

LEARN ABOUT NUCLEAR WEAPONS

Environmental effects of nuclear weapons production

There are many examples of the ways development, testing, use and dismantling of nuclear weapons around the globe have contributed to environmental damage and threatened people's lives and health. In this chapter we will look at three different cases of the environmental legacy of nuclear testing: Kazakhstan, the Nevada desert and the South Pacific. Since the nuclear testing has never been approved without widespread protesting from the civil society, examples of resistance will follow. More about the consequences of nuclear testing on human health can be read in the chapter about the effects of nuclear weapons on the human body.

Tooth-Fairy project

The true story about how scientists, physicians and civil society in St Louis, USA, together played a key role in achieving the Partial Test Ban Treaty that banned nuclear testing in the atmosphere, is fascinating. We'll let it open this section on nuclear testing and its disastrous effects on the environment and people's health.

A group called the Greater St Louis Citizens Committee for Nuclear Information (CNI), decided from the very beginning not to become part of the debate for or against nuclear testing - even though it was obvious that key persons in the group were against the testing. The greatest problem, according to the CNI, was a total lack of information. Too many people - politicians, military officials and other decision makers - were adopting decisive stances on the basis of indecisive information, or none at all.¹



Between 1958 and 1970 the CNI led the St Louis Baby Tooth Study, which collected and studied almost 300,000 baby teeth looking for evidence that human beings were ingesting radioactivity in the fallout from atomic and hydrogen bombs exploded in the atmosphere. Other baby tooth surveys, patterned after the St Louis survey, were undertaken in America and in other countries.



The St Louis study showed that the radioactive isotope strontium-90 was accumulating in the teeth of babies. The strontium was produced during atmospheric nuclear weapons tests, and was widely spread by the winds. Some radioactivity was brought down to Earth, particularly by the rain, and cows ate some of the contaminated grass. Human beings then drank the cows' milk and absorbed the radioactive strontium, which behaves like calcium in the body, into their bones and teeth. To speak out about the serious adverse health effects of nuclear testing during the Cold War in the 1950s took considerable courage. Mothers worried about their children's health joined the Tooth Fairy campaign en masse, to demand a ban on atmospheric nuclear testing. The public pressure was an important factor leading up to the negotiation of the Partial Test Ban Treaty in 1963, that put an end to nuclear weapons tests in the atmosphere.²

Kazakstan - Semipalatinsk

Between 1949 and 1989, Semipalatinsk in Khazakstan was the largest nuclear test site of the Soviet Union. The Semipalatinsk test range, covering an area of 18,000 sq. km, was officially closed by President Nazarbayev on 29 August 1991. Between 1949 and 1989, 456 nuclear tests, including 340 underground and 116 atmospheric tests, were conducted at Semipalatinsk Test Site facilities. The last nuclear test conducted at the Semipalatinsk Test Site took place in November 1989. From 1997-2000, a series of calibrated explosions destroyed testing infrastructure at Degelen and Balapan as part of a joint US-Kazakhstan effort.³

Five of these surface tests were not successful and resulted in the dispersion of plutonium in the environment. Starting in 1961, more than 300 test explosions were conducted underground. Thirteen of the underground tests resulted in release of radioactive gases to the atmosphere.⁴ The Soviet nuclear tests in Khazakstan have left behind an acute ecological crisis, contributing to severe health problems in the local communities. The Finnish



Radiation and Nuclear Safety Authority (STUK) conducted a radfiation and health study in the area in 2002. Blood samples were collected from members of 40 families in three generations. The families live in villages within a distance of 100 km from the nuclear weapons test site, in the area that received the heaviest radioactive fallout. The population in these villages was exposed to radiation doses that were in some cases even a thousandfold above normal yearly background radiation.⁵ The only on-site inhabitants during the testing programme were in the town of Kurchatov whose purpose was to service the site, and in the small settlements of Akzhar and Moldari along the northern edge of the site. Recently there has been a limited amount of resettlement within the area, mostly by semi-nomadic farmers and herders. The bulk

of the local population is in settlements just outside the site border. The total population of these settlements is estimated to be 30,000 to 40,000 people.⁶

The Nevada-Semipalatinsk Movement



The first anti-nuclear non-governmental organisation created in the territory of the former USSR was the Nevada Semipalatinsk Movement. This non-governmental organisation (NGO) was created in 1989 when 5,000 people filled the hall of the Writers' Union in Almaty to hear Kazakh poet O. Suleymenov denounce nuclear testing and call for a public meeting the next day. The movement's aim was to protect humanity from the nuclear threat, destroy all nuclear test facilities in Kazakhstan, establish public control of industrial wastes, and draw an ecological map of the region.

