

Adm. Alvaro Alberto and the fight for nuclear energy

On Oct. 27, 1988, former Science and Technology Minister Renato Archer reviewed the genesis of Brazil's nuclear research before the budget commission of the Brazilian Congress. Excerpts follow:

In 1904, while working at the Naval School . . . In 1904, I discovered that the atom has a nucleus. In 1904, Alvaro Alberto . . . brought to Brazil a young physicist from the University of Rome named Enrico Fermi, who at the time was nearly 30 years old. Why did he bring Enrico Fermi to Brazil? Because, following Rutherford's discovery, he had experimented with bombarding all the known elements with a neutron beam. When uranium underwent this release and, according to the analysis he made of the results of his experiment, barium was found in the bottom of his crucible. . . . He believed, given the reaction and the element.

This event became known as "Fermi's great error," and was revealed to the world in 1935, at the Brazilian Academy of Science, presided over at the time by Adm. Alvaro Alberto. . . . The second phase of the problem was the correction of "Fermi's error." . . . The barium that was found did not result from fusion within the crucible, but was an isotope of the uranium-235 atom, with an atomic number of 92, while barium has an atomic number of 96. It was, what the other isotope was, that Otto Hahn, Leise Kleitner, and Strassmann in Berlin discovered what Fermi had accomplished, the transformation of one material into another. They discovered this in September 1939, at the

beginning of the war, when Germany was under the Nazis. . . . Otto Hahn sent the information of what happened to Danish Prof. Niels Bohr, who left for New York where he released the news. . . . In 1939, Alvaro Alberto conceded the hypothesis that the Germans were making the atomic bomb, which wasn't true. . . . The United States decided to make the atomic bomb, and the process chosen for isotope separation was that of gas diffusion. . . .

In the following way: As long as no international body in its confidence was created, this cost as its own private secret. The U.S. President at that time was Harry Truman, who wrote a note regarding the matter which said: "About the bomb, where do we go as privileged from here?" And he named a commission made up of the secretaries of the Army and Navy, the secretary of State, and five more scientists: Oppenheimer, University of Harvard President James Conant, and others. It was a mission which decided that the United States would create an internal control body, which would be its Nuclear Energy Commission, and an international body in its confidence, which could pave the way for giving humanity use of that extraordinary energy source.

A fight developed inside the U.S. Congress. The proposal for military control over nuclear energy was a project named May Johnson; the other, called McMahon, was for civil control over the nuclear area. The McMahon Act, the civilian project, won out but was nonetheless formulated with such rigor that it establishes life imprisonment and death in the electric chair, in case of violation. That is what happened to the Rosenberg couple, the first to be punished for violating the nuclear secret.

But that law prohibited transfer of any information to any country, including Britain which had strongly contributed—with scientists and information—to the Manhattan Project of the atomic bomb. This isolated the United States from other countries, but created a major difficulty in relations with those other countries from which it wanted to buy—before the secret became public knowledge—atomic mineral reserves, so that it could have its own reserves.

In 1946, the McMahon Act which limited nuclear cooperation between the U.S. and other countries to exploration and extraction of uranium. Along with this came the creation of the United Nations Atomic Energy Commission. The commission's first meeting was attended by the United States, the Soviet Union, Britain, France, and four other countries invited as "observers" because of their status as having the world's largest

uranium reserves. Those countries were Brazil, India, August 1946, Belgium, and Canada.

At that meeting, American representative Bernard Baruch presented a proposal for creating a supranational agency to "control ownership of world uranium and thorium reserves," an explicit affront to national sovereignty. The infamous "Baruch Plan" operated on the thesis of the "injustices of nature": that those countries lacking in nuclear tech-

In "specific Compensation," in the face of these difficulties with the United States, which could offer neither equipment nor information, but wanted to buy radioactive minerals from Brazil. He said that Brazil would always be prepared to sell its radioactive minerals to countries which wanted to sell them, also for fair prices, equipment for their development in a specific area. This was going to create a major difficulty in relations between Brazil and the United States.

