

## The Man Behind Iraq's Supergun

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On a quiet evening this March, in the leafy Brussels suburb of Uccle, Gerald Bull walked down the hallway leading to his apartment and pulled out the key to his door. It was the last thing he ever did.

Behind him, hidden in the shadows, an assassin stepped forward and fired two 7.65-millimeter rounds at point-blank range into the back of his skull.

The killing bore all the hallmarks of a professional job. No one heard the silenced shots or the sound of the body slumping to the floor. No one saw the gunman. The \$20,000 in cash Bull was carrying remained untouched.

Gerald Vincent Bull, the world's greatest artillery expert, did not die alone. As the 62-year-old scientist fell to the floor, his lifetime obsession died with him: the dream of building a Supergun, a huge howitzer able to blast satellites into space or launch artillery shells thousands of miles into enemy territory.

Two weeks later, in the obscure English Midlands port of Teesport, British Customs would seize eight huge steel tubes, a meter across, designed to slot into a gun barrel 60 meters long. Labeled "petroleum pipes," they had been innocently manufactured by Sheffield Forgemasters, a British steelworks, and were waiting to be loaded on a freighter bound for Iraq.

Within a month, components for what has come to be known as the Iraqi Supergun would be found in packing cases in five other European countries. Project Babylon, the plan to build it, would turn out to be a huge and complex operation involving millions of dollars and dozens of illicit Iraqi arms-running operations.

But Project Babylon is more than an arms deal that went wrong. It is a Faustian drama, the tale of a brilliant scientist, who, frustrated by the refusal of the Western powers to back his grandiose vision, sold himself to one of the world's bloodiest regimes. Beginning in 1985, Iraq purchased hundreds of sophisticated artillery pieces developed by Bull. Having proved themselves in the Iran-Iraq war, the guns now pose a serious threat to the multinational task force based in Saudi Arabia. In addition, Bull designed for Iraq two mammoth guns mounted on wheeled vehicles that were unveiled at the Baghdad Arms Fair last year (box, page 50). The Supergun would have been Bull's masterpiece and a fearsome contribution to Saddam Hussein's growing arsenal.

No one knows who killed Gerald Bull. His family claims that it was the Israeli intelligence agency, Mossad. Shortly after the killing, Bull's son Michel said an unnamed intelligence agent had warned his father that Mossad was after him (he has since backed off that assertion). Despite Israel's denials, the family's suspicions are widely shared by intelligence experts. In the past, Israel has shown that it will move quickly and decisively to eliminate military threats from Iraq. In 1981, staging a pre-emptive strike, Israeli warplanes destroyed the Osiraq nuclear reactor near Baghdad to prevent Iraq from producing nuclear warheads.

But if Mossad is a prime suspect, there are many others who might have wanted to kill Bull: the Iraqis, the British, the Americans, the South Africans or even the Chileans. Bull moved in a dangerous world of hidden arms deals and murderous intelligence agencies. Bart Van Leysabeth, a spokesman for Belgium's public prosecutor, says, "It is a difficult case," adding that authorities are "not very hopeful." Only one thing is certain. Bull had a dangerous ambition, and someone pumped two bullets into his head to stop him.

The story of Gerald Bull and the Iraqi gun begins even more strangely than it ends - with secret documents from the last days of Imperial Germany. In 1965, a middle-aged German woman arrived in Montreal to visit a relatively unknown scientist at the McGill University Space Research Institute. The scientist was Prof. Gerald Bull, then 37.

Born in 1928, in North Bay, Ontario, Bull was the son of an English-speaking father and a French-speaking mother who died when he was 3. He was the second-youngest of 10 children. When his father, a lawyer, abandoned the family, he was brought up, apart from his siblings, by an aunt and uncle. It was a difficult childhood, and Bull grew into a difficult man, prickly and quick to take offense. "In a sense he was an orphan, and that affected his personality a lot," says Charles H. Murphy, a former colleague of Bull's and an aeronautic engineer with the United States Army. "He wanted people to like him, and he felt hurt and rejection keenly."

With artillery, Bull was a wizard - Canada's own "Boy Rocket Scientist," as Maclean's magazine dubbed him in 1953. At 22 one of the youngest students ever to earn a doctorate at the University of Toronto, he was known for his creative flair and technical prowess. He despised theoretical "cocktail scientists" and bureaucratic red tape.

