

TOO HOT TO HANDLE

By Richard Severo



A night during the week of Christmas 1969. Yuletide cheer in the home of a worker employed in the nearby nuclear recycling plant at West Valley, N. Y. Suddenly, men appear at the door. They enter and take away the worker's boots, the living room rug, a bedsheet, a baby blanket and other household items. The confiscated property is rushed off, some of it to be decontaminated, the rest of it to be buried in the earth. The plant's safety precautions had slipped. The worker has been tracking dangerous radioactivity over the countryside and through his home.

"We are," said Gov. Nelson A. Rockefeller, "launching a unique operation here today which I regard with pride as a symbol of imagination and foresight. . . ." The day was June 13, 1963, the place was a sparsely settled area near the hamlet of West Valley, N.Y., and the speech showed Rockefeller at his decisive and optimistic best. He was officiating at the groundbreaking for the world's first commercial nuclear-waste plant—a \$32.5-million facility that would take the spent fuel of the atomic-power industry and reprocess it for renewed use. The plant, to be operated by a newly created private company, Nuclear Fuel Services, would sell its recycled fuel to civilian atomic-power plants around the country, and the operation, said Rockefeller, would "make a major contribution toward transforming the economy. . . of the entire state."

Today, 14 years later, the plant, re-

It was the pioneer commercial plant for recycling nuclear fuel—but it proved unsafe. An investigation of a technological failure and its awesome legacy.

duced from full-scale operation to a skeleton crew of 50, sits silently in the undulating landscape 30 miles southeast of Buffalo, a technological and economic disaster, and Rockefeller is a disappointed man. Looking back at the misadventure that may end up costing the taxpayers of New York half a billion dollars, or a billion dollars, or even more, depending on whom you talk to, he concedes: "Obviously, this is not the answer, and there's no question that we've got a new problem: what do you do with the stuff?" The "stuff" is the 600,000 gallons of highly radioactive liquid wastes that are today contained in a tank buried in the ground nearby, and the 2 million cubic feet of buried radioactive trash into and out of which water has leaked, spreading radioactivity into Cattaraugus Creek, which flows into Lake Erie, from which the city of Buffalo

obtains its drinking water.

It would be easy to blame the fiasco at West Valley on the impetuosity of a Governor proud of being "action-oriented," unwavering in his belief in the credo of technology—that society must take risks if it is to progress and accept losses if it is to learn. But the story that emerges from an extensive investigation of this nuclear enterprise by The New York Times Magazine is one in which the blame is shared by many, many others—by everybody and by nobody.

It is the story of technocrats who assured and reassured the public that nuclear recycling was safe and that a thoughtfully engineered fail-safe system would minimize the hazards of any accidents that might possibly occur—without making it clear that their assurances were based on extrapolations from premises rooted in probabilities

and anchored in uncertainty. It is the story of company officials who repeated such assurances even after scores of incidents—known only inside the company and to a few Government inspectors—had made it clear that leakage of radioactivity within the plant was reaching dangerous levels.

From former employees interviewed in the course of the investigation, and from the files of the Atomic Energy Commission, come accounts that give an insight into some of the things that went wrong:

□ A malfunctioning vent spewed radioactivity into a workers' lunchroom.

□ A worker with contaminated hair was advised to have a haircut without telling his barber about the "problem."

□ Radioactive tools were "borrowed" for use outside the plant; a laundry room was evacuated because of radioactivity; radioactive water went by mistake through regular drainage pipes.

□ Workers showed up drunk for the night shift; a security guard, in a complex containing radioactive waste, fired wildly at a fox.

Rumors of these and similar "incidents" to be detailed in this article filtered through the farm country in which the plant is set. But, because of the isolation of rural living, these rumors remained indefinite and unconfirmed, and A.E.C. officials who investigated the incidents notified the company and then apparently filed the reports away. What little knowledge there was in the West Valley area was remarkably slow to spread. Because the story is also one of working people who wanted jobs, public officials who wanted taxes and businessmen who wanted economic benefits—all of them wanting to believe that the plant was safe and that its potential was great.

Finally, it is the story of a dream

The New York Times

Published: April 10, 1977

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gone sour—the dream born in those days after World War II when Americans saw a City of Oz in their future, a place where the nation's energy needs would be met by the wizardry of atomic energy. And there was money to be made. The nuclear fuel is uranium. Nuclear fuel not totally used up the first time around could be reprocessed, recovering not only unused uranium but plutonium, which is created from uranium in the reactor process. (The Government already had been doing some reprocessing of the uranium it uses for making nuclear weapons). The extracted uranium and plutonium would be used as new fuel. Our supplies of uranium—our source of nuclear energy—would be stretched out.

The country now has 64 operable nuclear power plants, according to the Atomic Industrial Forum, plus 72 under construction, 19 on which limited work has been done, 64 ordered, and seven more suggested by letters of intent. By the year 2000, if present plans hold, there could be between 200 and 300 such facilities in operation. Now, however, there is no certainty of agreement on what to do with the perilous wastes they produce. And the expectation that the wastes can be reprocessed into new sources of atomic energy has been dealt a heavy blow at West Valley, heavier than government and industry have cared to admit. In the light of this magazine's investigation of what was to have been the pioneer project of a whole new commercial industry, the technology surrounding the reprocessing and storing of nuclear wastes stands exposed and awkward, much the way the Wizard of Oz did when the curtain was pulled aside to reveal not a real wizard but a fallible if well-intentioned man.

It all seemed promising enough in 1963. Nuclear Fuel Services, formed as a subsidiary of W. R. Grace's Davison Chemical Company, built its plant on a part of 3,331 acres of land leased from New York State; the land had been purchased from farmers under the right of eminent domain as part of Governor Rockefeller's plan to place the state in the vanguard of peaceful atomic development.

The contracts, it was true, seemed curious even then, since they shifted virtually all of the risk of a profit-making venture away from the company and onto the shoulders of the state's taxpayers. Section 26.01 of the lease said that, whatever happened, N.F.S. would not be required "to remove radioactive contamination from the leased premises." And section 3.04 of the waste-storage agreement, signed with the state's Atomic Research and Development Authority, spelled out the taxpayers' liability even further: "Upon any cancellation or termination of the leases . . . the Authority will assume full responsibility for perpetual operation, surveillance, maintenance,

replacement and insurance of the then high level [intensely radioactive] storage facilities." The contract said this was to protect the "health and safety of the public."

