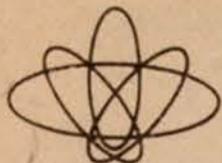


the Waste Paper



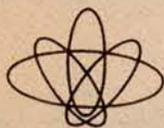
sierra club
radioactive waste
campaign

Fall 1980



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Arrogance of Oil

Round one in a New Jersey battle of the citizens versus the big oil company resulted in a resounding victory for the public and a defeat of Sohio, Standard Oil of Ohio. On September 3, 1980, 600 concerned citizens packed the high school auditorium of Jefferson Township in northwestern New Jersey. The extraordinary turn-out was to urge support for an ordinance prohibiting uranium mining in the township. The ordinance passed unanimously.

Only one person, Hugh Evans, President of Sohio Western Mining Company spoke against the ordinance. The Company executive noted that the giant oil company had spent over \$100,000 on exploratory drilling thus far, but probably would not challenge the constitutionality of the ban. Evans bemoaned the "emotional reaction" of "people who have had enough of Love Canals and Three Mile Islands." He admitted the reaction seemed to be a national phenomena.

Why should New Jersey suburbanites worry about uranium, the radioactive ore used to fuel nuclear power plants and to build bombs? Isn't the only uranium mining and milling conducted in the U.S. far, far away in New Mexico, Utah and Colorado? So far. But that was before the U.S. taxpayers financed a \$200 million aerial survey by USGS of uranium reserves throughout the country. The survey showed a rich deposit of uranium running in a southwesterly direction from Orange and Rockland Counties in New York, down through Passaic and Morris Counties in New Jersey (see map).

It's hard to believe the oil companies would consider mining and milling in New Jersey, the country's most densely populated state, but the arrogance of oil is great. For several years, Exxon and Sohio have been actively prospecting with exploratory drilling for uranium in rural New Jersey. Exxon has acquired mineral rights to 150 acres in West Milford, N.J. and Sohio rights to over 1000 acres in Jefferson. And just across the border in New York State, Exxon and Chevron have drilling rights in the tiny town of Warwick.

But it appears that the oil companies have made a major error. Not only have they targeted regions for exploratory drilling that are inhabited by upwardly mobile, articulate and feisty commuters, but also they have selected a region that is crucial to the reservoirs and water supply systems of two major cities in the Garden State — Newark and Jersey City. So while citizens in Morris, and Passaic Counties are mobilizing to pass local uranium mining bans such as the one just passed in Jefferson, the issue is promising to become a state-wide controversy as inner-city residents become aware of the threat of radioactively contaminated drinking water.

Newark, with a population of 350,000, gets its water supply from five reservoirs in the Pequannock River System. All of these reservoirs are within 10 miles of Exxon's exploration site near Upper Greenwood Lake. The Mayor of Newark, Kenneth A. Gibson, has already expressed his concern regarding possible contamination of the Newark water supply system in a letter to Jerry

English, Commissioner of the New Jersey Department of Environmental Protection. In the letter Gibson commented "Since tailings represent a threat to human and animal health and can seep into surrounding water supplies which contribute to Newark's water, I am concerned that disposal be safe and adequate."

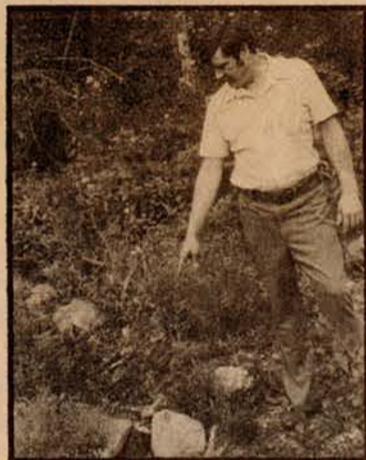
And Jersey City, with its population of 250,000, has a reservoir site on the Rockaway River which is being held for future development by the city. This reservoir site is within a few miles of the acreage leased by Sohio for exploratory drilling.

If water is an issue in New Jersey's metropolitan areas, it is an obsession in Jefferson Township where a substantial number of the township's 17,000 residents are already drinking bottled water. Although the Jefferson residents live in homes clustered around the many lakes that dot the region, clean water is a sore topic here. Because of contamination of one lake, over 1,000 houses have been buying bottled water for three years. Recently, the township persuaded the local water company to look for potable groundwater for these households. The prospect of Sohio's mining or milling made folks quickly think that the chance of getting groundwater would be permanently jeopardized.

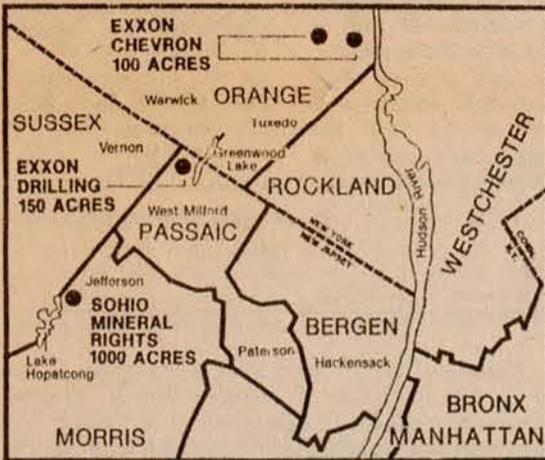
The residents' concern is legitimate. The record of uranium drilling, mining, and milling has not been reassuring. At every step of the process the threat of water contamination by the water-soluble radium, always present in the uranium ore, is very real. And, unfortunately, radium has a very long half-life (over 1600 years). As soon as the uranium is disturbed and the radium exposed and made accessible to water, the risk of migration of the carcinogenic material is radically increased.

The trouble can start with the drilling of an exploratory bore. A drill hole is typically 3" across, extending hundreds of feet into the ground. After exploratory drilling comes developmental drilling in which the oil company drills every 50 feet or so to define an ore body. With each type of drilling, the hole must be plugged with a material that will last thousands of years. Otherwise, water may reach the radium in the uranium bearing strata and then carry the radium to a previously uncontaminated underground aquifer or well.

Exploratory drilling may be where the trouble starts, but it is during the mining and milling (processing) of uranium that risk to public health is most severe. Mining causes the release of a radioactive gas radon-222. Because it is a gas, radon will move whichever direction the wind is



Ed Tanzosh points to Exxon exploratory drilling hole for uranium near West Milford, New Jersey.



From the Bergen County Record, June 29, 1980

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Nuclear Waste Bill OFF FAST TRACK

On October 4th Congress went into recess and legislators rushed to hit the campaign trail. Amidst all the pundits' analysis of the 96th session, a major victory for energy activists went unheralded. The McCormack Nuclear Waste bill did not make it to the House floor. The bill remained bottled up in the Rules Committee. However, the bill is NOT dead-it may be revived in the post November 4th lame duck congressional session. But HR 7418 definitely sustained grievous wounds and safe energy activists deserve the credit. Hurrah.

The McCormack bill, HR 7418 would put the selection and construction of a permanent repository for the country's growing stockpile of nuclear waste on a fast track. Two "demonstration" sites would be hastily selected before the end of 1981. And the process of site selection and repository design would be exempt from the provisions of NEPA (the National Environmental Policy Act), exempt from Nuclear Regulatory Licensing and summarily override local and state objections.

HR 7418 would impact seriously on New York. If the Department of Energy (DOE) so desired, the Finger Lakes in

central New York could be WITHIN ONE YEAR designated a repository site - and the heck with the Hoyt - Barclay bill which called for New York State legislature to expressly approve or disapprove any repository site. HR 7418 would be even more dangerous if an AFR an away - from - reactor - storage facility were added to the fast-track package. Then West Valley would be in jeopardy. This is a distinct possibility since AFR legislation has already passed the Senate and when HR 7418 or a version thereof got to Senate - House Conference Committee, an AFR provision would very likely be added, if not before on the House floor.

Over the summer, HR 7418 had been *peremptorily* pushed through the House Science and Technology Committee by "atomic Mike", chairman of a sub committee and the pro - nuclear representative from the State of Washington. (Mike's district includes the Hanford reservation and its 20 million gallons of liquid radioactive waste in southwest Washington). There was no mark-up of the bill in McCormack's subcommittee and it was not placed on the agenda of the full committee - so the nasty bill came to a vote with *no advance*

warning to committee members who might have objected to the legislation. Such is the way a democracy works in Washington D.C.

By early September the bill was on its way to the Rules Committee which gives all legislation heading for the floor a rule regarding the parliamentary procedure that will apply to the bill, the type of debate permitted or amendments that can be added. Washington energy lobbyists were filled with GLOOM. "Pray" commented one when asked what safe energy activists should do. Activists did not, to our knowledge, follow this advice.

Instead, a several pronged blitz of pressure was developed by the Sierra Club Radioactive Waste Campaign, the Sierra Club, Environmental Policy Center and Friends of the Earth. Repeated alerts from Washington begged and cajoled folks in the field to send in letters to targeted Congresspersons in the House leadership and on the Rules Committee. New York State House Speaker Stanley Fink sent letters to the Rules Committee members urging them not to let out the bill. Congressman Derrick of South Carolina and Cochran of Illinois (both of whose districts were potential AFR sites) lobbied

against AFR legislation. During this time, efforts by Congressman Lundine to stop an AFR in his district at West Valley were conspicuously absent.

