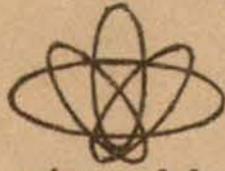


the Waste Paper



sierra club
radioactive waste
campaign

Volume 3, Number 4



What could swamps and radioactive waste have in common? See page 4

photo by Keith Gemerek

The Experiment – page 1

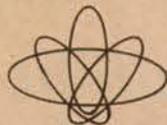
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The Experiment

Western New Yorkers are about to be subjected to a major experiment that may release large amounts of radiation into the air and water. The experiment is the solidification of the 600,000 gallons of high-level liquid waste sitting in underground tanks at West Valley, NY. Since this is a first try involving a complicated technology, the Sierra Club Radioactive Waste Campaign believes that the U.S. Department of Energy (DOE) should proceed with maximum public involvement and enormous care. Thus far, DOE is not meeting these requirements.

DOE Nixes Buffalo Hearing A draft environmental impact statement (DEIS) was released Aug. 7. DOE, despite repeated requests by local officials, citizens, and even DOE's own appointed citizen advisory group, the agency has refused to schedule a public hearing on the DEIS in Buffalo. The 1.8 million people residing in Buffalo are, potentially, at grave risk from the solidification project, because the city's water supply, Lake Erie, is linked by streams and tributaries to the West Valley site. If there are unacceptable releases of radioactivity at West Valley, the material could migrate downstream to Buffalo's drinking water. DOE's refusal to hold a public hearing may reflect the agency's desire to keep the residents of the state's second largest city in the dark (and quiet) about the project. We suspect that this tactic will backfire.

The DEIS is important not only for Western New Yorkers. How the toxic material at West Valley is handled impacts on dairy

farms in the area most of whose milk goes to New York City; affects how many canisters of hazardous radioactive waste will be carted through adjoining states on the way to South Carolina, Washington or an undesignated repository; influences what type of geologic medium the industry is likely to push for a repository; and will set important precedents for how carefully the nuclear industry manages nuclear waste.

The *Waste Paper* urges all readers to send comments to the DOE on the draft impact statement. *Stop. Do not say you are technically incompetent. Do not leave this task to the experts.* In the following section, we are providing you with some guidelines regarding the deficiencies of the DEIS and how to critique the document. We will first summarize some of our major criticisms and then discuss the glass versus calcination controversy in greater detail.

Six Major Criticisms 1) The DOE promotes borosilicate glass — a glass like the pyrex you might bake an apple brown Betty in — as the preferred final form for the waste. The Sierra Club Radioactive Waste Campaign opposes borosilicate glass. There will be increased radiation releases resulting from the high temperature process. Glass is a form incompatible with salt, the geologic medium currently favored by the DOE (though not favored by National Academy of Science experts) for a final repository. Furthermore, use of borosilicate glass is an experimental technology. Calcination, which is preferred by the Campaign, has been used

for twenty years at the Idaho reprocessing facility on fuel from experimental and submarine reactors.

2) DOE provides no data regarding origin of estimates regarding potential releases of radioactivity up the stack and what subsequently happens to this radioactivity. According to the DOE plan, all liquid wastes will be made into a solid (calcine or glass) or be released into the air. The question, how many of the 11 million curies of highly volatile cesium in the liquid will be released and not trapped by off-gas treatment facilities must be answered.

How the toxic material at West Valley is handled impacts on dairy farms in the area most of whose milk goes to New York City.

DOE takes no account of the fact that radioactivity in air will settle on the ground and be washed into Cattaraugus Creek and the Buffalo water supply. The Campaign opposes the initiation of any process without substantial evidence for the estimates of releases of radioactivity and health impacts.

3) DOE bases its estimates for exposure to personnel working on the solidification pro-

ject on experience at the Hanford waste storage facility. The Campaign feels this is an inadequate base. The Hanford facility data is incomplete. The government claims release of detailed information on radioactive emissions might jeopardize national security by allowing a researcher to draw conclusions regarding weapons manufacturing. Rather than allow personnel to work in a high risk job, DOE should see that radiation exposures are reduced.

4) DOE promotes leaving the high-level waste tanks in the ground after the radioactive sludge and liquid has been removed. The Campaign opposes leaving the tank in the ground. Even after 95% effective cleaning of the tank, 500,000 curies, primarily of strontium-90, will remain. This hazardous, long-lived material will leach into surrounding soil as the tank corrodes and concrete crumbles. The strontium will be a hazard for 300 years, the concrete will degrade in 30-60 years. Sand lenses in the vicinity of the tank could carry the dangerous materials to nearby streams. The tank must be exhumed.

5) DOE fails to discuss or analyze the impact on the solidification process of sand lenses, underground springs, swamps and gravel aquifers at the site. DOE continues to assert, blindly, that soil on site is a highly impermeable one. The Campaign believes a full geologic investigation of the area around the high level waste tanks is mandatory. How rapidly material can migrate off-site in the event of a leak or accident is central to public health and safety.

Continued on page 6

A Bridge Too High

The state of Michigan on June 24, 1981 joined dozens of communities across the country in opposing the shipment of highly radioactive fuel across its borders. Within hours of a decision by the U.S. Nuclear Regulatory Commission (NRC) to approve a route through the state for fuel from a Canadian reactor (see map), Governor Milliken of Michigan signed emergency rules blocking the shipments.

Poor Standards The highly toxic shipment from Chalk River, a research reactor in Canada, was to have crossed into Michigan at Sault Ste. Marie, then across the 191-foot-high Mackinac Bridge, down I-75 to Flint and on U.S. 23 to Ohio. Michigan's emergency regulation blocking the shipment focused on the inadequacy of the testing of the casks. The new regulation called for dropping the cask 191 feet (NRC testing requirements are only for a 30-foot drop, 61 feet less than the Mackinac Bridge height) and for submersion in 181 feet of water — the depth of the water under the Mackinac Bridge. The NRC test is only for submersion in three feet of water for eight hours.

At the time of the ban passage, the Governor of the state commented, "Although I recognize a national need to transport these materials through the states, I remain concerned about their transport over large bodies of water such as the Great Lakes."

This was the first transport ban in the country to focus on the inadequacy of NRC testing requirements.

Because of this focus, the Michigan ban may be exempt from the U.S. Department of Transportation (DOT) regulations which address routing requirements. The DOT regulations due to go into effect in February, 1982 will pre-empt most local transport bans and restrictive ordinances.

The Chalk River Shipments — The map shows the route for the irradiated fuel that the NRC approved one day prior to the Michigan state ban. The route was as follows: entry at Sault Ste. Marie and over the Mackinac Bridge in Michigan to Flint on Route I-75. From there to US-23 to Toledo, Ohio where it picks up I-475 south through Dayton to I-275 at Cincinnati. It reconnects with I-75 again in Kentucky, going south by Lexington and Corbin to meet I-40 in Knoxville, Tennessee. From Knoxville, it travels east on I-40 to Asheville, N.C. and then south on I-26 through Spartanburg, S.C. to Newbury. From there, it follows SC-121 to SC-19 and then to the Savannah River Plant near Aiken, S.C.

The inadequate testing of the 25-ton casks has been a target of the Sierra Club Radioactive Waste Campaign and the subject of the Campaign's popular fact sheet: "Shipping Casks: Are They Safe?" During the effort in Michigan to stop the shipments, phone calls poured into the Buffalo Campaign office and stacks of fact sheets went out to worried citizens. In Michigan, the Sierra Club, the Detroit Safe Energy Coalition and Greenpeace worked diligently to educate citizens and legislators about the dangers of irradiated fuel and the inadequate testing. The six-month emergency rule, which may be renewed for another six months, was the fruit of this labor.

New York Said "No" In 1980, the Chalk River shipments came through New York State. The RWC worked with local groups to pass ordinances in Syracuse, Cortland, Binghamton and at the Ogdensburg Bridge — the international bridge located in N. Lawrence County over which the hazardous fuel passed from Canada to the U.S. The Ogdensburg Bridge ban went into effect in July, 1981 forcing Atomic Energy Limited of Canada to look for another route and decide upon Michigan.

Now the shipments will be held up to February, 1982 and then there will probably be a court battle over the DOT applicability of the regulations.

The Chalk River reactor is a research facility that uses highly enriched uranium on lease from the U.S. After being irradiated, the fuel is returned to Savannah River, South Carolina for reprocessing. The reprocessed uranium is added to the U.S. Department of Energy's enriched uranium stockpile in Oakridge, Tennessee or sent to the gaseous diffusion plant in Portsmouth, Ohio. Then the material is used either in the U.S. nuclear weapon production program, the naval reactor program, or to create more fuel for other research reactors.

Other groups wishing to work on spent fuel bans should contact the Sierra Club Radioactive Waste Campaign for more information and a copy of the Michigan ban. Since the Michigan ban stresses cask testing issues which may be outside of the jurisdiction of the DOT, other communities may want to update or revise their existing ordinances to focus on the testing question.

Since barging of spent fuel is an option under increasing study by utilities anxious to avoid shipments through densely populated regions like New York City, the issue of adequacy of the three-foot immersion test for ocean transport is clearly open to question.