The German woman who sought Bull out was the daughter of an engineer who had worked on the top-secret Paris Gun Project during the First World War. Developed by Krupp, the German steel makers, the Paris Gun was an enormous howitzer with a range of 74 miles - double that of any weapon then existing. First fired on the morning of March 23, 1918, during Germany's spring offensive, it instantly brought terror to Paris's placid arrondissements. The first round hit the Place de la Republique. The French, aghast and mystified, sent intelligence officers into the woods surrounding the city in search of a hidden German gun emplacement. On Good Friday, March 29, the gun scored a direct hit on the Church of St. Gervais in central Paris, killing 91 and injuring 100.

The Paris Gun came too late to turn the tide of the First World War in Germany's favor. But it was an incredible technical triumph for its inventor, Fritz Rausenberger, Krupp's head of artillery development and production. Even with the relatively primitive technology of the time, the shell reached a height of 26 miles, an altitude not exceeded until Germany developed the V-2 rocket in World War II.

Despite the Western Allies' best efforts to seize them, the three huge Paris guns disappeared before the end of the war and the secret of their

design was seemingly lost forever. But through his German visitor, Bull gained access to an unpublished manuscript in the Rausenberger family archives outlining the gun's design and capabilities. Using computer models, he was able to reconstruct the devastating weapon. At that moment the obsession was born that would dominate Bull's life and determine his death. Bull realized that if the projectile in the huge gun was a powered rocket, its range could be increased dramatically. With the backing of the United States Army, the Canadian Department of Defense Production and McGill University, he established a test site on the island of Barbados and set to work on the High Altitude Research Project (HARP). By welding together two 16-inch guns that had been put in storage by the United States Navy, Bull created a huge gun 36 meters long, with a diameter of 424 millimeters. It remains the longest working gun ever built.

To extend the range of the shell, Bull and his team developed a number of revolutionary techniques, including the use of fin-shaped shell cases to stabilize the projectile. During firing, special sleeves, called sabots, which fell off in flight, were used to protect the fins from the explosive pressures of the gun-barrel blast. Other shells were rocket-assisted. The Barbados Gun demonstrated an unmatched ability to fire military and scientific payloads long distances. Bull claimed that, using a solid-propellant rocket, it could blast a 200-pound payload a distance of 2,500 miles or a smaller payload 160 miles straight up. Bull and his team had developed the world's most advanced artillery weapon.

Toward the end of the research program, Bull was in the early stages of developing a gun-launched three-stage rocket, with flip-out fins, capable of putting a small satellite into orbit.

"He thought HARP would be a big advancement for Canada in aeronautical engineering," his son Philippe, a heart surgeon in Vienna, later said. "They were already putting small probes into space. It was the drive of his life to be working on that project. He was alone, it was his project, it came from his brains, and it was functioning. It worked." Suddenly, on June 30, 1967, funds for HARP were stopped. Officially, the Canadian Government was unhappy to have its space research program linked so closely to such ostentatiously military hardware. In addition, the scientific establishment in Canada and the United States believed that the future of space research lay in rockets. The artillery-based HARP system, fixed and cumbersome, seemed outdated when compared with mobile missiles. The "gun scientist" had lost out to the rocket era.

Bull later admitted that personality clashes had aggravated his budgetary problems. Arrogance was his trademark, and he had made few friends among his government backers - he frequently referred to bureaucrats as "morons" and "the lowest form of life on earth." The abrupt termination of HARP devastated Bull. He was out in the wilderness, his dream of re-creating the Paris Gun still-born. His bitterness over the decision never diminished; it can still be felt in the mordantly anti-bureaucratic passages of his "Paris Kanonen - the Paris Gun and Project HARP," a tribute to his obsession, published in Germany 20 years after HARP's demise.

The cocktail scientists had beaten him, but Bull was determined to get his revenge. In an epilogue to the book, called "Studies of Ultra-Performance HARP Systems," he sketched out plans for an extraordinary new weapon - a launcher 32 inches in diameter that could blast a 1,200-pound payload 600 miles into space. The gun, Bull wrote, would have an optimum launch angle of 45 degrees; its barrel would consist of a "smooth bore 'pipe' with relatively short high-pressure sections." The description almost exactly matches the huge steel tubes seized by British Customs at Teesport in April. Bull had even put a price on the system, maintaining that a tube 300 meters long "could be built for well under \$10 million."

Bull's epilogue thinly masked a frightening development. In January 1988, capitalizing on his close business relationship with the Iraqi Minister for Industry and Military Industrialization, Brig. Gen. Hussain Kamel, Saddam Hussein's son-in-law, Bull had persuaded the Iraqis to fund his HARP dream.