N.F.S. was required to set aside some money to be placed in escrow as a "reserve for perpetual care and management of nuclear wastes." The funeral-sounding "perpetual care" referred to the fact that some nuclear wastes remain dangerous for hundreds of thousands of years. The escrow account now holds less than \$4 million—a modest amount, in view of the estimated \$500-million to \$1-billion it would take to decommission the plant and clean up the mess.

Representative Richard L. Ottinger of Westchester County, a critic of nuclear reprocessing in general and of N.F.S. in particular, says the state "practically gave the bank away" in signing those contracts. Rockefeller

ing role in the peaceful use of the atom.

In 1969, Davison Chemical Company sold N.F.S. to Getty Oil. The plant had been a perennial money loser, but Getty, according to N.F.S. general manager William Oldham, saw the investment as "patient capital": Sooner or later, the nation's growing demand for energy, coupled with its dwindling oil supplies, would force Americans to turn more and more to nuclear energy. And that would mean more and more nuclear waste to process. Profits, they thought, were on the horizon.

As for the site itself, company representatives said it lent itself well to reprocessing, storage of radioactive liquid wastes and burial of radioactive trash (such as the uniforms of atomic workers, gloves, tools, cast-off hospital equipment, and excreta from rats and other laboratory animals used in radioactive tests). At a meeting

Stretching the Atom

Uranium is mined mostly in New Mexico, Colorado and Wyoming. It is removed in a milling process from a sandstone-like substance with the aid of sulphuric acid. The uranium concentrate, called "yellowcake," is converted into a gas called uranium hexafluoride. The gas is taken to an "enrichment" plant, transported by truck in cylinders. There, it becomes the U-235 isotope.

At this point, it is still a gas, and from the enrichment plant it is taken to a fabrication plant and converted into uranium dioxide, a dark gray, ceramic-like substance looking rather like lead. These ceramicized pellets are placed in a fuel rod. About 200 rods form a typical assembly, and each assembly weighs about half a ton. The assemblies are transported by truck to atomic power plants — reactors that produce nuclear energy for civilian needs.

The rods may remain in a reactor for up to three years, and, in the process, plutonium-239—a man-made substance—is created. At present, spent rods are placed in deep pools for storage. But if commercial reprocessing were viable, the plutonium and unused uranium discarded as waste in both the civilian and military programs could be extracted from the spent fuel rods and used as new fuel. It was hoped that such reprocessing would enable the nation's atomic power plants to save between 20 percent and 35 percent of the uranium used, thus stretching the supply.

says he wanted to provide jobs for a state that needed them, and the contracts "may have been the only way we could get the operator [N.F.S.] to come in."

The plant opened in 1966. In its six years of operation, it reprocessed about 625 metric tons of nuclear fuel. Some of it came from commercial atomic power plants in Michigan, Minnesota and Puerto Rico. But since initially there weren't enough civilian wastes to keep the plant going, a deal was worked out to take wastes processed by the Government-owned reactor in Hanford, Wash. More than 60 percent of all the wastes processed by N.F.S. during its lifetime came from there. Some of the recovered plutonium went back to Hanford, apparently for the manufacture of bombs and other military purposes—a detail that would have come as a surprise to those New Yorkers who took pride in what they saw as the state's pioneer-

with staff people from the Atomic Energy Commission on June 22, 1970, the company talked of "extremely favorable geological conditions in West Valley . . . such as seismicological conditions, available disposable formation and impermeable cap rocks. . . ."

Yet Government safety standards—and, with them, the costs of operation—kept rising; there were still no profits; and, early in 1972, N.F.S. stopped all reprocessing (although the burial operation continued). In the announcement, the profit factor was hardly mentioned: Ostensibly, the operation was stopped so the plant could be decontaminated (radioactivity had gotten into places where it wasn't supposed to be), modified and expanded.

Expansion, however, required state and Federal permits, and that was opposed both by the State Attorney General, Louis J. Lefkowitz, and the then Conservation Commissioner,

Ogden R. Reid. Lefkowitz filed papers with the Atomic Energy Commission in the fall of 1974 complaining of "an operation record which raises serious questions about risks to those who work there." Reid raised questions a year later about the radioactive wastes that had been dumped into Cattaraugus Creek, which is used for recreational boating and fishing. The permits were never granted, and the processing was never resumed. N.F.S. proved a failure, environmentally and economically, before it reached the ripe old age of six.

Yet little of this was reflected in the company's public posture. An N.F.S. booklet issued in May 1974 still spoke in optimistic terms. "Reprocessing," the booklet instructed the public, "goes on inside concrete cells and 'canyons,' which keep the material locked securely inside. Air locks, absolute filters, extensive monitoring equipment and automatic safety systems simply prevent dangerous consequences—even in the case of equipment failure or human error." This despite all the cases (unknown to the public) in which the radioactivity did not remain "securely locked" and filters were not "absolute."

In the spring of 1975, the burial of radioactive trash was also discontinued, and last September 22 the company issued a press release announcing its decision "to withdraw from the nuclear fuel reprocessing business." Because of changing regulatory requirements, it said, the company would have to spend \$600 million—almost 20 times the original cost—to make the plant viable. N.F.S. president Ralph W. Deuster said "the single most overpowering regulatory change was a drastic increase in the seismic criteria for the West Valley site which created doubt over whether or not the plant could ever be licensed for [expanded] commercial reprocessing operations."

An admission of seismicological error? How could geological conditions described by the company as "extremely favorable" in 1970 be cited as the principal adverse factor in 1976? Had there been some breakthrough in seismic knowledge during those six years?