The Nevada-Semipalatinsk movement grew out of joint contacts between US and Kazakh activists, and became a significant pressure point on Soviet policy in the late 1980s. In the United States, demonstrations at the Nevada Test Site involved thousands of people, with as many as 2000 people arrested at a time. These demonstrations were little noticed by the media and apparently by the US government. However, the Nevada Test Site demonstrations were definitely noticed in Kazakhstan, where a powerful anti-nuclear movement succeeded in shutting down the principal Soviet test site in Semipalatinsk. That campaign was named the Nevada-Semipalatinsk Movement, in recognition of the link with demonstrations in the United States.

USA - The Nevada desert

The Nevada Test Site is the largest nuclear test area in the US – a massive 3500 square kilometer large outdoor laboratory surrounded by another 10 000 square meters of a buffer zone. The southernmost tip of the test area is only 105 kilometers from Las Vegas. At the Nevada Test Site, the US has conducted a total of 928 nuclear tests up to 1992 when the US declared a moratorium on nuclear testing. The US, however, has not ratified the Comprehensive Test Ban Treaty (CTBT).

100 nuclear tests were conducted in the atmosphere, the other 828 underground. As many as 38 underground events detonated through September 1992 released volatile radioactive materials (particulate or gaseous), which resulted in detection off-site. The remainder of the 809 tests that took place at the NTS between 1961 and 1992 were either completely contained underground or resulted in releases of radioactive materials that were only detected onsite. A total of 299 events resulted in releases of radioactive materials that were detected onsite only.⁷

During the 1950's, mushroom clouds from the nuclear tests could be spotted from a distance of 150 kilometers from the test site. In Las Vegas, a bit more than 100 kilometers away from the test site, the mushroom clouds became a tourist attraction.

Americans headed to Las Vegas not only to try their luck at the local casinos, but to watch the distant mushroom clouds from their hotel balconies. The 17 July 1962 nuclear test "Little Feller I" was the last atmospheric nuclear test at the Nevada Test Site. Up to the 1992 US nuclear test moratorium nuclear testing continued underground. Today, so called subcritical tests, where no critical mass is reached and thereby no actual nuclear fission, are conducted at the Nevada Test Site

But the threat of radioactive fallout lives on. In 2007 the Pentagon wished to test a massive earth penetrating conventional device, the Divine Strake, in Nevada. This weapon did not have a nuclear charge, yet radioactivity was one of the reasons for stopping the test. There was fear that the massive explosion would create a mushroom cloud that would tear up radioactive particles from the desert sand and travel downwind to cities like Las Vegas, Salt Lake City and Boise.⁸

In September 1997, scientists at the US Department of Energy Affairs (DOE) reported that plutonium from underground nuclear tests in Nevada had moved more than one and a half kilometres from the Test Site. This contradicted previous DOE reports on plutonium moving very slowly - only some ten centimeters in a hundred years. The fast movement of plutonium aroused concern that plutonium would reach the groundwater and thereby cause severe environmental and health problems. It also challenges the DOE plans of long term storage of high-level radioactive waste in the Yucca Mountain in the Nevada desert. The nuclear waste contains thousands of tons of plutonium that will remain radioactive and extremely dangerous for tens of thousands of years to come.⁹

On stolen ground

The Western Shoshone Nation is an indigenous group of people who have lived in the western regions of the United States for hundreds of years. The claims they currently have to lands, especially vast portions of Nevada, date back to a treaty with the United States recognizing their land rights. The Ruby Valley Treaty of Peace and Friendship was signed between the Western Shoshone tribal leaders and the United States government in 1863. Thus, the treaty is the "supreme law of the land" as guaranteed by the US Constitution, and thus superior to state law.

The treaty recognizes the Shoshone claims to the land, and allows for their continued occupation and use of the land. It also requires the Shoshone's acceptance of US military establishments along travel routes (referring to settler migrants) as well as the establishment of mining facilities, if the opportunities presented themselves for such mineral exploitation.

