

SCFS FORUM

Southern California Federation of Scientists

"Science in the Public Interest"

Volume 43 No. 2

Winter

1994

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Founded in 1951 as the Los Angeles Chapter of the Federation of American Scientists, the Southern California Federation of Scientists is a non-profit educational organization dedicated to issues affecting SCIENCE, SOCIETY and PUBLIC POLICY. The **FORUM** is intended as a communications vehicle among our members and readers. We hope that our readers will send their comments and debate one another on the issues of the day. Please contact or send all materials to:

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KAZAKHSTAN: ITS LEGACY OF SOVIET NUCLEAR TESTING

by **JAMES C. WARF**

THE OCCASION. — The first Soviet nuclear warhead was exploded in 1949 in eastern Kazakhstan, not far from the city of Semipalatinsk. The last test was in 1989. Altogether 456 test explosions were conducted at the Semipalatinsk proving grounds, 210 of them in the atmosphere. Responding to the severe damage to the health of the Kazakh citizens in the area, the Global Ministries of the United Methodist Church sponsored a trip of a team to Kazakhstan, July 30-August 10, 1994. This team comprised various scientists, physicians and diverse health-science personnel, interpreters and others.

KAZAKHSTAN. — The Kazakhs are a Turko-Mongol people who have lived in contact with Slavs for centuries. They build hemispherical *yurts* from sheepskins, as well as Western-style buildings. With the breakup of the Soviet Union, Kazakhstan became an independent country in 1991. Its capital is Alma-Ata. Kazakhstan is huge, being almost four times the size of Texas. The land is mostly steppes.

SEMPALATINSK. — Our group flew to the city, where we were met by our Kazakh hosts. The city has around 350,000 inhabitants and is bisected by the Irtys River. Early the first morning I took my Geiger counter to a nearby park and measured the activity of the soil at the foot of a huge statue of Lenin and at other locations. I had put a few samples of food in small plastic bags at the banquet the night before, and measured their level as well. It came rather as a mild

surprise to find that all measurements were just at the background level: there was no measurable excess radioactivity.

DIALOGUES. — The time was spent in lectures, meetings with counterpart Kazakhs, visiting nearby medical institutions and orphanages, and field trips. The lectures were translated simultaneously from English into Russian or vice versa. Each American gave a lecture; mine was “Nuclear Explosions, Radioactive Fallout, and Biological Effects of Ionizing Radiation.” The conference covered many kinds of conditions, including thyroid diseases, glaucoma, cancers of all types, ophthalmology, pediatrics, dentistry, and nursing.

Dr. Boris Gusev is director of the Kazakh Scientific Research Institute of Radiology and Ecology. The Institute has a staff of 125. During the Soviet years, they were under strict orders not to connect health damage with radiation.

Here are some of the high points from Dr. Gusev’s lectures. Of the hundreds of nuclear blasts carried out at the Semipalatinsk proving grounds, four of the large explosions were selected for most thorough analysis. The year and estimated yield (in kilotons) of the four bombs are: 1949, 20; 1951, approximately 50; 1953, 200 to 300; 1956, probably a 1-megaton hydrogen bomb. These explosions were conducted in the atmosphere until 1963, when they were banned by treaty. Beginning in 1964, the tests were conducted underground; in one case five bombs were detonated simultaneously. The last tests were conducted in 1989. At that time one borehole was loaded with two warheads, but there wasn’t time to detonate them, and they are still buried there. Many small towns were directly in the path of fallout from several huge blasts, and this was known to the Soviet military. For example, each inhabitant of Dolon sustained a minimum dose of 180 to 210 rads, and some got as much as 317 rads from the first Soviet explosion. In some cases, the radiation was direct gamma rays from the blast, not fallout. Many citizens contracted cancer which they otherwise would not have. Approximately 25% of the women were rendered infertile by radiation, and menopause came at an age under 40. The deleterious effects of radiation dosage on the human immune system and longevity were emphasized. The connections with birth defects

and anemia are other factors.

One day we were taken to a museum in which miscarried fetuses and related specimens were preserved. These were cases where radioactive fallout had caused grotesque deformations, such as found in the Cyclops case (single eye in the forehead). Let us hope that a foundation of some type can be established to study these effects.