In Washington, D.C. Drew Diehl, Dave Berick and Renee Parsons diligently buttonholed congressional aides decrying the McCormack bill and the merits of the Udall bill (HR 6390) which sets up an orderly step-by-step decision-making process for siting a repository with full NEPA and NRC licensing provisions.

The Sierra Club Radioactive Waste Campaign which has primarily focussed its efforts on local organizing and state legislation decided the situation was desperate. We would go to Washington! On one week's notice, 18 people agreed to make the ten hour (one way) trek to the Capitol. On September 15, seventy five offices were treated to a blitz of outraged and informed citizens saying no to an AFR and to the McCormack bill. And two weeks later, 30 people again made the trip. This time the activists hit 135 Congressional offices and a group of 12, including two members of the South Carolina legislature, met with an aide to Eizenstat at the White

— continued on page six —

Lundine Bill: Will The School Burn Down?

by Carol Mongerson

The first grade teacher leaves the room. She tells her class they are to play with the chemistry set, matches and propane torches. Aware that it may be a dangerous assignment, the teacher tells the first graders that they are responsible. No one will be watching them. They should be very careful not to burn the school down. In the case of solidification of the liquid high level wastes at West Valley, the "teacher" is the Nuclear Regulatory Commission, and the "first grade students" is the Department of Energy.

As Congress adjourns it is giving the Department of Energy the assignment of cleaning up the high level wastes at West Valley in a bill which requires no Nuclear Regulatory Commission licensing or regulation. We are not too hopeful for the success of either assignment. We hope the "students" don't burn down the school.

The Lundine bill which would provide authorization for the DOE to spend \$5 million on work preliminary to the removal and solidification of the high level liquid wastes at West Valley, has had a long and stormy history. In August, it finally emerged from the House Commerce Committee in a form that people in New York could live with.

Rep. Richard Ottinger had offered an amendment which gave the NRC the power to shut down the project any time it determined the public's health and safety to be at risk. Although Ottinger's amendment fell far short of the full NRC licensing citizens in the state thought was necessary, it seemed like the best we were going to get in terms of NRC oversight.

Whereas environmentalists thought the Ottinger provision had offered minimal but necessary oversight, Congressman McCormack and other ardent nuclear apologists went to town to kill the amendment. McCormack threatened to bottle up the Lundine bill and let it die,

rather than set what he saw as a precedent of involving NRC oversight of waste management matters. And with the prospect of McCormack, whose Congressional district in Washington State includes the Hanford reservation, killing the bill, Ottinger was put under unbelievable pressure to back off.

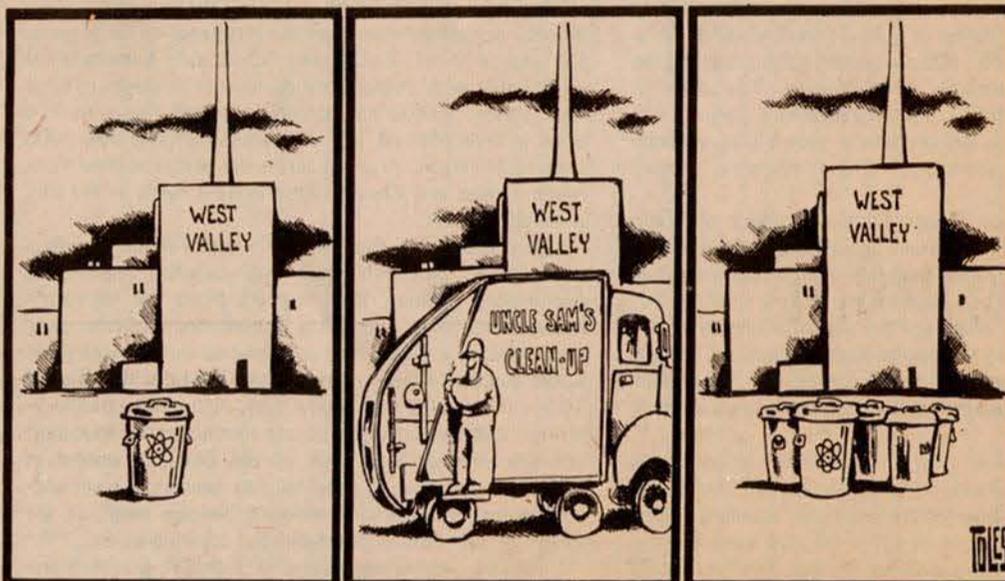
First, the Sierra Club Radioactive Waste Campaign was asked to intervene with Ottinger and request him to drop the provision. The Campaign refused and on

and Ottinger agreed to strike the offending amendment.

Last minute huddles on the legislation involving McCormack, Dingell, Wydler, Lundine and Ottinger also resulted in another significant compromise, allowing Getty Oil off the financial hook. Section 6 inserted by Congressman Dingell called for the Attorney General of the U.S. to conduct a study "to determine the identity of, and the legal responsibility" which "any person, may have for the

Getty Oil that currently has a lease on the site until December 31, 1980). Dingell stated he was going to try to get such a bill re-introduced next session, but this vague promise was no compensation to disappointed taxpayers.

So with two major strengthening amendments killed in last minute horse trading, the Lundine bill quickly passed both the House and Senate. Although newspapers consistently described the bill as calling for vitrification of the wastes, the



the contrary, sent a telegram to the Congressman asking him to stand firm. Governor Carey, Senator Moynihan, NYSERDA Chairman James Larocca, NYSERDA Board of Trustees members Joanna Underwood and Alan McGowan, and Congressman Lundine all put in personal appearances at the Ottinger office. During the Carey visit, a total of 8 gubernatorial aides and four reporters were waiting outside, to hear the word. The local Buffalo newspapers went to work on Ottinger as well. The high pressure worked

decontamination and decommissioning of the site." The provision allowed the Attorney General to recover costs from such person depending upon his responsibility.

This provision which met concerned citizens' worry that the federal legislation was allowing Getty Oil to walk away from the site without bearing a commensurate share of clean-up costs, was struck, it is rumored, because of NFS pressure to tie up the solidification project in litigation. (Nuclear Fuel Services is the subsidiary of

legislation very specifically stated solidification would be by "vitrification or by such other technology which the Secretary determines to be most effective for solidification." Thus, other solidification processes, more environmentally acceptable, are possible. The bill also allocated costs with 90% to be borne by the Federal taxpayer and 10% to be picked up by New York State taxpayers. The bill also specifies that

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Invisible Menace

by H.M. Bateman

What does it mean to have millions and millions of curies of radioactive materials at West Valley, or in a spent fuel shipping cask? In order to understand the magnitude of the threat we need to understand the basics of what is radiation.

Radiation - just the word alone scares people. Is the fear a gut association of radiation with a dreadful, awesome bomb that killed thousands at Hiroshima? Is it the thought of men, mysteriously clad in white, engaged in strange motions, manipulating material so dangerous that they must stand behind glass with their hands thrust into boxes? It cannot be seen, heard felt and yet it has enormous, complex, bewildering powers. Whatever the cause of the fear, we must penetrate through it.

Amory Lovins in *Non-Nuclear Futures* writes "The most important parts of the debate about nuclear power are not technical disputes, and are the legitimate province of every citizen, whether technically trained or not". To expand this "legitimate province" we will look briefly at the structure of matter, nuclear fission and radiation.

All matter is made up of atoms. Each atom includes a nucleus made up of protons and neutrons. The nucleus is surrounded by a cloud of light, fast moving electrons. Protons have a positive charge, electrons a negative charge and neutrons no charge. There are some nuclei that are unstable. These spontaneously emit energy in the form of neutrons and other particles. Although most nuclei are stable, nuclei can become unstable, if the nucleus is hit by a neutron. Only the neutron can break through the cloud of electrons and approach the dense nucleus with its positive charge. When the nucleus of Uranium 235 and a limited number of other heavy nuclides is hit by a neutron it divides or splits, sending off neutrons and radiation at very high speeds. The process is called nuclear fission - the dividing of the nucleus.

The nuclear division process generates a vast amount of heat that can be used to boil water as in a nuclear reactor or to produce enormously powerful explosions as in atomic weapons. The process also produces large amounts of radiation that comes in three forms. These forms are alpha and beta particles and electromagnetic waves. Alpha particles are not penetrating and can be stopped by a piece of paper. But the alphas are very heavy, weighing about 7,000 times as much as an electron, and carry two positive charges. Alpha particles are therefore very destructive when inside the body with access to tissue. Beta is not as heavy as alpha but is more penetrating. If sufficiently energetic, it can move through

skin Gamma is the most penetrating. It can only be stopped by lead. Like light, gamma is an electromagnetic wave but it is about 1 million times more energetic.