The seismicological records were no secret. The fact is that between 1840 and 1967 there were 13 earthquakes, with epicenters within 100 miles of the N.F.S. plant, carrying intensities of 5 or higher on the Modified Mercalli scale. The Battelle Pacific Northwest Laboratory, under contract to the United States Government, conducted a study in 1976 and concluded that the West Valley site could have an earthquake with an intensity of nearly 8 once every 750 years or so. That may seem like a long time. But some of the nuclear wastes buried in West Valley will remain dangerous for hundreds of thousands of years. The Modified Mercalli scale is different from the more familiar Richter scale, but at a level of 7, furniture breaks, chimneys come down, plaster cracks,

tant to discuss so sensitive an issue. "I have practiced in this area for seven years," said Dr. Reza Ghaffari of Springville, "and my impression is that the number of congenital anomalies is high for the number of people who live around here. We have had lots of cancer, lots of hydrocephalics, lots of cleft palates. But this is just my impression based on what I know of the area. It is not possible to make any broader statements; the statistical information is simply not there."

But much information—of specific occurrences at West Valley—is there. The Times's investigation has turned up at least 400 such "incidents." Here are some of them:

□ The case of the improperly venting stack. It happened on June 11, 1968, and the radioactivity was spewed not only into the lunchroom but into the lobbies and the second and third floor windows and onto the front lawn.

A report in the A.E.C.'s files says that both alpha and beta radioactivity were found on lunch tables and vending machines, that about 80 percent of the people in the lunch room had "hand and foot activities of between 10,000 and 50,000 counts per minute as measured with the hand and foot counter," and that some plant personnel inhaled radioactive particles. The lunch room was "decontaminated the next day." Apparently there was no way to decontaminate the front lawn, so it was literally dug up, taken to a radioactive burial site and buried.

Why the stack vented improperly is not explained satisfactorily in any reports found by The Times. The night supervisor's log said only that the "7D-13 tank had just finished jetting. The wind had swung from the east to out of the south." And the company's constant air monitoring charts, A.E.C. inspectors complained, showed no indi-

cator of any "particulate emission" on the evening of June 11, 1968. Why? Government inspection records say that "Mr. Wenstrand [the plant's Health and Safety Manager] believes that there is a small 'pip' on the chart that coincides with the emission, but similar 'pips' have occurred before when there was no particulate emission, so N.F.S. personnel would not have been alerted to a possible ventilation stack problem, on the basis of [monitoring] charts." (Italics added.)

□ In August 1966, a driver left his acid truck unattended. The truck rolled down a little hill and crashed into the south wall of the utility room, causing yet another week's shutdown and badly frightening a company supervisor who was using the nearby men's room when the crash occurred. He ran out of the men's room, tugging at his trousers, apparently convinced that the boilers had exploded and that West Valley was having its own little Doomsday. General manager William Oldham (not the executive in the men's room) recalls the incident. "It never should have happened," he said. "That damned fool forgot to chock his wheels."

□ The case of the worker with contaminated hair who was told to have a haircut outside. The incident occurred in March, and it remains unclear if the company considered what effect the recommended haircut might have on the barber, his instruments and his other customers.

□ On at least two occasions, railroad workers who coupled cars to locomotives on N.F.S. grounds found that their gloves had become contaminated with radioactivity. N.F.S. personnel confiscated the gloves and paid the men around \$3 each so that they could buy new gloves. According to A.E.C. records, a brakeman asked plant personnel if the same contamination problem would persist in subsequent switching operations, "and N.F.S. personnel said, in effect, 'how should I know?'" □ On April 14, 1968, a worker's finger was pricked by a plutonium-contaminated needle. The needle went through his fingertip. Inspection records say "the wound was surgically laid open and the tissue excised." The records do not say where the man is now or what the state of his health may be. Odds are he is fine, given the latency period associated with radioactive exposure. But no known effort is being made to follow his medical history and relate it to his employment.

□ In July 1969, it was decided that a device called a dissolver had outlived its usefulness, and company officials decided to entomb it "within the silty till in the high activity burial area." The dissolver was placed into a burial cask. En route to its final resting place, "a limited amount of contaminated solution dripped from the burial cask onto the roadbed." Moving with dispatch, management ordered that the dissolver, cask, and flatbed trailer, along with large chunks of contami-

nated roadway, would all share a common grave in the silty till.

□ Another Government report for July 1966 notes that workers found a way to chemically remove the yellow paint from the toes of the workshoes that had been provided by the company. The company had painted the shoes yellow because it did not want the shoes removed from the plant and its employees tracking radioactivity all over Cattaraugus and Erie counties. According to the report, company officials found out about the practice of removing the paint but did nothing to prevent it, "and now most personnel freely wear the supplied clothing [shoes] to and from the N.F.S. facility."