The extent of military operations on the Shoshone lands far exceeds the parameters of the treaty according to many Shoshone, who never ceded their land to the US government but only contracted to allow the US limited usage of those lands. The US government has asserted that the Ruby Valley Treaty is null because the lands of the Shoshone have been lost because of encroachment, but the Shoshone by and large

reject this assertion, and the money offered by the US government as restitution for the stolen lands have not been distributed. These moneys instead reside in a trust fund where they have been garnering interest, but have remained untouched by the Shoshone. Many Shoshone support the distribution of the funds, while others oppose such a move.¹⁰



Picture: Western Shoshone flag at a rally at the Nevada Test Site, May 2006.

Source: Andrew Lichterman

In 2006, panel of UN experts from the Committee on the Elimination of Racial Discrimination expressed concern over evidence that the US government was denying indigenous land rights to the Western Shoshone, and that the government's position is based on propositions "which did not comply with contemporary human rights norms, principles and standards that govern determination of indigenous property rights."¹¹

The anti-nuclear movement

From massive American Peace Test anti-nuclear rallies in the 1980's to today's small demonstrations, e.g. by the Shundahai Network – the Nevada Test Site has since its opening attracted protesters from all over the US.

Between 1986 and 1994, the US government recorded no less than 536 demonstrations at the Test Site, arranged by American Peace Test. An estimated total of 37,500 activists have attended, with around 15,740 arrests – mainly due to illegal trespassing into restricted territory. The largest American Peace Test protest attracted over 8,800 participants, more than 2000 of



whom were arrested, between 12 and 20 March 1988.¹²

The protests continue, however with somewhat less intensity since the nuclear test moratorium in 1992. Today the Shundahai Network and the Nevada Desert Experience are the most common protesters. As recently as in March 2008 19 activists were arrested for illegal trespassing during a yearly protest at the Nevada Test Site.¹³

About an anti-nuclear hero

Susi Snyder is the kind of person who, when thrown in jail for protesting nuclear weapons testing, reads books. Well, she's also the sort of person who gets thrown in jail for protesting nuclear weapons testing - a rare bird, these days.



Once, while sitting in a cell out in Tonopah, she read *The Plutonium Files: America's Secret Medical Experiments in the Cold War*, by journalist Eileen Welsome.

It's a shocking, Pulitzer prize-winning account of how in the 1940s, U.S. doctors and scientists working for the nation's atomic weapons program injected plutonium into 18 unsuspecting Americans, whom Welsome identified. All but one had died slowly, excruciatingly.

Stories like this, along with tales of irradiated Test Site workers and the horrors of Nagasaki and Hiroshima, add impetus to the 25-year-old Snyder's continuous vigil to stop nuclear testing. She also speaks out against the Department of Energy's proposal to dump high-level nuclear waste from the nation's nuclear power plants into Yucca Mountain.

And to think: Snyder once had a close shave with a career on Wall Street, where she worked as a receptionist for J.P. Morgan. "Towards March or April [1996], I was like, 'Aghhhh!' One day, my best friend and I went to an amusement park, Six Flags, and I thought, 'Oh, this is great! I don't want to go back to work.' So I didn't, for a week. I kicked around New York, hung out at the museums, the parks."

Her employers were nice about it. She could stay, with no raise or promotion, or she could leave with a month's severance. She took the severance and hitchhiked to San Francisco, where eventually she hooked up with environmental activists. It was summer 1996, she was 19, and the world was hers to save.

Later that year, Snyder had her first anti-nuclear encounter, with the Save Ward Valley campaign. It was a successful one - they stopped U.S. Ecology from building a low-level nuclear waste dump 18 miles from the Colorado River.

In the summer of 1997, she drove to Southern Nevada to meet people in the

Shundahai Network, founded by Western Shoshone spiritual leader Corbin Harney. She stayed - the people, the stars at night, and a mission, seduced her completely.

"I felt there was a hole here, and something pushed me into it, to fill that hole." Nearly five years have passed: five years of marching onto the Nevada Test Site, protesting in front of federal buildings, Kryptoniting herself by the neck to the underneath of buses, getting dragged off and arrested many times, speaking at hearings, reading in jail and living on \$6,000 a year. Throughout it all, she and others have developed a steady relationship with the DOE - one, you might be surprised to hear, marked by a deepening respect on both sides.