What makes these particles and rays so dangerous? The emissions of these particles are destructive to any cells that happen to be nearby. The particles shoot off at extremely high speeds -sometimes 600 miles per second. Gamma rays travel 186,000 miles per second. If the alpha-emitting radioactive material is inhaled and lodged in the lung tissue, the alpha may impact the surrounding tissue. This activity may directly kill or damage the cells of which the atoms are the basic building block.

The damage to the cell results when the cloud of electrons is impacted by a passing particle. One electron may be dislodged or dislocated. This interference with the electrons is called ionization. The atom that has lost more electrons is called an ion. It will have an electrical charge since the electron has a negative charge, its loss or gain will leave an atom positively or negatively charged. Hence we have the term ionizing radiation.

Ionization can have a mild or devastating effect, depending upon the type of atom affected, the extent of the damage and the extent to which the atom attempts to re-establish a balance. Here is the beginning of what can be a very long, perhaps 10 or 15 years, process, but a process that can be fatal. The atom missing an electron may form new chemical compounds as it re-arranges itself in a new configuration. Sometimes a cell affected by ionizing radiation may repair itself, sometimes the different cell may die and be ejected from the body, and sometimes the different cell may propagate uncontrollably. In several years or decades, this growth would be recognized as a cancer. The essential point is the ionization process may cause re-arrangements of molecules which may lead to cancer or, if the cells affected are chromosomes storing genetic information, genetic effects in newborns.

With the acceleration of nuclear energy and weaponry, there has been the creation of enormous amounts of radioactivity in our environment. The unit of measurement of the level of radioactivity of a substance is called a curie. One curie equals 37 billion disintegrations per second

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the Waste Paper

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Special thanks to Brent Scott for photographic work. Also much thanks and appreciation to Linda Pelino and University Press for their time and patience.

Cover Photo: Child at Greenwood Lake, New Jersey enjoys fishing. Will there be any fish after Uranium mining?



Shipping Cask Quiz

The nuclear industry has said that shipping casks, which carry irradiated spent fuel from nuclear reactors, are virtually indestructible and perfectly safe. They tell us that there is no need to pass shipping bans or permit systems, that there is no need for emergency training, no need for emergency equipment and no need for local communities to be pre-notified of an upcoming shipment. In fact, they tell us there is no need for anything but to trust their "experts". If you believe that, this test is intended to de-program you. A score of 8 wrong indicates you are brainwashed; a score of 8 correct indicates you know the facts.

1. Shipping casks must withstand a drop of how many feet onto an unyielding surface?
 - a. 40 inches
 - b. 30 feet
 - c. 40 feet
2. If a cask drops 30 feet onto an unyielding surface (no, you can't change your previous answer), how fast is it going at impact?
 - a. 30 mph
 - b. 40 mph
 - c. 55 mph
 - d. 80 mph
3. Casks must also withstand a fire of what duration, according to the regulations?
 - a. 15 min.
 - b. ½ hour
 - c. 1 hour
 - d. till white smoke exudes.
4. Shipping casks must be experimentally tested to determine whether they satisfy Federal regulations.
 - a. True
 - b. False
5. How much radioactivity does a truck spent fuel shipping cask contain (assuming one PWR spent fuel assembly, cooled 150 days)?
 - a. a miniscule amount
 - b. One Hiroshima bombs worth
 - c. Ten Hiroshima bombs worth
 - d. A Titan II missile's worth.
6. All communities must be notified by the utility when a spent fuel shipment is due to pass through.
 - a. True
 - b. False
7. All communities are trained and equipped by the Nuclear Regulatory Commission for nuclear shipping accidents.
 - a. True
 - b. False
8. If West Valley is re-opened to accept spent fuel, how many truck shipments per year could be passing through local communities en route to that facility?
 - a. 2,000 per year
 - b. one per day
 - c. one per week

— answers on page six —

Indian Point

Richard Brodsky is a Westchester County Legislator and delegate to the National Association of Counties. We reprint here an important "Dear Colleague" letter to members of the Westchester County Legislature on the subject of decommissioning Indian Point I reactor.

September 2, 1980

Dear Colleagues:

In the time since the Nuclear Regulatory Commission ordered the decommissioning of the Indian Point I reactor, it has become clear that serious questions about that process must be answered. It appears that Con Ed will be issuing a report on its proposals for the decommissioning. These proposals will have a significant public health and environmental impact, and a potentially serious economic impact. For these reasons I believe it important that the County immediately begin to inform itself on the consequences of this decision on our citizens.

The decommissioning of a formerly active reactor raises new issues, and in an important sense the people of Westchester will be guinea pigs as new policies are adopted. For example, there does not now seem to be an adequate technology for the disassembly of the highly radioactive

reactor core, and it is possible that Con Ed will propose we leave the reactor in place for at least thirty years. Serious doubts about the ability of any organization to maintain long-term security at such a site have been raised by the experiences with the Manhattan Project sites in New Mexico. The siting of Indian Point I on an active earthquake fault also seems to argue against leaving the danger as is for a long period of time. On the other hand, even if a technology of disassembly existed, which is not now the case, the cost could be astronomical. There is no site for the highly dangerous materials that need to be removed. Disassembly requires vastly increased transport of radioactive materials through Westchester, and a significantly increased exposure to radioactivity for those living near Indian Point or the routes of transport.

There are no simple answers to these questions. By its failure to address them in the past, the nuclear industry has mortgaged the health and the pocketbooks of future generations. To the extent that the concerned participation of the County Government can decrease the economic and health dangers, I believe we have no alternative but to do our best to insure the best possible resolution to the question. I look forward to an inquiry by the appropriate Committees.

Richard Brodsky

NEW!!!

This Issue: "The Lecture," a short story by Ruth Geller. See following page for the Waste Paper's first fiction piece.

Hot Off The Press

Order Now — "Shipping Casks: Are They Safe?" Individual copies are 50¢ More than 25 copies, 10¢ apiece and 50¢ postage.

League of Cities

In the Summer of 1980 *Waste Paper* published the strong statement by the National Association of Counties on the proposed DOT regulations. These regulations would pre-empt all local restrictions on nuclear waste transport. In July, 1980, the National League of Cities also took a stand against the DOT's intent to drastically limit local participation in route selection. Selections from the League's July 7 letter to the Department of Transportation by Alan Beals, Executive Director, are quoted below.

If your mayor and/or City Council has not yet taken a position on this important issue, you might want to bring the League position to their attention.

"...Under the proposed rules, local governments would have a very limited role in the identification and selection of specific routes along which materials can be shipped. The proposed rules appear to merely encourage local participation in the selection of "preferred highways" in those instances where an interstate highway is not suitable for radioactive materials shipments. However, local governments are more familiar with local highway conditions, travel patterns, and population densities than either state or federal governments, and this knowledge would be indispensable in the selection of appropriate routes. Hence, we strongly urge that the regulations explicitly require local governmental participation in the designation of specific routes over which large quantities of radioactive materials are shipped.

Further, the regulations do not provide any mechanism for appealing a burdensome or inappropriate routing decision. NLC strongly urges that in cases where unique local circumstances greatly limit a community's ability to comply with the regulations, local governments should be allowed to appeal a routing decision to the Department of Transportation which would then determine whether to waive the decision. If, for example a community could demonstrate that there are no suitable highways which could be designated as "preferred", then it should be allowed to apply for a waiver from the requirements....

The League is also concerned that the draft rules do not contain adequate notification requirements... exact information on the shipment routes, the time of shipment, and the amount and type of material being shipped which is provided prior to shipment would greatly facilitate the preparation of local emergency response plans and physical security arrangements. Therefore, NLC strongly urges that the regulations require prenotification of the chief law enforcement official of a community for all placarded shipments of radioactive materials....

Another issue of concern to the League relates to emergency preparedness and response procedures... the regulations make little mention of emergency response training of police, fire and rescue personnel. We submit that such training is essential to radioactive accident responses,

yet states and localities have few resources to undertake training efforts. Hence, NLC urges that federal funds be available for training and equipping of emergency personnel....

... The League is also concerned what the proposal regulations do not address the issue of liability at all. Often local governments are the first on the scene of an accident and as a result, have to bear initial cleanup costs, post accident monitoring costs and litigation costs. Some of these expenses can be reimbursed if the transporter, shipper or container manufacturer is held liable by the courts.

In many instances, however, carrier insurance is insufficient to cover cleanup and litigation costs, or liability for accidental discharge of materials is difficult to assign. In order to rectify this situation, NLC strongly recommends that the regulations set minimum insurance requirements for all placarded radioactive material shipments. Further, the Department of Transportation should examine the costs state and local governments have to bear for insurance, cleanup, monitoring and litigation, and should identify strategies to compensate for those costs".

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The Lecture

by Ruth Geller

It was last autumn that we went to the lecture on wood burning stoves. Our house has no insulation or cellar, and during cold winter nights the space heater barely keeps the pipes from bursting. Gladys had wanted a wood burning stove for some time; but I, mystified by its purchase, installation and care, was against the idea from the start. Then last autumn she read in the paper that the County Extension Association was sponsoring a lecture that she suggested would answer my questions and calm my fears.