Twenty years in the wilderness had changed the boy rocket scientist into a covert, amoral arms dealer who sold powerful weapons systems indiscriminately to South Africa, Iran, Chile, Taiwan and China. In the mid-80's, Bull had added Iraq to his list of clients.

After HARP was killed off in 1967, Bull had founded his own company, the Space Research Corporation of Quebec, modeled on McGill's Space Research Institute. The private corporation acquired HARP's assets at scrap-value prices, including the Barbados test area and a 20,000-acre site near Highwater, Quebec, on the Canadian border with Vermont.

Bull applied the results of HARP experiments with sleeved projectiles to produce actual weapons of war. Heavily dependent on United States military contracts, Space Research Corporation bought land on the American side of the border and built a factory to manufacture extended-range artillery shells - which had a potential nuclear capability and a range of 25 miles. It was a successful product: 50,000 nonnuclear shells were sold to Israel in 1973 for use in American-supplied artillery pieces.

In 1972, Bull was rewarded with his own Congressional bill, sponsored by Senator Barry Goldwater, Republican of Arizona, making him retroactively eligible for a decade of American citizenship and high-level American nuclear security clearance.

But despite its \$9 million in American defense contracts, the small armaments company could not finance the extensive research program Bull wanted. In 1976, Space Research Corporation established a European subsidiary, Space Research Corporation International. Forty-five percent of the company was owned by the Belgian ammunition manufacturer Poudreries Reunies de Belgique.

This injection of capital allowed Bull to develop what was then the most formidable battlefield artillery piece in the world - the GC-45 gun. (The letters stand for Gun Canadian; the number refers to the gun's caliber, meaning that the length of the barrel is 45 times its interior diameter of 155 millimeters.) The GC-45 can fire a shell about 25 miles and has a throw weight twice that of the biggest guns used by the West's armies. A triumph of military engineering, the GC-45 vindicated Bull's belief in his own genius. He took his revenge by selling it to the highest bidder.

That turned out to be South Africa, then fighting a costly war against Soviet-backed Angolan and Cuban forces on the savannas of Angola and in desperate need of a new long-range artillery weapon. Restricted by the United Nations arms embargo, the South African regime set out to acquire the GC-45 technology illegally.

At first, South Africa approached Space Research Corporation to provide 55,000 extended-range shells for its existing artillery. The United States helped the deal along when the Office of Munitions Control waived the requirement to obtain an export license for what were described as "rough steel forgings." Two "unidentified" gun barrels - GC-45 test models - were shipped out with the shells.

In 1977 the South African Government's armaments division, Armscor, secretly bought a 20-percent stake in Space Research Corporation of Quebec and a license from Bull to manufacture the GC-45. By 1983, the South Africans were marketing Bull's gun, under the name G-5, as the pride of their "home grown" arms industry.

When the scandal broke in 1980, Bull was charged with violating the United Nations arms embargo. He pleaded guilty and was sentenced to six months in a minimum-security prison in Allenwood, Pa. It was the ultimate disgrace. Space Research Corporation of Quebec went bankrupt, and after being released, Bull moved his operations to Brussels.

There he appeared to lead a tranquil life. Neighbors described him as quiet and reserved. They did not have much opportunity to see him, however. "He spent less than 20 percent of his time in Brussels," says his son Michel, chief executive of Space Research Corporation International until 1989 and subsequently a member of its board of directors. "He traveled extensively for his business. While he was in Brussels, he led the life of any businessman. He worked till quite late in the evening. His hobbies were work and reading."

"He was not the mad scientist, totally unaware of his environment," Michel Bull continues. "He was a party-loving guy. He went out to dinner a lot and enjoyed good conversation."

His rancor at the United States never abated. "He would say a variety of wild things," says his former colleague Charles Murphy. "It was almost irrational. He refused to return to North America for two years after he left jail. His wife had to go to Europe to visit him."

"There definitely was a major injustice done to my father," Michel Bull says. "He was convinced of that, and that is also my conviction. They used him as a scapegoat for political purposes. There was nothing illegal in what my father did."

For arms salesmen, countries at war are the best markets in the world. In the 80's, the best war was the seemingly endless conflict between Iran and Iraq. And Iraq, with an annual defense budget of \$14 billion, was the key buyer.

Emboldened by the chaos of Ayatollah Khomeini's Islamic revolution, Iraq had attacked neighboring Iran in September 1980. But Saddam Hussein's blitzkrieg soon degenerated into a grim desert version of trench warfare.

Heavily outnumbered - Iran's population of 53 million is nearly three times Iraq's - the Iraqis turned to sophisticated Western military hardware to counter the endless divisions of Iranian Revolutionary Guards, who swarmed in kamikaze-style human waves across the mine fields. One of the Western arms salesmen was Gerald Bull.

