

Congo Uranium and the Tragedy of Hiroshima

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Congo uranium starts the Manhattan Project

The nuclear bombs that destroyed Hiroshima and Nagasaki led to the tragic deaths of a large proportion of the men, women and children living there, and the anti-human technology that obliterated the two cities still casts a very dark shadow over the future of humankind. One of the little-known aspects of this tragedy is the role played by the uranium mines of Congo. In this paper, we will review the role that Congo Uranium played in starting the Manhattan Project, and how Congo uranium was used to make the first nuclear bombs. We will also look at what is happening today at the officially closed but very active Congo uranium mines. Finally, we will examine some problems of uranium and nuclear proliferation.

In the summer of 1939, while Hitler was preparing to invade Poland, alarming news reached physicists in the United States. In addition to articles on uranium fission published in *Naturwissenschaften* and *Deutsche Allgemeine Zeitung*, two meetings of German atomic scientists had been held in Berlin under the auspices of the Research Division of the German Army Weapons Department. Furthermore, Germany had stopped the sale of uranium from mines in Czechoslovakia.

The world's most abundant supply of uranium, however, was not in Czechoslovakia, but in Belgian Congo. Leo Szilard, a refugee Hungarian physicist living in the US, was deeply worried that the Nazis were about to construct atomic bombs; and it occurred to him that uranium from Belgian Congo should not be allowed to fall into their hands

Einstein's fateful letter

Szilard knew that his former teacher, Albert Einstein, was a personal friend of Elisabeth, the Belgian Queen Mother. Einstein had met Queen Elisabeth and King Albert of Belgium at the Solvay Conferences, and mutual love of music had cemented a friendship between them. When Hitler came to power in 1933, Einstein had moved to the Institute of Advanced Studies at Princeton; and Szilard decided to visit him there. Szilard reasoned that because of Einstein's great prestige,

and because of his long-standing friendship with the Belgian Royal Family, he would be the proper person to warn the Belgians not to let their uranium fall into the hands of the Nazis.

It turned out that Einstein was vacationing at Preconic, Long Island, where he had rented a small house from a friend named Dr. Moore. Leo Szilard set out for Peconic, accompanied by the theoretical physicist, Eugene Wigner, who, like Szilard, was a Hungarian and a refugee from Hitler's Europe.

For some time, the men drove around Peconic, unable to find Dr. Moore's house. Finally Szilard, with his gift for foreseeing the future, exclaimed: "Let's give it up and go home. Perhaps fate never intended it. We should probably be making a frightful mistake in applying to any public authorities in a matter like this. Once a government gets hold of something, it never lets go". However, Wigner insisted that it was their duty to contact Einstein and to warn the Belgians, since they might thus prevent a world catastrophe. Finally they found the house by asking a small boy in the street if he knew where Einstein lived.

Einstein agreed to write a letter to the Belgians warning them not to let uranium from the Congo into the hands of the Nazis. Wigner suggested that the American State Department ought to be notified that such a letter was being written.

On August 2, 1939, Szilard again visited Einstein, this time accompanied by Edward Teller, who (like Szilard and Wigner) was a refugee Hungarian physicist. By this time, Szilard's plans had grown more ambitious; and he carried with him the draft of a letter to the American President, Franklin D. Roosevelt. Einstein made a few corrections, and then signed the fateful letter, which reads (in part) as follows:

"Some recent works of E. Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element uranium may be turned into an important source of energy in the immediate future. Certain aspects of the situation seem to call for watchfulness and, if necessary, quick action on the part of the Administration. I believe, therefore, that it is my duty to bring to your attention the following..."

It is conceivable that extremely powerful bombs of a new type may be constructed. A single bomb of this type, carried by boat and exploded in a port, might very well destroy the whole port, together with some of the surrounding territory..."

"I understand that Germany has actually stopped the sale of uranium from Czechoslovakian mines which she has taken over. That she should have taken such an early action might perhaps be understood on the ground that the son of the German Under-Secretary of State, von Weizsäcker, is attached to the Kaiser Wilhelm Institute in Berlin, where some of the American work is being repeated."

