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Everything You Aren't Supposed to Know About NUCLEAR POWER

by Jeffrey Knight

GROWTH OF NUCLEAR POWER

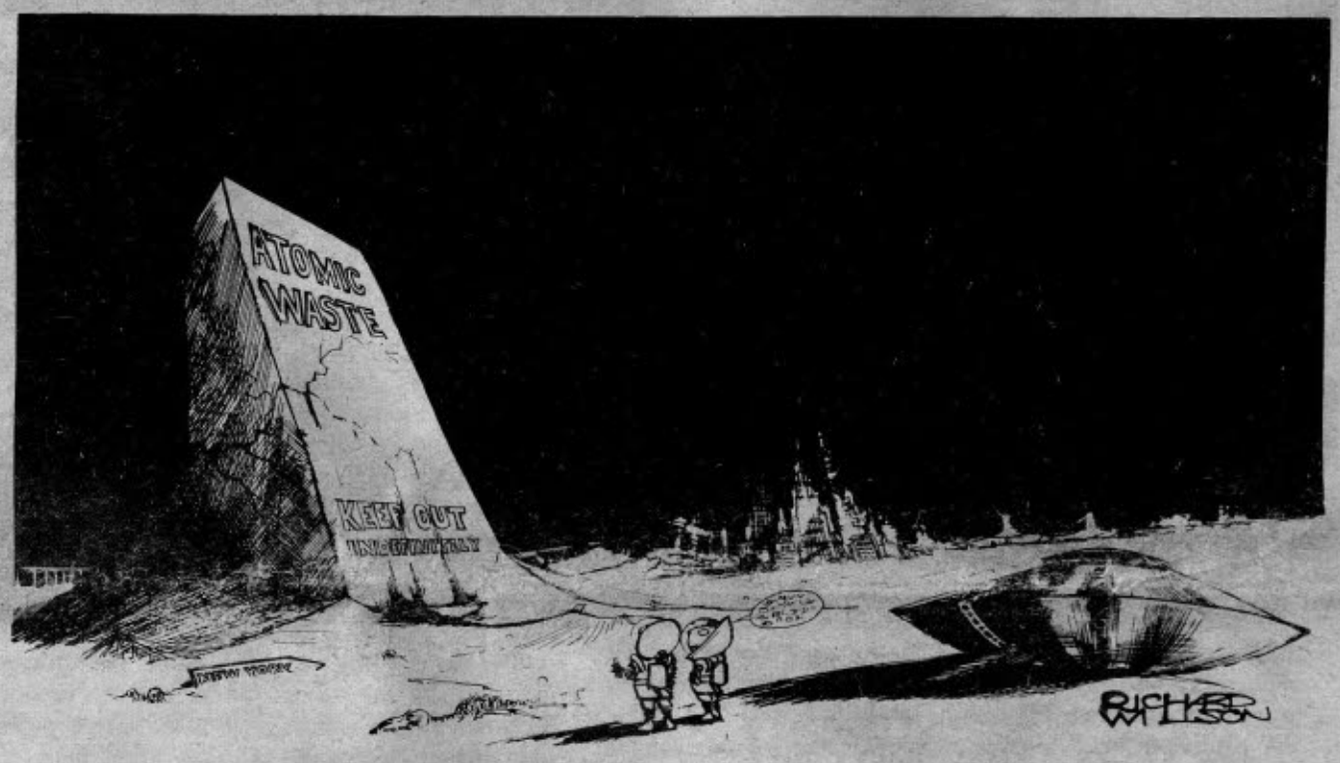
Today there are 36 nuclear power plants in the United States. Another 146 are under construction or on order, and the Atomic Energy Commission estimates that by the turn of the century more than 1,000 will be in operation, providing 50% of our electrical generating capacity.

Similar growth is taking place throughout Europe, Japan, the USSR, and Latin America. Dr. Alvin Weinberg, director of the AEC's major R&D facility, Oak Ridge National Laboratories, projects that the world will eventually need 12,000 nuclear power plants generating 5,000 megawatts (MWe) each to supply the electrical demand of the "ultimate world's population."

The cost of 1,000 nuclear plants would be a minimum of $500 billion. However, far more than money is involved. What we must decide is whether we are willing to accept, and to will to our children and their children, dangers and risks involved in this irrevocable dependence that are unlike any that man has ever undertaken. These risks involve the safety of nuclear power plants, the handling and storage of radioactive materials, and the damage that could result from accidents, malfunctions, sabotage, or acts of God.

Until now, public understanding of the peaceful uses of atomic energy has been inhibited. All commercial development of nuclear power has occurred under the auspices of the federal Atomic Energy Commission and its permissive legislative head, the Joint Congressional Committee on Atomic Energy. The AEC is a unique federal agency established to regulate an industry that it created. The joint committee is the only special, or joint, committee of Congress that has legislative power. The symbiotic relationship of these two groups has created a monopoly of expertise and authority, and a singularity of purpose, that both private citizens and the Congress as a whole find hard to question or combat.

And yet, the public and its representatives must make the policy decisions that have up to now been shrouded in complexity and secrecy, the moral decisions involved in the pursuit of atomic energy. The consequences of such decisions are too important to be left to the technicians.



(translation) "Presumably a shrine for one of their primitive religious cults."

THE PROCESS

A nuclear power plant uses the splitting, or fissioning, of uranium to produce heat and boil water. Most conventional power plants use oil, gas, or coal. Once the water is heated or boiled, it produces steam that turns electric generators.

In an atomic reactor there is a core of fuel. The core is an assemblage of thousands of thin metal rods, each filled with pellets of enriched uranium, and arranged to promote the fission process and to let a coolant flowing through them transfer heat from reactor to generator. (In the United States the coolant primarily in use is water, although gas and liquid metal can be used.)

The core and cooling system are housed in a steel reactor vessel intended to be leakproof that is imbedded in a containment wall of cement several feet thick. In the course of normal operations, atoms of uranium-235 are struck by neutrons and are split, releasing heat and more neutrons. The speed of the chain reaction is controlled by the coolant and by control rods that can be inserted into the core to absorb neutrons. The atoms of U-235 can split several ways, each leaving radioactive waste — two or three new lighter elements, or by-products, that are highly radioactive and generate intense decay heat.

The waste includes strontium-90, cesium-137, and iodine-131. The wastes have half-lives ranging from a few minutes to thousands of years. The most dangerous element produced is plutonium-239, created when an atom of non-fissionable U-238 in the core absorbs a loose neutron. Plutonium has a half-life of 24,400 years and is the most toxic substance known to man. A speck the size of a grain of pollen can cause lung cancer. Plutonium is also the fissionable material used to make atom bombs.

The nuclear fuel cycle is the term used to describe the entire cycle from mining to waste storage involved in the use of uranium. Most natural uranium ore is about 99% non-fissionable U-238 and 1% U-235. This concentration is not high enough for lightwater reactors, so after the ore is mined it is sent to an enrichment plant that increases the concentration of U-235 to 3%. The fuel then goes to a fuel fabrication plant where the fuel rods are made and then to the reactor.

After about a year's use as reactor fuel, the rods are removed and sent to a fuel reprocessing plant where the waste products and plutonium

(Continued on page 4)

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HIGH COUNTRY

By Tom Bell

Beautiful streamers of gold and pink lit up the blue heavens as my kids and I walked down to school and on to the office. And I was caught up in the wonder of it all just as those youngsters.

This is a new day of the Lord. A new day beginning, filled with eternal love and hope. A day in which each of us must do what we are able, not only for ourselves but for our own kind.

This day is all we have and may bring to us all we will ever have. In this we must be satisfied.

In these days of world turmoil, of uncertainty, of shortages and widespread unemployment, it is sometimes difficult to be hopeful. You hate to think of the future and what it may bring. Each of us may have only today but tomorrow still dawns on our sons and daughters. So we must think of tomorrow also, but mainly in terms of the kind of world we can pass on to them.

We would like to have them believe that is it their lot to have a world of pleasure and plenty. We avoid the pain and penury. Yet, I fear that many of them are doomed to the latter. And that is why it is so important to take hope in each day.

It is not a matter of deluding ourselves. And it is not a matter of being deluded by leaders who dishonestly feed us false hopes. It is a matter of meeting each day with reality and making do with what we have. If it means sliding back down the scale of affluence so be it.

We, as Americans, could reduce our standard of living by 50 percent and still be far above the main mass of humankind on earth. It would be unrealistic to think our standard of living will not come down in the years ahead.

We are only now beginning to feel the effects of energy shortages. In real terms the shortages are only the result of our depletion of our immediate resources. There is plenty of oil in the Middle East but it is being withheld from our own selfish purposes.

In the years ahead, it will not only be oil but the gamut of many material resources. **U.S. News and World Report** (Feb. 4, 1974) points to our dependence on other nations for many critical minerals.

