Hidden travels of the atomic bomb

By William J. Broad

Published: December 9, 2008

In 1945, after the atomic destruction of two Japanese cities, J. Robert Oppenheimer expressed foreboding about the spread of nuclear arms.

"They are not too hard to make," he told his colleagues on the Manhattan Project at Los Alamos, New Mexico. "They will be universal if people wish to make them universal."

That sensibility, born where the atomic bomb itself was born, grew into a theory of technological inevitability. Because the laws of physics are universal, the theory went, it was just a matter of time before other bright minds and determined states joined the club. A corollary was that trying to stop proliferation was quite difficult if not futile.

But nothing, it seems, could be further from the truth. In the six decades since Oppenheimer's warning, the nuclear club has grown to only nine members. What accounts for the slow spread? Can anything be done to reduce it further? Is there a chance for an atomic future that is brighter than the one Oppenheimer foresaw?

Two new books by three atomic insiders hold out hope. The authors shatter myths, throw light on the hidden dynamics of nuclear proliferation and suggest new ways to reduce the threat.

Neither book endorses Oppenheimer's view that bombs are relatively easy to make. Both document national paths to acquiring nuclear weapons that have been rocky and dependent on the willingness of spies and politicians to divulge state secrets.

Thomas Reed, a veteran of the Livermore weapons laboratory in California and a former secretary of the Air Force, and Danny Stillman, former director of intelligence at Los Alamos, have teamed up in "The Nuclear Express: A Political History of the Bomb and its Proliferation" to show the importance of moles, scientists with divided loyalties and — most important — the subtle and not so subtle interests of nuclear states.

"Since the birth of the nuclear age," they write, "no nation has developed a nuclear weapon on its own, although many claim otherwise."

Among other things, the book details how secretive aid from France and China helped spawn five more nuclear states.

It also names many conflicted scientists, including luminaries like Isidor Rabi. The Nobel laureate worked on the Manhattan Project in World War II and later sat on the board of governors of the Weizmann Institute of Science, a birthplace of Israel's nuclear arms.

Secret cooperation extended to the secluded sites where nations tested their handiwork in thundering blasts. The book says, for instance, that China opened its sprawling desert test site to Pakistan, letting its client test a first bomb there on May 26, 1990.

That alone rewrites atomic history. It casts new light on the reign of Benazir Bhutto as prime minister of Pakistan and helps explain how the country was able to respond so quickly in May 1998 when India conducted five nuclear tests.

"It took only two weeks and three days for the Pakistanis to field and fire a nuclear device of their own," the book notes.

In another disclosure, the book says China "secretly extended the hospitality of the Lop Nur nuclear test site to the French."

The authors build their narrative on deep knowledge of the arms and intelligence worlds, including those abroad. Stillman has toured heavily guarded nuclear sites in China and Russia, and both men have developed close ties with foreign peers.

In their acknowledgments, they thank American cold warriors like Edward Teller as well as two former CIA directors, saying the intelligence experts "guided our searches."

Robert Norris, an atomic historian and author of "Racing for the Bomb," an account of the Manhattan Project, praised the book for "remarkable disclosures of how nuclear knowledge was shared overtly and covertly with friends and foes."

The book is technical in places, as when detailing the exotica of nuclear arms. But it reads like a labor of love built on two lifetimes of scientific adventure. It is due out in January from Zenith Press.

Its wide perspective reveals how states quietly shared complex machinery and secrets with one another.

All paths stem from the United States, directly or indirectly. One began with Russian spies that deeply penetrated the Manhattan Project. Stalin was so enamored of the intelligence haul, Reed and Stillman note, that his first atom bomb was an exact replica of the weapon the United States had dropped on Nagasaki.

Moscow freely shared its atomic thefts with Mao Zedong, China's leader. The book says that Klaus Fuchs, a Soviet spy in the Manhattan Project who was eventually caught and, in 1959, released from jail, did likewise. Upon gaining his freedom, the authors say, Fuchs gave the mastermind of Mao's weapons program a detailed tutorial on the Nagasaki bomb. A half-decade later, China surprised the world with its first blast.

The book, in a main disclosure, discusses how China in 1982 made a policy decision to flood the developing world with atomic know-how. Its identified clients include Algeria, Pakistan and North Korea.

Alarmingly, the authors say one of China's bombs was created as an "export design" that nearly "anybody could build." The blueprint for the simple plan has traveled from Pakistan to Libya and, the authors say, Iran. That path is widely assumed among intelligence officials, but Tehran has repeatedly denied the charge.

The book sees a quiet repercussion of China's proliferation policy in the Algerian desert. Built in secrecy, the reactor there now makes enough plutonium each year to fuel one atom bomb and is ringed by antiaircraft missiles, the book says.