On October 11, 1939, three weeks after the defeat of Poland, Roosevelt's economic adviser, Alexander Sachs, personally delivered the letter to the President. After discussing it with Sachs, the President commented, "This calls for action." Later, when atomic bombs were dropped on civilian populations in an already virtually defeated Japan, Einstein bitterly regretted having signed the letter to Roosevelt. 80% of the uranium later used in the Manhattan project came from the Shinkolobwe deposit in Belgian Congo.

Shinkolobwe uranium and the collapsed state

When the Belgians left the Congo in 1960, they closed the mine by flooding the shafts and placing a concrete slab over the entrance. However, early in 2004, Arnaud Zajtman of the BBC found 6000

people working the mine illegally. Ore from the Shinkolobwe mine is taken to smelters both in Congo and in nearby Zimbabwe.

“They are digging as fast as they can dig, and everyone is buying it,” commented John Skinner, a mining engineer based in the nearby town of Likasi. “The problem is that nobody knows where it is going. There is no control at all.”

Besides containing uranium, ore from the Shinkolobwe mine also contains a high percentage of cobalt, which is used in mobile telephones. It is this richness in cobalt that makes mining the ore especially profitable, so that motivation for closing Shinkolobwe may be lacking. Congo’s President, Joseph Kabila ordered the mine closed in March 2004, but the order has by no means been enforced. Thus Congo’s uranium not only initiated the series of events that led to the development of nuclear weapons and the tragedies of Hiroshima and Nagasaki; it also contributes to the present danger of nuclear proliferation and nuclear terrorism.

The Congo Crisis

To understand the difficulty of closing Shinkolobwe, we need to look in detail at the recent history of the Congo. The Shinkolobwe mine is located in the province of Katanga (named Shaba during the Zairian time, 1971-1997) in South-Eastern Congo. The region is, like many other regions in the Democratic Republic of Congo, rich of minerals to an extreme extent. The region’s mining, which has been influenced by Zimbabwe (Robert Mugabe was a close ally and business partner to Laurent Kabila), played a crucial role in the time of decolonization and the change of regime that led to Joseph Mobutu’s thirty two years of kleptocracy and misrule of the country.

The Congo gained independence from Belgium on June 30, 1960. The following period was politically tumultuous and resulted in a complete breakdown of law and order in the entire country. Several riots occurred as well as mutiny in the Congolese national army. On June 7 Belgium decided to reinforce its troops that remained at key bases in Congo, not only to restore law and order but also to protect the remaining Europeans. On July 10, the central government in Leopoldville (Kinshasa) asked the UN for military assistance. The Belgian colonial power had left the indigenous Congolese poorly educated with little chance to govern the country successfully. When the Katanga province declared its independence from the central government July 11, the UN had its hands full. The cold war was at its height and Congo had become a strategic playground on the African continent. That was the Congo crisis.

The UN Secretary-General, Dag Hammarskjöld, was the key architect of the Congo mission at that time. It was named ONUC (French initials), and made three attempts to prevent Moïse Tshombé and his army of mercenaries from seceding the Katanga province from the rest of the Congo. The main tasks were to assist the central government in restoring law and order, and to maintain the territorial integrity of the country. Dag Hammarskjöld tragically lost his life under blurred circumstances. His plane crashed on a flight from Leopoldville (now Kinshasa) to the Katanga province. He was supposed to have met with Moïse Tshombé to negotiate, but the plane never reached its destination.