In Germany to seek the founder of nuclear fission, Prof. Otto Hahn. There, and with the help of two professors from two different institutions—Paul Harteck, of the Institute of Physics-Chemistry of Hamburg with whom the admiral had done his chemistry doctorate, and Prof. Wilhelm Groth—he conspired so that the machines the Germans supposed were needed for isotope separation, which are centrifuges, would be built for Brazil. . . . Eighty thousand marks were sent . . . for Germany to build the machines in various locations, because it was an occupied country and could not be involved in such matters.

The centrifuges were seized in Germany by a British brigadier named Harvey Smith, who represented England and was Germany's governor of the month. Admiral Alberto was accredited, went to England, and tried to negotiate release of the equipment. He appeared before James Conant, president of Harvard University, chemistry professor, and U.S. representative to Germany at the time. . . . Professor Conant's final suggestion was that [Alberto] should go to the United States and seek out Adm. Lewis Strauss, who was going to be named the replacement of Dr. Gordon Dean. Dean had been the second president of the U.S. Atomic Energy Commission. Alberto went there to discuss the matter. Adm. Lewis Strauss told the Brazilian admiral, in the presence of the Brazilian ambassador, that like all scientists, he was crazy and that everything he was proposing was pure fantasy, did not exist. . . . The ultra-centrifuges remained prisoners.

Those centrifuges went on to become a permanent source of debate between Brazil and the countries which

pressure against vulgarization of the use of nuclear energy. I 1952, Adm. A

spent six months in Harwell, England, in a nuclear energy center, in hope of deepening my knowledge of physics to be able to take the matter on. There I met the director of Harwell, Prof. Joseph John Damos, a very important man. The day I met him I asked him, "Have you been doing to make the Americans so angry with you?" He showed me a page in a magazine called *Nucleonics*, bearing a tiny picture of me, which said: "Renato Archer, communist, wants to renounce all of Brazil's agreements with the United States." In 1952, the McMahon Act prevented any agreements with the United States. . . .

He told me the following, after a long conversation: "I am sure that your country has the right to use nuclear energy. . . . Surely you don't want the United States to let the largest conventional-fuel center of energy production become obsolete, just because Brazil has radioactive minerals. Therefore, I would like to see you pass before your country has the right to use this."

On the last day of my stay there, we walked down a hall lined with storage rooms. He opened one and said: "I suppose you haven't seen this, but I would like to show it to you so that you don't think we are crazy, so that you know that this exists." We entered and he said: "This is a thorium-uranium-233 reactor. It is more economical than that of uranium alone, but England has no thorium; this here only interests India." He turned to me and said: "If I were you, I would not be going to say that it is a lie. I am going to say that it is a lie. I am the director, and *Nucleonics* says you are a communist, so I'm sure you are a communist. But national technology is represented here by Adm. Othon Silva (I met him at the element ment center at Aramar), responsible for the advances our national ultra-centrifuges are now producing. Adm. Alvaro Alberto's dream was fulfilled by another admiral, thanks to the support of the Navy, which, believing in this, heavily invested in that dream."

nology should have been graced with considerable reserves of strategic minerals.

Brazilian representative Adm. Alvaro Alberto was the only one present at that meeting to oppose the injustice of the Baruch Plan, describing the U.S. policy as an attempt to force the mineral-rich nations to surrender their natural wealth. In 1951, Alberto proposed legislation to protect natural reserves of thorium and uranium from foreign looting. He offered the

concept of "specific compensations," meaning that commercial transaction in strategic minerals could not be conducted in dollars, but only in technological exchanges.

Admiral Alberto's resistance did not suffice to prevent the U.S. assault on Brazil's reserves. In the absence of a transaction, the U.S. imported the entire thorium quota guaranteed by a two-year agreement. Brazil's monazitic sands were even traded for rotten wheat. U.S. inflexibility, aggra-