Ethics for Astronomers

December 03, 2012

“Ethical dilemmas in military research and technology transfer”

READINGS:
Office of Naval Research Faculty Sabbaticals
Edward Teller
Bertrand Russell

The role of scientists in the military

- Modern weapons are based on the work of scientists.
- Scientists have a priveledged position to understand how new discoveries may have a military application.
- Conversely, academic scientists can see the value to science of discoveries or innovations made by the military environment.
- Scientists have a transnational “voice” viewed as fact-based, unbiased and honest.
- Is this still true, or is this a relic from WWII and the Cold War?

Still relevant today: “Scientist Decapitation Strategy”

11 January 2012 Last updated at 11:59 ET

3.7K Share

Iran car explosion kills nuclear scientist in Tehran

BBC's Mohsen Asgari: "It seems a motor cyclist pasted a bomb to his car which he was in with two other passengers

A university lecturer and nuclear scientist has been killed in a car explosion in north Tehran.

Mostafa Ahmadi-Roshan, an academic who also worked at the Natanz uranium enrichment facility, and the driver of the car were killed in the attack.

The blast happened after a motorcyclist stuck an apparent bomb to the car.

Several Iranian nuclear scientists have been assassinated in recent years, with Iran blaming Israel and the US. Both countries deny the accusations.

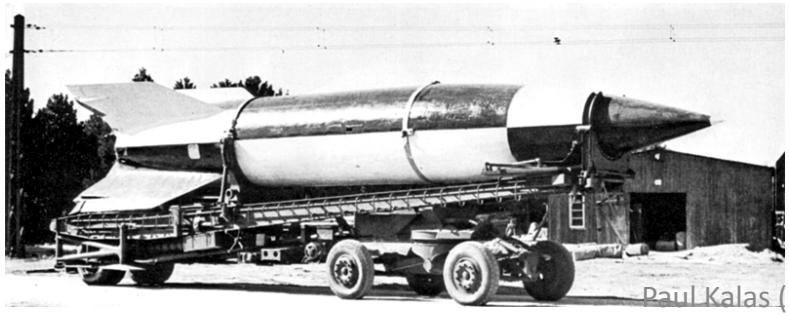
Credit: BBC

Dilemma: Dual Uses
Human welfare vs. harm

Recall the Bellmont Report: Respect for Persons, Beneficence and Justice

- A scientist may work ethically, yet the work used for different purposes

- Scientists seek understanding, but others (politicians) are to be blamed for misuse. Is this reasoning ethically valid? Can scientists be ethically neutral?



Ethical Dilemmas

Openess vs. Secrecy

The open discourse, academic freedom among scientists is publicly accessible, as opposed to the principle of secrecy in the military.

Fraternity vs. Nationalism

Scientists work without borders, but the motivation for a military is to maintain borders.

Sometimes scientists should or must work for the military out of obligation or duty, conflicting with principles underlying their career.

Honesty vs. Propaganda

Scientists value honesty above all else, whereas military/geopolitical goals may depend on the falsification and fabrication of facts.

For Astronomers: Dual Use Technologies

1. Telescopes
2. Instrumentation (CCD's, IR arrays, etc.)
3. Lasers
4. Radio Frequencies
5. Computation/Software
6. Launch Vehicles (really engineering)
7. Timing (clocks)
8. Position/Navigation
9. Materials (used in instrumentation)
10. Fill in the blank:

Astronomers: Real-life top three

#1 Jobs & Funding

NASA employment is an obvious one. Here is another example:

Subject: Funding Opportunity: Air Force and Naval Research Faculty Programs
From: "Beth Burnside, Vice Chancellor for Research (Campus-wide)
Date: Thu, September 18, 2008 6:00 pm
To: "All Academic Titles,"
TO: Full-time Science and Engineering Faculty

ONR Summer Faculty Research Program and Sabbatical Leave Program

The Office of Naval Research (ONR) sponsors the Summer Faculty Research Program and the Sabbatical Leave Program for U.S. citizens and legal permanent residents who hold teaching or research appointments at U.S. colleges and universities. These programs **provide an opportunity for faculty members to participate in research of mutual interest to the faculty member and professional peers at U.S. Navy Laboratories**.

The Office of Naval Research (ONR) coordinates, executes, and promotes the science and technology programs of the United States Navy and Marine Corps through schools, universities, government laboratories, and nonprofit and for-profit organizations. It provides technical advice to the Chief of Naval Operations and the Secretary of the Navy and works with industry to improve technology manufacturing processes.

One example:
Targeting Technology:
RF, IR, laser sensors, multi-sensor fusion, automatic target recognition, atmospheric turbulence and imaging.

Astronomers: Real-life top three

#2 ITAR: International Traffic in Arms Regulations

An article or service may be designated or determined in the future to be a ***defense article*** or ***defense service*** if it:

(a) Is specifically designed, developed, configured, adapted, or modified for a military application, and

(i) Does not have predominant civil applications, and

(ii) Does not have performance equivalent (defined by form, fit and function) to those of an article or service used for civil applications; or

(b) Is specifically designed, developed, configured, adapted, or modified for a military application, and has significant military or intelligence applicability such that control under this subchapter is necessary.

The intended use of the article or service after its export (i.e., for a military or civilian purpose**) is not relevant** in determining whether the article or service is subject to the controls of this subchapter.