China's deck also held a wild card: its aid to Pakistan helped Dr. A.Q. Khan, a rogue Pakistani metallurgist who sold nuclear gear on the global black market. The authors compare Khan to "a used-car dealer" happy to sell his complex machinery to suckers who had no idea how hard it was to make fuel for a bomb.

Why did Beijing spread its atomic knowledge so freely? The authors speculate that it either wanted to strengthen the enemies of China's enemies (for instance, Pakistan as a counterweight to India) or, more chillingly, to encourage nuclear wars or terror in foreign lands from which Beijing would emerge as the "last man standing."

Multimedia

Photos: Nuclear secrets spread around the globe

» View

Graphic: A chain reaction of proliferation

» View

Today in Health & Science

Hidden travels of the atomic bomb

Researchers put a microscope on food allergies

Severe heart attacks deadlier for women

A lesser pathway involves France. The book says it drew on Manhattan Project veterans and shared intimate details of its bomb program with Israel, with whom it had substantial commercial ties. By 1959, the book says, dozens of Israeli scientists "were observing and participating in" the French program of weapons design.

The book adds that in early 1960, when France detonated its first bomb, doing so in the Algerian desert, "two nations went nuclear." And it describes how the United States turned a blind eye to Israel's own atomic developments. It adds that, in the autumn of 1966, Israel conducted a special, non-nuclear test "2,600 feet under the Negev desert." The next year it built its first bomb.

Israel, in turn, shared its atomic secrets with South Africa. The book discloses that the two states exchanged some key ingredients for the making of atom bombs: tritium to South Africa, uranium to Israel. And the

authors agree with military experts who hold that Israel and South Africa in 1979 jointly detonated a nuclear device in the South Atlantic near Prince Edward Island, more than one thousand miles south of Cape Town. Israel needed the test, it says, to develop a neutron bomb.

The authors charge that South Africa at one point targeted Luanda, the capital of neighboring Angola, "for a nuclear strike if peace talks failed."

South Africa dismantled six nuclear arms in 1990 but retains much expertise. Today, the authors write, "South African technical mercenaries may be more dangerous than the underemployed scientists of the former Soviet Union" because they have no real home in Africa.

"The Bomb: A New History," due out in January from Ecco Books, an imprint of HarperCollins, plows similar ground less deeply, but looks more widely at proliferation curbs and diplomacy. It is by Dr. Stephen Younger, the former head of nuclear arms at Los Alamos and former director of the Defense Threat Reduction Agency at the Pentagon.

Younger disparages what he calls myths suggesting that "all the secrets of nuclear weapons design are available on the Internet." He writes that France, despite secretive aid, struggled initially to make crude bombs — a point he saw with his own eyes during a tour of a secretive French atomic museum that is closed to the public. That trouble, he says, "suggests we should doubt assertions that the information required to make a nuclear weapon is freely available."

The two books draw on atomic history to suggest a mix of old and new ways to defuse the proliferation threat. Both see past restraints as fraying and the task as increasingly urgent.

Reed and Stillman see politics — not spies or military ambitions — as the primary force in the development and spread of nuclear arms. States repeatedly stole and leaked secrets because they saw such action as in their geopolitical interest.

Beijing continues to be a major threat, they argue. While urging global responses like better intelligence, better inspections and better

safeguarding of nuclear materials, they also see generational change in China as a great hope in plugging the atomic leaks.

"We must continue to support human rights within Chinese society, not just as an American export, but because it is the dream of the Tiananmen Square generation," they write. "In time those youngsters could well prevail, and the world will be a less contentious place."

Younger notes how political restraints and global treaties worked for decades to curb atomic proliferation, as did American assurances to its allies. "It is a tribute to American diplomacy," he writes, "that so many countries that might otherwise have gone nuclear were convinced to remain under the nuclear umbrella of the United States."

And he, too, emphasizes the importance of political sticks and carrots to halting and perhaps reversing the spread of nuclear arms. Iran, he says, is not fated to go nuclear.

"Sweden, Switzerland, Argentina and Brazil all flirted with nuclear programs, and all decided to abandon them," he notes. "Nuclear proliferation is not unidirectional — given the right conditions and incentives, it is possible for a nation to give up its nuclear aspirations."

The take-home message of both books is quite the reverse of Oppenheimer's grim forecast. But both caution that the situation has reached a delicate stage — with a second age of nuclear proliferation close at hand — and that missteps now could hurt terribly in the future.

Reed and Stillman take their title, "The Nuclear Express," from a 1940 radio dispatch by Edward R. Murrow , who spoke from London as the clouds of war gathered over Europe. He told of people feeling like the express train of civilization was going out of control.

The authors warn of a similar danger today and suggest that only close attention to the atomic past, as well as determined global action, can avoid "the greatest train wreck" in history.