning, unbeknownst to the base personnel, Mentré met with Challe in Algiers and came out of the meeting convinced that the putsch was doomed. He flew to the base in the evening of the same day – not to seize control of it, but to hide himself from Paris. <sup>56</sup> The base had just learned earlier in the evening that the coup had failed. <sup>57</sup>

Evidence behind the "political" nature of the timing

There is little doubt that the timing of the test was at least partly political. As stated, various testimonies mentioned above concur to say that concern was high among the military and

effectués par la France entre 1960 et 1996 et éléments de comparaison avec les essais des autres puissances nucléaires, Assemblée nationale, 5 February 2001, p. 27.

<sup>&</sup>lt;sup>53</sup> Abramovici, op. cit., p. 308.

<sup>&</sup>lt;sup>54</sup> Bendjebbar, op. cit., p. 326.

<sup>&</sup>lt;sup>55</sup> Bellec, op. cit.

<sup>&</sup>lt;sup>56</sup> Abramovici, op. cit., p. 308. Vaïsse seems to imply that Mentré's choice was made on the 24<sup>th</sup> (Vaïsse, op. cit., p. 73). However, Mentré himself later reportedly claimed, during his trial, that he had switched his allegiance back to Paris on the 25<sup>th</sup>. Incidentally, he also claimed at that occasion that he had been instrumental in ensuring that the test was conducted. See Spector, op. cit., p. 30.

<sup>&</sup>lt;sup>57</sup> Bellec, op. cit.

civilian leadership at the site. One of the main figures of the French nuclear program, Yves Rocard, writes that the decision was meant to "clean the site of any atomic bomb and divert the rebellion's attention away from it". <sup>58</sup> Likewise, the CEA engineer in charge of the device, Pierre Billaud, says that "political circumstances" dictated the decision to test on April 25. <sup>59</sup> Moreover, the change in weather conditions (the sand winds) did not deter Thiry from giving the final go-ahead.

The yield of the device provides another clue. Various official sources refer merely to a yield of "less than five kilotons", the same vague characterization as the two previous tests (Gerboise blanche and Gerboise rouge). <sup>60</sup> It seems clear, however, that the test was a partial failure. (There is no evidence behind Brennan's 1968 assertion that the device had been "optimized" to ensure detonation even if it meant a lower yield. <sup>61</sup>) The official report for the CEA activities of 1961 is unusually modest regarding the results of Gerboise verte, an indication of the fact that they were somewhat disappointing. <sup>62</sup> An early account suggested

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<sup>&</sup>lt;sup>58</sup> Rocard, op. cit., p. 232.

<sup>&</sup>lt;sup>59</sup> Personal communication with the author, 15 September 2011.

<sup>&</sup>lt;sup>60</sup> There is little official, unclassified information available about French test yields. A comprehensive parliamentary study published in 2001 gives less than five kilotons for the second, third and fourth tests (Office parlementaire d'évaluation des choix scientifiques et technologiques, op. cit., p. 26.) The same data are given in Ministère de la défense, op. cit., p. 1. The government communiqué of April 24, 1961 stated that the explosion was of a "low energy", but this did not mean anything in itself: five kilotons could be considered "low energy" as compared to the first French test (70 kilotons).

<sup>&</sup>lt;sup>61</sup> Brennan, op. cit., p. [XX]. Nor is it clear that this means anything from the technical standpoint.

<sup>62</sup> It says that it "allowed the [Military Applications Division of the CEA] and the armed forces to build on the lessons learned at the occasion of the previous explosions, in particular regarding the functioning of the device, its overall effects (..)" (CEA, Rapport annuel 1961, quoted in Bendjebbar, op. cit., p. 330). This was not a lie, since the CEA team discovered, at this occasion, unanticipated and valuable information about the behavior of the plutonium sphere during the implosion (Billaud, op. cit., and personal communication with the author, 15 September 2011). In addition, Gerboise verte included progress in the instrumentation of the tests (Rapport sur les essais nucléaires français, op. cit., p. 242). The 1961 report also mentioned lessons learned about the "essential characteristics that military equipments and materials must have to ensure an efficient protection of personnel", an obvious reference to the live exercise. Contemporary presentations of the test are balanced. The CEA claims that "the experiment was conducted in a quasi-nominal fashion and almost all the scheduled

a yield of less than one kiloton.<sup>63</sup> The unpublished memoirs of Pierre Billaud state that the delivered energy was 5% of what had been planned, and put the yield at 0.7 kiloton instead of the anticipated 15 kilotons.<sup>64</sup> There is in fact some uncertainty at the CEA itself about the yield delivered (probably due to the fact that weather conditions precluded a precise measurement). A classified report gives several different values ranging from 0.7 to 1.2 kiloton, for an anticipated yield of 6 to 18 kilotons.<sup>65</sup>