GERMAN-SPEAKING KAZAKH CITIZENS. — With the Nazi invasion in 1941, Stalin ordered the Volga Germans deported to Siberia, mostly Kazakhstan. Although some have since drifted back to Russia or to Germany, about 6% of Kazakhstan’s people today are German. Being curious about the nature of the German language these people speak, I asked to be put into contact with some. I found that their spoken German was easily understandable, but had some weird expressions and sounded as if it had been recorded in Goethe’s time.

THE JEWISH COMMUNITY IN KAZAKHSTAN. — One of the junior physicians on Dr. Gusev’s staff is Dr. Rafael Rozenson, who gave two lectures. He told me that there is a tiny community of Jews in Kazakhstan. They came from Russia about a century ago, having been driven out by continuous Cossack attacks; in addition, the wide open spaces of Kazakhstan was inviting. They experienced no troubles with the Islamic Kazakhs. He plans to go to Japan for a year and study radiation effects in Hiroshima and Nagasaki.

THE ABAI AREA. — One day we were driven to the region where the Kazakh poet Abai had lived. In Karaaul, 115 miles from Semipalatinsk, we found that in a surprisingly chic restaurant a long table had been set for a banquet by the inexhaustibly hospitable Kazakhs. One drink was *kumiss* (fermented mare’s milk). It was sour, refreshing, and slightly alcoholic.

We toured Abai Hospital, and were introduced to the sole survivor of the 42 young men ordered to remain in Kainar when the first Soviet thermonuclear test was made. This was in 1953. The rest of the population had been evacuated. The survivor was apparently somehow shielded from the gamma rays and moved away before the fallout cloud came. He described the bright flash, and the spectacular mushroom and its shadow. The survivor seemed to be quite healthy today.

Returning, without warning the driver turned off the asphalt highway onto a dirt track. Suddenly we arrived at a Kazakh settlement in a lush valley. A welcoming committee dressed in native costume greeted us. It was about an hour before sundown, the start of a translucent evening.

There were several *yurts* with four inch-thick walls, made of hundreds of sheep skins. The structures were about 32 feet in diameter. An electric generator was started after dark. Another grand banquet had been prepared for us: mutton barbecued using dried cattle droppings as fuel giving it that extra zing, horse meat, *kumiss*, Russian sparkling wine, vodka, and much, much more. As the most senior member, I was served a sheep eyeball; a little bit gristly, perhaps, but not otherwise remarkable. Lovely young Kazakh women regaled us with sourceless melodies. The Kazakh chief gave a brief message. Paraphrased, the thrust of his words was: "We respect the Russians, we will cooperate and trade with them. But now we have our own country. No one will use our people as guinea pigs again. We will contact the West, the Americans, the Japanese, and others. Our destiny is in our own hands."

THE SECRET CITY OF KURCHATOV AND THE NUCLEAR TEST SITE. — Right after Hiroshima day, we zipped across the vast steppes on a good asphalt road, arriving at the formerly secret city of Kurchatov. The structures in the walled compound had clearly been built to last. In May 1992, a few months after Kazakh independence, the facilities were converted into a national laboratory for using radioactive materials in medicine and industry, and for other peaceful purposes. Kazakhstan has a fast-neutron

breeder reactor, the BN-350, producing about 140 megawatts of electricity. Its heat is used in desalination of water. Kazakhstan inherited roughly 1000

nuclear warheads from Soviet times. President Nazarbayev signed the Non-Proliferation Treaty in December 1993, and agreed to send most warheads back to Russia; the rest will be destroyed.

At lunch I was seated near nuclear physicist Smagulov. It gave me a decidedly queer, virtually surreal, sensation to be in such a place discussing nuclear matters openly.

In the afternoon we drove to the site of the first Soviet nuclear test on August 29, 1949. It was at the hind end of nowhere: not a house, not a tree, not an animal. A couple of miles before reaching the site, the soil registered background level on my Geiger counter. At one mile it was 1500 counts per minute. But about half a mile from the hypocenter, even inside the vehicle, the counter began to click rapidly. At about 100 feet, the clicking was a continuous noise, and I had to adjust it to a less sensitive setting. Walking toward the depression marking the hypocenter itself, it read 2100 counts per minute. At the rim of the crater, like the vortex of hell, the reading was around 100,000 cpm. The bomb, with a 20 kiloton yield, had been detonated on a 90-foot tower, and the downward force compacted the earth to form a crater about 30 feet deep. There was water in the bottom, so I could not get any samples from that area. Water plants, weeds, grass, and insects were everywhere. Walking in the direction downwind from the blast site the radioactivity increased to about 600,000 cpm. About two-thirds of the cesium-137 had decayed away. I took a sample of soil back home; it registered at 0.2 nanocurie per gram.