Radscope

Seawolf Returns?

Three thousand curies of cobalt-60 are sitting in a hill somewhere on the Kesselring Knolls Atomic Power Lab site near Schenectady, NY. The Department of Energy is not saying where this hill is nor how deep down the hazardous material is buried. Hopefully, employees at the lab are not enjoying lunch hours sitting on a hot spot of grass. Cobalt is a strong gamma emitter requiring thick lead shields.

The curies are in the reactor vessel of a

prototype of the USS Seawolf, the second nuclear submarine to be built in the U.S. The Seawolf prototype, after a period of testing, was decommissioned - the nuclear fuel removed and the reactor vessel dumped at the General Electric facility.

A contract has recently been placed by General Electric to exhume the reactor vessel. At that time, the vessel will need to be dumped, somewhere, but where?

Your Comments Please

The Nuclear Regulatory Commission has just released new regulations to establish requirements for the licensing of "land disposal of radioactive wastes," or for shallow burial sites. Although the concept of having specific requirements is highly desirable, the regulations do not take into account the long history of problems at burial sites such as West Valley, NY and Sheffield, IL. It is important for citizens concerned about low-level waste dumps to order the regulations and comment on them.

Write Dale Smith, Chief, Low-Level Waste

Licensing Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, (301) 427-4433. Ask for the proposed "Licensing Requirements for Land Disposal of Radioactive Waste," the new Part 61 of 10 CFR. The comment period expires October 22, 1981. If you would like to obtain a copy of the Sierra Club Radioactive Waste Campaign comments, send \$2.00 to the Buffalo headquarters.

Cash or Credit?

In July and August, it looked as if the West Valley solidification monies, allocated by the U.S. Congress, might go down the tube. Secretary of Energy, James Edwards, Congressman Manuel Lujan, Morris Udall, Tom Bevill, and Albert Gore were all asking questions about the Cooperative Agreement signed in December, 1980. That Agreement set up by the New York State Energy Research and Development Authority (NYSERDA) and the U.S. Department of Energy (DOE) set the terms for the project to solidify the 600,000 gallons of high level liquid waste at West Valley.

Congressional critics kept asking why New York was allowed to pay its 10% share of the project costs by receiving "credit" for staff time and for an estimated value of the contaminated reprocessing building. Why shouldn't New York pay its share in cash? Since project costs, currently estimated at about \$300 million, could zoom to billions, this 10% cash could be a lot of bucks.

Wresting Concessions Finally, in August an amendment to the Agreement was worked out. New York's credit for services

and staff time would have to be re-evaluated each year. In any one year the state can receive no more than \$687,000 credit for these services. In addition, the ceiling on how much New York ultimately might pay was removed. This means that each year Congressmen who are pro-nuclear or anti-New York will have a club with which to try to wrest concessions from the state - such as using the facility for other nuclear purposes or re-opening the burial ground.

Meanwhile, New York State taxpayers were asking, where did the 10% figure come from anyway? (See pie below and research project listed under "Public Investigators Wanted" on page 5.) Actually, New York nuclear reactors generated less than 5% of the fuel reprocessed at the facility. So why aren't citizens in other states whose reactors sent fuel to the plant also being asked to kick in their fair share? (It was the reprocessing of this fuel which produced the liquid wastes which now must be solidified.)

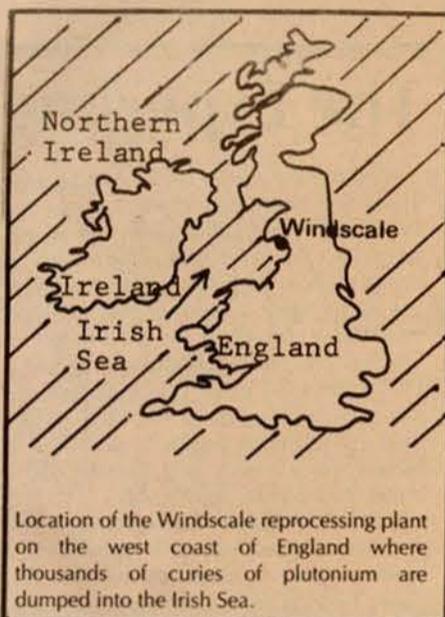
And, for that matter, why aren't Nuclear Fuel Services and Getty Oil, the corporate polluters, picking up their portion of the bill?

Windscale

Plutonium is building up off the coast of Cumbria, England. The Windscale reprocessing plant run by British Nuclear Fuels (BNFL) has poured 381,527 curies of plutonium-241 as of 1980 into the Irish Sea (see map). Average annual discharge is 30,000 curies. To date, this fiendishly toxic material is not subject to discharge limits. BNFL says that limits *might* be needed by 1983.

Plutonium-241, a waste product from irradiation of fuel, decays into americium-241, which has a half-life of 433 years. The cycle continues and americium decays into neptunium-237 with a half-life of two million years. In other words, the Irish Sea will be radio-active for centuries to come.

The reprocessing plant accepts fuel from Japan, Sweden and a host of other European countries. Several accidents at the reprocessing plant at LeHague near Cherbourg, France, have pressured Windscale to accept backlogs of irradiated fuel.



Location of the Windscale reprocessing plant on the west coast of England where thousands of curies of plutonium are dumped into the Irish Sea.

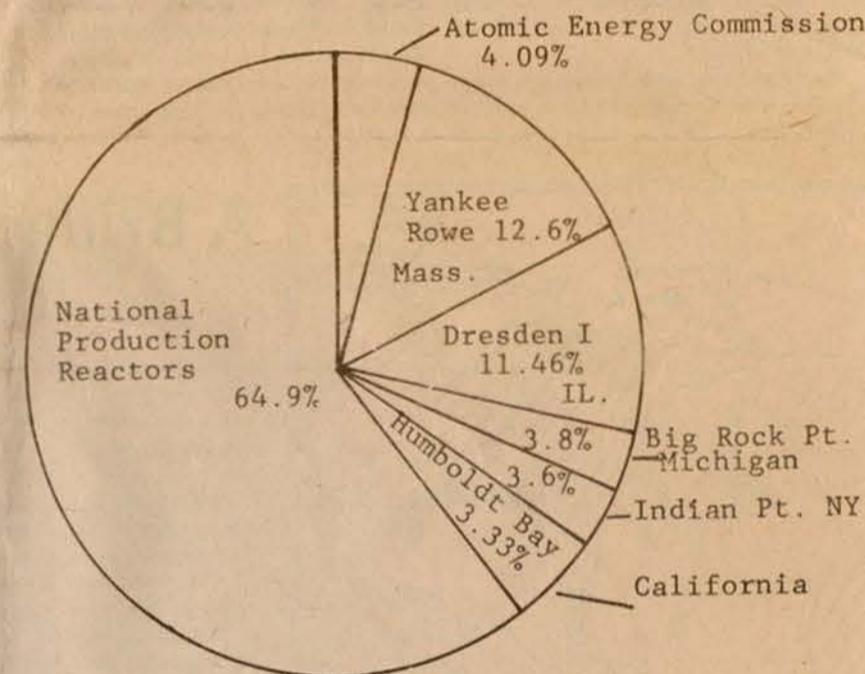
Nuclear Dump in Pa.?

Legislation has been introduced in the Pennsylvania General Assembly which would allow a nuclear dump to be established. The bill, H-955, would repeal a previous law preventing burial grounds in Pa.

Not to the Campaign's surprise, the Bureau of Solid Waste Management in Pa. has done a preliminary study of the state in search for areas to dump radioactive waste. The northeastern, northcentral and north-

western areas have been singled out as possibilities.

The bill has been referred to the Committee on Mines and Energy Management. Write or call J.L. Wright, House of Representatives, Harrisburg, PA 17120 or call (717) 787-8581 urging him not to support this bill.



Blueberry pie? Apple pie? No, it's a pie showing the sources of irradiated fuel reprocessed at the West Valley facility. A total of 624 metric tons (MT) were reprocessed. In addition to the 624 MT of uranium fuel which was processed, 16 MT of thorium-enriched fuel from the Indian Point 1 reactor was also processed at the facility and sits in a separate tank. This was government supplied fuel an experimental program.

the Waste Paper

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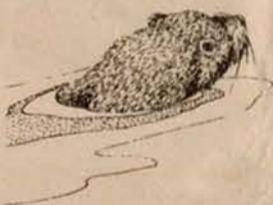
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Special thanks to Beverly Horozko, Greg Longo, Keith Gemerek, Lisa Bunin and Accu-type for all their help in this issue.

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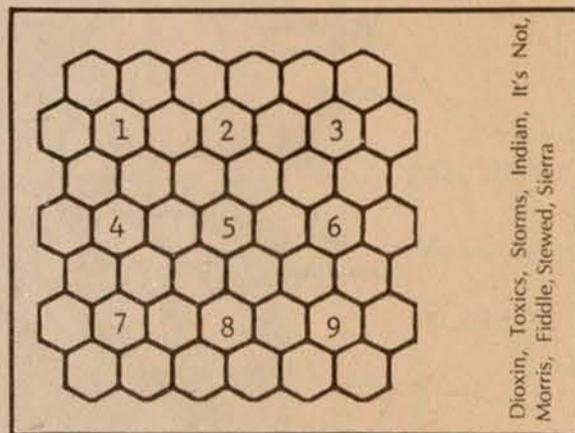
Fall, 1981



The Waste Paper Honeycomb

The answers to each clue must be transferred to the honeycomb around the corresponding number. The trick is in the placement of the answers on the honeycomb since letters for each answer overlap.