"Respect is a two-way street. And I've learned, if I'm going to get what I need to get - which is usually information - I've learned there's a certain amount of protocol that's expected. Even though I'm so angry at this process, I know it's not going to be effective to come into a meeting and rail. As a whole, they're [the DOE] moving forward in a bad way. But a lot of the individuals are nice people. These folks are doing what they've been directed to do."

And it really does work both ways. Last week, U.S. Energy Undersecretary Robert Card invited Snyder and several other grassroots activists to meet with him privately for an hour to talk about their specific concerns with the Yucca Mountain Project.

Sometimes, she says, she needs a break. But overall, she feels lucky. "Being an activist, I've met the most amazing people. It's almost like an extended family, that stretches throughout the world, of people that have this awareness of this full-on threat we have created. And all the activists I've met, all believed in their hearts in what they were doing.

"I worked on Wall Street, and I never met anybody who was doing what they believed in. They were working toward a personal gain, not toward the greater good."

This article was published in the Las Vegas newspaper City Life in December 2001¹⁴, when Las Vegas announced their annual local heroes. Susi Snyder was one of them. Today Snyder works as the Secretary General of the Women's International League for Peace and Freedom in Geneva. Nuclear disarmament continues to be close to her heart, but the methods of work have changed somewhat. Instead of direct civil disobedience acts, Snyder today acts from within the diplomatic system to change the decisionmakers' ideas and thoughts on nuclear weapons and a world free from them.



The Pacific Ocean

Pictures of the Pacific Ocean islands seem like the closest thing one can get to heaven on earth. For the people who have lived on these islands during the last 50 years, reality has not equalled the picturesque dream world. For decades both the US and

France used the Pacific Ocean islands to test their nuclear weapons. The human beings living in the area became guinea pigs on the effects of radiation on human health and lives. The results were far from beautiful.



Between 1966 and 1996 France conducted a total of 193 nuclear tests at the uninhabited islands of Moruroa and Fangataufa. Of these, 41 tests were done between 1966 and 1974. The Partial Test Ban Treaty put an end to atmospheric nuclear tests, and between 1974 and 1996 France conducted 152 nuclear tests

underground.¹⁵ Most of the earlier nuclear tests in the atmosphere were done from land or from a naval vessel. These bombs detonated at a low altitude, which creates the largest amounts of radioactive fallout. Later nuclear tests were conducted mainly from hot air balloons, bringing the test blow to a higher altitude.

The US conducted both atmospheric and underground nuclear tests at the Marshall Islands, the Christmas Islands, the Johnston Atoll in the Pacific and over the South Atlantic.¹⁶ In total, 66 nuclear tests were conducted in the Marshall Islands, with a combined yield of 108 megatons, which equals more than 7000 Hiroshima sized bombs.¹⁷ Another 40 nuclear tests were conducted at the Christmas Islands and the Johnston Atoll, as well as three explosions over the South Atlantic.¹⁸

The nuclear tests conducted in the South Pacific reach a combined fire power of many tens of thousands Hiroshima bombs. Both the US and France have been very reluctant to discuss their actions, as well as to recognize a connection between the nuclear tests and the deteriorating health situation in the area.

Castle Bravo and the Rongelap case

All nuclear explosions create radioactive fallout, but there are cases where something in the nuclear testing had not gone quite as planned, and the consequences have been far worse than expected. The American test Castle Bravo on 31 October 1954 turned into a real disaster. Castle Bravo was the largest nuclear weapon – 15 megatons – ever to be tested by the US, and the largest radiological disaster during American nuclear testing history. The unexpectedly high yield and changed weather conditions resulted in enormous amounts of radioactive fallout spreading to the west, towards inhabited islands.¹⁹

The inhabitants of the nearby Bikini and Enewetak atolls had been evacuated before the nuclear tests, but the same had not been done in Rongelap and Rongerik. Inhabitants of Rongelap have testified about the radioactive fallout pouring down as a snowstorm, eventually creating a two centimeter thick layer on the ground. The evacuation did not happen until two days later. The Rongelap people were returned to their island in 1957, in spite of the fact that it had been continually dosed with

fallout from nuclear tests during their absence. No 'cleanup' of radiation was ever conducted. The Rongelapese exposed to the tests had all the symptoms of severe radiation sickness: nausea, vomiting, diarrhoea, itching and burning of the skin, eyes and mouth. They suffered from skin burns over much of their bodies, and lost much of their hair within two weeks of the Bravo explosion. Thirty one years on, 95% of the population alive between 1948 and 1954 had contracted thyroid cancer and a high proportion of their children suffered from genetic defects.