We should not be deluded into thinking the preeminence of our country is dependent upon a profligate, affluent society. If we are fed upon delusion, our society is doomed.

It is the height of hypocrisy for President Nixon (or any other leader) to try to make us believe we can go on living in the splendor to which we have become accustomed. In a world already beset by tremendous social and environmental problems, we are only going to compound those problems by continuing our wasteful ways.

Because President Nixon has decreed that we are going to become energy independent by 1980, huge environmental and social problems are going to be foisted off on Colorado, Utah, Wyoming, Montana, and the Dakotas. In his speech to the nation last night, he spoke not once of living within our means, of belt tightening, of austerity in our national government and in our personal lives. (Admittedly, he is in no position to speak forthrightly in such realistic terms.)

Certainly, it will be a comedown for many Americans, and hurtful to our pride to give up those **things** which adorn our lives. But we can be thankful for what we still would have left. Our world stripped bare of the nonessentials would still feed us adequately, keep us warm and clean, and provide us with the glory of the heavens at sunrise. For that, any man should be thankful in that day.

Letters

STOP WASTE!
KILL-A-WATT!

Dear Staff of HCN,

High Country News seems to support the Sierra Club moratorium on nuclear fission, if not by design then by the lack of comment. As a chemist, the salvation of petroleum is vital to the future of my field. Without it, there would be no organic chemistry as we know it today. Therefore, I am willing to support any feasible means of power generation that relieves the burden on petroleum.

Despite many acclamations for solar, wind, geothermal, hydrodynamic, coal gasification, hydrogen generation and other methods of energy conversion the fact remains that none of these can replace present power sources in the near future. None of these offers the unique solution. By the same token, nuclear fission doesn't offer the only answer. Our only hope in averting a catastrophe is to use all of these to their best potential while investigating new methods such as nuclear fusion, fast-breeder reactors, and large-scale solar cells.

I find it astounding that anyone could prefer the pollution from burning coal to the comparatively insignificant amount of waste from nuclear fission plants. Does a drowning man refuse a life-preserver because he is allergic to foam rubber?

Each of the alternatives to present power production has advantages and disadvantages. Some are viable methods now and some promise to be in the near future. I don't feel that any of them should be discarded, nor should progress on the others be cast aside. At best, only solar power and nuclear fusion offer long term solutions. The others, except in rare cases, are stopgap methods to buy time.

I, for one, would be interested in seeing **HCN** publish an objective comparison of the merits and drawbacks of each method. Then we would have objective data to guide us and not the emotionalism with which decisions are now being made. I am always willing to change my support, but only when confronted with concrete reasons.

I trust this opinion will be met in the spirit it is offered. I only wish to generate analytical thought on the subject and do not mean for this to be construed as a condemnation of power-generating methods or of **HCN. High Country News** has filled an information gap in my life, and I have found it to be a welcome gift to my friends.

With gratitude,
James R. Beckett
Laramie, Wyo.

Editor's note: Your timely letter came as we had our front page article set. Our staff subscribes to the views presented therein. And we do indeed support the Sierra Club moratorium on additional nuclear fission reactors.

We, like many other people, are caught in the terrible dilemma of the energy problem. We are not alone as you have indicated in the agonies of your own words.

The assertion that you "find it astounding that anyone could prefer the pollution from burning coal to the comparatively insignificant amount of waste from nuclear fission plants" is a highly debatable subject. The waste from 36 (more or less depending upon current shutdowns) nuclear power plants may be relatively insignificant at the present time. But projections of dozens to hundreds more operating in the next decades greatly enlarges the problem. And as Professor Hannes Alfven, 1970 Nobel laureate in physics, says, "It is not correct to claim that long time deposit of radioactive waste is not a serious problem — because this problem **has not been solved as yet** and, further, no one knows how to solve it on the required large scale if nuclear technology spreads. . ." (Bulletin of the Atomic Scientists. Vol 30, No 1, Jan. 1974, p. 6.)

Smoke from power plants could be a temporarily historic event — even if we allowed it. The cleanup of London after generations of smoke pollution is living proof. But we do not need to accept massive air pollution. Technology is now available, even if costly, if we want to force industry to clean up emissions.

Deadly radioactive waste products are an en-

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Editorial

Energy - Temporarily Sold Out?

Wyoming Sen. Gale McGee took a 10 day tour of his state before returning to Washington for the new session. Everywhere he went in the Cowboy State he encountered the same three questions: When are you going to repeal the 55 m.p.h. speed limit? When are you going to repeal daylight savings time? What are you going to do about the cost of propane?

This short-sighted view of our predicament, this arrogance which calls for a return to business as usual and the "philosophy of abundance," is deeply disturbing. Whether the current energy shortage is real, or only manufactured by the oil companies to increase profits, it marks a watershed in the American way of life. We had best recognize this fact.

As Sen. McGee said, "Don't blame it on the Arabs. It may turn out that the Arabs are our best friends, for they are the ones that scared the pants off of us."

But will the past few months' startling events open our eyes or only make us more defensive and blind? Oil company ads speak the language of a salesman temporarily sold out of a successful product. "Patriotic" citizens turn down their thermostats to 68 and then buy a space heater. The calls for reducing energy demand are muted by shouts for crash programs. The sooner we get the Alaskan oil flowing in the pipeline, the sooner we tap our oil shale reserves, the sooner we bring more nuclear plants on line, the quicker we can resume our energy-wasteful life styles.

Supplying more energy is not the answer we must seek. The English economist and conservationist Barbara Ward points out, a new morality must replace the economic nationalism "in which greed and rapacity and continuous consumption have been seen as the secret of economic life." In other words, we must give up "some of our favorite bad habits" permanently, not temporarily.

David Brower, president of Friends of the Earth, said in a speech on energy, "When you go on a diet, for health or cosmetic reasons, you don't call it a food crisis." We have been living on an energy high. We have been gluttons with a precious finite commodity.

As Russell Train, administrator of the Environmental Protection Agency, put it, this nation suffers more from "an excessive and unsustainable level of energy demand" than from an energy shortage. Our mode and rate of consuming energy contradicts everything we know about how to live within a finite, delicately-balanced natural world.

In 1974 we have the opportunity and the obligation to change course, to cross the watershed and strike out on a new, more harmonious path. The alternative is for us to speed back down the same route at 70 m.p.h. into oblivion.

—B.H.

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tirely different matter. We are committing unborn generations to eternal vigilance over materials we have created. As Dr. Alfven puts it, "This is against the ecological imperative: Thou shalt not leave a polluted and poisoned world to future generations."

I wonder how we would feel if the Roman Empire had irrevocably committed us to such a monstrous task. But we are committing people for at least ten times longer than the time elapsed since the Roman heyday.

Thanks for offering your opinion though we must respectfully disagree. We would certainly agree that the wasteful use of such important organic materials as coal and petroleum for fuels is a form of folly in itself.

* * *

Dear Mr. Bell:

Your stand against the strip mining practices in this state is certainly admirable. In our search for new sources of energy to meet the energy shortage, we seem to be generally overlooking one of the most promising possibilities. It is clean, abundant and inexhaustible. It is windpower.

Until about 30 years ago windpower was used on a majority of farms and ranches in this country to pump water, and generate electricity for those that had electricity. If it had not been for money loaned to farmer cooperatives, almost interest-free, by the Federal Government through the Rural Electrification Administration, windpower would probably still be a very important source of power on the American farm and ranch.

The windmill is still widely used to pump water and generate electricity where there is no access to an electric transmission line. The windmill is, and always has been, generally considered far superior to a gasoline motor to pump water for livestock.

The people of Denmark, who were not blessed with so much oil and coal as the U.S., have been experimenting with the widespread use of windpower to generate electricity, and are now giving consideration to using it as a main source of electrical power. They have built a windpowered generator which has been successfully operating since 1957, generating electricity at the rate of about 200 kilowatts. This is the equivalent of nearly 300 horsepower.

A search for information of efforts made to develop the use of windpower in this country will show that there has been practically none in the last 30 years, until recently. Recently Fairchild Industries has funded a project at Princeton to develop a more efficient windwheel to turn a windpowered generator.

Also a number of utilities have contracted with Oregon State University for $132,000 to try to find a way to use the strong coastal winds to generate electricity.

For many years Congress has given the oil, coal and uranium industries a large tax incentive in the form of a depletion allowance deduction against gross income to encourage them to develop sources and produce these energy fuels.

If Congress is going to continue to do this, why not allow a comparable tax incentive to manufacturers of wind-powered equipment? For tax purposes, this would not enable them to sell windpowered equipment at any greater tax advantage than the energy producing companies are now allowed in selling energy fuels. A percentage production allowance deduction against gross sales (which is exactly what the depletion allowance is) would be a tremendous incentive for industry to find new and practical ways to utilize windpower, which is clean, abundant and inexhaustible.