- 1) Carcinogenic chemical detected in Love Canal.
- 2) Poison, chemical compounds produces by various microorganisms.
- 3) Violent atmospheric disturbances.
- 4) A native American.
- 5) _____ whether you win or lose. . .
- 6) _____, Illinois; radioactive waste dump site.
- 7) _____ Dee Dee.
- 8) _____ Tomatoes.
- 9) _____ Club.



Dioxin, Toxics, Storms, Indian, It's Not, Morris, Fiddle, Stewed, Sierra

By Greg Longo
Greg Longo, whose hobbies include crossword puzzle construction and word games, is a bio-chemistry graduate from the University of Connecticut.

Fall Reading Book Reviews

The People of Three Mile Island
by Robert Del Tredici

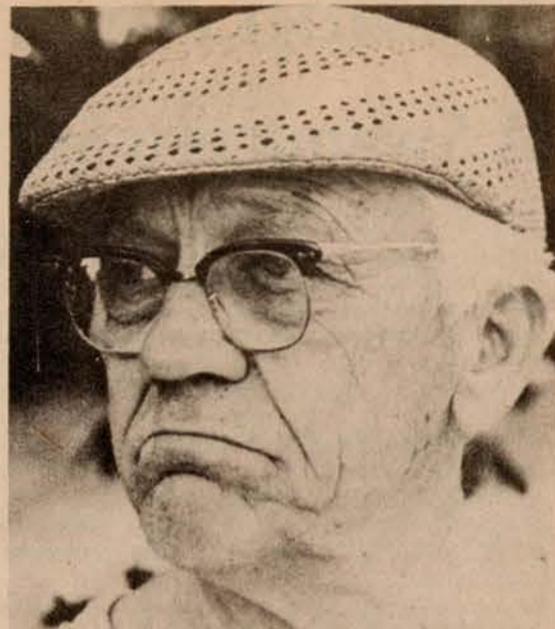
Two years may have passed since the government officially proclaimed that the nuclear accident at Three Mile Island was over, but for the residents of the neighboring area, the dangers still linger. Unit #2 remains seriously contaminated and vulnerable to further mishaps – a massive megalith of nuclear waste.

Sierra Club Books has published a unique and forceful photojournalistic commentary on the worst commercial nuclear accident to occur, to date, in the United States. Robert Del Tredici's *The People of Three Mile Island* (1980) has 37

interviews with the families, farmers, labors, health professionals, business people, politicians – the people whose lives were forever changed because of their proximity to a series of events that commenced at 4:00 a.m. March 28, 1979. The interviews are accompanied by engrossing black and white photos.

We also encounter in this book, the industry's experts, the bureaucrats, the public relation officials, the corporate flaks, assuring us that "all's well" in Middletown, Pa.

This is an excellent exploration of the human perspective of the commercial fallout of the atomic age. Robert Del Tredici is a photojournalist from Montreal. Cost is \$7.95 (paperback) plus 95¢ postage. Mail to Sierra Club Books, Box 3886, Rincon Annex, San Francisco, CA 94119.

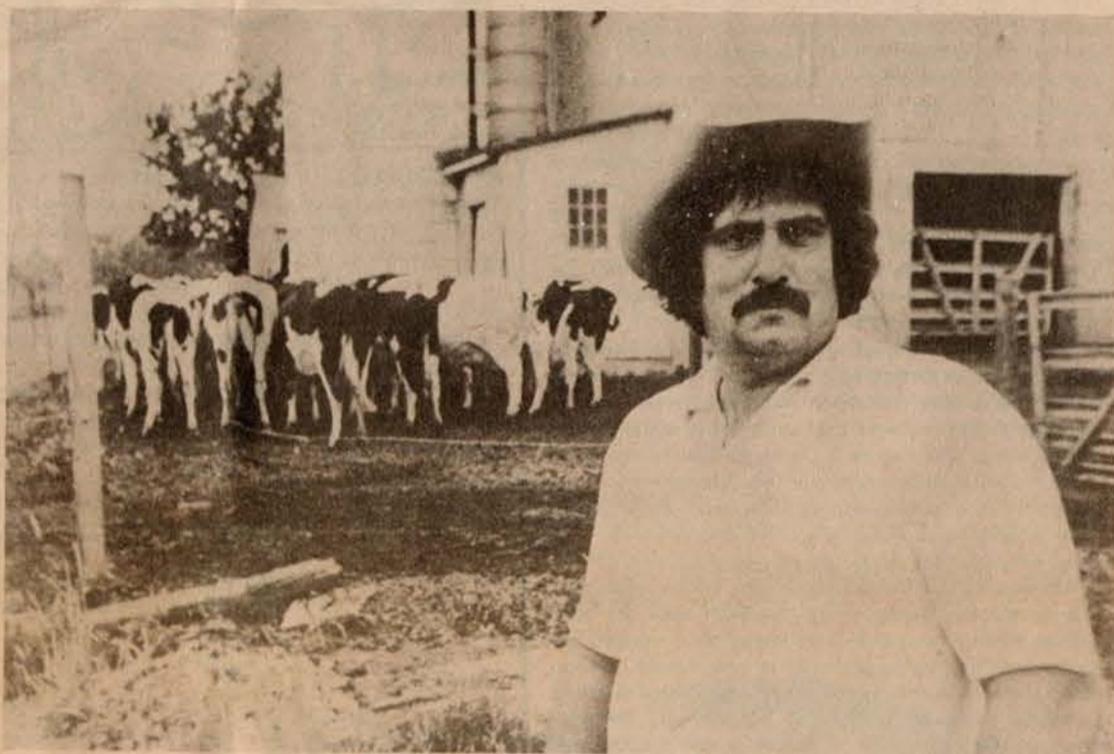


Peter Dorwart of Etters, PA.



Lynn Ann Biesecker, a fourth grader from Middletown, PA.

photos by Robert Del Tredici



Clair Hoover, a dairy farmer who lost several cattle the week following the accident at Three Mile Island.

Nuclear Witnesses, Insiders Speak Out
By Leslie Freeman

A physicist, a miner, an Army veteran and a pipefitter – these are just four of the sixteen people who speak out against nuclear power and weapons in *NUCLEAR WITNESSES* by Leslie Freeman.

These in-depth accounts of workers of the nuclear industry are shocking and straightforward.

Well-known opponents like John Gofman, Ernest Sternglass, Rosalie Bertell explain how each became aware of government white-washing and censoring of their controversial studies on radiation and effects on human health. Each of their interviews points to the Atomic Energy Commission and how it did not want to discover the hazards of radiation.

Men who worked at reactors, reprocessing plants, and mining sites discuss the sloppy procedures and cover-ups at each facet of the fuel cycle – at Shoreham on Long Island, at Yankee Rowe, Mass., and at West Valley, New York.

A carpenter talks frankly about his experience as a worker for the Long Island Lighting Co. (LILCO) at the Shoreham nuclear plant with its cracked containment walls left unpaired and supervisors and foremen who could not read blueprints. His list went on.

A pipefitter at Yankee Rowe, Mass. recalls an incident that overexposed him to high-level radiation. Two men went into a high-level waste storage room when they were to work in a low-level waste area. Only after the pipefitters repeatedly questioned whether they were in the correct room did the supervisor check a map to discover the hazard of the area in which he had sent the men.

Leslie Freeman's interviews with nuclear witnesses are strong and fascinating statements which should be read by both proponents and opponents of the nuclear industry.

NUCLEAR WITNESSES, Insiders Speak Out is available in hardcover for \$16.95 from W. W. Norton and Co., Inc., 500 Fifth Avenue, New York, NY 10011.



Pictures from the Past
By Ruth Geller

Pictures from the Past is a marvelous relief for radioactive waste activists. Curies, isotopes and rems never appear. Ruth Geller's compassionate and compelling stories are about working people subjected to the whims of corporate bosses, the poisons of Agent Orange and white collarism. The *Waste Paper* published "The Lecture" from the stories of this collection in the Fall, 1980 edition. Available for \$7.95 plus 10% postage from Imp Press, P.O. Box 93, Buffalo, NY 14213.

Nuclear Disaster in the Urals
By Zhores A. Medvedev

Nuclear Disaster in the Urals is an account of the "Kyshtym Disaster," the world's worst peacetime nuclear catastrophe. Hundreds of square miles were heavily contaminated in an industrial area on the eastern slope of the southern Ural Mountains in 1958. Hundreds, perhaps thousands of people were killed or severely injured. The region, located about 800 miles east of Moscow, Russia, is now desolate and uninhabited. It will remain that way for centuries to come.