The US government representative to the Marshall Islands had ruled that Rongelap was still perfectly safe, as long as the people stay away from the northern islands and eat imported tinned food. The Islanders pleas to the US government to be evacuated had always fallen on deaf ears. So at the request of Rongelap's representative to the Marshall Islands parliament, in 1985 Greenpeace agreed to take on the task of evacuating the entire population with their Rainbow Warrior to the safer island of Mejato 180 kilometres away.²⁰

A Japanese fishing boat, the Lucky Dragon, was also exposed to the radioactive fallout. The crew saw the mushroom cloud and the flashing light. Several hours later, white ash began falling on the Lucky Dragon. Several crew members collected bags of it as souvenirs. Before dark that day, everyone on board the fishing boat was ill. The crew of the Lucky Dragon are believed to be among the first people ever accidentally exposed to fallout from a nuclear weapon. All 23 people on board the boat were hospitalized after returning to Japan. One of them died seven months later of kidney failure related to radiation.²¹

Bételgeuse - C'est Magnifique!

On 11 September 1966, then French President Charles de Gaulle visits the French Polynesia, aboard the ship de Grasse. The President is to attend his first nuclear test, and is impatiently waiting. The technicians warn the President that the wind has changed direction, but de Gaulle is too eager. He himself gets to activate the nuclear test, creating an impressive firework, a massive mushroom cloud and a 110 kiloton yield. "C'est Magnifique", shouts Charles de Gaulle at the sight of the explosion of the bomb Bételgeuse over Mururoa.²²

Within hours radioactive fallout covered the entire Tuamotu and Society Islands (including Tahiti). Days later radioactivity reached Western and American Samoa, the Cook Islands and Fiji. The inhabitants tell the same stories as those in Rongelap: bad skin burns, hair loss, stomach disease and abnormally high cancer rates.²³

During the years to come this incident will be just one in a long row of nuclear tests. More than 200 tests conducted by the US and France in the area have endangered the lives and health of the inhabitants on many Pacific islands - not only those living during the nuclear test, but also generations to come.

Rainbow Warrior – an example of the resistance

The protests against nuclear weapons testing in the Pacific have been loud, long lasting and heard all over the globe. Governments as well as non-governmental organisations have expressed their objections about the health- and environment endangering tests. The Swedish-French couple Marie-Thérèse and Bengt Danielsson were anthropologists, and dedicated their lives to the struggle against nuclear testing. One of the best known examples of the resistance, however, is Greenpeace and its ship the Rainbow Warrior. In May 1985 the Rainbow Warrior evacuated more than 300 Rongelapese from their radioactive contaminated island to another, safer island. Only a few months later, a scandal took place. The Rainbow Warrior was moored in Auckland's harbour en route to protest French nuclear tests at Moruroa Atoll when French secret service agents bombed the ship. The ship sank and Rainbow Warrior crew member and photographer, Fernando Pereira, drowned. The bombing provoked global outrage and spread Greenpeace's influence enormously. Since then, the Rainbow Warrior has become an even stronger symbol of hope for all who care about life on earth and desire harmony and sustainability instead of destruction.

Four years later, Greenpeace launches the second Rainbow Warrior, and many of the ship's purpose-designed fittings are funded by compensation from the French



Government. Greenpeace International Develops a Pacific campaign. With its new ship, the organisation continues its touring of the Pacific. In 1995, the French government announces that it's planning to break a three-year nuclear test moratorium. The Warrior returns to Moruroa, where the ship is seized and its crew are arrested, interrogated and deported. A year later, The Rainbow Warrior is released from French

custody and thanks to global attention France agrees to stop nuclear testing. But the Rainbow Warrior's struggle is not over: In visits to the Marshall Islands, Majuro, Mejato, Kiribati, Tuvalu, Solomons, Papua New Guinea, Fiji and the Cook islands, the Rainbow Warrior collects 40,000 signatures calling for an end to nuclear transport ships in the Pacific.²⁴

Nuclear weapons production

After the fall of the Soviet Union, extensive information emerged that confirms the extent and severity of the consequences of nuclear weapons production. The production happened at great speed, as a highly prioritized preparation for war, with little consideration of the environment and human health. The book *Atom Declassified*²⁵ published by the Russian chapter of IPPNW describes vast areas suffering from severe radioactive contamination. In 1957 a container with highly radioactive material exploded at the plutonium factory of Kyshtym. Two million Curie, mainly long lived isotopes, were spread over an area of a few hundred villages with a total of 270 000 citizens. Part of the material flooded down into the

river Techa, already seriously polluted with waste from the plutonium factory. The number of dead, injured and ill has never been revealed.