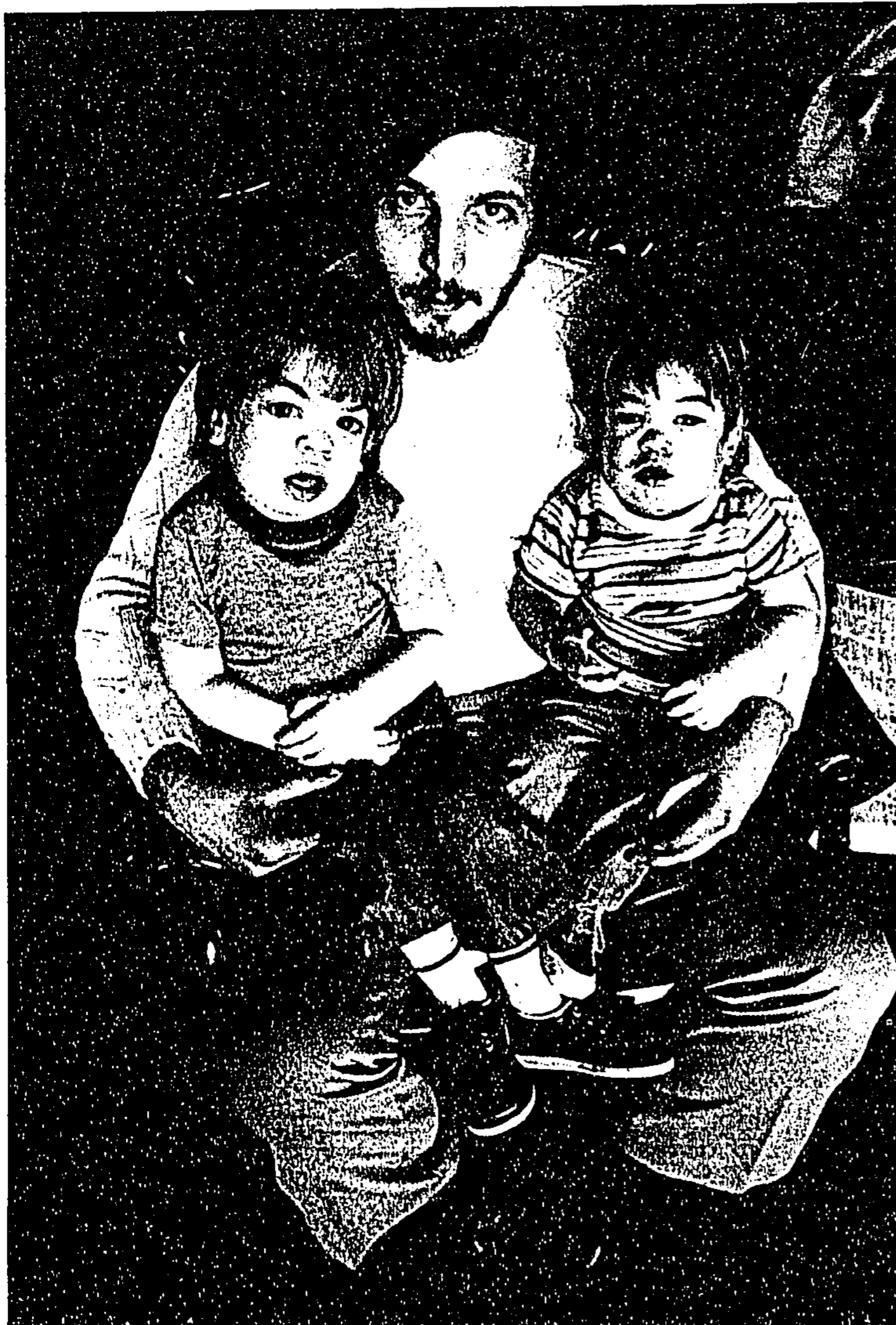
□ According to several former workers, some employees stole or "borrowed" highly radioactive tools from the plant and either sold them or used them in their own homes in the surrounding countryside. It remains unclear as to how they managed to get the tools past the plant's control system; where the tools are now; what, if any, radioactivity they now carry; and what effect this may have had on reports of an elevated rate in birth deformities in the area. No attempt is under way to find out. On at least one occasion, radioactive tools were sold at a local auction, and on another occasion a radioactive pump was sold at an auction in Pennsylvania. Where the stuff is now, nobody knows.

□ Early in 1967, according to Government inspectors, "a truck driver, who was unloading acid at the storage area east of the plant, lost his shoes and pants because they became contaminated and could not be decontaminated to off-site limits."

□ According to former employees, there were numerous leaks in the plant during the period of its operation. Many were not fixed. The dripping water was collected in plastic jugs. At least one jug had a sign on it that said "High Radiation." When it was filled up, the jug and its contents were supposed to be buried—like the roadbed, the dissolver, the flatbed truck and the front lawn—in the silty till. "We forgot about it once and the stuff ran all over the place," said one worker.

□ On several occasions, the wash water sump in the laundryroom backed up, with the result that the floor of the room became contaminated. On Jan. 8, 1967, a company executive wrote that "initial counts for the day sample indicated high alpha activity" in the laundryroom. "Laundryman was taken out of area and area posted as high airborne pending long-lived alpha count." Two days later, the executive wrote that the "floor in laundry reads greater than 200,000 small d.p.m. [disintegrations per minute] alpha direct."

On Feb. 9, 1967, employees Walt Zefers and Haafez Saadeck were ordered to evacuate the laundry area because of high airborne alpha radiation. In April of that year, Zefers quit N.F.S.



Gerald Brown and his dwarfed children. Was radiation at the nuclear plant to blame?

small slides occur, and large bells ring by themselves. In the case of West Valley, it means, at the very least, a transfer of risk to future generations.

□

An example of another kind of unforeseen problem may be found in the case of Gerald Brown.

Brown, who is now 22, was one of the more than 1,100 young people who worked for N.F.S. as temporaries under the "body bank" concept. Basically, that concept is that your body is a bank and that each time it receives an intake of occupational radioactivity, some of the "bank" is used up.

The young people had large "banks" to offer. Most had never worked in the nuclear industry before. The company needed them to do "hot jobs"—handling highly radioactive materials for short periods of time. It could not use its regular staff for this, since they had already received occupational radioactivity doses in their normal work. Upstate New York is a high-unemployment area, and the job offers delighted the young people. Some of them worked for only five minutes, were paid for the whole day, and were then let go.

Gerald Brown worked at these "hot jobs" from July 17 to Sept. 24, 1972. The radiation levels he received did not violate any Federal guidelines. But now he and his wife have had two sons suffering from Hurler's Syndrome—an incurable, terminal disease that is marked by dwarfism, retardation, failing eyesight and grotesque facial changes. The disease is rare and its causes are genetic: Both parents must have the recessive gene.

Neither Brown nor his wife, Susan, know of any cases of Hurler's Syndrome occurring before in their families. That doesn't prove anything: Medical researchers say the syndrome may not recur for generations, and the Browns may not know if an ancestor had it in the 18th or 19th centuries. But the question nags: Was the disease caused by a genetic mutation induced by radioactive exposure?

The company says there is no proof that Brown's work caused such a mutation, but Dr. Irwin Bross, director of biostatistics at the Roswell Park Memorial Institute in Buffalo, a cancer research facility, states: "The company can't say for sure whether this was caused by their genetic backgrounds or by radiation. Both are possible, and we can't be sure which. We can say, though, that the nuclear industry didn't understand what they were getting into and don't know how to get out of it."

Are there other illnesses that have been caused by the reprocessing operation at West Valley? Nobody can say for sure; there are no hard medical data. The company is not required by state or Federal law to do follow-up studies on its employees and has declined, thus far, to give Irwin Bross and others facts about radiation levels received by former workers.