Cursed by riches

The present conflict in the Democratic Republic of Congo has often been referred to as a resource based conflict, and as one crucial rapport from 2002 by the British government has put it: “...the country is cursed by riches.” The former Danish EU-commissioner, Poul Nielson actually received

a letter about the present problem with the Shinkolobwe mine and some stored cans with radioactive material in a nearby city. But he stated that: “it is a problem for the present central transitional government to take care of,” and that, “it is the lack of a strong central government and its lack of governance in the region that is the core problem.” To some extent he is right. It is not the valuable minerals that create the problems, but the failure of politics. Poul Nielson stated that the EU couldn’t go into specific troubled cases in DR Congo or take special action in the single case, but should rather support the Congolese people and transitional government in implementing democracy and a system of laws that will provide the necessary security in dealing with Congo’s various minerals.

Besides being a mineral resource based conflict the present problems with which DR Congo struggles with are of multilayered character. Violent factionalism and ethnic affiliation are all crucial elements that fuel the ongoing conflict. Strong financial interests from at least six neighbouring countries furthermore inflame the internal struggles that create outspread instability and millions of internally displaced people.

As René Lemarchand so eloquent says it: “In its most recent avatar – the Democratic Republic of Congo – the former Belgian colony is not just a failed state; it is the epitome of the collapsed state, whose descent into hell has set loose a congeries of rival factions fighting proxy wars on behalf of half a dozen African states.”

The peace initiatives never succeeded in having the expected impact in the eastern zone of DR Congo. Various rebel groups related to or supported by the neighbouring countries have found a good business in operating in an environment that on the surface seems anarchistic. The central government in Kinshasa on the other side of the country, 1500 kilometres away, has only modest control of the situation in the east. That makes the rebel groups’ basis for negotiating better than the central government’s, with arguments and unrealistic demands motivated from not wanting peace.

The conflict in DR Congo carries elements of civil war, ethnic disputes, and regular war because of the involvement of neighbouring countries such as Uganda, Rwanda and Burundi, but also Zimbabwe, Namibia, Angola who are interfering in the conflict as a part of the Kinshasa Governments faction.

The unstable environment, which is fuelled by the lack of a strong central government, allows for the continuance of organized crime by local actors, but also from business partners and companies outside the country. A list of companies that have profited from the conflict and avoided paying high taxes, underlines the commercial benefits and possibilities for making a good deal out of the chaotic situation and creates a picture of a multilayered and multi-dynamic conflict, which is hosting actors who prefer a “Cash-in a Suitcase- economy”. Ethnic affiliation is a key element in the game of extracting valuable minerals from the country. As Koen Vlassenroot says, “At a time when the existing economic, administrative, and social patterns that have defined the local space become increasingly unstable, subject to external penetration, and unable to offer clear contexts within which people on the ground can make daily and life-choices, ethnicity indeed easily becomes an excuse for political action and violence”

Uranium, nuclear proliferation, and nuclear terrorism

The dangers presented by Congo uranium are the typical of the general link between uranium and the proliferation of nuclear weapons. One of the troubles of preventing proliferation is that civilian nuclear energy and research facilities can be, and have been, misused to produce fissionable material and bombs.

Uranium contains several isotopes, i.e. it consists of atoms that have the same number of protons and electrons (and hence the same chemical properties) but which differ in the number of neutrons that their nuclei contain. The rare isotope U-235 is very slightly lighter than the common isotope, U-238. If uranium is to be used in nuclear weapons, the percentage of U-235 must be raised to at least 20%. (In natural uranium, the percentage of U-235 is only 0.71 %.) Since the chemical properties of U-235 and U-238 are identical, such an enrichment process depends on physical processes making use of the slight difference in mass. For example, a high-speed ultracentrifuge can be used to separate the two isotopes.

The problem in distinguishing between civil and military nuclear programs is that reactors used for generating power usually use fuel rods made of low enriched uranium (LEU), where the percentage of U-235 is 3-5%. However, if the same ultracentrifuges used to make LEU are run a little longer, they are perfectly capable of producing weapons-grade uranium. Thus it is practically impossible to distinguish between a civil nuclear program, aimed at producing electrical power, and a nuclear weapons program. The problem of making such a distinction is increased by chaotic political conditions, such as those within present-day Congo, just described.