Welcome to the Yurt

Some steel-and-concrete bunkers were nearby, and they had been crumpled. Telephone poles has been sheared off for several miles along the access road by the shock wave. Dr. Smagulov and I estimated the radiation dose which each of us received at about 0.6 millirad.

ATOMIC LAKE. — I requested some water from Atomic Lake. The day before we left, Dr. Rozenson came to the hotel, bringing a liter sample. It was in an old vodka bottle, of course. I carried it back to Los Angeles in a plastic bag, padded in dirty underwear. Analysis later at USC indicated a radioactive level of 150 nanocuries of Tritium per liter.

NEVADA-SEMIPALATINSK. — One of the world's most remarkable occurrences was the movement cannily called Nevada-Semipalatinsk. It started outside gates of Kurchatov in 1989. Demonstrations were staged in Alma-Ata, demanding an end of the nuclear tests. The movement played a decisive role in shutting down the test site.

DEPARTURE. — On our last evening, our gracious hosts gave us a final banquet. Each American was presented with a Kazakh cape and hat, elaborately embroidered. I arrived back in Los Angeles on August 10. A third Dialogue is planned.

[This is a severely abbreviated version of the original report]

August 1994

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Jack Jennings Memorial Award

On December 10, 1994 the first JJMA was given to **Tom Amneus** for “conscientious and responsible application of engineering principles in the face a severe adverse economic and political conditions”. While the award is not on a financial par with the Nobel, MacArthur, and other prizes, it did entail a \$400 check from the Jennings Memorial Fund — a sum the organization felt gave proper emphasis to the significant prestige associated with the award.

The following letter was received from Tom Amneus after he was presented the Jennings Memorial Fund Award:

“I am overwhelmed with the beauty of the Jack Jennings Memorial Award plaque and will treasure it for the rest of my life as my children will after me. The \$400 check was totally unexpected and greatly appreciated. It will help some of the causes I have been supporting.

In appreciation of your kindness to me and of the fine work you do to better the world

I am

Your friend,

Tom Amneus”

SCFS EXECUTIVE BOARD MEETING (Open to All Members)

Monday, January 16, 1995

7:30 p.m.

At the Home of Jim Warf

3930 Franklin Avenue

Los Angeles, CA 90027

(213) 661-1535

For Information about car-pooling, directions, or agenda

Call SCFS Office at (310) 390-3898

SCIENCE AND RELIGION TOGETHER FOR A LIVABLE WORLD *

by
J. Waiter Cobb, Ph.D.

An Abstract

A background of community organization activism in two major social institutions of nations around the world and a long career in human relations provide me with a unique challenge to contribute in the Eco-Justice Movement toward Common Security and Sustainable Development on Earth.

The goal is to achieve cooperation between leaders of science and religion sufficient to cause public and private policy makers, local to global, to reverse the disastrous current trend of population expansion and destruction of natural resources.

Being an activist member of SCFS and the Union of Concerned Scientists (UCS) as well as in my own church and in an interfaith group provides opportunities for progress toward the goal. Prospects are also enhanced by membership in a number of NGOs (Non-Governmental Organizations) affiliated with the United Nations.

Learning of James C. Warf's meetings of scientists of the U.S. and Kazakhstan financed thru the United Methodist Church and moderated by UM Bishop Hearn inspired me to share thru SCFS Forum.

The board of Church and Society of the California-Pacific Conference of the UMC backed a plan I initiated. Its objective was to place our Conference on record for encouraging the Council of Bishops of our church to issue a pastoral Letter to local congregations worldwide based upon the UCS brochure WORLD SCIENTISTS' WARNING TO HUMANITY.

Objective was achieved in sessions June 15-19. I have since been working in response to a request that

I provide leadership toward the goal in implementation of conference action.

CONCLUSIONS AND RECOMMENDATIONS

The global sustainability issue is one concerning which the UCS specifically challenges world religious leaders, among others, to act. This paper illustrates the potential for such involvement. A NEW COMMUNION; justice, ecology, spirit, community — appropriately named — Is part of that potential.