Local medical authorities are reluc-

Now, at the age of 68, he suffers from Paget's disease, which a medical dictionary defines as "a generalized skeletal disease of older persons of unknown cause, leading to thickening and softening of bones, as in the skull, and bending of weightbearing bones." On April 19, 1972, some five years after he inhaled "high airborne alpha activity," Saadeck died of lung cancer.

Neither case can be attributed with any certainty to employment at N.F.S. In Saadeck's case, for example, his medical history shows that prior to working for N.F.S. he had been employed for at least 20 years in a forge and, before that, in a coal mine. He also smoked.

The company says it attempted to determine if radioactivity played a role in producing cancer in his lungs. However, the autopsy report on file in Buffalo's Millard Fillmore Hospital does not indicate that an alpha monitor was passed over Saadeck's lungs to determine if alpha activity was still present there. In any event, the lack of more thorough follow-up studies has made both cases the cause of speculation that may or may not be warranted.

□ On one occasion, because an improperly trained worker did not turn on a valve, highly radioactive water went through regular drainage pipes that were designed to be used only for nonradioactive water.

□ A truck driver made the mistake of walking through a puddle of uranium nitrate in a pair of expensive cowboy boots with fancy stitching. The boots, like the front lawn, the roadbed, the dissolver, the flatbed truck, the gloves, the pants and the jugs ended up in the silty till.

□ The case of the unexpected visit to the home of a plant worker during Christmas week, 1969. The N.F.S. representatives who made the visit confiscated one pair of boots, one pair of workshoes, one fitted sheet, one baby blanket, two small throw rugs, one mattress cover pad, one footrest cover, one living-room rug, a pair of pants and a pair of socks. Some of these things were decontaminated and returned to their owner, while others went to the silty till. N.F.S. issued check 22011 for \$26.70 for the boots and check 21939 for \$97.43 for the living-room rug. It remains unclear how long the baby blanket and other items contaminated by something the worker brought home from the plant had been in the home before the confiscation.

□ After a Christmas party, two workers showed up for the night shift drunk and slept through their shifts. Said one, "We were not in the best of shape to be around nuclear materials." At least one of the temporary workers admitted he got "stoned" on marijuana so that he could cope with his job. Another man who had a supervisory job had a reputation for coming in drunk with some frequency, even when it wasn't Christmas.

□ In May 1966, according to A.E.C. reports, the low-level waste evaporator



Nelson Rockefeller: 'You can't have a riskless society....'



Physicist Resnikoff: 'Numerous unresolved problems remain....'



Cancer expert Bross: 'The nuclear industry didn't understand....'

"experienced burping." A.E.C. inspectors said "the control system was found to be unsatisfactory."

□ According to a former worker, the plant at one point hired a security guard who was an older man and had retired from work elsewhere. He worked nights in the gatehouse. "He used to leave the door open on hot summer evenings," the employee recalled, "and one night he saw a fox run by. He drew his revolver, fired, missed the fox but shot a tire that was on a parked car." The incident created a disquieting feeling among workers that an untrained security guard might send bullets in almost any direction in a complex containing so much radioactive waste.

None of this means that the West Valley plant was designed or dominated by incompetents or that all of its shortcomings should be blamed on the engineers and physicists involved in the planning. It does suggest, however, that even the best planning and administration available could not cope with ordinary lapses in human judgment. The problem is what Dr. Bross calls the "failure in the interface between humans and hardware that engineers leave out of their calculations" when they produce statistical predictions and probabilities as to how a given plant is going to operate.

Dr. Marvin Resnikoff, a physicist and technical adviser to the Sierra Club, put it another way. "The position of the Sierra Club and mine personally is not unalterable opposition to nuclear power. . . . However, my conclusion is that the reprocessing industry is not yet mature, that numerous unresolved problems remain, not all of which are design problems, and that the requirements of the reprocessing industry are on the threshold of our technological and human ability."

Apparently, the threshold of governmental ability was also reached. William Oldham complains that N.F.S. tried for two years to get permission from the state to pump "some unanticipated water accumulations" that

had been detected in the trenches containing radioactive trash. The company knew that something had gone wrong and wanted to pump the trenches dry before radioactive waste oozed out of the ground. The letters in his files indicate long delays and lack of decisive action on the part of the Bureau of Radiological Health in the State Department of Health. Finally, in March 1975, with the trenches overflowing, a plant official called the state in exasperation and said: "This is an emergency: we have to pump!"

The waste water was pumped into a treatment system, but—shades of Catch-22—they still didn't know what to do with it, and so it was discharged after treatment into Cattaraugus Creek. Oldham says the radioactive water was diluted by a factor of 2,000, and he feels that the toxicity of the stuff finally dumped into the creek was "negligible."

□

What, then, is the legacy of the mistake at West Valley?

Dr. Ernest Sternglass, professor of radiology at the University of Pittsburgh Medical School, says he calculates on the basis of Federal statistics that the infant mortality rate in Cattaraugus County rose 54 percent in the year after Nuclear Fuel Services began reprocessing nuclear wastes. Dr. Sternglass believes this was caused by small amounts of radiation contaminating water and milk. According to an environmental report prepared by N.F.S., most of the milk produced within a 25-mile radius of the plant was shipped to the New York City area.

