HOW WE ESCAPED THE ATOM BOMB

A Heroic Norwegian Professor Died a Gestapo Death to Save Us from the Full Fury of the Nazis

by HOWARD WHITMAN

THIS, THEN, is the professor's epitaph. You cannot carve it into any headstone, for the ashes of the professor's body are scattered perhaps over the green hillsides or the snowy plateaus or the ragged fiords of Norway. But you can record it in your hearts, for this professor—Leif Tronstad—saved us from Nazi atom bombs.

The glowing accounts of the American-British development of the atomic bomb piled praise upon the heads of many professors. Men of learning stepped from their cloisters and basked for a bit in the sunlight of well-earned tribute. They had developed the atomic bomb and won the war.

Said Winston Churchill in offering thanks for Divine help in the race for atomic power, "By His mercy British and American science outpaced all German efforts."

Thank God, to be sure. But it should not be overlooked that for this work He had an able servant in Leif Tronstad. As saboteur *par excellence*, the young professor was a ball and chain on Nazi ankles in this race to the atomic finish line.

He hindered the Nazis immeasurably in the development of their own atomic bomb. He held them back while our scientists did the outpacing. His final contribution was a parachute jump into Norway and a Gestapo death.

In Southern Norway, in a deep cleft called the Valley of the Moon, there is the town of Rjukan. Here are located the sprawling factories of Norsk Hydro, largest electro-chemical firm in Norway. In a tiny village called Vemork, Norsk Hydro had an electrolysis plant which was the largest producer of hydrogen in the world.

Norsk Hydro had a young advisor—tow-headed, blue-eyed Professor Tronstad of the department of chemistry at Trondheim Technical Institute. In the secrecy of his laboratory, Professor Tronstad was working at something during those pre-war years. Like scientists the world over, he too was probing the secrets of the atom, trying to split open the tiniest particles of matter and set free the basic energy of the universe.

With unshakable faith that one day man would work this miracle, Professor Tronstad persuaded Norsk Hydro to give him one small room in the electrolysis plant so that he could try to manufacture *heavy water*. He built his apparatus. It was successful. The tiny village of Vemork, in the Valley of the Moon, became one of the few places in the world where this mysterious substance could be produced. It soon became the world's largest producer, and the *only* quantity producer, of heavy water.

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To say "quantity producer" when speaking of heavy water requires an adjustment of semantic values. In the beginning the plant produced just a few grams a day. That was *quantity*. By 1940 it was producing two liters a day. That was tremendous quantity. When the Germans took over, they stepped production up to four liters a day.

Heavy water is water in which the hydrogen content is actually "heavy hydrogen," or deuterium. The formula is D_2O instead of H_2O. The deuteron, or nucleus, of the deuterium atom has double the weight of the hydrogen proton. Scientists had discovered that this rare substance was an ideal moderator in splitting the atom. It successfully slowed down neutrons in their bombardment of uranium atoms.

With the thunderous dawn of April 9, 1940, Nazis swept into Norway, and if their boots made the streets of Oslo tremble, there was even greater trembling in scientific laboratories the world over—for Germany now had in its power, in its stolen domain, the heavy water of Vemork. And that meant a substantial head-start in the race for mastery of the atom.

Professor Tronstad shuttled unobtrusively between Vemork and the university at Trondheim, pretending to be a loathsome quisling but actually keeping a sharp eye on every move the Nazis were making. He and his underground colleagues reported by radio to the Norwegian High Command in Lon-

don and London replied through code messages hidden in its regular Norwegian Service of the BBC. The Nazis never dreamed there was any special meaning in the incongruous remarks that popped up in the midst of a BBC program, remarks such as "The apples are not ripe yet."

Well, soon the apples ripened. The Germans had stepped up the production of heavy water in Vemork. It was time for an Allied move in this weird battle of the laboratories.

On advice from Professor Tronstad and his underground friends, British Combined Operations sent forty commandos aloft in two gliders towed by transport planes. They were to land on the Hardanger Plateau above Rjukan and then knife their way down to the Vemork electrolysis plant and blow it to kingdom come.

When the airborne saboteurs crossed the Norwegian coast the weather suddenly closed in. By the time they were over Rjukan there were billows of cumulus below them. It was impossible to see the prearranged ground signals which were to mark a safe landing ground, and their gas was insufficient to haul the gliders home.