Rev. Peter G. Moore-Kochlacs leads an Eco-Justice Group within the Board of Church and Society of the California-Pacific Annual Conference of the United Methodist Church which is in a strong position to take the initiative to achieve ecological action on a cooperative basis with worldwide ecumenical and interreligious resources. Peter, author of *Caring For God's Creation*, published by Environmental Ministries of which he is Conference Director, 7528 Garden Grove Ave., Reseda, CA 91335 (I have a borrowed 1st. draft, 1993, 140 pp., new 1994) is a close associate of David Gatchwell of NEW COMMUNION.

Recommendations (from my C.O. perspective): Californians Moore-Kochlachs, Gatchwell, and White should get together and arrange a meeting with Helen Caldicott and Gene LaRoque to plan a major conference with UCS (I serve as volunteer Consultant)

A Hope for Sustainability on Earth

Let us hope that two major institutions in societies of our Interdependent world, its science and religion, can together play a significant role in sustainable development and enable future generations of Homo Sapiens in the 21st. century to live in peace and security and in harmony with a clean and life-giving environment on our planet.

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**A full copy of this paper will be sent to all members.*

Vietnam Wind Farm Project

—by Shel Plotkin

As Forum readers are aware, SCFS has had this project in the works for several years now. In the last report Paul Vu and Shel Plotkin went to Vietnam to deliver two sets of wind monitoring equipment and consult in the installation of a 30 m (100 ft.) pole. The equipment was paid for by the American Friends Service Committee. The objective was to collect wind data for a significant period of time at Can Gio, a remote fishing village not too far from Ho Chi Minh City. If the data indicated the site was a good wind energy source, we were to then proceed to obtain funding

Without getting into precise details, Vietnam had difficulties keeping the equipment operational as well as automatically reading out the data. However, they were able to manually compile about eleven months of data which we have been able to use. SCFS appropriated several hundred dollars to process in Los Angeles a statistically accurate fraction of the data which was then transported to Denmark for evaluation. While that evaluation is still forthcoming, an SCFS analysis indicates that the site at Can Gio is as good as San Gorgonio (near Palm Springs) and Tehachapi, i.e. has a Capacity Factor of 0.24.

With this information a meeting was held with a foreign aid representative in the Danish Foreign Affairs Ministry in Copenhagen. We learned at that point that only relatively large long term programs are of interest. Thus we had to shift gears from our step-by-step approach to then write up the entire long term project we've had in mind. This project calls for a 250 MW (average delivered power) wind farm by the year 2010. Such an installation will consist of 4000 250 kW turbine-generators, i.e. 1000 MW power production capability.

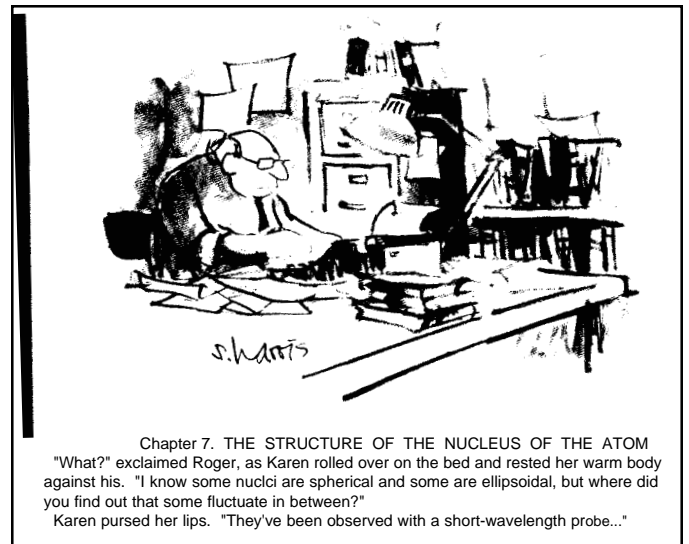
Naturally Vietnam government approval and active support are required in order to proceed. In this regard, Paul Vu and Shel Plotkin went to Vietnam the latter part of November and early December to pursue the project with our friends in the Science and Tech-

nology Committee of Ho Chi Minh City. If successful, SCFS and BTM Consultants in Denmark will provide technical consulting services throughout the program.