According to several testimonies, the reason behind this failure is that the neutron initiation of the fission reaction failed to take place properly. <sup>66</sup> One of the main goals of Gerboise verte was to test a new implosion architecture (and a new architecture of the physics package, allowing for better safety<sup>67</sup>). Two different explanations exist about what exactly took place, but they complement each other and support, each in its own way, the hypothesis of a hasty – and thus political – decision to test. According to Pô, the final preparation of the device, as far as the neutron initiation was concerned, had not yet taken place in Reggan when the order to test was given by Paris. <sup>68</sup> According to Pierre Billaud – who was in charge of the test – the weather was the real culprit: because of the heat and

measurements were acquired" (CEA document communicated to the author). A 1998 official documentary simply mentions Gerboise verte as having been "disappointing" (Histoire des essais nucléaires français, Etablissement de communication et de production audiovisuelle des armées, 1998).

<sup>&</sup>lt;sup>63</sup> Brennan, op. cit., p. [XX].

<sup>&</sup>lt;sup>64</sup> Billaud, op. cit. The author gives slightly different – but not inconsistent – data about the yields in another chapter of his memoirs (0.5-1 kiloton delivered for 10-15 kilotons anticipated).

<sup>&</sup>lt;sup>65</sup> Rapport sur les essais nucléaires français 1960-1996, Tome I: La genèse de l'organisation et les expérimentations au Sahara (CSEM et CEMO), p. 118, p. 229, p. 231. Although classified, the report is available on various websites.

<sup>&</sup>lt;sup>66</sup> Pô, op. cit., p. 139 ; Billaud, op. cit. ; Bellec, op. cit.

<sup>&</sup>lt;sup>67</sup> Billaud, op. cit.

<sup>&</sup>lt;sup>68</sup> Pô, op. cit., p. 139.

strong sand winds, the neutron flux was delivered five micro-seconds too early, which explains the low yield delivered.<sup>69</sup> As stated above, the atmospheric conditions unexpectedly turned bad the day before or the night preceding the test. In normal circumstances, says Billaud, the test should have been postponed.<sup>70</sup> And Thiry had the authority to stop the process. But he did not do it.

What did the loyalists seek?

But what did de Gaulle and the troops loyal to him seek in moving forward the date of the test? Was it to avoid the capture of the weapon? Or was it to make a symbolic show of authority in the eyes of the French population, the armed forces and the world? According to an early and well-informed account of the coup, it was clearly the latter.<sup>71</sup> But perhaps both considerations were in their minds.<sup>72</sup>

It is also possible that motivations were different at the various levels of decision. De Gaulle's "strategic" decision to move forward the date of the test (from on or after May 1 to on or after April 24) seems to have been primarily motivated by political considerations: the need to show France and the world who was in charge. Had he really been worried by a capture scenario, he would have ordered the test to take place as soon as possible. (The fact that the military exercises scheduled during the test, as well as simultaneous "cold" nuclear

 $^{69}$  Personal communication with the author, 15 September 2011. The same design ended up being successfully tested in 1963 (Billaud, op. cit.).

<sup>&</sup>lt;sup>70</sup> Personal communication with the author, 15 September 2011.

<sup>&</sup>lt;sup>71</sup> Fauvet & Planchais, op. cit., pp. 231-232.

<sup>&</sup>lt;sup>72</sup> This is what Abramovici implicitly suggests (op. cit., pp. 306-307).

<sup>&</sup>lt;sup>73</sup> Historians of the Algerian war have called the test "an extraordinary demonstration of the realities of Gaullist power" (Horne, op. cit., p. 459), one that "showed the whole world that the Government's authority extended to the far ends of the Sahara" (Fauvet & Planchet, op. cit., p. 232).

experiments, took place as planned, is another clue to the fact that the process was hasty but not hurried.<sup>74</sup>) But Thiry's "tactical" decision to test on Tuesday 25 despite unfavorable wind conditions may have been at least partly driven by on-site security considerations (as well as the increasing heat on the site).