I had to work late the night of the lecture, and thinking I would not have time for supper, stopped for a fast food hamburger which I ate on the way home. I work in the Customer Service Department of an automobile dealership where it is my function to intimidate people who come to me with legitimate complaints about their cars. I deal all day in lies, and Gladys occasionally remarks that I will soon develop an ulcer. She's probably right, and I appreciate her attempts to humor me when I come home from work feeling miserable and acting mean.

By the time I arrived home, the chewed and swallowed food seemed to have reassembled into a heavy lump at the base of my stomach, and I headed straight for the bathroom in search of the antacid tablets I'd forgotten that morning. Gladys was in the kitchen watering her plants, examining their leaves for red spider, mealy bug and scale, and testing the moisture content of their soil with her fingertips. She'd been laid off from her job for about a month, was receiving unemployment compensation, and was confident she'd be called back to work by winter.

"Forget your pills?" she called into the bathroom.

I stood at the sink, my hands bracing my weight against the white porcelain as I diligently chewed the chalky tablets.

"Rough day?" she called.

I walked into the kitchen, my tongue probing the corners of my mouth. "Do we really have to go to this lecture thing?"

She refilled the jar of water, and after she turned off the faucet she paused, one hand still on the faucet and the other holding the jar. She seemed to be staring at one of the raised numbers that divided the quart into ounces, or perhaps she was staring at the water itself.

"Hey. Wake up."

"What?"

"This alleged lecture on wood burning stoves, is it an absolute necessity that we go?"

"Yes," she answered, and recited: "If we have a bad winter I'm sure the pipes are going to burst, it's not even going to help to keep the taps running, and a wood burning stove is the cheapest additional heat source. At least I *think* it is, that's why I want to go to this lecture."

"Okay, okay, then let's get out of here before I start to relax and I *really* don't want to go."

"As soon as I'm done," she said, hovering over a plant and poking gently into the soil.

"Gladys, get the lead out, I busted my ass getting home. I'm sure your Santasserrio will survive until we get back."

"Sanseveria," she corrected, sounding like I'd mispronounced the name of her first born.

"Oh Lord, excuse me all to pieces," I said, but the truth was that I admired her knowledge of the natural world. Gladys was raised in the country and knows all about eating pig-weed and burdock, which berries are poisoned and which are sweet. I don't even know the *names* of plants and trees, let alone how they interact with their environment and other living things. I spent so many years in school and these were the things I learned: gerunds and logarithms and the history of the American Revolution. I spent so many years being

taught, and I didn't learn what's important at all.

The lecture was being given at one of those sprawling one story suburban high schools that arrogantly consume as much land as they possibly can with various wings, side buildings, lawns and athletic fields. Inside, the floors were carpeted. We walked to a large acoustically designed auditorium and sat down in upholstered seats that reclined. "Get a load of this," I remarked. "I wonder if we'll have a floor show with the lecture."

Within a few moments the lights dimmed, and a tall man with reddish hair walked to a podium on the stage and announced that there would be two lectures: he would speak on the maintenance of wood lots, and the second man, on the purchase and installation of wood burning stoves.

Gladys and I exchanged wry glances. The closest thing we have to a wood lot is the scraggly maple tree she planted three years ago in the tiny space that masquerades as our back yard.

The man began to speak, illustrating his points by Technicolored slides projected onto a screen. My eyes had become accustomed to the dark and I scanned the audience. From their expressions it seemed that many people owned wood lots: some nodded attentively, others took notes. I thought of the acres and acres of forest

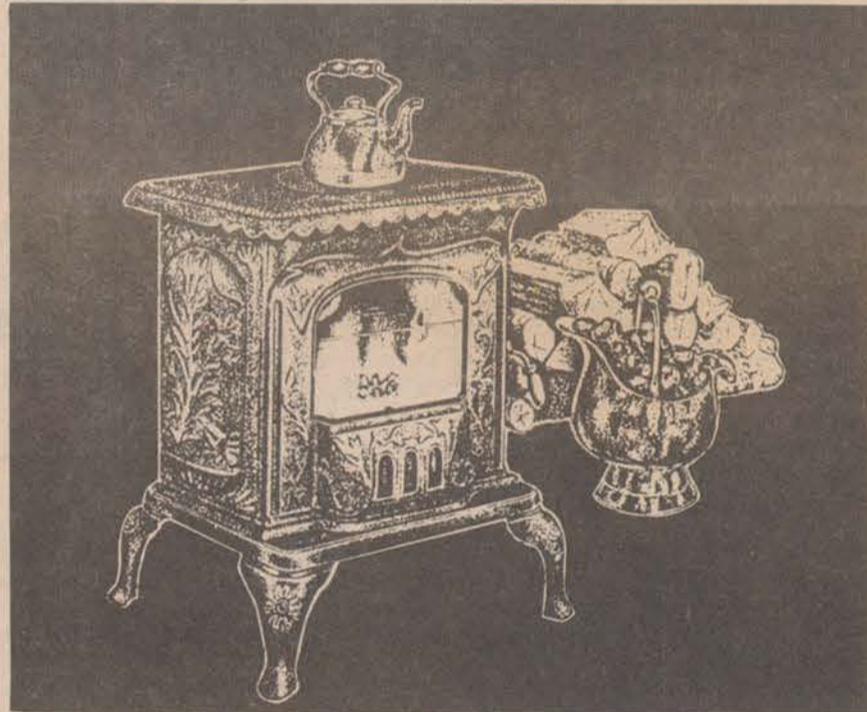
stared at its eyes. Again, the audience oohed and aahed. The lecturer said: "Now the owner of *this* wood lot provided a desirable area for fox, thereby providing him with a nice, though small, pelt business. You'd be surprised at the profit you make. A pelt like this can net you about eighty dollars." The oohs and aahs were this time more decided. "Proper wood lot management can provide you with some nice pocket money."

A man several seats to my right nodded as though he had never thought of this specific use of his wood lot and would change his plans accordingly.

I paid little attention to the rest of the lecture; I kept seeing that caged fox waiting to be skinned. Its pelt was probably by now sewn to the collar of a stylish coat, the "pocket money" for its life already spent on a fancy dinner or tickets to the theater.

I hardly noticed when the first lecturer finished and the second came to the podium. At first Gladys took notes, but soon began shaking her head repeatedly. I got the sense that a wood burning stove was beyond our means, and was resentful that the lecture had robbed me of the few hours in which I could relax before I had to get the sleep that would prepare me for a full day of lies at the Customer Service Department.

Finally Gladys closed her notebook.



that they owned, and how they would clear out some dead trees to fuel their wood burning stoves, leave others for animals to inhabit, and plant fruit and nut bearing trees for the animals to feed on, just as the lecturer suggested. Something inside me argued self-righteously: "See? Maybe capitalism has its good points: the State itself sponsors these lecturers to go around educating people to care for nature..."

But his words demolished my fantasy, for as I listened I understood that the purpose of supplying homes and food to forest animals was to lure them in as game. As an example, he projected onto the screen a photograph of a man proudly holding four or five birds, pheasant perhaps, or quail. The man held them by their talons so that they hung upside down, wings stiffly spread, feathers fanned. The audience oohed and aahed, and the lecturer pointed out that the man had gotten such a good day's hunting because he'd cleared an area of his wood lot and let the brush grow up, thus attracting these birds, for brush was where they liked to make nests and lay eggs.

I reached into my pocket for my antacid tablets.

The next photograph was of a fox confined in a small cage. The fox was looking straight into the camera, and I

"Well, that's the end of that," she said and looked at me, her eyebrows raised. "Wanna go?"

"Sure," I answered, and we walked back up the aisle and outside the building.

Halfway to the parking lot we stopped, and standing side by side under the cloudy sky, looked around at the countryside. Before us was a vast lawn, all cut and controlled.

"I've come to the conclusion that the human race was not only one big fat mistake," I said to her with a sour smile, "but the worst thing that could have happened to this poor planet." I looked up at the sky, speaking to God or the superior race of beings whose failed experiment we were. "You blew it, folks. Back to the drawing board."

Gladys nodded vaguely but her thoughts seemed elsewhere.

I began to wonder aloud how things got to such a sorry state: was it the nature of men to control and exploit, or was it capitalism that had caused people to feel so alienated from the world in which they lived... I stopped, for I saw she wasn't listening. It had begun to drizzle, a fine mist that fell refreshingly on our heads and shoulders. Gladys sighed and I thought the sigh meant she considered my intellectual debate to have little point, but I was wrong. She murmured something I didn't

quite hear, and I asked, "What did you say?"

"I wonder if this is acid rain," she repeated. "I read it's already destroyed half the lakes in the Adirondacks. We're only a couple hundred miles west of the Adirondacks, and I was wondering if *this* was acid rain."

I didn't know, and said nothing.

"When I was a kid and it rained, sometimes I'd stretch my head back and open my mouth and let the rain fall on my tongue. I'd never do that now."

The question of purchasing a wood burning stove seemed quite irrelevant. I started to shiver and we walked back to the car.