Funding is anticipated to come from Denmark for the initial start-up stages with final stages, the largest part of the project, coming from commercial industrial production income in Vietnam. Basic analysis using Los Angeles Department of Water and Power data indicates that wind farms like Tehachapi, San Gorgonio, and Can Gio produce electricity for' approximately the same cost per kW-hr as natural gas and coal. (Altmont Pass near San Francisco has a Capacity Factor of about 0.21, so it is somewhat less efficient than the other two California wind farms). Only hydro power produces electricity less expensively, the problem being that source's limited availability. Even though Vietnam has one very large hydro electric generating facility, that source will not be sufficient for the country's long term needs.

Hopefully, SCFS will be able to convince Vietnam and other developing nations to use renewable energy sources for electric power generation. And finally, we hope the U.S. and other developed countries will learn from such power system installations how to switch over as the nuclear plants are shut down and gas/coal plants lose their efficiency over the years.

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SCFS Task Group Reports

Economic Conversion/Jobs

A revised version of our paper appeared in the December issue of Monthly Review under the title "Is Economic Conversion and Jobs Really Possible?". Additionally, a modified version is presently being reviewed by the Technology & Society Magazine of the IEEE. Also a shortened version of only the Economic Conversion section has been submitted to the Bulletin of Atomic Scientists; they have published other approaches to E.C. in the past.

Of concern is the lack of any response from numerous legislators, Center for Defense Information, Friends Committee on National Legislation, Center for Economic Conversion, to name a few. It appears that the only interested people in solving either conversion or jobs are those who are presently unemployed. As long as a person has a job, even that of lobbying ostensibly for solutions, it appears as though they have little real concern for others out of work.

Transportation

Unfortunately there is no group known to us that has a real interest in structuring and promoting a truly effective mass transit system for Southern California or even the Los Angeles area. Any ideas as to a possibly effective direction for our efforts would be appreciated.

Disposal of High-Level Nuclear Waste

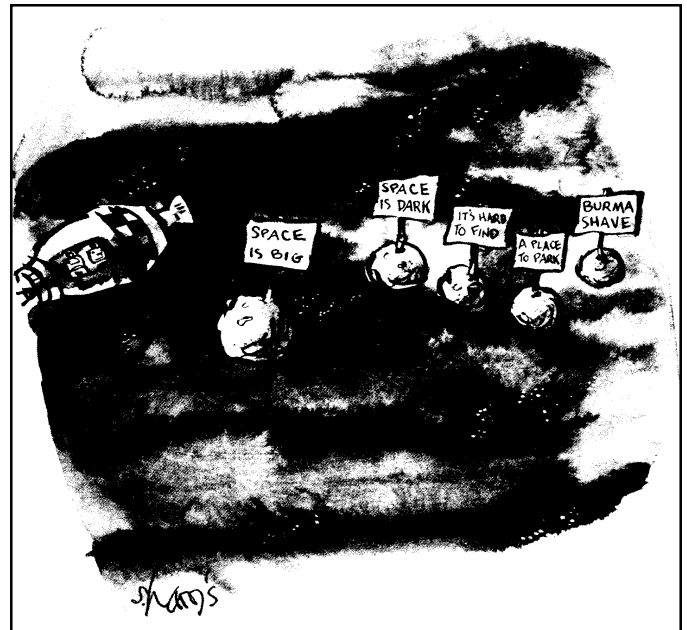
The group (Warf and Plotkin) is in the process of compiling an SCFS pamphlet on the subject. Good progress has been made and results should be forthcoming within several months. Exactly who might be interested in the results of our study remains a moot point; however, it is the group's view that publication of such a work is long overdue. Perhaps the forthcoming conclusions and recommendations will see the "light of day".

Ward Valley

At present the National Academy of Sciences has a group evaluating and analyzing this waste dump project. Unfortunately, appearances are that the nuclear industry and its supporters have been able to bias this study such that approval is contemplated shortly, SCFS and Bridge the Gap technical input being totally ignored.

If this approval does occur, it is then possible for the Superior Court to cancel the order for an adjudicatory hearing on long term safety considerations. Needless to say, our people involved in this matter are not very confident of prevailing in the end. However, as the saying goes, "it's not over till it's over"; perhaps our present pessimistic views will prove to be erroneous. A significant aspect is that we are almost out of options, so we have to contemplate the gradual future contamination of the Ward Valley-Needles-Colorado River areas.

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Please help the **Southern California Federation of Scientists** provide the scientific and technical knowledge that will enable the public and it's officials to better understand the issues affecting science, society and public policy.

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