In haste to develop the atomic bomb in the late 1940's, the Soviets established a secret nuclear weapons center outside the city of Chelyabinsk to produce plutonium. Many sloppy procedures were followed and the final result was an explosion of millions of curies of radioactivity into the air. Medvedev reminds us that such an accident could have happened at the Hanford, Washington site before U.S. officials became concerned and had the plutonium-rich soil exhumed.

The book is well written, well-translated and thoroughly documented. Medvedev's detailed study of published Soviet research on environmental radiation reveals heavy government censorship. His account is convincing, with a wealth of scientific detail, yet remains quite readable for the layperson. Available from Vintage Books, 1980 for \$2.95 in paperback.

Michael Aaron

Radioactive Waste: Politics, Technology and Risk
By Ronnie Lipschutz

This is an invaluable tool for radioactive waste activists. The book contains a good analysis of disposal technologies currently under consideration by the U.S. government. Solidification techniques, plus geologic, seabed, space and ice disposal proposals are all examined. There is also a brief history of major radioactive wastes sites all over the country. The book abounds in excellent charts and graphs. A series of tables listing the curie content of irradiated fuel after different cooling periods, is a must for citizens attempting to convince local officials of the necessity of transportation bans and pre-notification systems. Available from Ballinger Publishing, 17 Dunster Street, Cambridge, MA 02138.

Letters

Dear Waste Paper:

Re: *Bovine Blues Revisited*, Vol. 3 No. 3. The cows near the Scriba, NY power plants may be picking up radioactive minerals in the water (and in the pasture). This would lead to improvement when well water is used and the large mineral dose (5 lbs.) would flood the cow's system with minerals and stop the cows from absorbing the radioactive minerals. Remember iodine stockpiles near Three Mile Island to prevent folks from absorbing the hot iodine which Three Mile Island threatened to leak.

Peter Stuhl
Alfred, NY

To the Editor:

I would like to commend you on the quality of your paper and its responsible journalism. I am sure other readers feel as I do that your paper is an important instrument of the campaign.

Anonymous letter dated August 6, 1981

Swamp Awareness Events

A Swamp is a Swamp

In Spring of 1981, the Campaign discovered, through a Freedom of Information Act request, that there are THREE identified swamps at the West Valley site. We were quickly alarmed regarding the possibility that this water connects with underground springs. We became even more alarmed talking to farmers in the area who had known all along how boggy was Rockefeller's choice of location for the world's first commercial reprocessing facility. One farmer told us, "We tried to tell Bechtel [the contractor responsible for construction] but they

were in too much of a hurry to listen. They thought we were country hicks."

Obviously, a farmer who daily tramps after his cows and walks a fence line, knows the terrain. But the nuclear establishment, in its haste to make a buck on reprocessing, hired experts to say the geology of the site was okay. And the same experts have been singing this same tune ever since. (One of the subcontractors for the solidification project, [see "The Experiment", page 1], Dames and Moore, did much of the early geological survey work.)

Meanwhile, as the Campaign has sought further information from the state bureaucracies about these swamps, there has been a grand attempt to define the swamps out of existence. "Those aren't swamps, those are 'moist areas'" commented Dr. Axelrod, Commissioner of Health. And the Department of Environmental Conservation head Robert Flacke said we have only "swamp-like areas." Finally, New York State Geological Survey asserted that the swamp phenomenon is only "surface ponding."

We believe A SWAMP IS A SWAMP. Ac-



tivists around the state are urged to increase swamp awareness by sponsoring a talk on the geology of West Valley, by encouraging youngsters to spend a few days studying swamps by using our resources. As long as legislators and bureaucrats refuse to admit they have made a mistake, we will continue to be bogged down in the quagmire of nuclear power.

A Pod* of Pods

Once again, we present the Waste Paper readers with an intricate diagram, this time suggestive of a complex form of psychological testing. (In "Trenchant Report," Vol. 3 No. 3 our readers were treated to an elaborate network of lines showing erosion and gulying at the Sheffield burial site in Illinois.)

The diagram on the right is taken from "Geologic Study of the Burial Medium at a Low-Level Radioactive Waste Burial Site at West Valley, N.Y." NYSGS/79-2411. The diagram depicts the relationship between sandy areas called "pods," fractures and sandy strata in one test trench, which was dug in 1976. The test trench was dug about 600 feet east of the state-licensed burial ground.

Clay and More Clay? One test trench is insufficient to build a theory for the geology of the West Valley site. However, the findings at this trench contradict the current state and federal agency theory that sandy strata at the site are discontinuous and cannot act as underground migration paths for water into trenches or for radionuclides out of trenches. (Since water can move along sandy strata, a continuous sandy strata would seriously compromise the supposed integrity of the impermeable, clay site.)

The impermeable theory rests, in part, on the assumption that Nuclear Fuel Services (NFS) bulldozer operators while digging the trenches would have immediately reported any sandy strata to their bosses who, in turn, would have ordered the cessation of burial operations. (Burial within a permeable zone was illegal by the terms of the state license.) This assumption is based on the idea that 1) bulldozer operators and field staff had some rudimentary knowledge of geology, and 2) would take the time and energy to inspect, carefully, trenches as they were being excavated.

One time when an open trench was inspected by the staff of an outside agency, the Environmental Protection Agency, a large sandy stratum - 1 foot by 65 feet was detected. This permeable stratum had not been previously reported by NFS personnel. To rely on bulldozer operators and other NFS staff inspections, when company profit pressures to dig and bury expeditiously were paramount, seems unwise.

The second basis for the view of officialdom on the geologic integrity of the site is a series of reports and studies which we believe have been badly flawed by the political bias of state-licensed facility was well operated. In upcoming Waste Paper issues, we will review some of these reports in greater detail. Some of these reports have important data which seem to lead to different conclusions than those drawn by officialdom. Such is the case NYSGS 79-2411.

Three demonstration trenches were excavated. One trench was, for some inexplicable reason, dug during the rainy weather season. Of course, the trench filled with water. It had to be closed before any data was collected. No diagrams have been published on trench three, though this trench is frequently cited to endorse the concept of West Valley's good characteristics as a burial site.

No Peas Here The diagram of trench two which was excavated to a depth of 15 feet. Only six hours after opening, the north wall collapsed because "it intersected a major sand and gravel pod." The south wall of this same trench showed that, in the upper part, sand was found in circular and ellipsoid "pod" shapes but, in the lower level of the

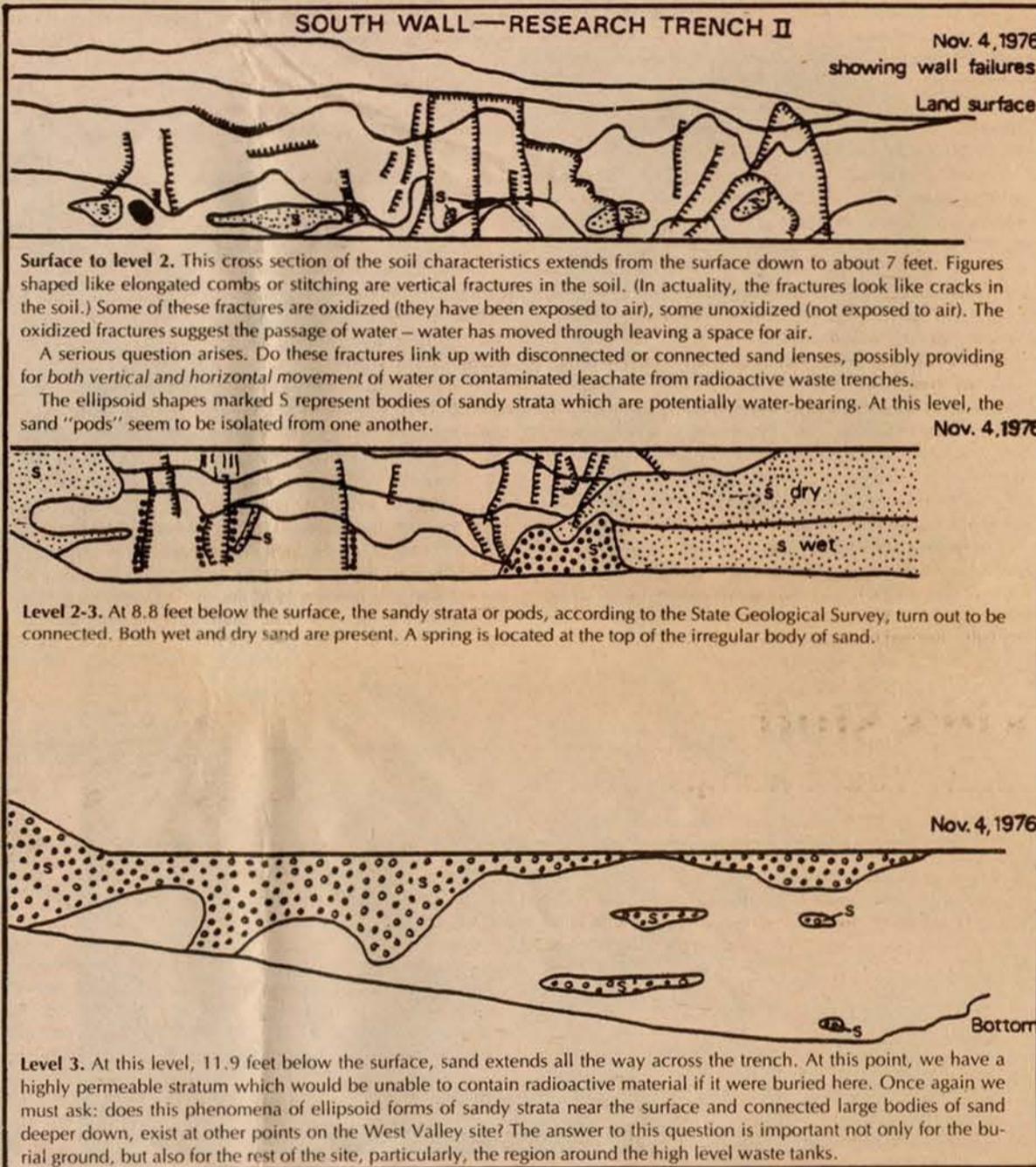


Figure 3. Cross-section of soil study in Trench II, from Geologic Study of the Burial Medium at a Low-Level Radioactive Waste Burial Site at West Valley, New York, NYSGS/79-2411