Iraq received its first order, 200 GC-45 guns, in 1985. The guns were manufactured under license by Austria's state munitions company, Voest-Alpine. To circumvent an Austrian embargo on the sale of arms to belligerents, Jordan, a close ally of Iraq, supplied a false end-user certificate declaring that the guns were for its own army. The Austrian Government, well aware of the subterfuge, simply turned a blind eye. The artillery barrels were then delivered to the port of Aqaba, in southern Jordan, and driven straight to Iraq.

Three years later, Bull finally persuaded the Iraqis to fund the Supergun project. According to testimony given to magistrates by Aldo Savegnago, an Italian engineer arrested after the Supergun's breech mechanism was seized in Naples this May, Project Babylon began in the spring of 1988. It was an enormous operation, spread out over seven European countries and costing millions of dollars.

Savegnago says he was hired in June 1989 by a British technician named John Heath, head of Advanced Technology Institute, a company registered in Greece. The company, which also had branches in Brussels and Baghdad, was closely associated with Bull's Space Research Corporation. Heath's predecessor at Advanced Technology, Christopher Cowley, was also an executive of Space Research.

The project, managed by Space Research Corporation and Advanced Technology, involved not one but three guns: a relatively small prototype, a midsize tester with a diameter of 330 millimeters, and the 1-meter Supergun itself. The prototype, known as Baby Babylon, has already reached Iraq and been test-fired near the northern city of Mosul. Both of the British steelworks approached to forge parts, Sheffield Forgemasters and Walter Somers, say they were first contacted by Space Research, which claimed to be working as an agent for the Iraqi Ministry of Industry and Minerals. The company called the tubes it wanted built "petroleum industry products." In fact, there is no Iraqi Ministry of Industry and Minerals, and the telephone number on the documents is that of Hussain Kamel's Ministry of Industry and Military Industrialization - Iraq's main armaments division. Savegnago said his job was to make sure that the steel parts manufactured in Italy by the Societa della Fucine steelworks for Iraq conformed to the drawings supplied to him by Advanced Technology. Savegnago, who said Advanced Technology claimed that the Italian steel parts were for dam gates, also visited Sheffield Forgemasters and the Von Roll steelworks in Switzerland to check other components. Parts manufactured at the Von Roll works were later seized at the Frankfurt airport in April.

Advanced Technology also placed a \$5.4 million order in 1988 with Poudreries Reunies de Belgique for "unusual types of propellant for what investigators later called very large guns." The declared destination was Jordan.

Savegnago also claimed he met Bull at a dinner party with other Advanced Technology employees in Brussels. After Bull was killed, he said, Heath, who had originally hired him, called to tell him the job was temporarily suspended. Heath has since disappeared and is believed to be hiding in Europe.

At least one of the companies approached by Space Research in 1988 was highly suspicious of the order. Executives at Birmingham-based Walter Somers could not understand why the 330-millimeter steel tubes they had been contracted to build were designed to cope with pressures 12 times those normally found in the petroleum industry. The company's managing director informed his local member of Parliament, who immediately contacted MI6, Britain's overseas intelligence service, the Department of Trade and Industry, which monitors the export of sensitive military goods, and the Ministry of Defense. His notification had no effect whatever. Although all military exports to Iraq are banned under British law, Somers was told it did not need an export license for the steel tubes.

In other words, the company run by the world's greatest artillery genius, with a notorious track record in arms sales, was now acting as agent in an order for an extraordinarily thick Iraqi "pipeline." But somehow no one in the British Department of Trade appeared to be suspicious.

Others were. In September 1989, the British munitions company Astra Holdings took over the ailing Poudreries Reunies de Belgique. Going

through the books, the new directors spotted the Jordanian propellant contract and immediately informed the British Ministry of Defense.

According to John Pike, the company's new British director, officials at the ministry expressed great interest and wanted more information. "It was pretty obvious that they knew there was some form of significant project in Iraq," he says. "But they were uncertain about key elements. They did not know about the actual launching system, whether it was a gun or satellite launcher, or what the breech mechanism was and how it might be controlled or sighted."

One of the enduring mysteries of the Bull story is the behavior of the British authorities. British intelligence certainly knew who Bull was and was suspicious of his Iraqi links. In May 1989 the British Government had refused to give a development grant that would allow Space Research to join forces with an Iraqi company and take over the abandoned Lear Fan Jet Company in Belfast, fearing that the new company would manufacture and export sensitive missile components to Iraq.