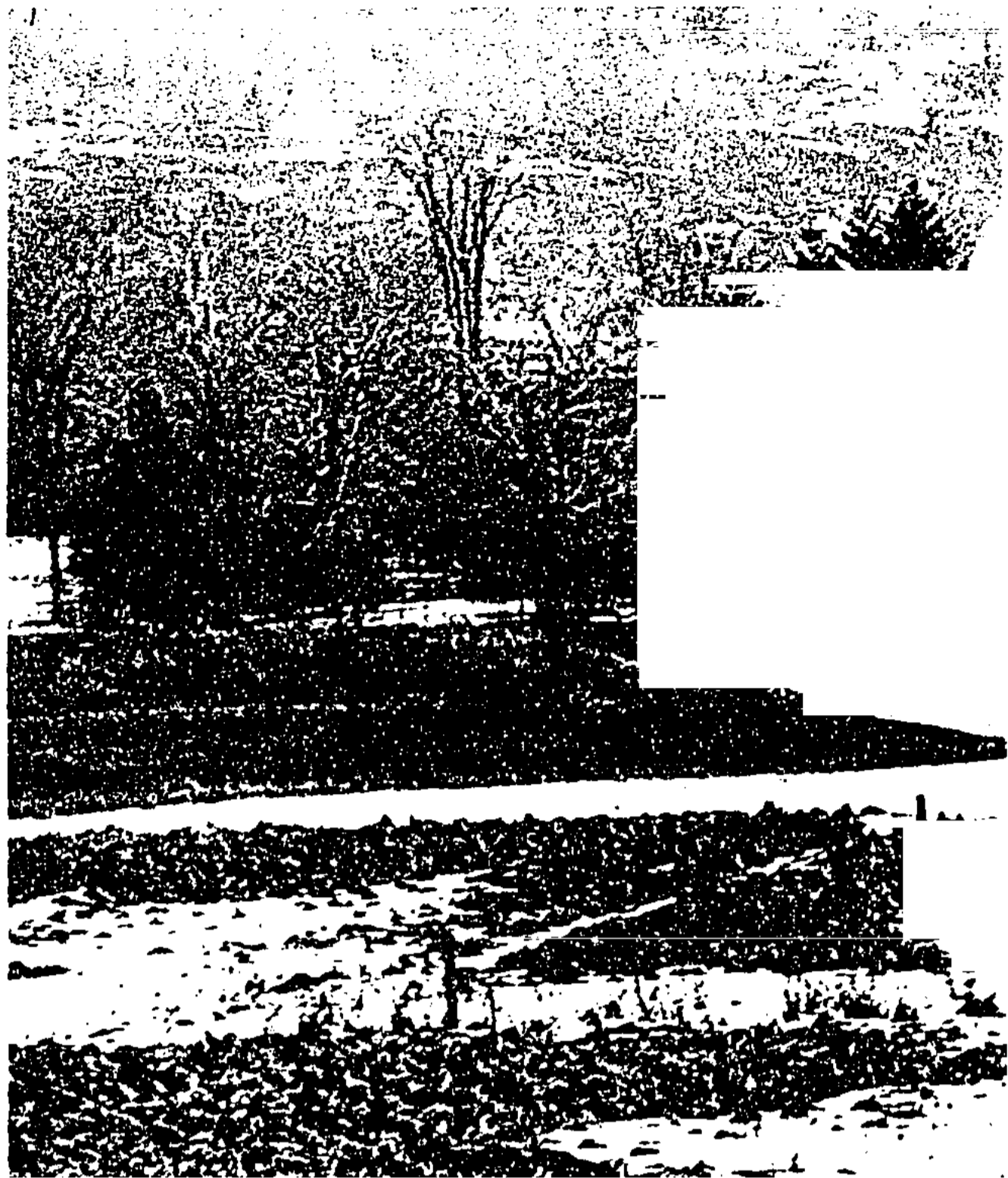
William Oldham, who feels that much of the criticism of his plant is unsubstantiated, was asked to recommend a scientist he felt could present an unbiased view of nuclear reprocessing generally. He suggested Dr. Bernard Cohen, a nuclear physicist who is also at the University of Pittsburgh. Cohen is widely regarded by both nuclear proponents and opponents as a man who sincerely believes in the future of nuclear energy—so much so

that he has traveled far and wide at his own expense to explain his views.

Dr. Cohen said Dr. Sternglass's conclusions were statistically unsupportable. He affirmed his belief that plutonium is so safe that "I am willing to eat eight-tenths of a gram of it before a public audience." Dr. Cohen also said he would be willing to eat a smaller amount of strontium-90.

Anthony Roisman, an environmental lawyer in Washington who has worked closely with the Natural Resources Defense Council, says the idea of eating plutonium is "irrelevant," though he notes that there was a time when "people drank DDT" to prove that it was all right." He has presented evidence to a review being conducted by the Federal Government to determine if there should be—and can be—a nuclear reprocessing industry in this country. Roisman notes that plutonium is relatively easy to handle but that once it becomes a powder, which happens during the reprocessing, it becomes far more hazardous, because it can be inhaled. It is lethal when ingested that way. Nuclear proponents, he says, are always asking for data proving that nuclear reprocessing causes harm, but "they know that the cancers will take 15 to 20 years to manifest themselves, and how will they be traced to nuclear reprocessing? The industry will probably blame cigarettes or color television sets."

Elsewhere, there is growing concern about nuclear fuel reprocessing, some of it caused by the West Valley experience, some of it because of technical problems that continue to escape solution. At Morris, Ill., where General Electric spent \$65 million to construct a nuclear waste reprocessing plant, the company decided to mothball the facility before it processed any radioactive material. "We did not think it would be prudent to make the plant radioactive," said Dr. Bertram Wolfe of G. E.'s Nuclear Energy Programs Division. He added that because of changes in Government regulations, the prospect (Continued on Page 34)



The plant's burial ground for its dangerously radioactive

Nuclear recycling

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for ever using the plant is "low."

At Barnwell, S.C., a \$250 million plant has only recently been constructed by Allied-General Nuclear Services, which is owned jointly by Allied Chemical Company and General Atomic, a subsidiary of Gulf and Royal Dutch Shell. The Nuclear Regulatory Commission has not yet granted the plant a license to operate, and interveners before the commission have made it clear they don't think it should ever operate. The story is similar to what happened at West Valley: Rising Federal safety standards appear to require the plant to invest still more money, and this the company seems unwilling to do.

The whole arithmetic of the reprocessing industry is not what people thought it would be. In 1970, N.F.S. contracted with Consumers Power Company of Jackson, Mich., to provide reprocessed fuel for \$22,400 a metric ton. Last July 13, however, N.F.S. told its customers that if it did any more reprocessing—and it wouldn't

—the price per metric ton would have to be \$1,009,300, an increase of 4,300 percent; a lawsuit is in progress. And the Government's experience in reprocessing this waste has apparently not produced the expertise the private sector would need to make reprocessing both safe and profitable.

