A Secrecy Primer

As more countries acquire the scientific knowledge to build nuclear weapons, the U.S. response should not be heightened secrecy but a renewed commitment to strengthening political safeguards.

David Hafemeister

Secrecy is in the air. Last July, the Los Alamos National Laboratory, still recovering from the Wen Ho Lee "Chinese espionage" controversy, shut down classified work for 10 weeks after two computer disks containing sensitive material were reported missing. Some 12,000 personnel remained idle during a lengthy investigation that in the end revealed the two computer disks hadn't even existed–bar codes for the disks had been created and inventoried, but never used.

Alternatively, anyone with a credit card and a casual interest in the secrets of bomb-making could have visited Amazon.com and purchased for $34.95 (plus shipping) The Los Alamos Primer: The First Lectures on How to Build an Atomic Bomb. The curious history of the Los Alamos Primer–a history in which I played a very small part–in itself offers a worthwhile primer on the evolving nature of secrecy in the nuclear age and on the need to develop political instruments to cope with the inevitable dissemination of knowledge and technology.

In April 1943, Robert Serber, a protegé of J. Robert Oppenheimer, gave a series of five lectures on atomic physics to the new hires at Los Alamos. "The object," declared the young physicist, "is to produce a practical military weapon in the form of a bomb in which the energy is released by a fast neutrino chain reaction in one or more of the materials known to show nuclear fission." Topics ranged from fast neutron reactions to the probability of predetonation. The lecture notes, which for years were mimeographed and passed around among Los Alamos scientists, became known as the *Los Alamos Primer*, or *LA-1*, the first classified report on nuclear weapons at the laboratory. The *Primer* remained a Top Secret document until 1965, when it was entirely declassified. Serber stated that declassifying *LA-1* was natural because "the information it contains had by then become publicly available in other sources."

Others would later disagree. In 1977, as special assistant to the undersecretary of state for arms control, I was working on nuclear nonproliferation in the Carter State Department. I learned that Sen. John Glenn, Democrat of Ohio, would be chairing hearings on the transfer of basic physics designs to the Middle East. One item on the agenda was U.S. government sales of nuclear documents (such as *LA-1*) that were advertised in the catalogs of the National Technical Information Service (NTIS), which was created in 1950 as a federal clearinghouse to disseminate scientific and engineering information. I called nuclear-weapon designer Theodore Taylor–who had left Los Alamos in 1956 to devote his work to safeguards on peaceful applications of nuclear power–and asked him how useful *LA-1* was for beginning weapons design. Not only was it useful, he said, but something should be done to stop the government from this dangerous practice. As the State Department point-person on this issue, I arranged an interagency meeting with NTIS director Bill Knox. He reminded me that we couldn't destroy all copies of declassified papers like *LA-1*, since the 1966 Freedom of Information Act requires the government to respond

to requests for any documents that have been declassified. But the director did agree that NTIS would cease advertising *LA-1* in its catalogs. Short of burning books, this idea seemed the best outcome, and I considered the case closed.

I forgot about *LA-1* until 1992, when I saw an ad in the *Bulletin* and elsewhere for the *Los Alamos Primer*. The new version offered additional editorial comments from Serber and contained updated parameters, such as the correct critical masses for uranium and plutonium. I immediately called Taylor and asked him about the seriousness of the reborn *LA-1*. This time, Taylor's response was less apocalyptic. The *Primer's* equations were by now too well-known to be of great concern, he said.

In retrospect, Taylor was correct, as *LA-1* is a series of back-of-the-envelope calculations that had become common fare in the physics community. One does not expect great accuracy from these calculations and one does not learn the most serious secrets, which are the engineering tricks and manufacturing processes that make nuclear weapons small, reliable, and predictable.

Taylor's change in perspective between 1977 and 1992 highlights a central dynamic of nuclear weapons research: Technical barriers to the bomb inevitably decrease over time as secrets become more widespread. And new technologies, in such areas as uranium enrichment, have made it easier to obtain weapon-grade materials. South Africa elegantly developed the helicon jet-nozzle process (an alternative to using a centrifuge), spending a total of only $300 million with 1,000 employees to produce six nuclear weapons during 1980-1990. This effort cost considerably less than the Manhattan Project ($25 billion with 40,000 employees) and the unsuccessful Iraqi nuclear weapons program ($10 billion with 7,000 employees).