That night I dreamed that the city was crumbling, populated by humanoid beasts that embodied the spirit of destruction because they had no instinct for survival. Their weapons of war and tools of life had poisoned the city; and one day at dawn we left in search of a new home. For days we walked, our throats parched, before reaching our destination, a forest in whose midst we found clear shimmering ponds. I was filled with delight at having come to this place, but as I bent down I saw that we could not escape the city: the water had turned to acid, and to quench my thirst would mean my death.

I opened my eyes and lay waiting until it was time to rise, whereupon I boiled water for instant coffee while I brushed my teeth and washed, drank the coffee as I dressed, and left the house to go to work; for after all, nightmares change nothing in the routine of our days. But throughout that routine day I could not banish the image of myself kneeling to drink the clear, deadly water.

It was a mild winter and it was unnecessary to let the faucets drip. The snow melted within days of falling, and the snowless city landscape was bleak. Gladys did not get called back to her job and didn't think she ever would since she had five years seniority and the company had laid-off up to seven. Over the winter I came to the conclusion that I had to find a new job, but with Gladys' unemployment insurance benefits due to run out in the late spring we opted for security and I stayed at the Customer Service Department, continuing to lie to people who were probably very much like me.

In early spring there was a rally at the Nuclear Fuel Services Plant in West Valley, New York. N.F.S. was the nuclear waste reprocessing facility for such things as spent fuel rods from nuclear power plants from the Northeastern region of the United States. (The reprocessed plutonium, after being extracted from the fuel rods, was intended for use in nuclear weapons production.) The result of this reprocessing is six hundred thousand gallons of liquid waste presently buried at West Valley, including strontium and plutonium, radioactive waste material that will be toxic for thousands of years but is stored in a carbon steel tank that has an expected lifetime of forty years.

Besides the liquid waste, there are two burial grounds for solid waste, trenches in which is stored both high-level material such as a ruptured fuel assembly, and low-level material such as carcasses of radioactive laboratory animals. Waste from both burial grounds has leaked into the ground water in 1976 and 1979; and radioactive tritium has been found in Frank's Creek, which eventually empties out into Lake Erie, the water supply for eleven million people including me, Gladys, and just about everyone we know.

The rally was to demand that the liquid waste be solidified, and the burial grounds for solid waste be exhumed, decontaminated and permanently closed in an above-ground concrete bunker that could be monitored and would be safe

Book Review

by Warren Liebold

Review of *A Scoping Study of Spent Fuel Cask Transportation Accidents* by W.P. Rhyne, et al, NUREG/CR-0811, June, 1979.

... "the point is that rigid standards and exhaustive testing programs have virtually insured that even if an accident occurred, there would be no threat to the health and safety of the public" — Matthew Cordaro of the Long Island Lighting Company, August, 1978

... "Unless the laws of physics have been repealed, the shipment of spent fuel in these containers, even if a traffic accident should occur, pose no conceivable hazard to the public" — N. Peter Rathvan Jr., General Counsel of Brookhaven National Labs, July, 1980

These statements are typical of utility representatives' claims to the public regarding the all-encompassing research and elaborate tests that, supposedly, assure the safety of spent fuel casks. These claims are belied, however, by a recent Nuclear Regulatory Commission study, "A Scoping Study of Spent Fuel Cask Transportation Accidents" NUREG/CR-0811. This study of already completed research into spent fuel cask safety concludes that our knowledge of the technical issues surrounding transport accidents is alarmingly limited. It turns out that while the laws of physics are secure, the testing of casks has been far less "exhaustive" than is claimed. In many cases, the necessary research has not been carried out at all.

This 145-page report prepared by a team of scientists at Oak Ridge does not attempt to ascertain probabilities for accidents but, rather, consequences of possible accidents. It provides an excellent search of existing

literature to determine what we know and what still must be researched.

Knowledge about any technology is based on carefully-planned and executed experiments designed to provide detailed information about a technology's performance. In the case of studies of spent fuel casks and their behavior under normal operating or accident conditions the information needed includes: ability of cask materials to withstand impacts and heat and the effects of heat, impact and pressure on the irradiated zirconium-alloy (Zircaloy) fuel rods which contain the highly radioactive spent fuel pellets. Finally, we need to know how the radionuclides in the spent fuel will behave during heat-up and impact conditions of an accident. Will they vaporize or volatilize and therefore escape the cask more easily? Will only the gaseous wastes (i.e., krypton) be able to escape or will the more toxic but easy-to-volatilize substances like cesium, iodine and ruthenium be lost as well? What about the heavier, solid wastes like strontium, plutonium, etc.?

So how well are these and other phenomena understood? Not very well according to NUREG/CR-0811 which is peppered with the phrases "limited available data", "no data appear to exist" and the words "probably" and "apparently".

The report stresses the fact that in all cask tests cladding around the fuel was *unirradiated* stainless steel: "therefore the applicability of these tests is questionable." (page 9) all italics in quotes are the Waste Paper.

The report also states, "the observations of behavior of unirradiated stainless steel clad fuel assemblies in cask accidents are interesting, but they are certainly inconclusive in terms of evaluating the possible behavior of fully irradiated LWR (light water reactor) Zircaloy-clad fuel assemblies. The fact that the unirradiated, stainless-steel clad fuel rods showed no evidence of cladding failure in cask impact tests is not very comforting

in view of the large differences in strength and ductility between unirradiated stainless steel and irradiated Zircaloy cladding." (page 63)

The Oak Ridge scientists point out that it is very important to know how the cladding will perform during an accident. "The primary concern in an accident where there is a fire or loss of coolant is the release of radionuclides to the cask and subsequently to the environment. . . . Therefore, of primary importance is the ability to predict the behavior of the fuel rod cladding, especially in its integrity, and the behavior of the cask in an escalating temperature environment". Without any tests involving irradiated cladding which has a tendency to crack and rupture, these predictions cannot be accurately made.

Two other weaknesses in cask testing are highlighted by NUREG/CR-0811: The response of casks to a major impact and possible respirable airborne releases. In fact those tests conducted so far suggest that casks integrity could be breached by cracking at the welds. "Evaluation of the dynamic response of casks to severe impact environments, however, is minimal to date. While the large scale test programs that have already been conducted indicate that a gross failure of a cask is highly unlikely, it is possible to postulate failure modes that could lead to a breach of cask integrity, e.g. cracks emanating from an inadequately designed weld joint such as a corner weld where stress risers occur. In order to deal with this situation adequately, additional testing is required." (page 64) At an earlier page in the study, it is pointed out that in the oft quoted 30 foot drop test, "cracks appeared in the corner welds."

On page 65, the report further details the lack of information about "the amount and the particle size distribution of fuel dust that would be present in spent fuel rods or could be generated by the impact forces associated with an accident." Knowledge of what chemical and physical changes would occur in the spent fuel during an accident are particularly important. Without this information it is impossible to predict the probabilities of nuclides like cesium and iodine escaping from the cask and being inhaled by people in the vicinity. The NUREG report finds large gaps in information regarding what would be released from the fuel pellets and from the gaps between the pellets and zirconium cladding. During fuel manufacture, a space or gap is left between the pellets and the cladding to prevent the pellets, which get very hot during reactor operations from burning the cladding.

Waste activists should acquire NUREG-0811. It is a highly useful tool for deflating industry's exaggerated claims on cask safety. Don't be discouraged by the boring title, the technical language or the high price (\$11.00). The meat of the report can be understood by everybody. There is nothing quite so effective as using Oak Ridge scientists to counter utility spokespersons. Some consider it better than quoting the *Waste Paper*. Write the National Technical Information Service, Springfield, Virginia, 22161.

Warren Liebold is on the Executive Committee of the Atlantic Chapter of the Sierra Club. He is a frequent contributor to the *Waste Paper*.



—continued from page 2—

Invisible Menace ...

—with each disintegration representing the shooting off of either a particle or ray of the damaging sort described above. A curie is thus a measure of activity, the way ounces are a measure of weight. For radium, it takes one gram to get one curie, for other radioactive materials it is more or less, depending upon their rates of radioactive emissions or disintegrations.

Prior to the nuclear age, there were very few curies of any substance in the world. Now the astronomical count defies any comprehension. What, in fact, is the significance of 302,000,000 curies of Strontium 90, or 1,650,000 curies of Plutonium 239 that will be accumulated at West Valley if a 5000 metric ton spent fuel facility is constructed?

In trying to draw an image of the destructive potential of one curie of, for example, plutonium, it is important to remember that *one millionth* of a gram can cause cancer if inhaled. It is because Plutonium and other radioactive isotopes are hazardous in such tiny tiny amounts that permissible doses are specified in micro and milli and nano curies — or one/millionth and one/thousandth and one/billionth. Surely if a minuscule amount of these materials — the amount that can be balanced on a pinhead, are dangerous, it is very unwise to concentrate thousands of tons of the stuff in one place. Yet, that is the scheme being promoted by unwise men in Washington and utility board rooms around the country.