trench, the sandy zone became one, interconnected area. In fact, according to the Geologic Survey, the "pods" at this level are not separated but "represent upward bulges of a large pod with an irregular top."

Furthermore, "water was observed seeping into the trench" from both pods and fractures (cracks in the soil). And all sand and gravel layers were found to be saturated with water.

This data is not encouraging regarding soil conditions at the site. But New York State Geologic Survey, thus far, sees trench two as an anomaly, a freak. The agency maintains

that the burial site only a few hundred feet away is still, predominantly, a clay medium with only isolated sandy areas.

If you are concerned about the significance of this anomaly, tear out this article and send it to your local legislator - let him or her know about your concerns regarding problems at the West Valley burial site. And if you live outside of New York State, remember that West Valley is a good model of what may happen in your backyard.

* Whale buffs know that a herd of whales is called a pod. Sandy strata at West Valley are sometimes in the shape of a round pod, sometimes sand appears in elongated stratum.

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Please make checks payable to the Atlantic Chapter Radioactive Waste Campaign. Send to the above address. Thank you.

- Yes, I would like to subscribe to the Waste Paper at the reduced introductory rate of \$6.00 per year. I am enclosing a check in this amount.
- Yes, I would like to volunteer some time for the Radioactive Waste Campaign. I will help with research, clerical, organizing, public speaking (please circle your interest).
- Yes, put me on your mailing list.
- Yes, I would like to stop radioactive wastes. Here is my contribution of _____ to the Campaign.

Wanted: Public Interest Investigators

Starting a new semester at a university? Looking for a topic for an interesting term project or paper? Or are you one of those volunteers who wants to do research for the campaign? Here is a list of important projects which we do not have the woman or man power to do right now. Write the campaign if you need additional guidelines regarding sources for each project. The projects are listed under applicable academic disciplines. Send us your paper when it is finished. If your completed research meets our rigorous standards, we will publish the results in the *Waste Paper*.

ECONOMICS / POLITICAL SCIENCE / ENVIRONMENTAL STUDIES

Cost/Benefit Analysis of West Valley Nuclear Fuel Reprocessing Facility

The West Valley facility, supposedly, was a benefit to society. But what were the actual costs to State and Federal taxpayers? How do these costs compare with the alleged benefits? Some of the questions that need to be asked: How many jobs were generated by construction and operation of the facility? ("Jumpers," part-time employees brought in to do work in high radiation areas, should be treated separately and be evaluated in terms of future cost to society of probable health impacts.) Estimate the number of jobs produced by construction and engineering of the plant. What was the benefit in terms of electricity that was produced by fuel reprocessed at the facility. (This electricity would have been produced regardless of whether the fuel was reprocessed or not.) Check which reactors sending fuel were PWR's or BWR's, calculate tons of fuel, estimate months of electricity generated. Examine, whether, in fact, the reprocessing of this fuel could be considered a benefit. What is the detriment in terms of having a liquid that must be solidified versus unprocessed fuel that could have been stored in an air-conditioned room. What was benefit in terms of plutonium that was exported to Germany?

Some of the costs to be examined: Total annual expenses borne by New York State Department of Environmental Conservation, Department of Health, regarding pumping of water, radiation monitoring, maintenance of cow herd. Total cost of studies done by U.S. Environmental Protection Agency, U.S. Geological Survey, Department of Energy, General Accounting Office. Cost of loss of farmland, damage to the community, unknown health effects. What was cost of fuel supplied by the U.S. taxpayer, via the Atomic Energy Commission, to Nuclear Fuel Services? Include an estimate regarding future costs of solidification, burial of solidified wastes in repositories, exhumation of state-licensed and NRC-licensed burial grounds.

HEALTH CARE / MEDICINE / BIOLOGY / ENVIRONMENTAL STUDIES

Management Options for Medical Wastes

A high percentage of radionuclides used in medicine have very short half-lives. Seventy-five percent of the radioactive waste generated by hospitals have a half-life of less than 1 week. These radionuclides are being mixed with long-lived materials and dumped in low level burial grounds. A new waste management policy is needed at hospitals and medical institutions that integrates sorting and storing at the site to reduce the volume going to dump sites. Local hospitals should be surveyed to see what are present waste management policies and how they could be improved. What are the barriers to more efficient sorting and storing on site? What volume of material would have to be stored? How difficult would it be to train technicians and nurses to handle radioactive garbage differently?

OCEANOGRAPHY/ENVIRONMENTAL STUDIES

Analysis of Sea Dumping of Radioactive Waste

Starting in the 1940's and 1950's, the Atomic Energy Commission gave licenses to dump radioactive materials at sea. A moratorium was placed on new licenses in 1960. June 1970 was the last disposal at sea. Research these licenses to obtain listing of all locations where material was buried, amount and type of material that was buried, how the material was packaged and who did the burying.

POLITICAL SCIENCE, ECONOMICS, ENVIRONMENTAL STUDIES

Federal legislation mandating the solidification of the high level liquid wastes at West Valley established that New York State should pay 10% of the clean-up costs of the project. As the project costs escalate from an estimated 300 million to billions, this 10% will be increasingly burdensome. How was the 10% figure arrived at? What rationale is there for charging New Yorkers this sum?

Supposedly, the figure was derived from the Uranium Mill Tailings Remedial Action Act. What are the similarities, dissimilarities between the millions of tons of uranium mill tailings piles sitting throughout the southwest and the West Valley waste? And what was the rationale for the 10% figure being selected for the mining waste? Does this reflect the percentage of profit realized by the company which stayed in the host state in the form of employment benefits and taxes? How come the companies that produced this waste are not paying a percentage of the costs? Or does the 10% come from the Highway Trust Fund? Or some other federal/state cost sharing model?

ENVIRONMENTAL STUDIES

Radiation Monitoring at West Valley

As a result of budget cutbacks, radiation monitoring at West Valley is being gradually reduced to what the Campaign considers to be unsafe levels. At the peak of radiation monitoring at the site, what were the number and location of stations, how frequent and what was the type of sampling? Which nuclides were sampled? How has this sampling changed? What stations have been eliminated or drastically reduced? What potential impact does this have on public health and safety?

ENVIRONMENTAL STUDIES-GEOLOGY

Plutonium Exhumation at Hanford

The 7 kg (about 15 pounds) of plutonium in the trenches at Hanford were exhumed in 1972. The exhumation was initiated because the Department of Energy feared the plutonium might shift into a configuration that could cause a criticality. What were the exhumation techniques used at Hanford? Was a bubble used? What type of protection did workers have? What type of exposures did workers receive during the operation? How long did the project take? What did it cost? Could the same techniques be used to dig up the plutonium and other isotopes at the West Valley trenches?

Please note: Plutonium-238 the isotope present in largest quantities at West Valley does not easily fission, particularly, when wet. The isotope plutonium-239 which was present at Hanford becomes more fissionable, as it becomes wet. (After the plutonium was exhumed at Hanford, it was re-packaged in drums and dumped BACK in the ground.)

GEOLOGY/ENVIRONMENTAL STUDIES

The Geology of the West Valley Dump Site

Dozens of studies of the West Valley burial ground have been conducted by the U.S. Environmental Protection Agency, Geologic Survey and New York State Geologic Survey. Despite early Nuclear Fuel Service's surveys of the site which showed a permeable sandy strata at elevation 1355' and despite continued water infiltration into the trenches at elevated rates, all of the studies "prove" the site is safe. The methodology of the studies, type, location and frequency of sampling and assumptions made, need careful re-examination. Expertise in ground water hydrology and geohydrology would be desirable.

GRAPHIC DESIGN/ART

The Campaign is chronically in need of maps, charts, and illustrations for slide shows, fact sheets and the *Waste Paper*. Why not as a term paper work with us on one of these productions?