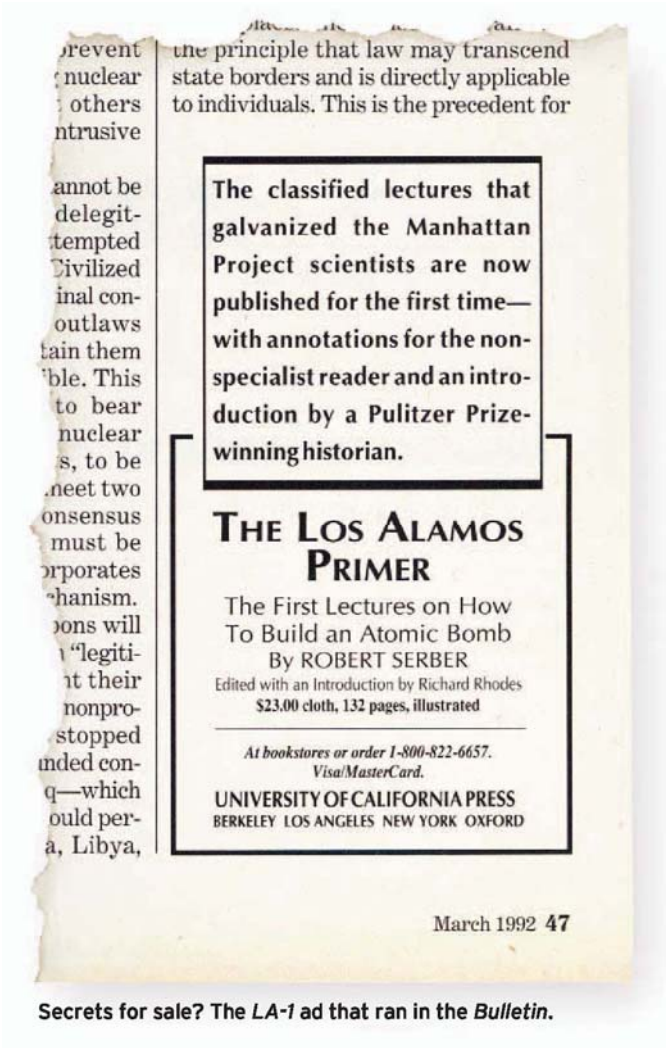
But accepting the proliferation of knowledge is not an argument in favor of actively disseminating it; not to mention publishing high-quality, how-to-build-bombs manuals. In that context, I believe that physicist Hans Bethe and others were correct–on the basis of what was then known to have been declassified–in opposing the publication of Howard Morland's article, “The H-Bomb Secret,” in the November 1979 *Progressive*. (Taylor was shocked by the erroneous declassification of *UCRL-4725*–the Lawrence Livermore National Laboratory report that was the basis for the article–referring to it as “the most serious break of security I am aware [of] in this country's post-World War II nuclear weapons [development] programs.”) For his part, *Progressive* editor Erwin Knoll justified publication by noting: “We hope the debate over [‘The H-Bomb Secret’] will be a beginning of a process in which all of the nuclear policies pursued by our Government will be held up to public scrutiny and review.” I wish I could agree with this sentiment, but can Morland and his supporters offer any substantive examples of how this article has advanced the debate over nuclear weapons in the 26 years since it was published?

Yet, while I disagreed with the *Progressive's* decision, I share the belief that excessive secrecy in the name of national security has often stifled public debate over critical issues. For instance, overclassification prevented a full vetting of the seismic data from 1988 to 1990 that allowed the United States to charge the Soviets with a “likely violation” of the Threshold Test Ban Treaty, which prohibited nuclear underground tests with a yield exceeding 150 kilotons. This deliberate false charge prevented the United States from following Soviet President Mikhail Gorbachev's call for a nuclear moratorium in the late 1980s. Moreover, closed government bodies, such as the

Pentagon's Defense Science Board and the Energy Department's National Nuclear Security Administration, often fail the nation by not being critical when the physics, economics, and strategic underpinnings of projects are untenable. Classification keeps bad science hidden from public view. Case in point is the proposed orbiting “Star Wars” Excalibur X-ray laser project that cost taxpayers $900 million between 1984 and 1989, yet never materialized.

So while the spread of potentially dangerous scientific knowledge is a legitimate concern, the knee-jerk response should not be more secrecy. Instead, as the technical barriers to the bomb continue to shrink, it is incumbent upon the United States to strengthen political barriers. The United States should ratify the Comprehensive Test Ban Treaty, and it should strongly reaffirm its 1995 pledge not to use nuclear weapons against non-nuclear weapon states that are members of the Nuclear Non-Proliferation Treaty (NPT). Washington cannot expect other nations to play by global proliferation rules if it does not fulfill this basic promise to the 183 non-nuclear weapon states that renewed the NPT indefinitely.

Technological advances have not rendered these diplomatic initiatives moot. If anything, history has shown that the two trends can be mutually reinforcing. There is little doubt, for example, that President Dwight D. Eisenhower's “Atoms for Peace” program accelerated nuclear proliferation. The United States trained Indian scientists in plutonium foundry practices, helping India to build its first plutonium nuclear weapon. Iran hid its nuclear weapons program behind its peaceful nuclear power program while working on uranium enrichment. However, this pessimistic story is not the full story. Atoms for Peace paved the way for the almost universally accepted (albeit imperfect) nonproliferation regime, with the NPT and the International Atomic Energy Agency as its linchpins. Without this regime the planet would be in far worse shape. Can the regime be improved? Yes, with luck. Atoms for Peace gave us the long-term political barriers that are more important than the near-term losses. Hopefully, the United States will summon the political will to cut those losses even further.



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the principle that law may transcend state borders and is directly applicable to individuals. This is the precedent for

Secrets for sale? The *LA-1* ad that ran in the *Bulletin*.

"The president doesn't want to hear excuses! We need those earth-penetrating warheads and we need them now!"