From the world's largest plutonium factory close to Krasnoyarsk, large amounts of highly radioactive waste have leaked or been released for more than 30 years, heavily polluting the tributary stream to the river Jenisej. Enormous containers of limited durability store many hundreds of millions Curie radioactive material. Government officials and experts from the Russian Atomic Ministry have told IPPNW that management of these amounts of waste will require up to a century, and cost vast sums of money. As will the decontamination of polluted areas.

In the US, the amount of radioactivity kept in liquid form, is estimated to about a billion Curie, mainly in long lived isotopes. Also in the US, some areas and waters have been heavily polluted by the production of nuclear weapons.²⁶ There is reason to worry about these radioactive storage facilities leaking or even exploding. A terrorist attack aimed at one of these storages would lead to enormous radioactive contamination.

1 Nuclear Files http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/health-environment/human-costs_article-wyant.htm

2 "Walter Bauer – Pathologist who led the 'baby tooth' study that helped to end atmospheric nuclear testing", Times online

3 Nuclear Threat Initiative http://www.nti.org/e_research/profiles/Kazakhstan/Nuclear/4278_4313.html

4 International Atomic Energy Agency (IAEA) <http://www-ns.iaea.org/appraisals/semipalatinsk.htm>

5 Radiation and Nuclear Safety Authority http://www.stuk.fi/stuk/tiedotteet/2002/en_GB/news_204/

6 International Atomic Energy Agency (IAEA)

<http://www.iaea.org/Publications/Magazines/Bulletin/Bull404/article2.pdf>

7 Global Security <http://www.globalsecurity.org/wmd/facility/nts.htm>

8 Whaley, Jean. "Divine Strake blast delayed indefinitely". Las Vegas Review Journal, 27 May 2006.

9 State of Nevada, Nuclear Waste Project Office <http://www.state.nv.us/nucwaste/yucca/plut01.htm>

10 Reaching Critical Will <http://www.reachingcriticalwill.org/resources/factsheets/indigenousUSA.html>

11 Report of the Committee on the Elimination of Racial Discrimination. UNGA Official Records A/61/18

12 Rogers, Keith. "Test site a magnet for anti-nuclear demonstration". Las Vegas Review Journal, 18 December 2000.

13 "19 anti-nuclear protesters cited at Nevada Test Site". Associated Press, 23 March 2008.

14 Las Vegas Review Journal <http://www.lasvegascitylife.com/articles/2001/12/20/export3447.txt>

15 Atomic Forum <http://atomicforum.org/france/france.html>

16 Nuclear Weapon Archive <http://nuclearweaponarchive.org/Usa/Tests/index.html>

17 Marshall Islands Nuclear Claims Tribunal <http://www.nuclearclaimstribunal.com/testing.htm>

18 Federation of American Scientists <http://www.fas.org/nuke/guide/usa/nuclear/nv209nar.pdf>

19 Johnson, Giff. "Exposing the US nuclear test legacy in the Marshall Islands" in News Zero – the New York Times and The Bomb. Monroe, ME: Common Courage Press, 2004.

20 Greenpeace International <http://www.greenpeace.org/international/rainbow-warrior-bombing/the-evacuation-of-rongelap>

21 Kennedy, Bruce. "The Lucky Dragon. Unlucky fishing boat became a symbol of Japanese nuclear dread". CNN Interactive <http://www.cnn.com/SPECIALS/cold.war/episodes/08/spotlight/>

22 Atomic Forum <http://atomicforum.org/france/1966.html>

23 WISE <http://www10.antenna.nl/wise/index.html?http://www10.antenna.nl/wise/509-10/5024.html>

24 Greenpeace International http://weblog.greenpeace.org/pacific/background/greenpeace_pacific.html

25 Yemelyanenko, A. *Atom Declassified*, 2nd Ed. Russian Agricultural Academy, Moscow 1996

26 Hu, H, Makhijani, A, Yih, K. *Plutonium. Deadly Gold of the Nuclear Age*. Internat. Phys., Press, Cambridge Mass 1992.