War enforces tough decisions. This time the decision was to cut with radio to help them, it was a week before the two groups could contact each other on the trackless plateau. On February 28 the leader of the commando party, Joachim Roenneberg, led nine of them down the cliffs into the Valley of the

Moon. Two were left above to keep radio contact with Britain.

Once in the valley, six of the commandos hid at vantage points around the plant, snuggling close to the ground, only the muzzles of their Tommy guns exposed. The other three entered the plant through a tunnel which professor Tronstad told them about. They crept to the room on the ground floor where the professor's heavy water equipment was concentrated.

Norwegian night workers got the high-sign of the Norwegian underground and quietly disappeared. Within ten minutes the wires were made fast, the explosive charge was set, and the fuse was touched off.

The commandos were hardly out of the plant when the charge exploded, blasting the heavy water equipment to bits. At first German guards thought this was just another land mine, blowing up some innocent Norwegian. In the few seconds while sentries chuckled, the commandos were back to the cliffs and away.

"Mission completed," they radioed back to England. Then they skied 250 miles to the Swedish border while the Nazis vainly searched for them.

Professor Tronstad was elated. For nine months the Germans worked feverishly to rebuild the heavy water apparatus, slipping back farther and farther in the international race toward realization of the atom bomb. Norwegian engineers developed sudden illnesses, loss of memory, or acute attacks of ignorance. The Nazis finally

brought in their own top-drawer scientists and by November, 1943, the plant was again in working order.

THE PAINFULLY slow process of producing D_2O began again, and by the spring of 1944 underground agents reported to Professor Tronstad that the Nazis were ready to ship a considerable quantity back to Germany. It would have to be ferried out of the Valley of the Moon across Tinnsjo Lake.

Professor Tronstad radioed instructions to two of the most trusted members of the underground. They hid aboard a little steamer on Tinnsjo Lake, waited until the Germans brought a precious tank of heavy water aboard, then planted a time bomb in the engine room and slipped ashore.

When the little steamer was in the middle of the lake it suddenly lifted out of the water, burst its sides and slid stern-first to the bottom.

The steamer was one of several that the Nazis were using to deliver tanks of heavy water to a large cargo ship. When the cargo ship was fully loaded, it was blown up by an American bombing plane at Menstad, near Skien.

In autumn, 1944, Professor Tronstad knew that the underground could do no more. Messages grew fewer and fewer. Yet the race for the atom bomb grew more desperate. Hitler had already hit Britain with V-1 and V-2. Intelligence sources feared that V-3 would be atomic energy, and the

end of the war.

Professor Tronstad went to Combined Operations and asked to be taught parachute jumping. He took with him his trusted laboratory assistant, Gunnar Syverstad.

"There is only one thing to do now. I must return to Norway and destroy the heavy water apparatus myself," he announced.

And so a British plane soared once more over the mountains of Telemark and from it leaped Professor Leif Tronstad and Engineer Gunnar Syverstad.

They took to their skis and rounded up underground fighters in the mountains. A small mountain cottage became their headquarters and there Professor Tronstad worked with charts and drawings on a new plan of attack.

Twice in the weeks that followed, the plan was almost given away by Norwegian quislings. Tronstad and his men rounded them up and brought them to the cottage as prisoners. But the one man they didn't suspect was a half-witted farm hand, considered perfectly harmless, who slipped away from the cottage one night and returned with a Gestapo patrol. In the battle that followed several of the underground men escaped but Professor Tronstad and Gunnar Syverstad were captured.

On March 11, less than two months before Norway was freed, the Germans took the professor up into the mountains of Telemark and there they killed him. They burned

his body and scattered his ashes.

This was a typical expression of Nazi rage. They had burned to black dust the man who was the ball and chain around their ankle. Yes, now Professor Tronstad was dead. But there were others to win the race for our side, to cross the finish line at Oak Ridge, Tenn., and Alamorgordo, N. M.

Had the blue-eyed professor not held the Nazis back, who is to say that London and New York would not have felt the atom bomb—instead of Hiroshima and Nagasaki?

Lief Tronstad (1903 - 1945)

Coronet
November, 1945