A break-through that would make possible the widespread use of windpower for home heating and for the production of electricity now being produced by oil-powered generating plants, could make a great deal more fuel available for transportation and industry. It could also permit us to keep our houses warm enough to be comfortable.

Furthermore, a tax incentive, such as that proposed above, would not promote the pollution of our air and water as does the tax incentive to produce oil, coal and uranium.

Sincerely yours,
Stephen C. Tarver
Gillette, Wyo.

* * *

Dear Mr. Bell:

I've been seeing your fine publication fairly regularly for some time, and since I agree with most of your views on current trends in the use and misuse of our environment I guess I'd better get a subscription myself and support what I believe in. So, here's my check.

Of course, the energy crunch, soon to be added to by a minerals crunch, will require all the strength that can be mustered to prevent catastrophic damage to all aspects of our natural and cultural environment. Personally, I see no way but nationalization of all energy production and distribution. Much of our energy resources are in the public lands and are the property of all the people in any case. And so long as corporate profit remains the primary motive in resource extraction, production and distribution, so long are we bound to continue to degrade our society and the world we live in.

Further, as a professional historian I see the constant erosion of our cultural sites as devastating. And not only is the natural environment of the West in grave danger, but the societal and cultural losses due to radical land use and economic changes can result in tremendous impacts on the West I have lived in and studied for almost 50 years. I would hope that more studies can be undertaken and published of the impacts of strip mining, massive industrial growth, and boom and bust situations on the existing populations and human use and social patterns in the West.

Cordially yours,
Don Rickey, Jr.
Evergreen, Colo.

N-Power . . .

are separated from the unused U-238 and U-235. The unused fuel is sent back to the fabrication plant while the wastes are put in storage areas where they will supposedly remain until their radioactivity deteriorates. At present the plutonium is also stored, although in the future much of it is intended to be used as reactor fuel.

THE PROBLEMS

Beginning with the major difficulties of the cooling systems, here are some of the problem areas in the use of nuclear power that need extensive debate and consideration.

EMERGENCY CORE COOLING SYSTEM: A reactor cannot blow up like an atom bomb, but during operation present reactors build up enough radioactivity to equal several thousand times what was released over Hiroshima. Such a release should concern everyone. What is to prevent it?

The reactor vessel and containment wall are two of a reactor's many safety features and backup systems. Another backup system is the Emergency Core Cooling System (ECCS), center of most of the nuclear controversy of the past few years. The ECCS is designed to flood the fuel core with water if an accident causes the loss of the primary coolant (LOCA). If the core is left uncooled for as long as a minute, the radioactive wastes inside it can generate enough heat to melt the core. The melted core can eventually melt through the steel vessel and the concrete wall and release much of its radioactive gases and particles to the environment. The last line of defense against this disaster is the ECCS.

The dynamics of such a catastrophe are unclear, but the danger is clear enough that the AEC contracted for a study of the consequences by its Brookhaven National Lab and requires a foolproof defense against such an accident. Brookhaven's 1957 report (WASH-740) estimated that such an accident in a reactor generating 200 MWe could result in 3,400 deaths, 43,000 injuries, and $7 billion in damages. A 1965 update of that study found that an accident in an 800 MWe reactor could kill 45,000 persons, injure 74,000 and cause damages of $17 billion or what the AEC termed a significant percentage of the Gross National Product. The AEC did not release this update until 1973 because it said the new information was not needed. Present reactors are as large as 1,300 MWe and are being built nearer large cities than the older ones. A report to be issued by the AEC in 1974 will discuss their damage potential.

The only independent study in this area was released in 1972 by the Boston-based Union of Concerned Scientists and concluded that besides the deaths, an accident could result in land-use restrictions that might persist for years 500 miles downwind from the reactor. The AEC has expressed its confidence that such an accident will never happen. It says that the odds of a loss of coolant accident alone are upwards of 1 in 100 billion a year, and that to add these odds to the possibility that the ECCS would fail at the same time make such an accident literally incredible.

However, to consider any malfunction in a highly technical piece of machinery "incredible" seems indicative of a dangerous arrogance. In addition, there are nuclear engineers who believe a more realistic estimate of the chances of a LOCA to be about 1 in 1,000 a year, a startling figure when over 1,000 plants will exist within a few decades, making an accident a year possible.

"Plutonium-239, the most poisonous element ever handled in quantity by man is the very heart of the nuclear power industry, breeder or non-breeder. . . . Given the 24,400-year half-life of plutonium-239, any plutonium dispersed into the biosphere presents a major carcinogenic hazard for more than the next thousand human generations. The annual handling of plutonium-239 in a fully developed nuclear power economy will be in the one-hundred-ton category, or some 200,000 pounds annually. . . . Dispersed as fine insoluble particles (about one micron in diameter), one pound of plutonium-239 represents the potential for some nine billion human lung cancer doses." — Dr. John F. Gofman, professor of Medical Physics at the University of California and a Research Associate at the Lawrence Radiation Laboratory.

Finally, there are questions about whether the ECCS as designed will work. The ECCS in current reactors has never been given fullscale tests. An extensive test by the AEC is presently six years behind schedule and has accumulated cost-overruns exceeding $100 million. It is not expected to be ready until 1974, when more than 50 reactors with untested ECCSs will be operating in the United States.

During the late sixties there were several internal AEC reports that questioned the advisability of the course of action that led to the present state of affairs. The lack of knowledge concerning the effectiveness of the ECCS was called "the most urgent problem area in the safety program today."

Late in 1970, the AEC conducted some tests of the ECCS on a small nine-inch semiscale model reactor. In all six tests the ECCS completely failed to deliver its coolant to the reactor core. As a result, the AEC promulgated new criteria for ECCS design, and after the test failures and other critiques leaked out, announced that it would hold hearings on the subject in Bethesda, Md., in 1972.

The hearings turned into a confrontation between the AEC and reactor industry, and local citizens groups from all over the nation that had formed to oppose the hazards of nuclear power. In general, the critics' fears were not mollified, and it was discovered that there was widespread dissent within the AEC over the effectiveness of the ECCS. This was a direct contradiction of the AEC's public stance that the agency was completely satisfied with the reliability of the ECCS.

The hearings highlighted the problems and the dangers of having one agency, the AEC, handle both the development and regulation of nuclear power. It further brought into question the veracity of the AEC, the vendors, and the utilities, and the sincerity with which they profess to welcome public debate and consideration of nuclear power.

THERMAL POLLUTION: About one-third of the heat generated by any power plant is converted to electricity. The rest must be released to the local area as heat, requiring the use of large quantities of water and air. There can be adverse environmental effects if care is not taken to diffuse the effects of this heat on ocean, river and lake temperatures or the temperature of the atmosphere.

LOW-LEVEL RADIATION: Nuclear power plants in all phases of the nuclear fuel cycle emit low levels of radiation to the surrounding area. The AEC says the levels emitted are harmless and are much less than one receives from normal background radiation. However, radiation accumulates in the body, and the long-term effects of such accumulation are unknown. A Pennsylvania scientist, Dr. Ernest Sternglass, has released findings that seem to indicate an alarming increase (50 times) in leukemia and cancer among children living near the Shippingport, Pa., reactor (operating since 1958). His findings may be disputed, but they stand alone as almost the only research done in this field. More studies are needed.

FUEL-ROD DENSIFICATION: It has been discovered that the shrinkage of fuel pellets and the heat and expanding gases inside the fuel rods cause the rods to bend, expand, or squash, thus hampering the flow of coolant through the core and causing hot spots in the fuel that might lead to a release of radioactivity. After threatened court action by Friends of the Earth, the AEC in August 1973 ordered that ten U.S. reactors decrease their power output slightly to counteract this safety problem. This is another example of the unexpected problems that make an investment in nuclear power open-ended and only quasi-economical.

QUALITY CONTROL: Since the investment is so large, the utilities are under great pressure to get their reactors on the line fast. They try to cut corners and avoid delays, even going so far as to instruct their workers to ignore AEC quality assurance standards. Since the standards are meant to insure a safe plant, this is a

dangerous practice.

TRANSPORTATION: Radioactive materials must be transported between each stage of the fuel cycle. There are questions as to whether this activity is adequately safeguarded, either against accident or theft. By the turn of the century more than 500 shipments per week are expected, and each could cause grave local damage if an accident caused the containers to break open.

SABOTAGE AND BLACKMAIL: The spectacle last year of a hijacker threatening to fly his plane into the reactors at Oak Ridge, Tenn., served as a reminder of the vulnerability of nuclear power plants. Even if a plane crash did not break a reactor, plants are still vulnerable to bombs or missiles released in war or by terrorists bent on destruction or blackmail. One needs only a few pounds of plutonium and some rudimentary engineering skills to fashion a crude atomic bomb. The nightmare of terrorists, criminals or other fringe groups hijacking plutonium or breaking into a storage facility and stealing it is too real to ignore. Plutonium is worth $15,000 a kilogram, and many people foresee a nuclear black market arising in the future where have-not countries or criminals would obtain the materials to build nuclear weapons. There is not enough expense, expertise, or manpower devoted to this problem, either in the transport sector or in the area of safeguarding storage and reprocessing facilities. These activities remain vulnerable to thieves, and the public remains vulnerable to the consequences of, for example, a crude atomic bomb being mindlessly detonated in the center of a large city at midday.