One question remains: if security was uncertain and the weather was getting hotter and hotter, then why did Thiry decide that the test would take place only on Tuesday 25, and not on Monday 24, since he apparently had the authority to do so and was requested to test as early as possible? There are two possible explanations. It may be that the winds were not expected to be favorable on the early hours of the 24<sup>th</sup> (an explanation consistent with the CEA document mentioned above). Alternatively, it is possible that Thiry was still uncertain about his political loyalties during the whole day of Sunday 23 (an explanation consistent with Bendjebbar's account, largely based on Billaud's testimony).<sup>75</sup>

Whatever the reality, what Paris sought to convey is that it was business as usual that day, Tuesday 25, 1961, on the Reggan test site.<sup>76</sup>

## The Aftermath

<sup>&</sup>lt;sup>74</sup> Two cold experiments involving small amounts of plutonium were separately conducted that day under the codename "Augias 2". Rapport sur les essais nucléaires français 1960-1996, op. cit., p. 118.

<sup>&</sup>lt;sup>75</sup> A third explanation, that the engineers were requesting more time to prepare the device, would be inconsistent with Billaud's testimony according to which they were arguing for an early detonation because of heat and security concerns.

<sup>&</sup>lt;sup>76</sup> Pierre Messmer, who was defense minister at that time, claimed in a seminar held in 1992 that, to the best of his knowledge, there had been no pressure from the rebels for the test to not take place. See Les expérimentations nucléaires françaises, op. cit., p. 110. See also above the quotation of former French officials by Brian Jenkins (although contrary to Messmer, the officials in question had perhaps not had access to the relevant information).

The coup ended rather quickly. In the evening of April 23, de Gaulle made a major speech on television and the government mobilized the population in support of the Paris authorities. He resorted to Article 16 of the new constitution, giving him full powers (in effect, a form of legal counter-coup). Faced with limited support in Algeria and even less on the metropolitan territory, the generals gave up during the night of April 25-26.

In the end, the nuclear event of 1961 appears as the perfect symbol of De Gaulle's consolidation of power. For beyond its security and diplomatic value, the nuclear program was also, to some extent, an instrument to control the armed forces.<sup>78</sup>

It is interesting to note, in this regard, that two of the leaders of the 1961 coup, generals Salan and Jouhaud, were vocal opponents to the nuclear program. While they might not have guessed that nuclear weapons were going to consolidate the primacy of the politicians over the military, they perfectly understood that de Gaulle's priorities – building an independent deterrent and withdrawing from the NATO integrated military command – conflicted with an enduring, politically and financially costly, "pacification" operation in Algeria. De Gaulle's historical speech of 3 November 1959 to the armed forces had heralded the withdrawal from the NATO integrated command and drawn the contours of a new defense policy, without once mentioning Algeria; what he had hoped that day was to

77 France remained under Article 16 until October 1961.

<sup>&</sup>lt;sup>78</sup> On this see for instance Tertrais, op. cit.

<sup>&</sup>lt;sup>79</sup> On Salan and the nuclear program see Abramovici, op. cit., pp. 130-131. Zeller too was against the Bomb, but more for ethical reasons (personal communication by Bernard Zeller, 13 September 2011).

<sup>&</sup>lt;sup>80</sup> "How is the atom bomb going to help us pacify Algeria?" wondered Jouhaud in 1958 ("L'heure d'un choix", L'Air, 15 December 1958, quoted in Cohen, op. cit., p. 163).

stir patriotism and encourage French soldiers to think beyond their obsession with "pacification".<sup>81</sup> It was, as a historian put it, "either Algeria or the Bomb".<sup>82</sup>

The 1961 event is also connected in several respects to the decision taken less than a year later to propose the popular election of the President of the Republic (who was until then elected by a college of 81,000 elected officials). First, a direct election would shelter de Gaulle against an attempted military coup (or any other form of sudden eviction from power). Second, one of the reasons behind the 1962 reform was the legitimacy de Gaulle believed he needed to have the sole authority over the employment of nuclear weapons. The Evian agreements for the independence of Algeria were signed in March 1962. They stipulated that France would continue to use the Sahara as a nuclear testing ground for five years.