Nevertheless, the British did nothing. By the time British Customs raided the Teesport dock in April, 44 of the Supergun's 52 parts had been shipped to Iraq.

For a week after the dockside seizure, the Department of Trade and press spokesmen at the Prime Minister's office poured scorn on the Supergun theory, saying the components were "probably only a pipeline." Customs officials angrily retorted that they were absolutely certain the tubes were "part of a cheapo satellite launching system, which could be used for rocket-borne weapons."

"It stinks to high heaven," says one British defense expert, who spoke on condition that he not be identified. "There was not even a call for any form of diplomatic initiative to be taken against Iraq. My feeling is that someone in the Government, somewhere, must have known and for some reason did nothing. Either we have been making money from it, or we have been gaining something political from it."

In the aftermath of the seizures, Bull's sons Michel and Steven liquidated the Space Research group of companies and went into hiding. Poudreries Reunies de Belgique went into bankruptcy soon after. Two British businessmen, Christopher Cowley of Space Research and Peter Mitchell, managing director of Walter Somers, were charged by Customs with offenses relating to the illegal export of arms. British Customs says investigations are continuing. For his part, Michel Bull insists that Space Research had nothing to do with the Supergun: "My company and myself are total strangers to it."

What was the supergun for? No one in the West is quite sure. It is clear from Bull's book that the gun was primarily a satellite-launching platform designed to send space probes into low earth orbit. The weapon could also have been used to fire chemical shells or nuclear shells for thousands of miles - though its size would have made it vulnerable to air attack.

Whatever its exact purpose, the Supergun would have been an important step forward in Saddam Hussein's arms race with Israel.

Although the Supergun's designer is now dead and some of its parts have been seized, the weapon has not been destroyed. It is quite probable that the Iraqis have the blueprints, and they retain the vast majority of the components. It would seem to be only a question of time before Iraq enlists an unscrupulous or unsuspecting foreign steelworks to complete the missing parts of the jigsaw. Gerald Bull may finally get his gun.

#### HUSSEIN'S ARSENAL: ARMS BY BULL

Iraq's impressive arsenal of guns developed by Gerald Bull could pose a serious threat to the multinational task force in Saudi Arabia in the event of a ground war.

Most worrisome are its 300 155-millimeter howitzers, all versions of the GC-45 gun that Bull developed in the 1970's. Two hundred of them, under the variant name GH N-45, were shipped to Iraq from Austria via Jordan in 1985. They played a major role in artillery battles during the Iran-Iraq war. The remaining 100 guns came from South Africa, where they are marketed under the name G-5.

"In terms of range and accuracy, the G-5 will outdo anything the U.S. Army has got," says Christopher F. Foss, editor of Jane's Armour and Artillery. "It is going to give the Iraqis the edge if they go into combat against our chaps." Andrew Duncan, a weapons analyst of the Institute of Strategic Studies in London, says simply, "It's a bloody good gun."

The gun uses an ingenious "base bleed" system perfected by Bull. A small burning charge in the base of the shell burns away during flight, significantly reducing drag and extending the shell's range - to just under 25 miles. Because of its simpler design, the gun can also deliver a bigger explosive punch - twice that used in certain Western systems.

"The idea of an artillery piece is to put a lot of high explosive on a target," Foss says. "Unlike Bull, the United States has used rocket-assisted projectiles to extend the range of their shells. That system tends not to be so accurate, and if you have a big chunk of rocket motor on the back, you have to reduce the high-explosive content."

At about the same time he began work on the Super Gun, Bull designed two advanced self-propelled artillery systems for the Iraqis: the 210-millimeter Al Fao and the 155-millimeter Majnoon, both unveiled at the 1989 Baghdad Arms Fair. The systems - six-wheeled armored carriers with a large barrel extending from a turret - differ only in weapon size.

The Al Fao is the most powerful artillery piece in the world. With a weight of 48 tons and a range of 35 miles, it can fire four 109-kilogram rounds a minute from its 11-meter barrel. The Iraqis claim that the Al Fao and Majnoon can attain a top speed of 45 to 55 miles an hour on the road.

The Al Fao seriously outranges and outclasses anything in the armory of the Western powers. But according to the latest Western intelligence reports, neither it nor the Majnoon has been produced in quantity.

Iraq is not the only Gulf state with guns designed by Bull. Western military analysts believe that during the Iran-Iraq war, Iran obtained 140 of the GC-45 guns through Libya. And earlier this month, the United Arab Emirates, under threat from Iraq, announced an order for 70 G-6 guns - a self-propelled variant of the G-5 - from South Africa. - K.T.