H.M. Bateman is active with C.A.N.C.E.R., the Coalition Against Nuclear Contamination and Economic Recklessness in Buffalo.



Thirty activists from New York, South Carolina and Illinois met in the beautiful hills of southern New York on August 2 & 3 to brain-storm strategies to oppose the siting of an AFR (away-from-reactor storage facility) at West Valley, N.Y., Barnwell, S.C. or Morris, Ill. (Clockwise from the left): A group meeting on the lawn; Mary Clauson and Janie Pyles prepared the terrific meals (thank you); co-host Ron Cook provided a marvelous house and barn in the heart of Amish country (again, thank you).

—continued from page 4—

The Lecture ...

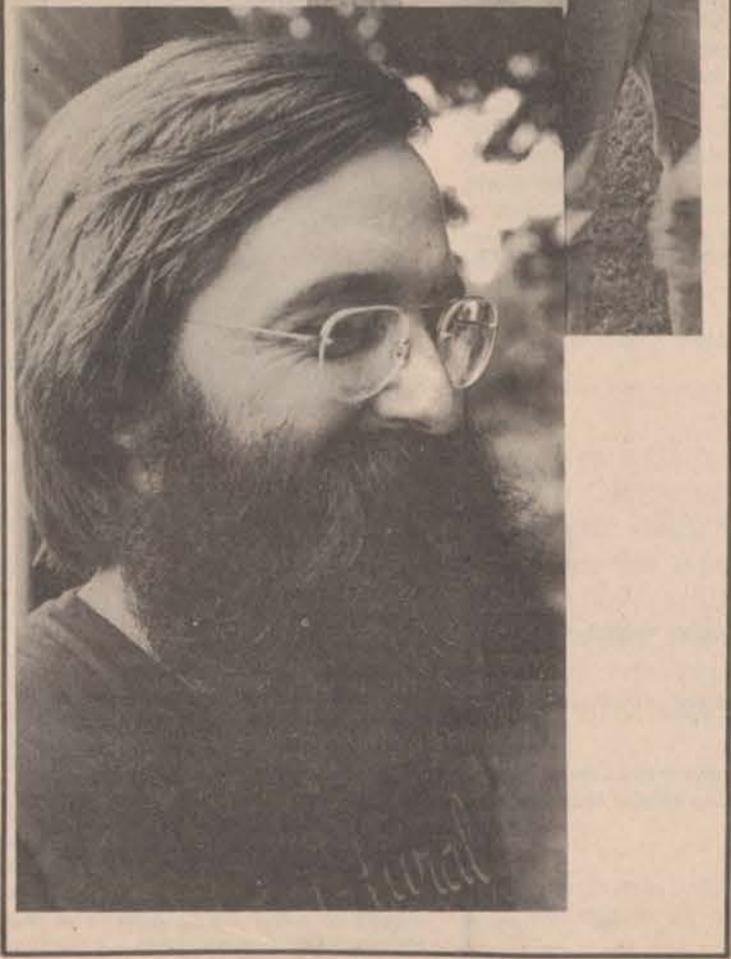
from ground water leakage.

Gladys had been talking about West Valley for some time, and I was trying my best to ignore her because I did not want to go to the rally. I'd had a hard week and wanted only to laze through the weekend in front of the television, substituting other people's lies for my own. More than that, I did not want to think about West Valley, for the possibility of such environmental desolation was too brutal for my mind to comprehend.

Gladys stood by the window, watering a plant. She paused, the glass jar in one hand while she inspected the underside of a leaf. The water and the glass reflected a ray of sunlight, bringing to mind the nightmare I'd had after the lecture last autumn. No matter how I tried to forget, I could not escape from what was happening and my cynical comments about the failed experiment of the human race gave me no comfort. Clearer than any convenient cynicism was the image of animals gathering at a poisoned pond, of myself kneeling to drink the water that is death.

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Ruth Geller is the author of *Seed of a Woman*. "The Lecture" is a story in her upcoming collection, *Pictures from the Past*.



-continued from page 3-

Quiz Answers ...

1. b. 30 feet, The casks must also withstand a drop of 40 inches onto a spike.
2. a. 30 mph, the Federal regulations only require therefore a crash of 30 mph into an unyielding surface such as a bridge abutment. The Sandia film, shown by your local utility, allegedly show collisions up to 80 mph, but, in fact, the casks themselves actually impact at less than 30 mph. Now ask yourself - do highway vehicles impact at greater than 30 mph? You bet your patuzies.
3. b. 1/2 hour, how long does it take a volunteer fire department to reach a fire?
4. b. False, tests may, and usually are done by computer simulation. The companies claim it is too expensive to test a new cask.
5. c. 10 Hiroshima bombs worth, Surprised?
6. b. False, no, the utilities keep this information secret.
7. b. False, a community can rope off an area, direct traffic and call the State Police. A geiger counter is necessary to detect radiation. Otherwise, pray a lot.
8. a. 2,000 per year, Most of these shipments will come along Route 17 and Interstate routes.

- continued from page one -

Arrogance of Oil ...

blowing. Radon's decay products, called the "daughters of radon" adhere to dust particles in the air. If inhaled, they can then lodge in a person's upper respiratory tract and lungs, irradiating the surrounding tissue. The damage to the tissue can result in a lung cancer 10 to 15 years later. Since the 1950's a clear association has been established between exposure to radon and increased incidences of lung cancer. Study after study has shown uranium miners with a cancer rate 3 to 5 times the expected rate.

Mining also involves a direct threat to a community's water supply. Water must be continuously pumped out of deep shaft mines so that miners can work without drowning. Mine dewatering rates can range from 200 to 3000 gallons of water removed per minute. This water, contaminated by radium, is dumped into creeks or onto the ground. The water will seep into the ground where it can move through cracks and fissures and mix with underground water systems and wells. The same process of contamination can occur with water pumped out of an open pit uranium mine.

It is not only during the mining and milling that radon gas and radium is a problem. After the milling, a large amount of radioactive waste in the form of mill tailings is left behind. This material is a result of the inefficiencies of the milling process. What happens is that the uranium ore is crushed to the consistency of a fine sand and then liquid is added to form a slurry and the uranium is chemically

leached out with strong acid. For every 100 lbs. of ore that is processed, only one lb. of uranium is extracted. The remaining 99 lbs. are waste. But these wastes, called mill tailings, still contain 85% of the radioactivity that was in the original ore.

In the past, these tailings have been piled on the ground, forming man-made radioactive mountains, some almost 100 feet high and over a mile long. These mountains are easily subject to wind and rain erosion. And these mountains will keep emitting radon and releasing radium when water gets to the pile, for centuries and centuries.

The current disposal practice is to store the sandy tailings and liquid portion of mill effluent on the mill site, above ground, using earthen dams to contain the materials. But the earthen dams are notoriously unstable. On July 16, 1979, a United Nuclear dam at Church Rock in Colorado broke less than two years after being licensed by the state. The resulting spill released over 100 million gallons of radioactive liquid into a local river used for drinking and watering livestock. *Waste Paper* readers will remember that United Nuclear was also the owner of the Plutonium factory in Brewster, New York where now a controversy rages regarding a nearby contaminated lake (see "Hiking the Plutonium Trail," *The Waste Paper*, Winter 1979-80).

Another problem with uranium production involves the sulphuric acid, used to leach out the uranium during milling. The acid may easily move into local waterways, chemically contaminating drinking water and lakes, and destroying trees and vegetation. Elliott Lake, Ontario, where uranium mining and milling has taken place for several years, is a virtual moonscape. There are acres of lakes with no fish, and sterile land with dead trees and no animals or humans. The land there is not brown and green, but grey. Entire thriving communities were uprooted as the mining proceeded. This damage was caused by the acid.

All of these problems are serious in the relatively dry Southwest where most of the country's uranium mining is conducted. Clearly in New Jersey with a much higher annual rainfall and severe winters, the possibility of substantial migration of radium is far worse. Sohio, aware of the problems associated with mill tailings piles, originally told New Jersey residents that the company would truck or ship all of the mined ore 3000 miles away to Texas where the milling would be performed. However, when confronted with the unlikely economics of an oil company paying to ship all that waste across the country, Sohio modified its position and stated that milling would be, in fact, conducted locally, but near an impermeable clay strata.

People in northern New Jersey within a few short months became informed about the hazards of uranium

mining and started to work to assure that uranium stayed in the ground where it is isolated from contact with the human environment.

A just-formed group in Jefferson, called SUN - Stop Uranium Now - gets the credit for getting the town ban passed. The group received a lot of help from the Safe Energy Alliance which helped set up educational forums and slide presentations over the summer. People in West Milford are busy too. A fledging organization called PUMA - Prevent Uranium Mining Alliance - has already gotten a 90 day moratorium on uranium exploration of any kind and is working on a ban. And a group of citizens in Warwick, N.Y. are rapidly mobilizing to alert their neighbors to some of the health hazards associated with mining.

