

Déjà vu all over again

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The Manhattan Project grew out of a chilling intelligence assessment by scientists—many of whom would later work at Los Alamos—that the Third Reich was actively pursuing the development of an atomic explosive. Indications were that research was being carried out by a team headed by Werner Heisenberg in the Reich Research Council, which reported to Field Marshal Hermann Goering. Development of an atomic warhead for the German V-2 rocket had the real potential of changing the course—and probably the outcome—of the war.

Tracking the Third Reich program instantly became the single most important intelligence task for the United States and Great Britain. Unfortunately, when the question of the status of the Third Reich atomic-explosive program was posed to the Office of Special Services (OSS)—the forerunner of the Central Intelligence Agency—the probable response from General Donovan, the head of the OSS, was, “What is an atomic explosive?” Information

necessary to make such an assessment was so compartmentalized that even Vice President Truman did not know of the existence of our program until he became president following the death of President Roosevelt. Albert Gore, Sr., who as a congressman was told by Speaker of the House Sam Rayburn to hide millions of dollars in the budget for a “special project,” did not know or dare ask about the project for which the money was appropriated.¹

Therefore, the function of assessing the status of the Third Reich program had to be transferred to Los Alamos because only scientists actually working on our atomic-explosive project had the requisite clearances and knowledge to make the crucial judgements demanded by the enormity of the threat.

¹Private communication, 1986. Senator Albert Gore, Sr., said that money for the Manhattan Project was dispersed throughout the federal budget. He had no idea what the money was for until he read about the use of the atomic bomb in Japan. He opined that the project was possible only because of the trust and discipline that existed in the House of Representatives at that time.

A team of scientists was assembled at Los Alamos and charged with providing the required assessments and tracking of the Third Reich program. Relying on technical literature published by the Germans even in the throes of World War II, on information collected by the Alsos Mission,² and on contacts that a few Los Alamos scientists, such as Niels Bohr, had had with Heisenberg, the team determined that the Germans had grossly overestimated the amount of highly-enriched uranium required for an atomic explosive and had overestimated the thermal-neutron cross section of graphite. The team suggested that the Germans would possibly pursue heavy water in lieu of graphite as the neutron moderator in their plutonium-production reactor.

²The Alsos Mission was established by General Leslie Groves within his Intelligence Department to collect information on German nuclear-physics programs. The mission operated within European areas liberated by Allied Forces. For more information about the Alsos Mission, see *Alsos* by Samuel A. Goudsmit (Henry Schuman, Inc., 1947).

As a result, the heavy-water plants in Nazi-occupied Norway were targeted for destruction by the Royal Air Force and British commandos. There was some uncertainty as to whether the Germans had knowledge of the use of plutonium in atomic explosives or even knew of its existence. Therefore the destruction of the heavy-water plants was only added insurance that the Third Reich never would be able to develop a plutonium-production capability.

Inspection of German facilities after the war by intelligence officers indicated that the Los Alamos team had provided very accurate assessments of the Third Reich effort. According to Samuel A. Goudsmit, historian of the Alsos Mission, because of the lack of progress and direction, support for Heisenberg's efforts by the Third Reich had waned substantially about the same time that our program was going into high gear.

In 1990, as American troops were being assembled for deployment to the Persian Gulf, we were again confronted with the chilling prospect that a despotic regime was on the verge of acquiring one or more nuclear weapons. Like Adolf Hitler, Saddam Hussein—the regime's ruler—had already demonstrated a capability to deliver weapons of mass destruction³ and had demonstrated a resolve to use such weapons even against his own people. In the words of Yogi Berra, “It was déjà vu all over again.”

Coming to grips with that prospect was a frantic process made all the more urgent by the impending

deployment of U.S. military forces and compounded by the dearth of information available on the Iraqi nuclear-weapons program. However, before U.S. forces landed in Saudi Arabia, the U.S. intelligence community, relying heavily on assessments from Los Alamos and Livermore national laboratories, had reached a general consensus that the Iraqis were still within several months to a year of having a nuclear weapon. Barring the diversion of highly-enriched uranium from their research reactors at Tuwaitha, the Iraqis probably did not possess enough plutonium or enriched uranium to actually build a nuclear weapon. Moreover, inspections by the International Atomic Energy Agency found the reactor fuel still in place.

However, our assessment of the status of the Iraqi program—although technically accurate—proved more an example of good fortune than an example of good intelligence. Unknown to us at the time our assessment was made was the sheer magnitude of the nuclear-weapons program being carried out by the Iraqis—in violation of the Nonproliferation Treaty—under the cover organization Petro Chemical 3 (PC-3).

Borrowing the technology behind the “calutrons” developed early in the Manhattan Project, PC-3 had built an enrichment facility and was in the process of separating weapon quantities of highly-enriched uranium. In essence, these separators, which the Iraqis called Baghdadtrons, were large mass spectrometers capable of deflecting uranium ions of differing masses into graphite collectors. The basic technology, called electromagnetic isotope separation, had been abandoned by the U.S. as a means of separating large amounts of uranium because of its relative inefficiency

and high operating costs. However, the technique had provided top product enrichment for the uranium used in the “Little Boy” device.

Considering the size of the Iraqi nuclear-weapons program, had the Iraqi invasion of Kuwait not occurred and had that invasion not precipitated a military response by the Allies, Iraq probably would today possess material for one or more nuclear weapons, forever altering the strategic situation in the politically volatile Middle East.

Since Desert Storm, Los Alamos scientists have served on several inspection teams under United Nations sponsorship and have played a significant role in developing our understanding of the scope and nature of the Iraqi program to build nuclear weapons. Currently, as part of an ongoing effort, the Laboratory is heavily involved in developing new nonproliferation-monitoring methods and negotiating more effective agreements on dual-use technologies. This process goes on today.

The major lesson learned in Desert Storm is that because of the growing availability of plutonium and enriched uranium throughout the world and because of the proliferation of nuclear-weapons know-how, we cannot afford to enter future conflicts blind to the realities of any nuclear-weapons programs in the area of conflict. We cannot have any future déjà vu interrupted with an inopportune flash of blue light. It is this realization that has provided the real spur to nonproliferation initiatives and programs within the DOE and other federal agencies. ■

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³Interestingly, the Iraqi AL ABBAS and AL HUSSAIN missiles were derivatives of the Soviet SCUD missile that was, in turn, a derivative of the Third Reich's WASSERFALLEN surface-to-air missile.