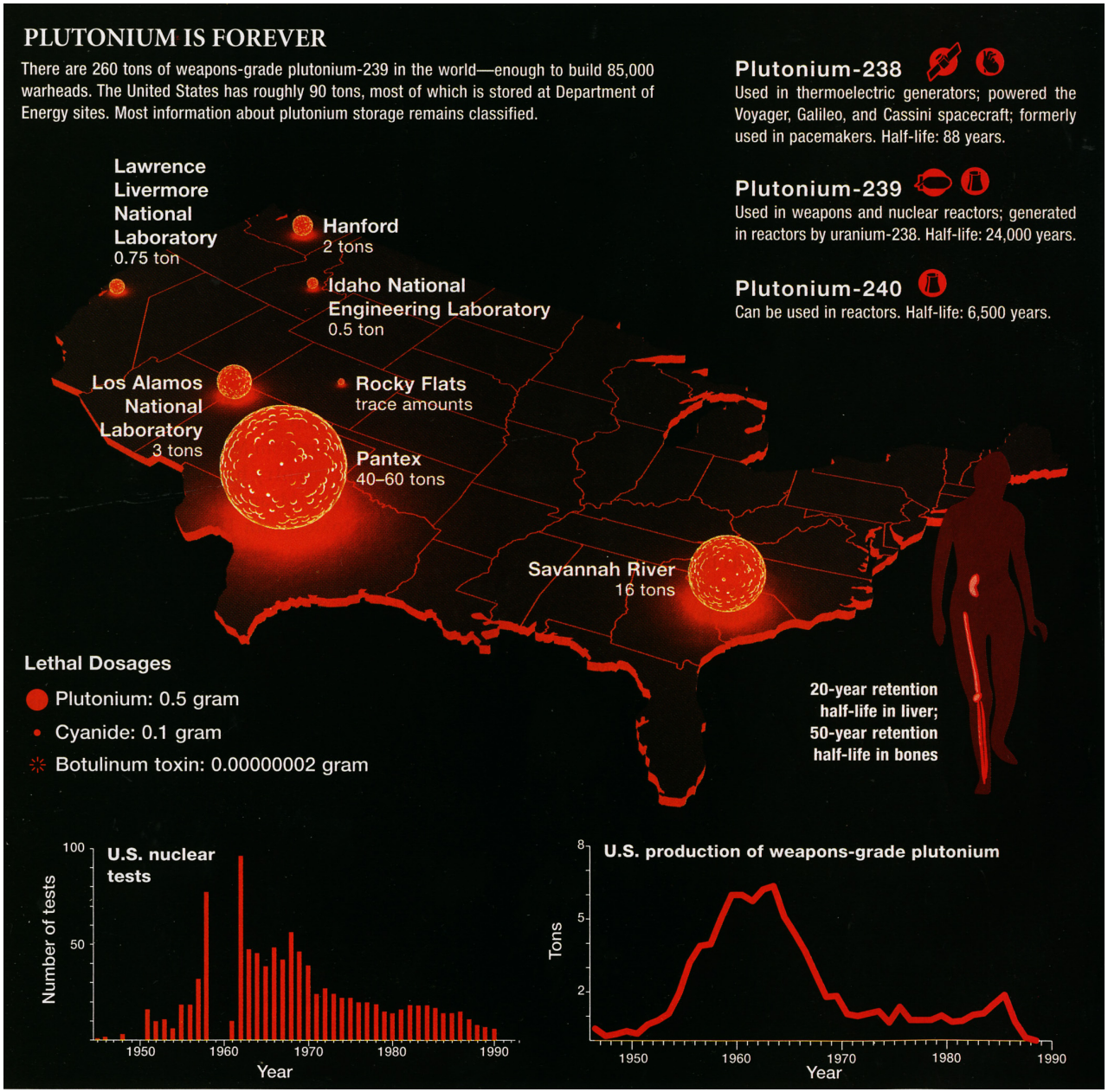
Examples of astronomy in "The United States Munitions List"
(1) Electronic equipment specifically designed or modified for spacecraft and spaceflight
(2) Non-military second generation and above image intensification tubes, non-military infrared focal plane arrays, and image intensification tubes…
(3) Antennas…With aperture (overall dimension of the radiating portions of the antenna) greater than 30 feet;

Astronomers: Real-life top three

#3 Education and multiple missions of institutions.

Expertise as an educator influences many groups within a nation, including the training of military.

One may be a student/educator at an educational institution, but the institution may have a research or management component directly tied to the military.



Graphics from Discover Magazine

UC Berkeley Physics & Edward Teller

- UC physicists crucial to the Manhattan Project
- Edward Teller taught physics at UCB, had students and postdocs, and was the official PhD supervisor of Chris McKee
- Edward Teller also successfully designed the hydrogen bomb, campaigned against nuclear test ban treaty, and advocated for more military spending.
- At the same time helped create LLNL, LBL and SSL, which has supported and trained hundreds of scientists and research projects.
- What connections do you see? Have you benefited directly?

Case Studies

- Tony is the Principle Investigator of a laser guide star (LGS) adaptive optics system at Gemini South. He is a US citizen residing in Chile, funded by the Gemini Consortium. He receives an email from a person in North Korea who says that he is an astronomer at a national university who will head the modernization of the nation's premier astronomical observatory. He would like to visit Gemini South to better understand the complexity of the LGS system and to help North Korean astronomers build their own system. Tony enthusiastically hosts the North Korean astronomer, showing him all aspects of the technology and answering questions.

- How is an LGS system a dual use technology?
- Is Tony violating the principles or the spirit of ITAR? Is the answer different if the location is Gemini North (Hawaii)?
- What ethical principles of science is Tony following in making his decision? If you were in Tony's shoes, would you have responded differently?

Case Studies

- YOU are Tony's Ph.D. student, and you are on the job market for a postdoctoral position. You have an offer to work at a federal facility, but a portion of your time must be spent working on research topic directly related to weapons or intelligence gathering, none of which can be revealed in detail before you accept the position.

- Under what circumstances would you take the job?
- Under what circumstances would you resign from the job?
- State your principles in both cases.