All of these groups are using as a model a ban that was passed in the state of Vermont in April, 1980. The Vermont Law specifies that approval for mining will only be granted if the General Assembly of the Legislature determines that the extraction, mining or milling of uranium "will promote the general welfare". The Vermont ban had been hotly debated throughout that state for 1 1/2 years after environmental groups discovered that a German company, Uran Gesellschaft, had leased 1500 acres in Jamaica, Vt. for exploratory drilling. In Vermont, the ban was initially opposed by Governor Richard Snelling as an example of "know-nothingism". But after 36 towns passed local bans, the Governor could not resist the popular pressure and agreed to sign the bill.

In New Jersey, citizens are well aware that local town bans will not be sufficient to prevent uranium development and are moving towards a state ban. Public officials, medical societies and health organizations are becoming involved in the issue. The Mayor of Jefferson, Horace Chamberlin, has sent a letter to seventy other communities asking them to oppose uranium mining. The Morris County Medical Society and the Morris County Public Health Association have also gone on record against the oil companies' plans. As we go to press, Senator John Dorsey has just introduced a bill into the legislature that will be a ban on uranium mining.

Persons interested in becoming involved in the uranium mining issue in New Jersey and New York should contact: Gary and Mary Gittleson, Rural Rte 3, Box 494, Hewitt, New Jersey (West Milford Site). SEA Alliance, Box 271, New Vernon, New Jersey 07970; Bill Rogge, 914-986-7683 (Warwick site). *Late breaking item:* As we go to press, West Milford has just passed a ban on uranium mining!

Linda Sachs works for the Association of New Jersey Environmental Commissions. She is active with Sea Alliance. Thanks for research and reporting on this article.

- continued from page two -

Lundine Bill ...

public hearings must be held within the vicinity of the site before September 30, 1981 on the proposed actions.

There will be yearly appropriations for the solidification project but how citizens will obtain information about the activities of DOE systematically and on a regular basis during the ten-year project or make known their objections to proposed actions is unclear at this time. One public hearing for a ten year project is clearly not enough. And we remain with the unpleasant feeling, that to give the Department of Energy the power to regulate itself is as irresponsible as it was to give the Atomic Energy

Commission the power to regulate itself. This power given to the AEC in the 40's was taken away in 1974 when the Nuclear Regulatory Commission was set up to oversee the old AEC, renamed as Energy Research and Development Agency, and now called DOE. We think this regressive step of no oversight of DOE is asking for the first graders in the chemistry lab to burn down the school.

Carol Mongerson has been active on the West Valley issue for six years. She is one of the founders of the Coalition on West Valley Nuclear Wastes.



The fate of the contaminated reprocessing building at West Valley is not covered by the recently passed Lundine legislation.

Sierra Club Radioactive Waste Campaign
 Box 64, Station G
 Buffalo, New York 14213
 (716) 832-9100

Name

Address

City State Zip

Phone: Work () Home ()

.....

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.

Nuclear Waste ...

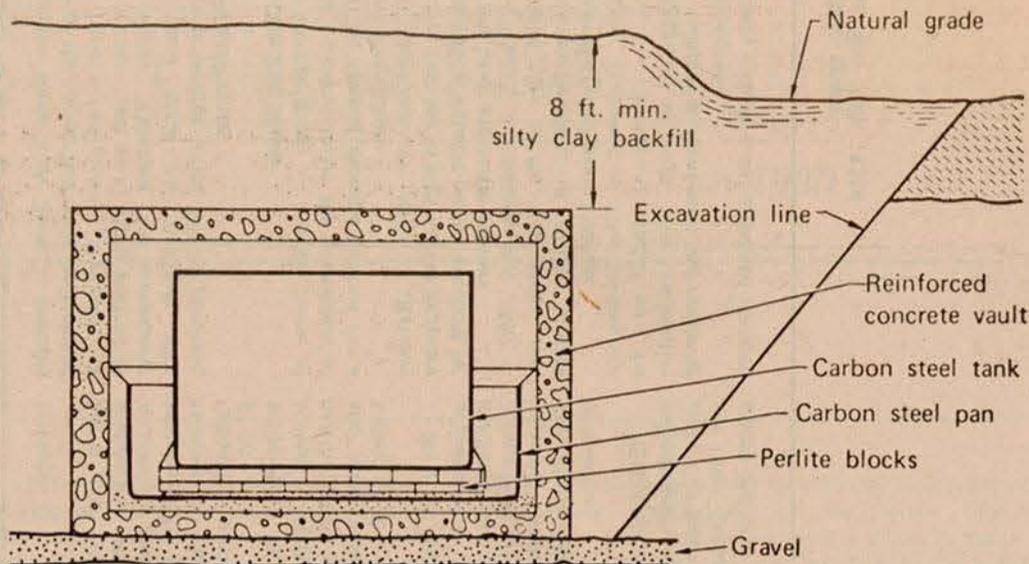
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House. In the two weeks between these trips, President Carter had called Rules Committee Chairman, Richard Bolling, from Air Force 1 and asked for nuclear waste legislation including AFR and the Department of Energy had sent some top staffers to lobby Congress. But, the tide had turned. The second group of 30 lobbyists found a Congress that now wanted to avoid the controversy of the McCormack bill.

Who knows what role the hardy New Yorkers who journeyed all the way to Washington played in the shift of opinion. We think it was very important. But so was the work of all the diligent letter writers and the Washington lobbyists. Everybody deserves high praise.

But, remember, keep those letters going to Washington. The McCormack bill may raise its ugly head again in the lame duck session. We cannot rest until the bill is as dead as the proverbial door nail.

The Cracked Vault: Barriers Into Sieves



For years citizens in Western New York have been told, "Don't worry about the high level waste tank at West Valley. It's safe. The multiple barrier system is at work. The 600,000 gallons of intensely toxic liquid cannot get into the environment. The tank won't leak *but if it does*, the liquid will be caught in the saucer. The saucer won't leak, *but if it does*, the liquid will be caught in the vault. The vault won't leak, *but if it does*, the silty till will prevent off-site migration of the materials for thousands of years..."

One by one these barriers have been turning into sieves. In December of 1978, the saucer barrier turned to a sieve when the Nuclear Regulatory Commission announced that the saucer had a defect or hole or crack through which liquid would leak. During a test of the condition of the saucer, water was injected into the pan. It leaked into the vault. On September 18, 1980, in a presentation before the NYSERDA Board of Trustees (NYSERDA is the State agency that owns the site), the Sierra Club revealed that the 1 1/2 foot concrete vault must also be cracked. If the tank leaked, the vault would be the principal barrier between 35 million curies of radioactivity and the public.

What if radioactive material leaked from the tank, and vault? Would the highly toxic liquid reach Buttermilk Creek? The last "barrier" is allegedly impermeable soil. But, the evidence to support the low permeability of the soil surrounding the vault is one, *yes*, just one boring in the vicinity of the tank. How the geologic

profile of several acres can be determined by one boring is one of the great mysteries of the nuclear industry. Our last barrier becomes a sieve.

Thus, the vault crack is an extremely serious matter and a matter that should have been made clear to policymakers in New York and Washington. The cracked vault information is buried in a report entitled, "Seismic Analysis of High Level Neutralized Liquid Waste Tanks at the Western New York State Nuclear Service Center, West, Valley, New York". The report was intended to show the effects of an earthquake on the neutralized high level waste tank. However, in order to calculate seismic effects, the study had to examine all the stresses on the tank and the vault. One such stress was due to the difference in temperature between the inside and the outside of the vault. The high level wastes are presently at a temperature of 180°F. The temperature outside the vault is 50°F. This 130°F difference is sufficient to cause the vault to crack. At times, the differential has been even greater. Between 1968 and 1972 Nuclear Fuel Services (NFS) operated a heat exchanger within the tank to boil off excess liquid because the evaporators in the reprocessing building did not operate properly. During that time, the temperature differential was as much as 162°F.

According to the NRC, this temperature difference has caused the vault to crack. As the commission states in engineering dialect, "Based on experience with similar reinforced concrete structures, we assumed

the stress relief (from the temperature difference) resulted from creep and formation of cracks in the concrete." In ordinary language, the temperature difference caused stress, and cracks formed to relieve that stress.

In 1980, the NRC still does not know if the cracks extend through the 1 1/2 feet of reinforced concrete or if they are only on the exterior of the vault. The only way to determine the extent of the cracking is to examine the interior of the vault with a TV camera to see if water is leaking into the vault. The NRC has requested permission from NFS to conduct this work, but, thus far, the company has resisted allowing the Commission to initiate the work. Apparently, NFS is concerned that they will be liable if cracks are found.

Most surprisingly the NRC did not take these cracks into account in analyzing the structural integrity of the concrete vault. This factor was omitted in estimating the seismic hazard at the site. Clearly a cracked vault is seriously weakened and will react differently and sustain more damage during an earthquake than a vault that is structurally sound.

The Waste Paper believes that the failure to incorporate the cracking factor into the seismic analysis invalidates the entire report and calls into question the scientific probity of Lawrence Livermore Laboratories who conducted the analysis.