During the next few decades, we are likely to witness a steady increase in the price of oil. Petroleum experts, such as Collin Campbell, estimate that the Hubbert Peak for oil (i.e. the year during which production and consumption reach a maximum and thereafter begin to decline) will occur within about a decade. Faced with the resulting energy crisis, many people will respond by suggesting nuclear energy as a universal answer. But given the near-impossibility of distinguishing between civil and military nuclear programs, can we risk the dangers that will result from an extremely widespread use of nuclear energy?

In 1945, the year of the tragic bombing of Hiroshima and Nagasaki, the Nobel-laureate physicist James Franck headed a committee of scientists at the University of Chicago that desperately tried to prevent the use of the bomb and also earnestly proposed ways to prevent nuclear weapons from endangering human civilization. The committee stated in its report, that the best way to stop the spread of nuclear weapons would be to prohibit the mining of uranium. This would mean forgoing the benefits of nuclear power, but the price would not be too high to pay to save humankind from the grave dangers of nuclear war. Today, 60 years later, we can see the wisdom of this recommendation of the Franck Report. Can we hope to rid the world of nuclear weapons while uranium continues to be mined? Can we rid the world of nuclear weapons while nuclear power is proposed as a universal solution to the energy crisis that will come with the rising price of petroleum? Do not uranium and nationalism, human greed and fallibility form too dangerous a mixture to be tolerated?

DR Congo serves as a key example of the dangers presented by the mixture of state implosion and proliferation of weapons material in general. One example from DR Congo gives an idea about the problem with civilian nuclear energy production and outdated facilities. When buying the uranium from Shinkolobwe, USA made a deal with Belgium. In return of the low price for the uranium USA supported Belgium in funding its peacetime nuclear energy programme. In the tumultuous time just before independence, Luc Gillon, a Belgian priest who had studied nuclear physics, imported a 50-kilowatt training and research reactor for isotope production, in the belief that the Belgian colony in Africa that helped ending the Second World War deserved its own atomic reactor. It was installed on the university campus in Kinshasa. The campus as well as the capital is built on fragile sandy ground, and the risk of erosion and landslides was and is a close reality. The forty-year-old reactor that has survived several riots and army mutinies was last upgraded in 1970. Now it is left without regularly checks and the water used to cool the fuel rods is grubby and impure. There is a serious risk of dangerous contamination from the dilapidated reactor because of the corrosion of the uranium rods. During the time under Mobutu, one of the fuel rods from this

research reactor disappeared and was gone for twenty years. In the late nineties the Italian police succeeded getting hands on it; in blurred circumstances it had ended up in the hands of the Sicilian mafia. Another fuel rod from the same installation has totally disappeared and has still not been found. Congo became the first African member of IAEA.

Threat of spread, global control is needed

Not only the DR Congo, but also the Russian Federation, with its present lack of security in controlling nuclear materials and highly enriched uranium, can give us a glimpse of what is likely to become a true reality in the near future, namely uncontrolled spread of weapons and highly dangerous material leading to terrorist attacks against civilians with nuclear weapons. The security issue in DR Congo as well as in the Russian Federation is of multilayered character since the environment of corruption, poverty and unstable political structures creates the core of the problem – profitable proliferation. While in DR Congo the situation is a web of disorder and chaos, in the former Soviet Republic the problem are instead very poorly guarded laboratories using highly enriched uranium, in the politically fragile satellite states.

There is no lack of states or groups in the world that would like the prestigious ownership of an atomic bomb. States like Pakistan and Iran are possible purchasers of weapons grade uranium and nuclear weapons, and in the complexity of world politics today the risk of a nuclear bomb (or just a so called dirty bomb) being used is a realistic scenario. Unless the nuclear weapon states begin to take concrete steps towards the complete nuclear disarmament (in accordance with Article VI of the Non-Proliferation Treaty), and unless civil nuclear programs come under much stricter international supervision, we may well witness the explosion of a smuggled terrorist nuclear bomb in one of the world's major cities.