### Questions

So, was there ever an actual risk of the device being put under the control of the rebels? If yes, could they have used it in any way?

Was the device ever at risk?

The way the events unfolded, it seems that the device was never really at risk of being controlled by the rebels.<sup>84</sup> For sure, Thiry hesitated for twenty-four hours: but had he

<sup>83</sup> On this see for instance Tertrais, op. cit.

<sup>&</sup>lt;sup>81</sup> Jean Lacouture, De Gaulle, tome III, Le Souverain, Paris, Seuil 1986, p. 80.

<sup>82</sup> Vaïsse, op. cit., p. 110.

<sup>&</sup>lt;sup>84</sup> The base was never under the control of the rebels, contrary to what Spector hypothesized in 1987 (Spector, op. cit., p. 25, p. 30). The misuse of some French sources in this part of the Spector book was noted by political

refused to test (he could have argued that weather conditions were not appropriate), would it have been enough for Algiers to claim control of the Bomb? Moreover, this would not have changed anything to the outcome of the coup one day later. As far as the "insider threat" is concerned, there is no evidence that some of the units present in Reggan had the willingness to seize the device, whatever their personal inclinations regarding the coup. Finally, the fact that the test took place in the early hours of the morning – which was apparently standard procedure for technical reasons – is another indication that there was no clear and present danger to the security of the device. Had Thiry's prime objective been to scuttle it in order to prevent its capture, and thus disregarding the scientific aspects of the experiment, then the test could have taken place at any time.

There is no evidence either that the Algiers generals ever intended to devote the resources needed for a capture of the device. The control of the Sahara, with its vast oil riches and the presence of a nuclear tests and missile proving grounds, would have been an important strategic objective for any power seeking to establish itself in the French Algerian territories. However, nothing indicates that the timing of the coup depended on the planned test, or that the control of the testing site was a key objective of the rebels. The question of fate of the R1 device was probably discussed by Algiers as an afterthought, an opportunity to be seized.85

scientist Samy Cohen in "France, Civil-Military Relations, and Nuclear Weapons", Security Studies, vol. 4, n° 1, Autumn 1994, pp. 177-178.

<sup>&</sup>lt;sup>85</sup> Pierre Billaud recounts that his flight to Reggan was particularly unusual. Flying over the Mediterranean, the plane received an order from Paris to return to its base. Then it received another order, this time to land in Algiers instead of going straight to the test site. Billaud and his colleague George Tirole (who were the only two passengers) had their identities checked by a rebel unit, but they then let them go to Reggan. Whether or not this was an cumbersome attempt to stop or delay the test is unclear. See the testimony of Pierre Billaud in Bendjebbar, op. cit., pp. 327-328, and Billaud's own account (Billaud, op. cit.). No mention of the date of the flight is given, but this was probably on April 22, since Billaud then mentions that he and his colleague had

Would it have been possible for the generals to take control of the device by force?

If the generals had decided that the device was a key objective, an option would have been for them to ask some of the military forces in Reggan to capture it. As stated, some of the onsite military personnel were clearly sympathetic to the cause of the generals. However, this could have meant a bloody and uncertain battle at the base itself. Moreover, one has to assume that these units had direct means of communication with Algiers.

Another option would have been for Algiers to organize a dedicated operation to seize the whole testing grounds by force. As stated, the Reggan base was operationally under the control of Paris, but organically dependent on Algiers for its supplies (which came by air). <sup>87</sup> However, the success of such a move would have meant a significant diversion of rare military resources by the rebels, flying forces – say one regiment of 1,000-1,500 men – about a thousand miles south of the coast. (The six regiments that the rebels could count on were needed to control the main coastal cities.) Security at the base was not heavy: dedicated forces apparently included only company of soldiers and one platoon of gendarmes on the base (as well as another company in Adrar, some 50 kilometers away from Reggan). <sup>88</sup> The security culture as said to be rather lax (probably because the isolation of the site was its

<sup>&</sup>quot;forgotten" that a coup was taking place. This in spite of the fact that they were the only two passengers in the flight – obviously due to the particular political circumstances – whereas the previous three tests had been attended by many visitors from Paris.