Urgent questions are also pending as to who will clean up the mess at West Valley. Under the original contracts, the bill for decontaminating and decommissioning the plant, and for the containment and ultimate disposal of the wastes, lies with the taxpayers of New York State. George W. Cunningham, director of the Division of Waste Management, Production and Reprocessing of the United States Energy Research and Development Administration (ERDA), said at a recent Congressional hearing that the "ballpark figure" for decommissioning the plant might be as much as \$1 billion, although it could be "more on the order of \$500 million to

The New York Times

Published: April 10, 1977

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Cup? How do you explain that to the guys at the bar down at Nolan's?

"That's a long story . . . The reason I haven't played this year is because I ripped some muscles in my back, and I tried to come back too soon, and I just got sour on tennis for a while. I couldn't have played well, and anyway, the team won without me. . . . It's a question of what my schedule is."

Connor's schedule is pretty well locked up. He has signed an exclusive contract with the World Championship Tennis group, a contract guaranteeing him something like \$500,000 for the year. Honoring that contract, he played in a W.C.T. tournament around the time of the year's first Davis Cup match. He played hurt.

So maybe it's the money. Maybe it's the team captains, with whom he's never particularly ingratiated himself, and vice versa. Maybe it's just the injury. Maybe it's everything in combination. But one thing it isn't. It isn't that Jimmy Connors isn't patriotic. Because there ain't no more American a player than Jimmy Connors.

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He's been waltzing through Philadelphia, beating people in a tournament there by embarrassing margins. We're sitting in the Spectrum locker room and I ask him about fame. He answers easily, his face open, his manner loose. He never goes to a crowded restaurant and demands a table because he's Jimmy Connors, he says, but he "kind of grooves on" hearing people whisper, ". . . that's Jimmy Connors."

Then he adds something strange: "But I wouldn't want to be famous like a Frank Sinatra, or a Muhammad Ali. Those guys don't have any time to themselves."

And I think back on all the times I've seen him in hotel lobbies, bars, parking lots. I don't remember seeing him ever enjoy privacy, or thinking that he wants privacy, and I wonder about his sense of self.

Suddenly, he asks: "Have you seen the movie 'Rocky'?"

No.

"Well, it's all about this third-rate fighter from Philadelphia named Rocky. Some of the locker-room scenes were even done here in the Spectrum, I think. Anyway, it's not like Rocky doesn't have any talent. It's just that he always wasted it. He never trained as hard as he could. And then he gets this shot at

the champ, a guy named Apollo Creed—sort of an Ali type. Rocky gets the shot because the guy that Apollo's supposed to fight gets hurt, and the champ needs an opponent he can beat. So, all of a sudden, Rocky's got this chance of a lifetime. . . ."

Connors goes on, playing Rocky now. He is animated, acting out the dialogue. He is up on his feet, bouncing around the locker room doing the fight scene, delighted.

Whom did he identify with, Rocky or the champ, the loved underdog, or the antihero?

"I don't know," he said. "Both, I guess."

"Let me tell you something," Connors says. "Let me tell you a story I never told anyone before. When I first turned pro, the only thing I wanted was that first check. I wanted that check because I knew what it was like to be poor."

"When I was 17, I was in Beverly Hills, and one day me and my friend, Spencer Segura, were walking past some stores, and I saw this blue double-breasted blazer in the window of a store, and I just knew that I had to have it."

With gold buttons?

"Yeah, gold buttons. How'd you know?"

Just a guess.

"So, anyway, I go into the store, and I try it on, and it fits perfectly. And I say to the guy: 'How much?' And he says \$85. Now, that's like \$80,000 to me, but I tell the guy: 'Good. Hold it. Don't sell it. I'll be back.'"

"I get home and I tell Mom that I've got to have this coat, that I've just got to have it. And she says: 'How much is it?' And I tell her it's 85 bucks, but if she gets it for me, I promise, I'll wear it all the time. I'll wear the damn coat to the bathroom."

"The next day, she gives me the \$85."

So you got the coat?

"Yeah, and I wore it once. It didn't look good on me. I've got the damn thing hanging in my closet to remind me, so I'll never forget."

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Has Connors said something important about himself, something important about his values? Has he learned the difference between what he thinks he needs and what he really does need?

No, that was not the point.

"The point is—now I can give my Mom the \$85."

The locker room is quiet. The only sound comes from the pipes as the steam hisses its way through the metal. ■



trash—clothing, tools, hospital items.

\$600 million. . . . It depends on what one wants to do."

Actually, nobody knows what to do. A U.S. Nuclear Regulatory Commission report said in January that "no commercial or major ERDA [reprocessing] site has been decommissioned to date" and that "national standards for these aspects have not been developed." While the problem is being considered—and that may go on for years—New York State will have to pay between \$2 million and \$3 million annually just to make sure the plant is containing the radioactive wastes.

New York is asking for a Federal bail-out. The state's Energy Research and Development Authority, in a report presented by its chairman, Dr. N. Richard Werthamer, said the problem is well beyond New York's financial and technical resources. It concluded: "A program which excludes West Valley from Federal ownership and control while including all other radioactive wastes would be an unjustified anomaly." As things now stand, the contract under which N.F.S. operated runs out Dec. 31, 1980, and the whole problem legally becomes New York State's alone.