Kid's Stuff Know Your Swamps

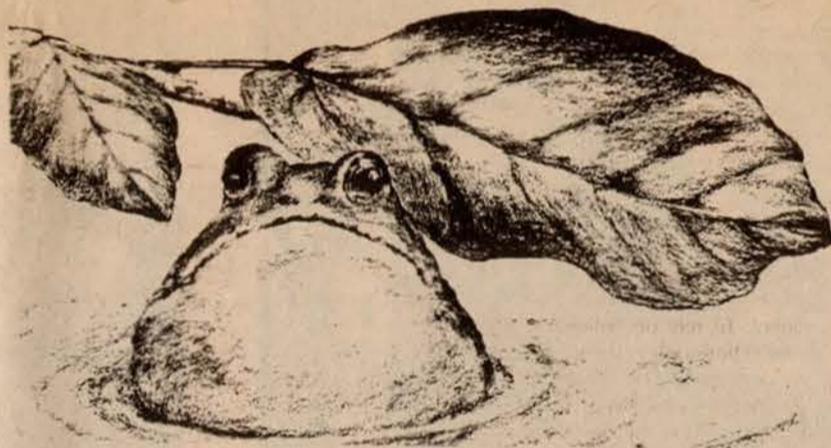
Here is a puzzle for our young friends. Why not encourage them to bring it to school for a science project. Use the CAPITALIZED WORDS from the sentences to solve this word-find puzzle. Words go in all directions - horizontally, vertically, diagonally and run forwards and backwards. Have fun! When you have found all the words, write out the remaining letters in order and cross out the Letters B, H, J, K, Q, V, X, Y and Z to find a secret message.

1. SWAMPS are not the same as MARSHES or BOGS because swamps are WETLANDS that have TREES or BUSHES - WOODY VEGETATION - rather than having only herbs, grasses or moss.
2. There are two swamps called GREAT SWAMP - one in New Jersey and one in Rhode Island.
3. The GREAT DISMAL SWAMP is found on the Virginia-North Carolina border.
4. The FOUR HOLES swamp is found in South Carolina, as well as the CONGAREE and WOODS BAY.
5. In early spring, the OKEFENOKEE of Georgia is covered with CARNIVOROUS BLADDERWORT PLANTS, which eat INSECTS. You will also find carnivorous PITCHER PLANTS and ALLIGATORS.
6. The GREAT CYPRESS swamp of Delaware is a place of quiet beauty.
7. The BIG THICKET, located in Texas, is made up of soggy wetlands and mirror-like POOLS, amid dense FORESTS. It's the home of many kinds of WILDLIFE, BOBCATS and poisonous SNAKES included.
8. The ALAKAI of Hawaii is covered with TREE FERNS.
9. HONEY ISLAND SWAMP is located in

10. The BIG CYPRESS and CORKSCREW SANCTUARY of Florida are the home for ORCHIDS and GATORS.
11. MINGO SWAMP of Missouri is the part-time home of many MIGRATING BIRDS.
12. The ATCHAFALAYA, located in Louisiana, is the third largest swamp in America.
13. Perhaps the best known swamp, the EVERGLADES, is found in southern Florida.
14. Some swamps, like the Everglades and the Okefenokee, have a DRY SEASON, during which the vegetation and PEAT deposits catch FIRE and BURN, as part of the swamps' natural LIFE CYCLE.
15. The SWAMP LAKES, REELFOOT (located in western Tennessee) and CADDO (on the Texas-Louisiana border) were formed by the same earthquake.
16. The GREEN SWAMP is located near Disney World in Florida.
17. LARUE swamp is part of the Big Muddy River in Illinois.
18. SPITTLER SWAMP in West Valley, New York is now the location of a NUCLEAR WASTE dump and a shut-down reprocessing building.
19. FOUR swamps presently surround the WASTE BURIAL GROUNDS at West Valley.
20. Some other common swamp plants are: CATTAILS and LILYPADS. Some other common animals are FROGS, TOADS and TURTLES.
21. Swamps often produce METHANE, which is also known as MARSH GAS.
22. CYPRESS TREES, found in abundance in the Okefenokee Swamp in Georgia, are deciduous, which means they lose their leaves during the winter season.

By Beverly Horozko

Beverly Horozko is a seventh grade science teacher in Hamburg, NY.



C O N G A R E E K O N E F E K O S B H J C N
A O O K Q S T C E S N I O V S S T X Y Z A U
R S R S W A M S M P S S U J P T S K Q S D C
N A C K V B P A H Z D U R X I N E W L E D L
I G H R S M E V R A Q B H N T A R O M X O E
V H I Z A C S T O S H M O O T L O W I A D A
O S D W E G R T B Z H H L S L P F I G Y P R
R R S J O E P E A T X E E A E R K L R Q M W
O A G R E E N S W A M P S E R E C D A V A A
U M F S F O B O R S Z Y X S S H Y L T N W S
S F X V Q K O U J H A B F Y W C P I I O S T
B G I R O D G S S K J N H R A T R F N I D E
L B O R S Z Y Q V H X N C D M I E E G T N B
A O T B E S N R E F E E R T P P S X B A A U
D Y A S D A P Y L I L S Z H U M S E I T L R
D Y B K A A Y A L A F A H C T A T L R E S I
E S S E L T R U T S J T S V Q W R C D G I A
R E F O G R H B K R J E L E V S E Y S E Y L
W K Q Z R Y X N U O U K I N C T E C G V E G
O A R E E L F O O T L C A A E A S E A Y N R
R L A R V Z F X S A Q I T H J E H F T D O O
T P B K E V Y N W G A H T T S R T I O O H U
P M A W S L A M S I D T A E R G E L R O I N
L A B J N K Q X Z L Y G C M V K H D S W A D
A W U R E M P S B L B I G C Y P R E S S K S
N S U S H J K Q V A X B O B C A T S Y Z A B
T B H G R E A T C Y P R E S S J E U R A L K
S D N A L T E W Q V P M A W S O G N I M A X

Secret Message: Swamps were made for frogs, not for nuclear dumps.

The Experiment . . .

Continued from page 1

6) DOE fails to consider the possibility of a major accident at the facility while the radioactive sludge and liquid is being removed and during the solidification process. Given the awesome accident which occurred in the Urals of Russia in 1957, where 1000 square miles were devastated, utmost caution is required. Although the cause of the Urals accident is unknown (the CIA has information it has refused to release), the striking absence of strontium-90 among isotopes found spewed over the landscape, suggests some waste management process was underway. The absence of strontium-90 is a clue that cesium and strontium were being separated or had been *already* separated. Only in waste management operations is strontium removed.

Calcination Versus Glassification The accompanying chart (See right) details some of the differences between the borosilicate glass technique and the calcination technique. Calcination means to produce an ash by roasting in an oven. The argument used by DOE in opposing calcination is that the ash is highly dispersible and leachable and would be dangerous to transport to a repository. This is a problem. The Campaign supports mixing the ash with a binding material, then compacting and forming round pellets. This is a well-developed technology. After this process, the calcined waste could be transported.

There is no reason given by DOE for the agency's support of the glass process. Perhaps the agency likes glass because this form has been studied more than any other process. Also, glass is perceived as a *final*, waste form. And indeed, once made into a glass, there is no possibility of re-making it into another form. Actually, if placed in a salt repository, the glass will rapidly crack and fragment, as it is attacked by the brine found in all salt formations. Thus, in this

geologic medium, glass is likely to be a temporary form. The bureaucratic perception, however, is that glass is *permanent* and calcine is a *temporary*, or *interim* waste form.

It is accurate to say that calcine is an interim form. The Campaign feels that selection of an interim waste form is appropriate, at this time, because a decision has not yet been made regarding the geologic medium of a repository. To move forward with glass which would be incompatible in a salt repository is absurd. Since calcine can *later* be transformed into glass, it makes more sense to go for a calcine form now and make a decision regarding the final form, later.

Out the stack The most telling argument against the glass process is the high temperature process which it requires. (See chart). The heat used for glass manufacture is in excess of the temperature at which cesium volatilizes. We do not know how effective off-gas removal of cesium will be. (Again, past experience on cesium removal has been at military installations for which detailed data is not available.) Significant quantities of cesium could escape up the stack, be wafted hither and yon by the wind, then drop down on pastures and watershed areas, and be consumed by grazing dairy cows or washed into nearby streams. Once in the water the soluble cesium could easily migrate long distances. With 11 million curies of cesium sitting in the tank, utmost care is required.

Given this situation, citizens should urge DOE to re-evaluate its fondness for glass and look again at calcination. Cesium has a long half-life - 30 years. It will be hazardous for 300 years. So get out your pens and write up your comments now. Send a copy to your local Congressperson. The deadline for comments is Oct. 31.