<sup>&</sup>lt;sup>86</sup> It is unclear whether specific units were actually clearly siding with the rebels. As stated above, several sources state that armored units were sympathetic to the generals' cause. See for instance Pô, op. cit., p. 139, and Abramovici, op. cit., p. 307. The testimony quoted by Pô refers specifically to a unit which was present for the exercise planned during the test; however, these troops had no contact with the base personnel and were probably largely unaware of what was going on (Rommès, op. cit.). Abramovici mentions armored units and Legion étrangère units.

<sup>&</sup>lt;sup>87</sup> Pô, op. cit., p. 139.

<sup>&</sup>lt;sup>88</sup> Yves Rocard goes as far as saying that the site "did not even have a single machine gun to defend it", a dubious assertion. Rocard, op. cit., p. 232.

first line of defense). 89 But here, too, such an attack would have meant the risk of fighting at the base itself. 90

Moreover, the rebels would not necessarily have known whether the elements of the device were stored in Reggan or already transported to the testing grounds. And in Reggan, the physics package and the conventional explosives were stored in different locations, at a distance of 200 to 300 meters from each other. The operation would not have been a simple one. <sup>91</sup>

Thus even if the control of the base had been a key objective, by far the best option for the rebels would have been to wait for the coup to succeed and most French forces present in Algeria – including those at the testing site – be under their command. <sup>92</sup> There is not much the CEA experts could have done against that, except, maybe, to sabotage elements of the device as to render it inoperable.

If they had, could they have used the device?

Even if the rebels had been able to get hold of a functional device (either physically by force or legally by succeeding in their enterprise), they would hardly have been able to use it as a

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<sup>&</sup>lt;sup>89</sup> Bellec, op. cit.

<sup>&</sup>lt;sup>90</sup> Whether or not French forces would have gone as far as spilling "blood for the bomb" is dubious. Vaïsse notes the prevailing culture of the French military included a strong repugnance to the idea against fighting against one another (op. cit., pp. 292-294). More likely, a confrontation on the site would have had one side ceding to the other before actual fighting could have taken place.

<sup>&</sup>lt;sup>91</sup> Antoine Schwerer, Auprès de ma bombe, unpublished manuscript, March 1990, p. 49.

<sup>&</sup>lt;sup>92</sup> Another possibility would have been to seize the device before it reached Reggan, assuming it was not yet on the site (see below).

weapon had they wanted to.<sup>93</sup> Assembly was planned to be made by an automated process; a new mechanism would have had to be designed. (This automated assembly mechanism was located in the testing tower itself near Hamoudia, some 50 kilometers away from the storage areas. The key to initiate the mechanism was under military control.<sup>94</sup>) Also, R1 was a device, not a weapon: even if assembled, it was not meant to be transported and detonated at will.<sup>95</sup> The rebels would thus also have had to design a new mechanism for its remote detonation.

More realistically, the control by the rebels of the elements of the device would have been an instrument of political blackmail – as feared by many on the base – or more simply, and more likely, a testimony of their control over the most potent symbol of French power. 

According to Pierre Billaud, general Challe's counter-order to Thiry was probably meant to 

"affirm his control over the Sahara". 

97 Just imagine the Paris media announcing "The rebels"

<sup>&</sup>lt;sup>93</sup> This is a theoretical discussion. It is hard to conceive a scenario in which such use would have made sense, apart from proceeding with the test at a moment of their choice, to demonstrate their control of the Sahara.

<sup>&</sup>lt;sup>94</sup> Schwerer, op. cit., p. 49, p. 65. The *"final 35 minutes"* of the assembly process were automated according to a CEA engineer interviewed by the French public radio broadcasted on 17 March 1960 (archives of the Institut National de l'Audiovisuel).

<sup>&</sup>lt;sup>95</sup> One account suggests that the core of the device had not yet been delivered to the Reggan base when the coup took place. The head of Radio-Alger, André Rossfelder (appointed by the rebels in the first hours of the coup) claims that he was informed in the evening of the 22 April that the device – without its detonator – which was due to be transferred to Reggan, was a in a military warehouse in the port of Algiers. When he sought to having the story confirmed, he was told by a military official that this was a mistake and the device had already been delivered to Reggan. While Rossfelder does not hypothesize about the veracity of the events, he seems to implicitly suggest that the Algiers generals had deliberately allowed the core to be transferred to Reggan. André Rossfelder, Le onzième commandement, Paris, Gallimard, 2000, pp. 497-499.