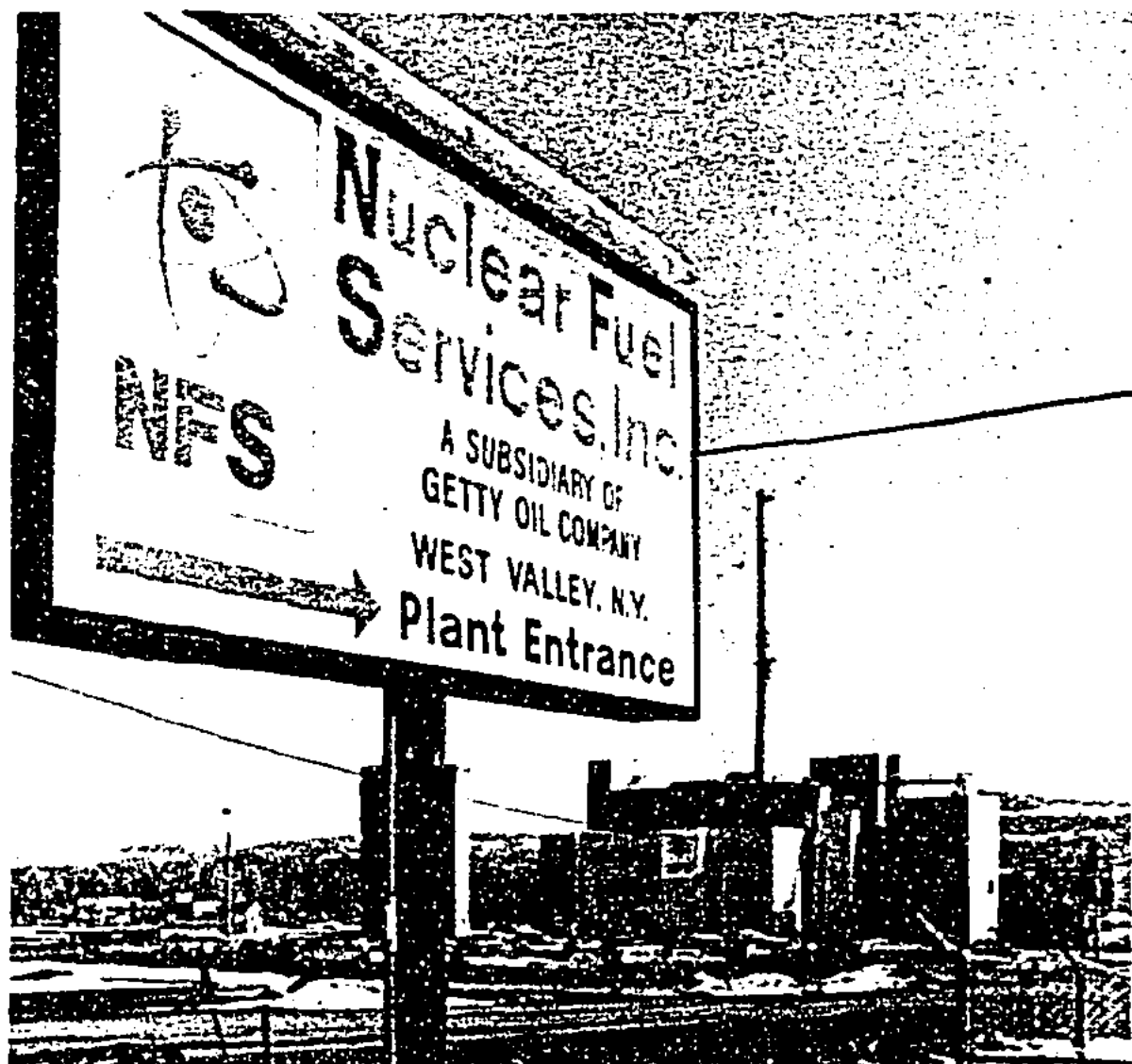
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"There is considerable doubt over whether there will be any further commercial reprocessing in the U.S. The

reprocessing industry is in a state of turmoil. . . ."

This admission of defeat came from Nuclear Fuel Services itself, in an affidavit filed with the United States District Court in Buffalo. What would a final abandonment of commercial reprocessing mean? It would not mean the end of the atomic power industry. It would mean that our uranium deposits would be used up that much faster, although there is now some difference of opinion as to how much uranium we have. Moreover, it should be borne in mind that reprocessing, even if successful, would not solve the nuclear-waste problem, since reprocessing generates wastes of its own. In any event, nuclear proponents are moving ahead with construction of atomic energy plants, feeling that if the spent fuel rods cannot be reprocessed, they can be stored.

But where? Consolidated Edison has adequate space at its Indian Point plant to store spent fuel rods until about 1985, a company spokesman said. The rods are now in large, deep pools that resemble swimming pools. The water over the rods is supposed to act as a shield against excessive radiation leakage. If no commercial reprocessing or burial sites are available when Consoli-



The plant. Once it looked as if profits were on the horizon.

dated Edison runs out of space, "we'll seek more storage space," the spokesman said. The company is considering building more nuclear plants in the mid-Hudson area, about 90 miles north of New York City. But such plans are running into strong opposition from nuclear opponents and their future is uncertain.

Late in his Administration President Ford expressed his reservations about reprocessing, and President Carter has indicated his concern about what is perhaps the most powerful argument of all against commercial reprocessing: that if the United States develops such an industry in private hands, there would be a proliferation of such facilities all over the world, with the danger that any country owning reprocessing plants could obtain enough plutonium to make bombs.

So, what to do with nuclear waste? The problem is all the more awesome in view of the atomic waste generated by the Government's weapons program. Government sources have estimated that the Federal establishment has accumulated between 75 million and 80 million gallons of highly radioactive waste since the end of World War II.

Present thinking among many scientists is that all stored liquid wastes, including those at West Valley, should be solidified—using one of several processes under development—and disposed of. Disposal suggestions under consideration thus far have included burial in a huge salt dome, far below the surface

of the earth, with the hope (bolstered by extrapolations and probabilities, of course) that the burial area will not be disturbed by water, meteorites, bombs or earthquakes for hundreds of thousands of years ahead. Also proposed is burial of nuclear wastes in either Antarctica or Greenland, or disposal in the seabed of the deeper areas of the Pacific Ocean.

There is another proposal: that all the world's radioactive garbage be loaded onto rockets and sent into high orbit around the earth, or around the sun, or into the sun. This is called "extraterrestrial disposal." Rockefeller still firm in his faith in technology, hopes one of these methods will provide a solution for West Valley. He is sure that if rockets were used—and thousands of them would be needed to solve the problem on a national scale—there would be no misfires, that a rocket would not land in Cleveland or Yugoslavia by mistake.

As to what happened at West Valley, he says that if he were still Governor, he'd order an investigation. "But," he emphasizes, "you can't have a riskless society. Man's ability to contain, to channel and master his discoveries are what has made civilization." Asked how he would respond if another reporter came to him at some future date because all the reprocessing and disposal methods now under consideration had proved to be a mistake, Rockefeller replied: "I would say that we worked within the best knowledge of our time." ■