The reliability of the seismic analysis is further undermined since cracks at the top and bottom of the vault were also not

taken into account in evaluating the earthquake hazard. These cracks were caused by the "flotation incident" of 1965 during construction of the vault. For some reason, over 30 feet of water got into the construction pit causing the massive tanks and vaults, each weighing over 2850 tons, to float 3 to 4 feet above the bottom of the pit. When the water was pumped out, the vaults settled at an angle. A large number of cracks emerged at the top and bottom of the vault. In the roof alone, there were 40 radial cracks with one circular crack 17 feet in diameter. These cracks were patched with cement. The NRC analysis failed to take into account these cracks and assumed an undamaged vault.

Both set of cracks - the thermally induced cracks and the flotation incident ones - seriously impact on the issue of the condition in which the site will be left by the corporate owner. The thermal cracks are due directly to the poor design of the high level waste tank - vault system. If the vault had been properly ventilated and cooled, the stressful temperature differential could have been eliminated and the cracking avoided. From the Waste Campaign perspective, both set of cracks indicate that the vaults are not being left in *good condition* by Getty Oil, the parent company of NFS. The Campaign is pressing the NYSERDA Trustees to more vigorously pursue the multi-national oil company for the increased costs these problems engender. ☸

Vitro: Here Today, Gone Tomorrow

In Canonsburg, Pa., 23 miles southwest of Pittsburgh, there are 60,000 to 200,000 tons of radioactive waste left over from the Manhattan Project and an early radium factory. During the 1960's, the hazardous material was dumped into a lagoon, yes, a lagoon, immediately adjacent to a small creek. Now, twenty years later, radiation levels at the filled-in lagoon and at old buildings on the site are unacceptably high. In addition, the Department of Energy has recently designated 25 homes in the area as "hot" (see



The Town Park in Canonsburg is contaminated with radioactive sand that was trucked in from the old Vitro plant. Sand in this area will either be removed or covered over with "clean" material. Note monitor.

Waste Paper, Late Summer, 1980) and soon expect to classify a town park as in need of decontamination (see photo).

The lagoon, the homes plus the park's sandbox play area (see photo) and sand and gravel materials near a picnic shelter are all contaminated. The contamination comes from radioactive soil and sand that was taken from the old uranium processing plant, run by Vitro Corporation. The Department of Energy estimates that it may cost the federal taxpayer \$20 million to clean up the Canonsburg site.

Several thousand miles West in Salt Lake City, Utah, another gift from the Vitro Corporation is a health hazard to residents of that city. An enormous uranium mill tailings pile sits in the middle of a residential area in the Mormon city. Here, between 1951 and 1964, Vitro processed uranium ores, realizing \$103 million in income, during the 13 years of operation. Now wind and water are eroding the pile, subjecting citizens to the hazards of radioactive dust. Local businesses have taken a shellacking. The City recently banned new construction within 1 mile of the site, leaving acreage that would normally sell at \$300,000 per acre, worthless. According to *Science* magazine, Oct. 1978, it may cost \$550,000 to \$30 million to clean-up the pile and prevent further off-site migration of hazardous materials.

It could cost federal taxpayers \$50 million to clean up these two sites. Meanwhile, the company responsible for the mess has long ceased to exist as an independent entity. Vitro Manufacturing Corporation originally organized in 1909, conveniently disappeared in December, 1968, when it was bought for \$50 million (ironically the same figure as the estimated clean-up costs) by Automation Industries.

In 1978, when the *Pittsburgh Press* first reported on the problems of the 18-acre Canonsburg site, the newspaper stated the company had received a special

exemption from the Atomic Energy Commission to dump the material in the lagoon because Vitro was an important defense contractor with friends in high places.

The Waste Paper has not yet discovered who those friends in high places were, but the company definitely was rich in defense contracts during the time corporate executives were seeking permission to dump thousands of tons of hazardous radioactive material into a lagoon. Between 1963 and 1968, Vitro was favored with \$178.9 million in contracts for the Polaris missile, other ballistic missiles, for maintenance and operation of the Elgin Air Force base and for various NASA and Navy contracts. At the time the company was looking for an inexpensive way to dump radioactive materials at the Canonsburg site, Vitro's profit picture was handsome. In 1965, the company had a total income of \$68 million with a net income of \$1.7 million and in 1966, things looked even better with a total income of \$40 million and a net income of over \$2 million. If during those same years, just a few hundred thousand had been allocated to store the radioactive wastes properly, taxpayers would not now be faced with paying millions for the clean-up.

At one dump site after another, citizens are being asked to bear not only the health impacts, but the financial burden of the clean-up as well. When will the corporations be fairly assessed for the toxic by-products of their profits?

The Waste Paper would welcome any information regarding persons who played a key role in Vitro during the late sixties or those friends in high places, cited by the *Pittsburgh Press*, who helped smooth the way for the lagoon dumping. A reward of one "You Can't Run From Radioactive Waste", T-shirt will go to persons providing us with clues about those Vitro friends.

Thanks to Tony Petrillo for researching this article.

Late-Breaking News from Canonsburg

The clean-up of the contaminated site at Canonsburg is about to begin. Or is it? (see *Vitro: Here Today, Gone Tomorrow*, page 7). The Federal Department of Energy, Albuquerque office, has just announced that the "clean-up" may involve moving the wastes to no more than one mile away! The wastes are located in a valley in Canonsburg, PA; DOE would move the wastes to the top of the surrounding hills (Oct. 9, *Pittsburg Press*). Radon, a heavy radioactive gas emitted from the uranium wastes, tends to settle in low lying areas and basements. This "solution" would not appear to protect the health of valley residents.

Meanwhile, the Pennsylvania Department of Environmental Resources has announced the formation of a task force "to keep local officials and interested citizens aware of remedial activities." The nine member task force consists of two local activists and local, state and federal officials.

According to Thomas Gerusky, Chief of DER's Bureau of Radiation Protection, the panel "will provide a forum of discussion

for planned remedial actions, not only at the former processing site, but also at contaminated vicinity properties" (*Pittsburg Press*, Sept. 7). The number of off-site contaminated properties may range up to 125. DOE is presently investigating the Canonsburg area for additional contaminated sites. The "clean-up" will not begin until late 1981.

On another front, a pilot health study of the Canonsburg area by a University of Pittsburg researcher, Dr. Evelyn Talbot, has revealed lung cancer incidences among older men five times higher than a control area. Radon gas has led to an increased lung cancer rate among uranium miners. Radon gas is emitted from the wastes at Canonsburg.

Editorial comment on recent Canonsburg developments by *The Waste Paper*:

We welcome the formation of a committee of local citizens and responsible local, state and Federal officials, and a study of the health hazards at the Canonsburg site. A similar committee formed in 1978 at Lewiston, NY was useful in providing local citizens

with important information concerning the Lewiston site where Manhattan project wastes are also located. However, the Lewiston committee began to bog down when it came to "solutions" of the waste problems. The committee meets, but is ineffective.

As is well-known to everyone, there is no safe repository in which to place these uranium wastes. There is a need for locating such a repository, but unfortunately, nuclear waste legislation which Congress is presently considering will not provide such a waste repository. Neither the McCormack bill HR.7418, the Udall bill HR.6390, nor the Senate bill S.2189, will accommodate uranium wastes from the de-commissioning of nuclear reactors. We urge our readers to write their US Senators and Representatives asking them to amend the above bills to include uranium wastes (Canonsburg, Middlesex and Lewiston) and reactor de-commissioning wastes (Indian Point-1 and others). Congress will be back in session November 12 for a "lame duck" session and will be considering nuclear waste legislation at that time.

Resources

Radioactive Waste Slide Show — Includes review of the nuclear fuel 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 one week rental.

Sierra Club Fact Sheets:

Salt Will Not Work, — a brief review of current concerns about the promotion of salt as the favored geologic method for a permanent repository.

On The Job At NFS — Reviews conditions that led to high worker exposure at West Valley, valuable graphs, excellent for organizing labor and health workers.

West Valley, A Challenge For 1980, — Detailed history of the West Valley site, includes explanations of current storage problems and burial ground leakage.

Nuclear Transport: Is Your Community Ready?, — Important facts on the transportation of high level radioactive waste, includes accident rates and review of NRC guidelines.

\$.10 each, include a self-addressed stamped

envelope.

Sierra Club White Paper No. 2, — Is Radioactive Waste Clean-up Technology Available? Analysis of the status of technology for cleaning up the West Valley radioactive waste dump. Applicable to radioactive waste problems in other states. \$1.00

White Paper No. 3, Health Hazards at West Valley, — Important information on the health hazards of the high level liquid waste and solid waste burial grounds at West Valley. \$1.00

We have back copies of *Waste Papers* available which contain important articles on irradiated fuel accidents, Manhattan Project dumps in New Jersey and Pennsylvania, and an analysis of the condition of the reactor at TMI. Please contact us for a complete listing of resources.

NEW Shipping casks: Are they Safe? An indepth analysis of irradiated fuel shipping casks. Can they withstand highway accidents and fires? Useful for all communities and groups impacted by "hot" fuel transport. \$.50

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