WASTE STORAGE: Nuclear wastes must be stored for such long periods of time that storage does not appear reasonably possible. The AEC has originally planned to create a storage facility in abandoned salt mines in Kansas until it was found that they were not geologically stable and were too near the water table to assure that radioactivity would not enter the environment through seepage into the water supply. For the moment, wastes are stored in large tanks or concrete ditches in the ground. The AEC's Hanford, Wash., storage facility is the oldest of its kind, having been in use for almost 30 years. At that facility over the last decade there have been 15 leaks of high-level waste into the ground, the most recent a spill of 115,000 gallons last June. Hanford is situated on clay hills 250 feet over the Columbia River water table, and although the AEC says that the clay will prevent any leakage into the river, such leakage must be prevented for hundreds of years. The reason for the leaks? Just the old age of the tanks and the wear and tear they suffered from holding such hot wastes for so long. Since it takes so long for the radioactivity to deteriorate, the problems of waste storage could be with us for eons.

LIQUID METAL FAST BREEDER REACTOR (LMFBR): The breeder is designed to be introduced into the United States before 1990 as the successor to present reactors. Since there is a finite amount of natural U-235, the breeder appears as a latter-day alchemist and creates its own fuel. The fuel consists of a core of plutonium surrounded by a blanket of U-238. During operation it produces more plutonium than it burns up, thus creating an "unlimited" fuel supply. President Nixon has made development of the breeder his top energy priority because some reports suggest we will run out of U-235 in several decades. Yet there are even more problems associated with this new reactor than with current ones, including its liquid metal coolant and the mushrooming stocks of plutonium it will create. Plutonium is so toxic and so long-lived that it will be with us for thousands of years, and we must be protected from it.

NUCLEAR DEVELOPMENT OVERSEAS: There is a potential for billions of dollars in sales overseas of U.S. reactors and of nuclear fuel. By 1980, foreign nations will invest from $30 billion to $40 billion in installing 100,000 MWe of nuclear capacity, and by 1985 they will double their investment and number of plants. Equipment suppliers and industrial participants stand to receive a "sizeable portion of the total investment," according to AEC Commissioner William Doub in November 1972. "With this expanding sector of the world's energy market," Doub said, "it is paramount that the United States plan its participation . . . to realize its tremendous potential. This will be essential not only to balance our international energy accounts, but to make the maximum contribution to an overall trade balance."

The United States dominates the world's nuclear marketplace, and all the reactors it sells use enriched fuel. Since building a fuel enrichment plant requires an investment of $1.5 billion, few if any nations will be able to afford such an outlay. Thus a long-term market for U.S. enriched fuel is being created. In 1972, the United States and Japan signed a $320 million contract to supply fuel for existing Japanese needs until 1980. The prospect of reversing the balance of payments deficit by selling reactors and fuel overseas brings stars to the eyes of nuclear power promoters.

Unfortunately, no one has questioned the morality of selling faulty reactors overseas, and enthusiasm for the anticipated boom does not take into account the fact that nuclear waste produced overseas is brought back to the United States for reprocessing and storage. Thus we have the specter of the United States becoming the world's nuclear dump. And while we may have the arrogance to believe that we can keep the lid on this Pandora's box, is it right for us to add this peril to the lives of citizens in other nations?

THE "PEACEFUL ATOM"

In the period right after the war, when it was first suggested that we could harness this awesome power of destruction to serve mankind in constructive and peaceful ways, it almost seemed too good to be true. We espoused atomic energy with the feeling that finally technology had overcome the shackles of conventional forces and we had entered a new era of instant and unlimited potential energy. However, farther down the path we have discovered that the dangers are still there; they have only been transformed and seem less dramatic than a rising mushroom cloud. And we must ask ourselves if this is really the way we wanted to go, if our energy use really must grow as fast as has been projected, and if the benefit that nuclear power brings is worth the risk. We cannot let those who have the most to gain decide the question for us. We must, as a society, decide whether our interests, the interests of mankind, and the interests of all living things yet unborn are best served by embracing nuclear power.

☢ Radiation in the Rockies ☢

by Joan Nice

The Northern Rocky Mountain region has come to represent liberty from the sheiks. Our gas, oil, coal, and oil shale have set the eyes of the American consumer upon us. As a result of the spotlight, we are becoming well aware of the problems that surround the fossil fuel industry.

The nuclear industry, on the other hand, seems out of our reach — a problem for eastern states with too many people and nothing left worth burning. In actuality, the West plays a crucial, low-profile role in the nuclear industry.

The Rockies contain the very roots of the atomic economy — the uranium fuel for bombs and power plants. The atom was first turned into peaceful power in Idaho, at the National Reactor Testing Station. Westerners have lived with nuclear blasts for natural gas, nuclear bomb factories, and nuclear warheads in silos. While the promoter and regulator of the industry, the Atomic Energy Commission, was looking the other way, the region's miners were poisoned by radon gas and the region 's homes were built with radioactive sands. Next June, a plant in Colorado will produce a few watts of nuclear-generated electricity.

In short, the Northern Rockies have been a vital part in many of the steps in the nuclear fuel cycle: the mining, milling, enriching, reacting, reprocessing, and storing of nuclear materials to produce electrical energy. The Rockies have also been the site of a number of quests to find other peaceful uses for the atom.

QUIET RESEARCH

The Rocky Mountain West has been a part of the nuclear power industry from the beginning. Eager to prove that the atom could be used as a source of electric power, the Atomic Energy Commission established the National Reactor Testing Station (NRTS) near Idaho Falls in 1949.

Fifty reactors have been built at NRTS, including the country's first pressurized water reactors, boiling water reactors, and liquid-metal cooled fast breeder reactors.

> **"...there is a widespread conviction that the new knowledge is sound, that the new technology is therefore competent, and that the new power is thereby irresistible. The first 25 years of the atomic age tell us that this belief is deeply, tragically, wrong."**
>
> **Barry Commoner**
> **THE CLOSING CIRCLE**

The station seemed a quiet, productive institution lost in a dry spot on the map until this summer when Idahoans questioned the safety of the station's nuclear garbage dumps. After all, critics said, the Atomic Energy Commission had allowed massive leaks of radioactive wastes at their Hanford, Wash. facility. What about Idaho?

In the early days some wastes were merely buried in cardboard boxes. Later wooden boxes were judged to be more prudent — then carbon steel drums, then stainless steel drums. Now although NRTS can't be said to have solved the problems of nuclear waste disposal, they are using the most sophisticated methods available for safe, short-term containment of the hot materials.

NRTS is storing its own wastes and those generated by a few commercial reactors around the country. The station's Chemical Processing Plant has developed a way to transform highly radioactive liquid wastes to solid granules. The product is a smaller, safer, tighter waste parcel than those produced at other AEC facilities.

(Continued on page 6)

Rockies . . .

(Continued from page 5)

First, liquid wastes are allowed to cool off in storage tanks for two to four years. Then they are solidified through a process called calcination. After calcination, the dry pellets of waste are placed in stainless steel drums or barrels which rest in concrete vaults with walls about two feet thick. The vault is designed to last 1,000 years. Of the four million gallons of liquid wastes generated at the Idaho plant, about two million gallons have been converted to solid form over the past 10 years.

This treatment is called "interim storage" by the AEC. The proper final resting place for these hot pellets and all other radioactive wastes is still unknown. Surveillance will be necessary long beyond the 1,000-year life of the concrete vaults.

DOUBLE CHECKS

Despite the superior methods used at the AEC facility in Idaho, leaks at the Hanford, Wash. facility stirred up the Idaho citizenry. In August Gov. Cecil D. Andrus asked the AEC for money to help set up a state monitoring system to check for possible leakages of radioactive wastes.

The AEC was already monitoring, but Andrus said that "this secondary monitoring system would be to provide additional credibility to that data currently collected by the AEC." The credibility would come at a cost of about $52,590 initially and $18,940 annually after the first year. The AEC spends $340,000 on their own monitoring efforts.

Rep. Orval Hansen, an Idaho member of the Joint Committee on Atomic Energy, came home with the news that the state could establish a program to monitor radiation from NRTS, but not with AEC funds.

After a tour of the facility, Gov. Andrus backed off. He said that he had been personally assured by AEC officials that all safety measures were being taken to protect Idaho water from atomic waste pollution.

"Monitorings of the groundwater beneath the NRTS shows that the low concentration of radioactivity discharge at the station does not exceed federal drinking water standards at the nearest points of use on the NRTS," an AEC spokesman told the governor.