<sup>&</sup>lt;sup>96</sup> According to a personal testimony, the idea of a nuclear blackmail did not square well with the mentality of the four generals. Personal communication of Bernard Zeller with the author, 13 September 2011.

<sup>&</sup>lt;sup>97</sup> Personal communication with the author, 15 September 2011.

have the Bomb!". It would have been, in a sense, poetic justice: the ultimate revenge of the generals against de Gaulle. 98

Whether this would have affected the outcome of the coup in any way remains open to speculation. 99

#### Lessons

How much and how far this episode is worth using in support of the idea that nuclear terrorism is a real danger? Can any parallels be drawn with the foreseeable evolution of contemporary nuclear-capable States?

Lessons that can be learned from this episode include the following:

- The possibility of a nuclear device falling into unauthorized hands (either physically or legally) is not a farfetched scenario.

<sup>&</sup>lt;sup>98</sup> The notion of poetic justice is suggested by Rossfelder (op. cit., p. 498). One thing the rebels could have done is proceeding with the test according to their own timetable, to demonstrate their control of the site; but this would have meant acquiring the cooperation of the CEA personnel

<sup>&</sup>lt;sup>99</sup> The details of the Reggan events remained secret for several weeks and there is no evidence that the United States, for instance, was aware in real time of what was going on at Reggan in April 1961. No mention of the episode is made in the studies of US archives done by French experts (Vincent Nouzille, Des secrets si bien gardés. Les dossiers de la Maison-Blanche et de la CIA sur la France et ses présidents 1958-1981, Paris, Fayard, 2010; and Vaïsse, op. cit.) No US official analysis of the events has been found by this author. A declassified 1964 CIA study entitled "The French Nuclear Weapon Program", available on the National Security Archive website (OSI-SR/64-10, 27 March 1964), comments each French test, but the description is excised in the declassified version. A report drafted by Prof. Thomas Schelling for the Kennedy administration in October 1962 recounting delivery possibilities for new nuclear powers states that "a fishing boat or a cheap airplabe might have been an adequate means of delivery for, say, the Algerian Nationalists against Marseilles, or Castro's Cuba against Baltimore and Miami" (quoted in Francis J. Gavin, "Same As It Ever Was: Nuclear Alarmism, Proliferation, and the Cold War", International Security, vol. 34, n° 3, Winter 2009-2010, p. 22); perhaps this scenario was inspired by the April 1961 events and the subsequent agreement allowing France to continue testing in Algeria after independence.

- The control of non-weaponized devices can become a key political objective for competing armed factions in a situation of political instability. This could happen in countries such as Iran, North Korea, Pakistan and China. Indeed, particularly interesting scenarios include a secessionist movement in the restless regions of Baluchistan or Turkestan, which respectively host Pakistan's and China's testing sites.
- At the same time, a scenario such as the 1961 one is more likely to happen in an emerging nuclear-capable State with a nascent program and rudimentary means, than in a mature nuclear power such as China. In addition, even in such an State, the context could be very different from what it was fifty years ago: technology diffusion (as well as a greater global sensitivity to nuclear surety concerns), suggest that security of devices and installations such as testing sites, as well as communications between authorities and nuclear installations, could be much better in, say, 2021, from what they were in France in 1961. (For the same reason, contrary to what happened in 1961, several countries would be able to follow the events in real time by satellite means, and possibly influence the crisis.)
- Complex command arrangements for military nuclear activities can prove to be problematic in crisis situations, creating legitimacy conflicts or uncertainties about who controls various nuclear commands and institutions.<sup>100</sup>
- Nuclear weapons can become instrumental in the consolidation of the primacy of civilian power over the military, and of the primacy of the executive over the legislative branch, and of the popular legitimacy of the head of the State. What

<sup>&</sup>lt;sup>100</sup> A stated above, the CSEM reported both to Paris (Joint Staff) and Algiers (Sahara Command), and the GOEN reported both to the Ministry of Defense and the CEA.

happened in France was, in a sense, the reverse of what happened later in Pakistan, where control of nuclear weapons reinforced the armed forces' primacy over the civilians.