Persons in or near Buffalo come to a citizen hearing we are holding on this important project on Sept. 24, 5:30-10:30 p.m., Erie

Parameters	Agglomerated Calcine*	Borosilicate Glass
Number of high level waste canisters	165	300
Number of 55 gallon drums of salt cake	6656	6656
Process temperature**	550°C	1050°C
Occupational Exposures	lower	higher
Radiation Releases to the Environment	lower	higher
Flexibility	calcine can be made into glass later	glass is final form
Technical Problems	calcine compaction and pelletizing can be done by reliable, remote operation	thorex waste will separate from borosilicate glass
	no need for extensive storage on site, calcine removed as made	no place to send glass, need extensive storage on site
	equipment fits more easily into NFS existing cells	NFS plant will have to be substantially altered or a new building constructed
	low temperature of process means less stress on equipment	high temperature means frequent breakdown of equipment
Policy Issues	Calcine allows time to design waste form compatible with geologic repository	glass will be incompatible with salt repository

* Agglomerated calcine is a calcine that has been mixed with a binder, compacted and formed into round pellets.

** The temperature at which cesium volatilizes is 570°C. Considerably more cesium will be released by the borosilicate glass method.

County Library (Lafayette Square), Buffalo, NY. Please bring *written* comments to this hearing which we will forward to the DOE sponsored hearing on the solidification project to be held all day Sept. 26 starting at 9:00 a.m. The hearing will be at the West

Valley Central School.

Readers of *the Waste Paper* wishing a copy of the Campaign's detailed comments on the DEIS should send \$2.00 and a self-addressed, stamped envelope to 3164 Main St., Buffalo, NY. ☸



photo by Lisa Bunin

New Jersey Workshop - Citizens from New Jersey and New York gathered at Hidden Valley Farm at the Delaware Water Gap to discuss and learn about radioactive waste problems in their area. Marvin Resnikoff explains shipping cask hazards.

Have you read "Insecure Landfills: the West Valley Experience"? A must for activists anxious to stop local radioactive waste dump sites. If you are in a moderate to high rainfall region, particularly one which was glaciated, learn about the problems at West Valley - the same problems are likely to occur in your backyard.



photo by Michael Aaron

What's a SWAG? Toni Petrillo, as the concerned citizen, and the chorus perform a play about the nuclear dump in West Valley, NY, at a picnic this summer. To find out more about a SWAG, write for a copy of our play.

Resources for Dump Site Activists

- * Speeches on hazards of "low-level" dumps and the West Valley experience are available from the Sierra Club Radioactive Waste Campaign.
- * Our slideshow - A Dump is a Dump - on low-level waste. Good overview of the dump site problem. What is "low-level"? The experience of West Valley, Sheffield and Maxey Flats? Why medical wastes should be segregated from reactor waste. Comes with keyed, written text. Available soon.
- * 45 min. tape of WFX radio interview of Mina Hamilton on problems at the West Valley dump. Available for \$4, 1 week rental, \$6 purchase.
- * Set of six overhead transparencies showing problems at West Valley \$3.
- * Reprint of the *Waste Paper* article on medical waste: different types of medical waste, discussing management options. 50¢.
- * NUREG/CR 1137. *Institutional Radioactive Wastes*. An invaluable analyses of curie content and of different

waste streams generated by medical hospitals, bio and non-bio research institutions. A must to counter nuclear industry false claims that hospitals will have to shut down if waste dumps are not sited. Obtain from your nearest government depository library or National Technical Information Service, US Department of Commerce, Springfield, VA 22161.

- * Other highly recommended reading: *Characterization of Existing Surface Conditions at Sheffield, Illinois Low-Level Disposal Facility*, NUREG/CR 1683 Reviewed in Vol. 3, No. 3 *the Waste Paper*. Shows that problems at West Valley dumpsite are not an anomaly. The Sheffield site is plagued by erosion and gullying.

NUS-3440. Revision 1 *The 1979 State-by-State Assessment of Low-Level Radioactive Waste Shipped to Commercial Burial Grounds*. Find out how much waste your state generates. This study is badly flawed by describing waste only in volume and omitting curie content. ☸

The \$7 Million Mishap

Radioactive waste in your communities' backyard? Nuclear dumps in Pennsylvania? Florida? Massachusetts? North Carolina? The threat of new dump sites is becoming intense. The waste builds up at reactors, the U.S. Congress passes legislation mandating the siting of new dumps, and more and more citizens say no. *Don't dump on us.*

Citizens all over the country are questioning dump site safety. What is the past history of supposedly "low-level" dumps? The statistics are not reassuring. Three out of six commercial radioactive waste burial grounds have closed down. These are not odds to bet on. West Valley, NY, Sheffield, IL, Maxey Flats, KY. — all closed in the past few years due to environmental and health hazards.

The Waste Paper has in the past several months run detailed profiles on the problems at West Valley (see West Valley Dumpsite: Sand Lenses and Swamps, Vol. 3 No. 1) and at Sheffield (see "The Trenchant Report," Vol. 3, No. 3.) Now we take a look at Maxey Flats, the first commercial burial site to open in the U.S., and the most expensive one to maintain since it shut down.

Maxey Flats opened in 1963. Two-hundred-fifty-two acres of rural Appalachia was leased to Nuclear Engineering Co. (NECO), since renamed U.S. Ecology Inc. NECO had covered the market. The company had leased also the Sheffield site and the Hanford, Washington site.

Maxey Flats is located in northeastern Kentucky, about 65 miles east of Lexington, surrounded by three commercial dairy farms. The dump is situated on ridge, bound by steep slopes on three sides. The soil, generally shale embedded with sandstone stratas, is a pathway for nuclide migration.

The site is cut by tributaries of the Licking River which feeds into the Ohio, the water supply for over one-half a million people.

Two-Football-Fields High There is a total of 4.75 million cubic feet of radioactive materials. This is roughly the equivalent of two football fields each loaded to a height of 50 feet (about five stories) with radioactive waste. Two and one-quarter million curies of radioactivity were dumped here including 200 lbs. of plutonium-239.

As in West Valley, water started accumulating in the unlined trenches. By 1972, over 1 MILLION gallons of water had mysteriously appeared in the soil trenches. The following year an evaporation system was installed. (This was a more elaborate procedure than the treat-and-release-into-the-creek operations at West Valley.) Forty-eight steel tanks were installed on site. The contaminated water from the trenches was pumped into the tanks, the liquid evaporated and the resulting sludges dumped back into the trenches. In addition, radioactive particles are released into the atmosphere from the evaporator stacks.

In 1975, the Environmental Protection Agency (EPA) followed up on a state report which held that plutonium had moved off-site through subsurface migration. NECO had previously claimed that was impossible. The company estimated that "waste would not migrate more than one-half of an inch during one half-life of 24,000 years."

Yet EPA found plutonium approximately three feet deep in core drilling samples taken near the site. This highly toxic waste was also found in surface soil, in monitoring wells and in drainage streams.

Temporary Cures The problems continued. In 1977, radioactivity was detected in a newly dug trench — a trench into which radioactive materials had not yet been dumped! The radioactivity may have migrated through a sandstone layer extending into an adjacent and already filled and closed trench. At this time, Maxey Flats was shut down.

The state of Kentucky paid \$1.2 million of taxpayers' dollars for the outstanding NECO lease. The lease was due to run another eight years. And the company walked away scot-free, absolved of all liability.

The situation at Maxey Flats is a warning — not only regarding the siting of low-level dumps, but also of high-level repositories.

Since then, the cost of attempting to stabilize the site has been very high. Dames and Moore of White Plains, NY was brought on site for remedial action. Various temporary "cures" for the site have cost \$763,500 this far. Actions have included reshaping the soil trench covers for better water run-off and adding more and more compacted soil to the covers.

Similar "cures" were attempted at West Valley, where trench cover was increased from four feet to eight feet. But little improvements in the water accumulation has resulted at West Valley or Maxey Flats.

This problem with water infiltration persists, more studies are conducted, more taxpayer dollars spent and still the cause of the problem is not understood. As at West Valley, officialdom takes the position that water infiltration is primarily through the soil surface but the potential for lateral subsurface migration of water is still being explored. Several springs emerge on the steep slopes surrounding the site, suggesting the presence of a complex, underground water regime.

The 7-Million Dollar Gamble The states continue to pour money into the site. In addition to the \$1.2 million spent by Kentucky



in buying out the NECO lease, and the \$763,500 spent on surface "cures," the state will spend an estimated \$1.5 million on pumping another 5 million gallons of contaminated water out of the trenches over the next three years. Then, taxpayers will still have to pay for the costs of evaporating this radioactive liquid. This will add another estimated \$3.5 million over a nine-year period. Thus only four years after closure of the burial ground, the state is facing a bill of \$7 MILLION. And there is no sign that after this period the "cures" will take affect and remedial action will cease.

A Sisyphean process of pumping out contaminated water and evaporating liquid for decades to come is not attractive to state officials and local taxpayers. The state is currently evaluating several more permanent schemes such as laying down asphalt paving over the entire area, at an estimated price-tag of \$2 million; putting a four-layer seal over the site to the tune of \$3 million or creating a steel roof structure over the troublesome dump. This last option would cost a whopping \$5 million.

All of these remedies assume that the primary route for water infiltration is through surface soils. Cover the soil and the problems will go away. Despite the expense, this would be a relatively simple solution and far easier than exhuming the waste or inserting metal shields down to the bedrock.