Although Andrus nodded to AEC expertise in the area of waste disposal technology, he said he would oppose a move to make the AEC a repository for the nation's atomic wastes.

"This state will not serve as the jackrabbit for the nation," Andrus said.

Despite the governor's feelings, the station has been accepting wastes from around the country for "interim storage" with no signs of a permanent solution in sight.

LEAKY FLATS

Posting a state watchdog to guard an AEC facility proved healthy for the citizens of Colorado.

This September when radioactive tritium leaked from the Rocky Flats nuclear weapons plant into the water supply of Broomfield, Colo., the state Department of Health was the first to discover the problem — not the AEC or its contractor, Dow Chemical. A few weeks later when plutonium leaked from the bomb factory into Walnut Creek, once again the state was first to discover the threat.

These incidents and an embarrassing history of fire, labor strikes, and reports of workers injured by overexposure to radioactivity have led the AEC to oust its contractor by opening the Rocky Flats contract for bidding.

The plutonium leak resulted from stirring up radioactive sludge at the bottom of a waste-settling pond. Instead of building a temporary dike downstream, the sludge simply was allowed to drain away, down the creek. The tritium that appeared in the Broomfield reservoir had carelessly been dumped into a building drain.

"These incidents demonstrate well how individuals in an engineering organization, operating in secrecy, can be so blinded by expediency as to lose their common sense," says biochemist Peter Metzger, author of the **Atomic Establishment.**

Similarly, the AEC has blamed its civilian contractor for the leak of 115,000 gallons of highly radioactive liquid waste from storage tanks at its Hanford facility. An AEC report states that if the Atlantic Richfield Hanford Co. had detected the leak earlier, the amount of material lost into the soil "could have been limited to between 26,700 and 37,600."

The AEC admitted in meetings with representatives of the nuclear industry this winter that it routinely discovers serious shortcomings in safety programs and frequent violations of AEC regulations. On routine examinations of power plants in 1972 the AEC recorded 164 violations of its rules.

30 BOMBS FOR GAS

The AEC may choose Colorado, Wyoming or Utah as the site for a grandiose experiment in nuclear stimulation of natural gas.

The West has endured smaller AEC experiments before — Gasbuggy, Rulison and the largest and most recent experiment, the three 30-kiloton blasts at Rio Blanco, Colo. But the latest plan for up to 30 bombs in a single test would dwarf all others.

Plans call for three to five atomic bombs in each of five to six adjacent wells. Explosions in each well would be fired simultaneously. Well-by-well firing would be separated by several minutes.

AEC Chairman Dixy Lee Ray revealed plans for the proposed test in a letter this January to Wyoming Rep. Teno Roncalio. Her letter came as a reply to Roncalio's request for more information about a $107.6 million item in the agency's research budget. Ray said that $56.2 million of the sum would be spent for the 30-bomb gas stimulation test and $51.4 million would be used for experiments in nuclear stimulation of oil shale. The test might take place in one of the three Western states within five years, Ray said.

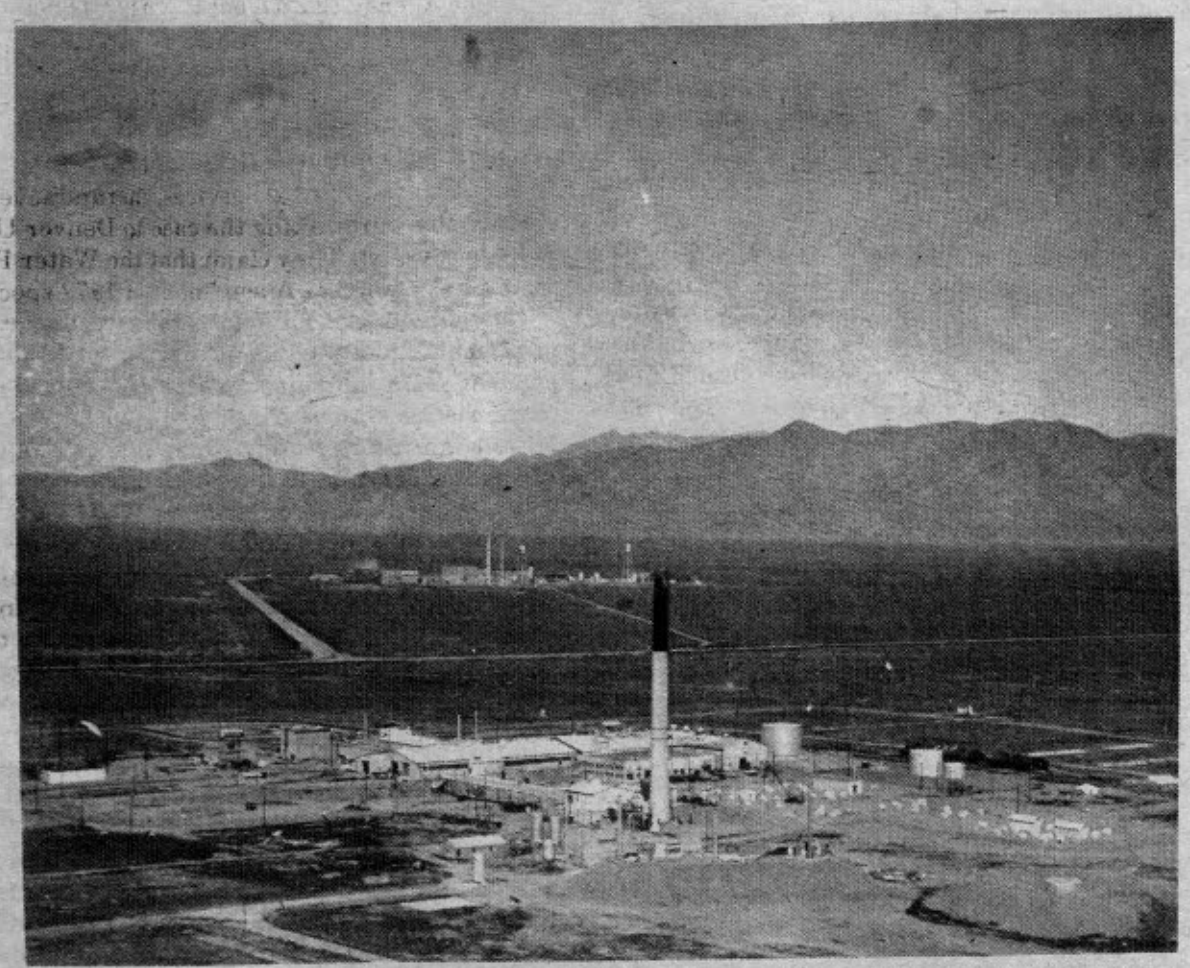
The AEC's ultimate goal is to release about 300 trillion cubic feet of natural gas locked in Rocky Mountain sandstone formations. Geological engineer David Evans has determined that it would take about 13,000 wells containing from one to five bombs each to accomplish that goal. No usable gas has been marketed from any of the previous three experiments.

Critics of the blasts say that dubious benefits are outweighed by substantial radioactive risks. Water entered the underground cavity created by the Project Gasbuggy bomb detonated in New Mexico in 1967 and "appears to be entering the Rulison cavity" (1969), says the Colorado Committee for Environmental Information, a group of scientists who criticized the blasts.

The water seepage is important because soluble radioactive materials might be carried away from the experiment into the ground water system. The rock surfaces in the blast chimney store both strontium-90 and cesium-137, elements which are deadly for hundreds of years.

". . . it is difficult to avoid the impression that the (Atomic Energy) Commission has been casting around in some desperation for something technologically and politically feasible to do with its bombs and expertise," says Graham Chedd in the **New Scientist.** "Plowshare's most grandiose scheme — for a sea level canal across the Panama isthmus — was sunk on both counts. Underground explosions are about all that are left to it."

Both Colorado and Wyoming have raised a storm about nuclear bombs in their state. Who is in charge — that state or the AEC — is still



The atom was first used as a source of electrical power here at the National Reactor Testing Center in southeastern Idaho. The U.S. Atomic Energy Commission is in charge of the facility. At the Chemical Processing Plant in the foreground, engineers have developed improved methods for storing radioactive wastes — in pelletized form. No one has yet come up with a long-term solution to waste disposal problems, however.

unclear. A decision by Denver District Judge Harry Santos last spring indicated that the state has a right to interfere with a federal project in Colorado. But David Engdahl, the attorney who fought the case on the side of state jurisdiction, said that Santos' ruling may be viewed as a narrow one. Engdahl believes that the judge ruled on the basis of existing contracts between the AEC and Colorado.

"The terms of those contracts may change," Engdahl says. He is fighting for a clear-cut ruling on the broader issues of state jurisdiction. "This will be extremely important for the state," he says. "It will be their only basis for rational planning."