But what if there is significant lateral underground water migration? The smooth, new expensive asphalt concrete surface will be unveiled at a press conference with ribbon cutting and hoopla. The number of monitoring wells will be drastically reduced and the media and citizens will go away satisfied that the public health and safety is protected. Underground, the slow but persistent migration of radionuclides off-site will continue until someday an angry citizen comes in with a high geiger-counter reading. Then a new phase of tests, studies and remedial action will be initiated.

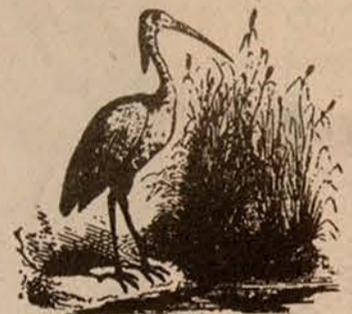
Hopefully, this disturbing scenario will not develop because of the vigilance of concerned scientists and citizens of Kentucky. The situation at Maxey Flats is a warning — not only regarding the siting of low-level dumps, but also high-level repositories. Can a site be adequately geologically characterized to assure that the integrity of the burial medium is sufficient to sequester radioactive materials for hundreds of years in the case of low-level dumps, thousands of years for high-level dumps? Or will the state and the taxpayers enter a perpetual motion machine — chronically, repeatedly attempting to control a complex underground water regime?

As we go to press, the state of Kentucky has poured another \$425,000 into proposed "cures" at Maxey Flats. The Hittman Nuclear & Development Corp. of Columbia, Maryland has been contracted to put a plastic cover over the entire site in hopes of cutting down the water infiltration rate in the trenches.

STATE COSTS AT MAXEY FLATS SINCE 1978. . . .

1979	
State buys lease from NECO	\$1.2 million
1979	
Two one-year contracts with Dames and Moore, a subsidy of National Waste Management Service	\$ 667,000
1980	
Emergency service contract with Dames and Moore due to unusually heavy rainfall in Fleming County, Kentucky	\$ 96,500
Estimated three year pumping of contaminated water from the trenches	\$1.5 million
Estimated nine-year evaporating of contaminated water	\$3.5 million
TOTAL	\$6.9 million

Source: Kentucky State Special Advisory Committee on Nuclear Issues, (March, 1981)



Bernie Eats His Words

Bernie Cohen, pro-nuclear physicist at the University of Pittsburgh, who once offered to eat a pound of plutonium, has instead eaten his own words. In an as yet unpublished paper, titled, "Effects of ICRP Publication 30 and the 1980 BEIR Report on Hazard Assessments of High Level Waste," quietly making the rounds of universities, Cohen substantially alters his assessment of the longevity of nuclear waste. The Waste Paper obtained a copy from an anonymous friend who thought the truth should come out.

Cohen had previously argued that after 600 years highly irradiated fuel from nuclear reactors would be no more dangerous than the natural uranium ore from which it was mined. However, he now says that highly irradiated fuel does not decay down to the levels of natural uranium until 11 million years.

Waste Guru Cohen's articles, which appeared in *Scientific American* and *Physics Today*, provided the scientific basis for nuclear industry assertions that the nuclear waste problem was "solved." After all, if the nuclear waste problem was only a 600-year

problem, then the nuclear industry could easily engineer solutions. Ads by Mobil Oil and pamphlets by the Atomic Industrial Forum, the nuclear lobbying group, using the Cohen figures downplayed the waste hazard. Cohen became the "Waste Guru" for the nuclear industry.

"We see that the toxicity in the waste does not decay down to that of the original uranium . . . until 11 million years for highly irradiated fuel." He also re-evaluates earlier statements that a high-level waste repository must be designed only for 1000 years. ("It is often said that a high-level waste repository should be designed to maintain security for only about 1000 years.")

Cohen doesn't mention, of course, that some non-industry scientists and citizens who might have to live next to these waste dumps, have always been skeptical of these self-serving nuclear industry assurances about the safety of nuclear waste and this "600-year problem." For example, an article by Dr. Marvin Resnikoff ("Nuclear Wastes: Myths and Realities," *Sierra*, July/August,

1980) stated that the high level waste dump would remain hazardous for hundreds of thousands of years. With over a trillion curies, or enough radioactive waste to give fatal cancer doses to trillions of humans, local citizens were alarmed and vitally concerned that the location and design of the high-level waste dump be done in a scientifically responsible and conservative manner. It seems that citizens had the correct perspective on the problem.

Tech Fix Rather than facing the problem of defining an underground repository for a million years, he proposes a quick technical fix, wrapping the high level waste in titanium alloy of "one or more centimeters of thickness." (Titanium is one of the more expensive metals in existence.) And rather than accept the implications of his "new" results.

Cohen believes the "data on which it is based should be subjected to intense scientific scrutiny." Cohen never called for such "intense scrutiny" when the data pointed to a lesser hazard. Well, the Waste Paper is certain as we can be in this area of scientific

uncertainty, that the 11 million year figure will be subjected to "intense scrutiny," particularly by pro-nuclear advocates. We wish the basic proposition, that a high-level waste dump contains the potential for trillions of cancers, would also be "scrutinized" as carefully by Bernie's friends.

With his changing viewpoint on the hazard of high-level waste, one aspect of Cohen's thinking has remained unchanged. Cohen remains ready and willing to sacrifice his body for the good of nuclear power. Before it was with a pound of plutonium, and now it is with neptunium-237. Because neptunium-237 is now considered by the international body ICRP to be much more hazardous than before, Cohen says it should be tested on humans. He offers his services. "(I) would be happy to volunteer for participation in such a measurement." Our counsel to the good Doctor Cohen is, "Don't do it." Who knows what hazards of high-level waste you will uncover next year? Better to eat your words than neptunium-237.

Harry Chapin: 1942-1981

Harry Chapin, folksinger and friend to millions, who put his body on the line for what he believed, raising over \$5 million for just causes, is dead at 39. Harry died in an auto accident on the Long Island Expressway July 16.

Harry appeared in many a concert in New York State. He was concerned about Love Canal and West Valley. His main focus was on world hunger. He intensively lobbied Congress to create the Presidential Commission on World Hunger. Pat Leahy, U.S. Senator from Vermont, described Chapin's commitment on the hunger issue by recalling a meeting with President Carter at which the

President agreed to create the commission. According to Leahy, "Harry would not stop. He continued to hammer the reasons for it into the President. Carter sat there trying to explain that he agreed; he agreed, but Harry wasn't going to let him off that easy. He wanted not only for him to agree, he wanted him to be committed. That's the difference between Harry Chapin and those who simply give lip service to a cause." (from Rolling Stone, Sept. 23).

Nine Senators and 30 Congressmen paid tribute to Harry Chapin on the floor of Congress. Millions of us do the same. Thanks, Harry.

The Kind of Talk That Inspires Confidence

"Spent fuel shipping casks will move only by exclusive-use trains, regardless of who said what and if the nuclear industry and government shippers don't go along with our wishes, their shipments will sit and rot in the freightyards."

Statement by an official of the Atchison, Topeka and Sante Fe Railway Company at the Nuclear Transportation Program Development Seminar, April 18 and 19, 1979, Albuquerque, New Mexico.

Our Favorite Quotes

Gordon: "When you are testing the NRC casks, are you testing the casks you have designed? I should hope not."

Jefferson: "We have not tested any casks which are licensable to date. We have tested only obsolete casks. We did that for the very simple reason that we are not interested in proving any licensed cask's capabilities or lack of capabilities."

Exchange of questions and answers (regarding irradiated fuel shipping casks) at the Nuclear Materials Transportation Program Development Seminar, April 18 and 19, 1979, Albuquerque, New Mexico between Emmanuel Gordon, Atomic Industrial Forum, and Robert Jefferson, Sandia Laboratories.

For a complete listing of information send for our Resource Sheet today.

Resources

Radioactive Waste Slide Show – Includes review of the nuclear cycle, problems of low level radiation, hazards of transportation and an in-depth portrait of West Valley. Excellent for community groups and teach-ins. Available with cassette or written script. \$55.00 purchase, \$15.00 one week rental.

Sierra Club Fact Sheets

New

Salt Will Not Work – A revised look at current concerns about the promotion of salt as the favored geologic method for a permanent repository for nuclear waste. Reviews the Lyons, Kansas site with a map of salt deposits in the U.S. 50¢; for 25 or more, 10¢ each plus postage.

West Valley: A Challenge for the 80's – Detailed history of the West Valley site, includes explanations of current storage problems and burial ground leakage with a map of the site. Current status of the dumpsite is updated. 50¢; for 25 or more, 10¢ each plus postage.

Also

Shipping Casks: Are They Safe? – An in-depth analysis of irradiated fuel shipping casks. Can they withstand highway accidents and fires? Useful for all communities and groups impacted by irradiated fuel transport. 50¢; 25 or more 10¢ each plus postage.

Uranium-Mining Chart – Describes uranium deposits in the NY, NJ and CT area plus directions to the mines and levels of radioactivity from AEC investigations. \$1



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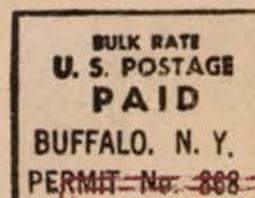
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