Citizens in Wyoming feel equally shaky about their rights to determine their destiny. Residents in Sublette County, Wyo., where Project Wagon Wheel may take place, voted four to one against the project. But the project was declared "dead as a doornail" by Dixy Lee Ray last year for budgetary, not democratic reasons. A new fiscal year has brought new rumors about going ahead with the five 100-kiloton underground explosions.

The question, as Wyoming Sen. Gale McGee put it in a letter to the AEC is "What value, I ask, does the Commission place on the stable and sensitive way of life of citizens in one of the most sparsely populated counties in one of the most sparsely populated states of the Union? Must policy decisions be either so remote from citizen participation or dependent on pure economics as to constitute a clear perversion of the public interest?"

YELLOWCAKE MINING TODAY

Wyoming has larger uranium ore reserves than any other state, 55.5 million tons. New Mexico is next with a slightly smaller, but richer, body of ore. Texas, Colorado and Utah follow with 10.6 million tons, 3.1 million tons and 2.5 million tons respectively.

The mining industry is betting on the AEC's ability to produce a nuclear future in the U.S. For now, that future is uncertain. The result is a "soft market" for yellowcake (U308), according to George F. Getty II, chief operating officer of Getty Oil. Getty runs the Petrotomics uranium mining operations in the Shirley Basin of Wyoming. He closed down his operation, the second largest in Wyoming, in the spring of 1973. Officials said the mine would be reopened when the market improved.

The large scale mining of uranium began in the Southwest in 1946. The boom continued until 1968, when the AEC announced that it had adequate stockpiles of nuclear fuel. From 1946-1960 about 6,000 underground miners were "significantly and needlessly exposed to radioactive gases present in the air of uranium mines," according to two researchers at Brandeis University.

The researchers, Arell S. Schurgin and Thomas C. Hollacher, unearthed facts about the health of 4,180 uranium miners from 1950 to 1971. Of these, 67 miners had died of malignancies by 1971, most of which were lung cancer. According to the researchers, a Public Health Service official believes that 600 to 1,100 deaths due to lung cancer will eventually occur among the entire group of 6,000.

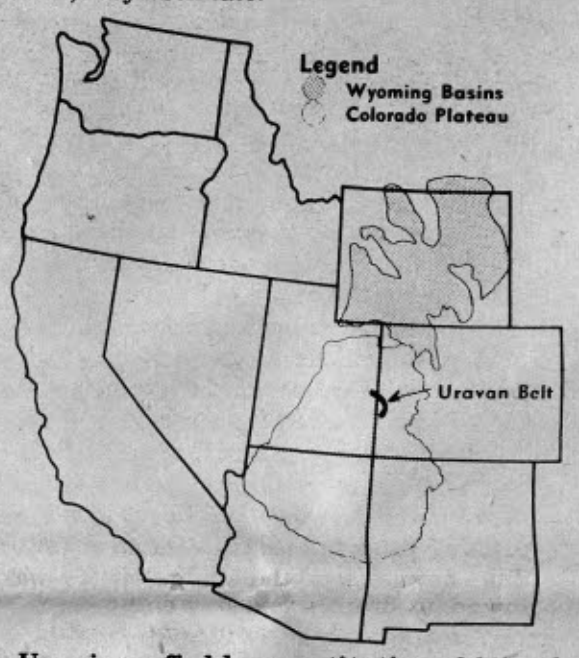
Schurgin and Hollocher attribute these premature deaths to "the failure of federal authorities to set adequately conservative radiation standards and to require control programs. . . ."

The danger lurks in the radon gas found in the air of the uranium mine tunnels. The gas forms from radium 226 in the natural decaying process of uranium-238. This radon and the solid particles which result from its decay — polonium-218, lead-214, bismuth-214 and polonium-214 — lodge in the miners' lungs.

Conditions in the mines have improved only very recently. In 1967 uniform Federal Radiation Council standards came into effect. Methodical air monitoring programs began in 1954. Radon control programs were not very effective before 1961.

The AEC still takes no responsibility for these safeguards. The agency has narrowly interpreted its domain to exclude nuclear materials until they are removed from mines. Responsibility is taken by states, by the Department of Interior and by the Department of Health, Education and Welfare. This committee management has resulted in improved, but far from absolutely safe, mining conditions.

Schurgin and Hollocher suggest that the present federal standards for exposure to radon and its daughters (radioactive products) in underground mines are about eight times too high to assure safety to the miners who may spend their entire working lives breathing the materials. Reducing the radioactivity to what Schurgin and Hollacher would consider a safe level would add a cost of 10-20% of the value of the uranium mined, they estimate.



Uranium fields constituting 90% of 1948-1969 production.

TROUBLE WITH TAILINGS

Grand Junction, Colo., is famous for its sad attempt at resourcefulness. Grand Junction and many other western communities did what should have been expected with the tons of sand from uranium mills at hand. They tried to make some practical use of the tailings.

Here again, the AEC backed away from responsibility. They said the concentration of uranium in the piles was too low to be dangerous. Although they were right about the uranium, they failed to consider the radium, none of which is removed from the ore in the uranium milling process. Radium decays into the radioactive gas called radon and then into highly radioactive solid particles, the radon daughters.

Those who used the tailings as fill out in the open were safe enough. But those who had used it in fill, slabs and mortar for their homes were living in something akin to a uranium mine shaft. Every hour they spent in their homes they filled their lungs with radon and its daughters.

About 5,000 homeowners in Grand Junction had used the tailings. The health department calculated that the lungs of the people in 10% of those houses had been exposed to an equivalent of more than 553 chest X-rays per year.

After years of avoiding the problem, in June of 1972, the AEC finally agreed to remove tailings where they caused a dwelling to exceed radiation levels recommended by the Surgeon General.

Dr. Herbert Lubs, a researcher hired by the state of Colorado observed what may have been the effects of the radiation dosage on the unborn children in Grand Junction. "There already appear to be too many chromosome breaks in cells from the (umbilical) cord-blood of the babies." He also noted that mongolism occurred three times more than is considered normal among newborn children.

POVERTY THROUGH ENRICHMENT

Rumor has it that Wyoming or Montana may become part of the second step in the nuclear fuel cycle. Either state may soon boast of a nuclear enrichment industry.

The AEC manages only three enrichment plants in the country. If reactors proliferate, the need for enriched fuel will be great. Natural uranium contains only varying small amounts of U-235. The fuel is changed by a process called gaseous diffusion. (Europeans have developed a newer technology using the centrifuge.)

The states trying to lure such an industry see a three to four billion dollar investment in their economy which could provide enough nuclear fuel for 75 nuclear plants of 1000 megawatts each. They dream of the additional money to come across the border in the pockets of 6,000 to 8,000 construction workers and 1,000 employes needed to maintain the operation.

But the lucky state will have big sacrifices to make, too. The state will probably provide about 10 million tons of coal and 60-65,000 acre-feet of water every year. All of the coal and most of the water will be used to run a 2,500 megawatt plant to power the enrichment facility.

The lucky community will also endure wrenching social change and the airborne delights of burning more coal every year than the Four Corners power plant in New Mexico.

THE GOAL: POWER

By June of this year Colorado is scheduled to use first watts of nuclear power. The Ft. St. Vrain High Temperature Gas-Cooled Reactor will provide the electricity — 330,300 kilowatts of it.

Strangely enough, the Environmental Protection Agency (EPA), not the AEC, is facing a lawsuit over Ft. St. Vrain.

The Colorado Public Interest Research Group (COPIRG) says that the EPA should regulate the plant's discharge of radioactive elements into the South Platte River. COPIRG, Colorado Environmental Legal Services, Inc. and several individuals are taking the case to Denver U.S. District Court. They claim that the Water Pollution Control Act Amendment of 1972 specifically directs the EPA to regulate radioactive effluents.

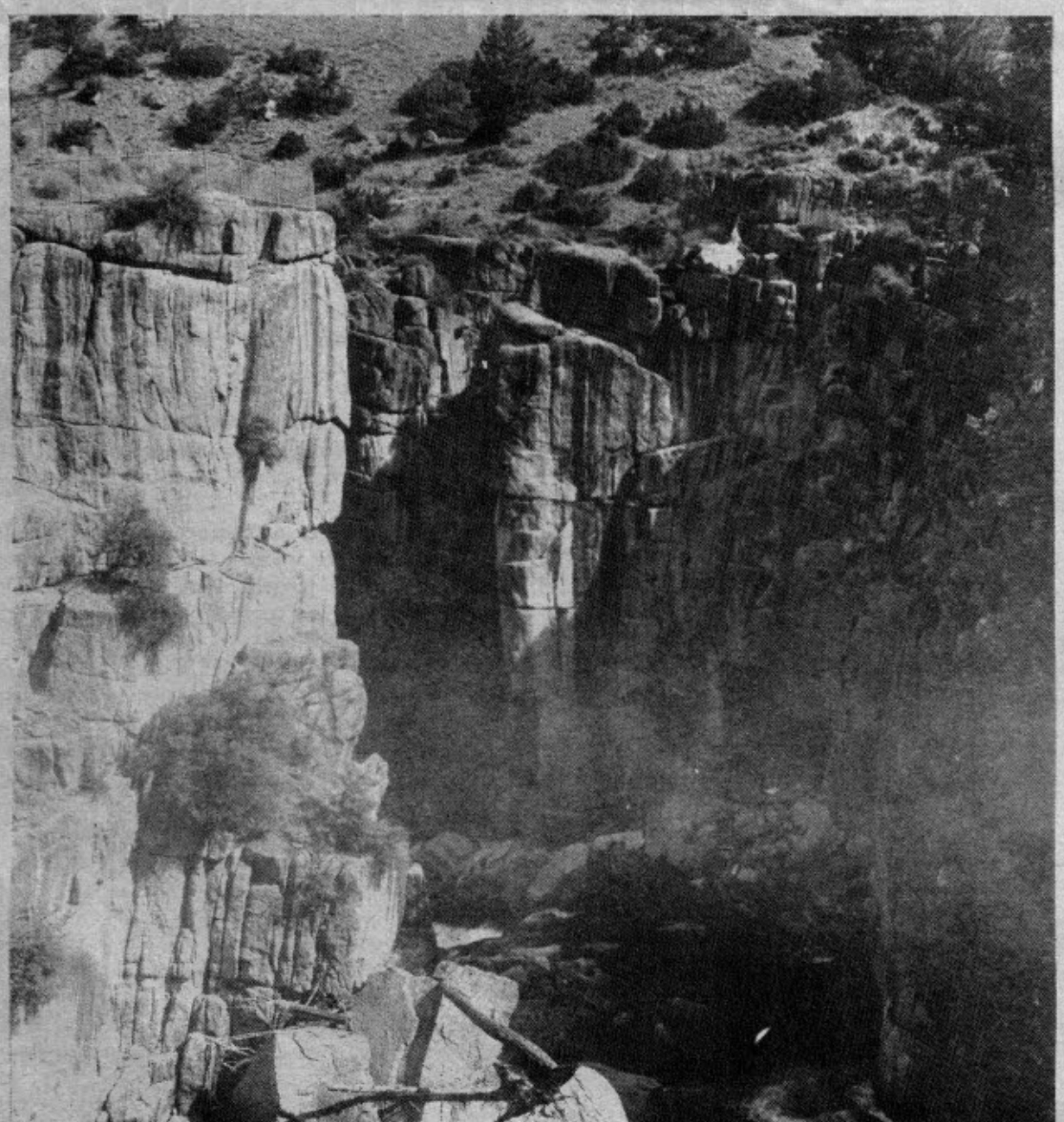
The EPA announced it would regulate radioactive wastes through the issuance of a discharge permit. But when the AEC challenged their jurisdiction over radiation, the EPA backed off.

One member of COPIRG, Joe Frizzell, says he expects the Ft. St. Vrain effluent to contain only "very small amounts of radioactivity." In a gas-cooled reactor no water circulates in the reactor core near the radioactive fuel. Ft. St. Vrain is important not because it is particularly dangerous, Frizzell says, but because it is the first nuclear reactor to come under the 1972 water law amendment.

The AEC seems strangely possessive of its radioactive domain lately. In the days of dangerous tailings and mine shafts, people begged the agency for guidelines and controls. The AEC had done promotion and some regulation in those cases, but shrunk from the responsibility of the damages that resulted. The results of the agency's most recent activities are yet to be seen.

SHELL

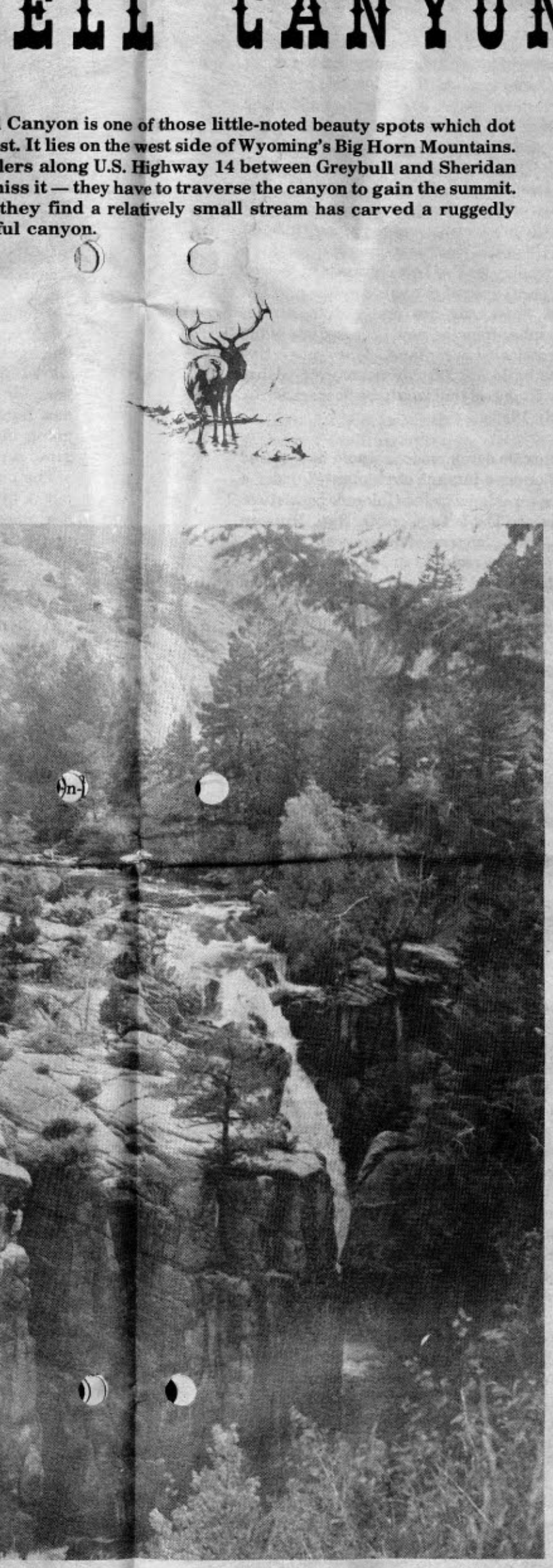
Shell Canyon is one of those litt
the West. It lies on the west side of
Travellers along U.S. Highway 14
can't miss it — they have to travers
There they find a relatively smal
beautiful canyon.



Photos by Marge H

ELL CANYON

Canyon is one of those little-noted beauty spots which dot st. It lies on the west side of Wyoming's Big Horn Mountains. lers along U.S. Highway 14 between Greybull and Sheridan iss it — they have to traverse the canyon to gain the summit. they find a relatively small stream has carved a ruggedly ful canyon.



Photos by Marge Higley

Reckoning from Washington

by Lee Catterall

The energy pinch has renewed talk of exploding nuclear devices far underneath the ground to get at fuel reserves, a scheme that opponents thought had entered a long period of dormancy several months ago.

Ear-cupped environmentalists set off a healthy howl in opposition to last May's underground blast in Colorado, only shortly after people from Sublette County, Wyo., had returned home from Washington where they protested the proposed Project Wagon Wheel beneath their prairie. The blasting is intended to shatter rocks and free large amounts of natural gas.

Many neighbors of Wagon Wheel said it would also dislodge buildings, crack irrigation systems and possibly even irradiate the area. The Atomic Energy Commission then dolefully announced that underground nukes would be shelved for at least a few years because of a tight budget. Rep. Teno Roncalio, a member of the Joint House-Senate Committee on Atomic Energy, has since tried unsuccessfully to lock the shelf.

Recent soundings from the commission indicate the energy crisis is causing some people to take another look at the Plowshare Program, the umbrella for Wagon Wheel.

In a report to President Nixon in December, commission chairman Dixie Lee Ray said "one further stimulation demonstration is planned" to free natural gas. "High risks" also should be taken to remove gas from coal and oil from shale before either reaches the ground, the report said. Nuclear stimulation is considered a possible technique for both.

Noting that next year's proposed budget for the commission includes money for nuclear stimulation, Roncalio has renewed his attack on Plowshare. This time, however, Roncalio bases his opposition not only on the environmental risks but on what he describes as a "drastic shortage" of enriched uranium, the fuel for nuclear energy.

In a floor speech last week, he said using uranium for Plowshare would be "wasteful" and would be "jeopardizing" other atomic energy activities "by misuse of the uranium atom."

Rep. Craig Hosmer, chairman of the joint committee, and, to a degree, the commission acknowledge an impending uranium shortage. But they believe uranium needs can be met by increased efforts to explore for more, and a greater push to refine the stuff.

"Of course, none of us (on the joint committee), anticipate an actual nuclear fuel gap," Hosmer wrote in a recent letter to the administration. "We can't afford such a thing, even if we have to set up a mini-Manhattan poject to avoid it."

Hosmer also plans to push for the creation of a "government enrichment program" in which industry and government would share the responsibility for refining the uranium — no cheap process.

Of Roncalio's concern about Plowshare burning up our uranium resources, Hosmer told this column, "There isn't going to be that much Plowshare activity that would dig that deep a hole in the uranium supply."

An AEC spokesman agreed with Hosmer, calling the relative use of uranium for Plowshare "a nit on the side of an elephant."

Asked to comment on the AEC spokesman's remark, Roncalio said, "That's precisely what contribution those gas reserves would make as far as solving our energy problems." The reserves, which the government estimates at 300 trillion cubic feet, are "infinitesimal" compared to our energy needs, Roncalio said.

Emphasis ENERGY

in the Northern Rockies and Great Plains

A sloping mesa across the Colorado River from Grand Valley, Colo. will be the site of the first **oil shale boom town.** The small ranches, orchards and open space that occupy the 1,000 acre site will be supplanted by homes for 4,000 people within four years.

Peter Mahony, project planner with Conklin and Rossant of New York, said the community would not be a "company town." His firm is experienced with creating new towns and is responsible for Reston, Va., near Washington, D.C. Mahony said a modular home factory could well be built in the area to provide prefabricated houses. He noted that a population of 200,000 is forecast for the region during the next 15 years.

The firm of Conklin and Rossant was retained by the **Colony Development Corporation** which owns the town site. Colony is planning a 50,000 barrel per day oil shale plant 16 miles from the new town. Colony and other oil companies own thousands of acres of private land in the region and have leased it to ranchers. Colony is made up principally of Atlantic Richfield Oil Co., The Oil Shale Corporation and Ashland Oil Co.

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Bryan Morgan, a lawyer with the **Environmental Defense Fund,** told members of the House that **oil shale** development on Colorado's western slope may exhaust the region's remaining water. Morgan speculated that oil shale development might preclude development of new communities, resorts or expanded agricultural activities. "We must candidly face the fact that the million barrel a day industry that is being planned would require all the water left in western Colorado from available sources," Morgan said.

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Scientists at the Denver Research Institute (DRI) are studying **cancer-causing substances** in **oil shale** residue. Poly-condensed aromatic pollutants, some of which are known to cause cancer, make up about three parts per million by weight of waste oil shale. An average 50,000 barrel per day above-ground retort operation will produce about 20 million tons of waste each year, according to DRI. The waste would contain about six tons of poly-condensed aromatics.

DRI feels that controlling dust and confining waste water used to wet and compact waste shale would keep most of the cancer-causing residues out of the environment. It still isn't known whether plants will take up the substances into their systems.

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The 3,000 mw **Kaiparowits** coal-fired plant is being reconsidered for the **Four Corners** region. The plant, turned down last summer by Interior Sec. Rogers C.B. Morton on environmental grounds, is now proposed at a new site 12 miles from the original location. John C. Whitaker, Under Secretary of Interior, stated, "Interior has carefully reviewed the newly proposed Four-Mile Bench site and determined it adequate for application."

After the application is filed, the Bureau of Land Management will begin preparing an environmental impact statement. The schedule calls for site preparation by 1975 and the first unit operating in 1980. Robert S. Currie of Los Angeles, project manager, said the Southwest is in "critical need" of the power the plant would provide.

Hank Hassel of ISSUE (Interested in Saving Southern Utah's Environment?) feels the new site is just as bad as the original one. "The region is highly scenic," Hassell said, "and contains vistas of unexcelled clarity and beauty. It is a dry land, roadless, a wilderness, has value as a livestock range, and its high elevation makes it an important airshed for the surrounding national parks."

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The **Los Angeles Department of Water and Power** says it will cooperate with other California public utilities in a proposal to build a $1.5 billion coal-fired power plant in southern Utah. Studies for the **Intermountain Power Project** are expected to occur over the next few months. Three sites are under study. One is only 30 miles from the new proposed site of the Kaiparawits power plant. The cooperative hopes to build a 3,000 mw generating facility fired by Utah coal that would be in operation by the early 1980s.

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Large-scale developments would be required to file **"energy impact statements"** under a bill to be considered by the Colorado legislature this session. The bill's sponsor, **Rep. Morgan Smith,** said planners of large-scale developments would be required to set forth the effects their plans would have on energy consumption. Design factors such as proper insulation and windows shielded from the sun would be included in the disclosures. Smith said there is nothing in the bill to require developers to meet certain standards, but he feels public disclosure of the facts should force builders to be more energy-conscious.

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Campbell County, Wyoming, site of one of the richest coal deposits in the world, is slated for two more open pit mines. Carter Oil Co., a subsidiary of Exxon, says it has contracted to supply five million tons of coal a year from a mine about eight miles north of Gillette. The coal will go to Indiana and Michigan Electric Co. The contract is for 30 years with deliveries to begin in July, 1976.

In the same area north of Gillette, AMAX (American Metals Climax Inc.) has announced it will open another mine. Coal leases extend to the city limits of Gillette. The company has announced that its Belle Ayre Mine, 18 miles south of Gillette, will triple production to 30 million tons a year by 1978. AMAX has present coal contracts with Kansas Power & Light Co. for 200 million tons over a 40-year period; Public Service Co. of Colorado for 20 million tons for 20 years, and Southwestern Electric Power Co. for 3.5 million tons a year.

Atlantic Richfield has two large coal leases south of Gillette. That company has known contracts for about six million tons a year with Oklahoma Gas & Electric Co., the Nebraska Public Power District, and Southwestern Public Service Co.

Kerr-McGee has leases south of Gillette where it contemplates a mine or mines to provide coal for Arkansas Power & Light Co. and Central Louisiana Electric Co. That company's known contracts total over seven million tons a year.

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The **Montana legislature** is considering a bill that would give constitutional protection to the state's **resource indemnity trust fund.** The $100 million fund, established last year at the urging of Gov. Thomas Judge would become "forever inviolate . . . guaranteed by the state against loss of diversion," if the proposed amendment passes. The fund is derived from a tax on natural resources extracted from the state. The principal may be invested and the interest and earnings used to reclaim lands dis-

turbed by resource extraction. The amendment's sponsor, Rep. Francis Bardanouve says he doesn't have faith that future legislatures would not raid the fund for other purposes unless it was placed out of reach by the constitution. Gov. Judge supports the proposed amendment.

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Burlington Northern Railroad has announced that land aquisition for the **Gillette-Douglas rail line** will begin in early February. The route, running through Campbell and Converse counties in Wyoming, would open up the region to massive coal development. Atlantic Richfield Co. and Kerr-McGee Corp. have surface coal mines planned along the route. Panhandle Eastern Pipeline Co. has announced plans for coal gasification facilities in the same area.

A major roadblock to the route has reportedly been removed since Mrs. Dorothy Reno, a Campbell Co. rancher, has made an agreement with the railroad interests. Originally the route snaked 14 miles through 11 of Mrs. Reno's pastures. Atlantic Richfield sent out an engineer to determine a more acceptable route.

In addition, the Interstate Commerce Commission (ICC) has been informed that Burlington Northern and the Chicago and Northwestern Transportation Co. have agreed to jointly construct the railroad. Both companies had earlier filed to build separate lines. An ICC permit has not been granted yet, but railroad spokesmen say they are proceeding with the Amax to ARCO part of the line because technically it is a spur line and does not need ICC approval.

The Sierra Club has filed a complaint before the Federal Power Commission (FPC) over the proposed **Gerald Gentleman** power plant in **Hershey, Neb.** The complaint asks that the Nebraska Public Power District be made to show cause why the construction of the 600 mw coal-fired plant should not be ceased. The Sierra Club contends that the project, "is taking place within a hydro-electric project area in the absence of Federal Power Commission approval."

The Gerald Gentleman plant, now being built on Sutherland Reservoir, would use the reservoir's storage capacity and would affect water regulations and water quality in the reservoir. "Nevertheless," the club complaint reads, "Nebraska Public Power District has proceeded with its activities and ignored FPC jurisdiction."

Anthony Ruckel, Sierra Club Legal Defense Fund attorney, said the Sutherland Reservoir and other water projects along the Platte River and its tributaries "are interrelated, and (any) significant change in reservoir management can affect the larger and very sensitive interrelationship of the various projects in the Platte and Missouri River basins."

The Gerald Gentleman plant would burn coal from northeastern Wyoming and to provide power for the Midwest.

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Officials of the U.S. Forest Service have reported that private industry is seeking permission to prospect for uranium on 38,000 acres of the Little Missouri Grasslands in western North Dakota.

Reader Tom Milne of Kansas City sent us the ad reproduced above. It appeared in the Kansas City Star, Jan. 20, 1974. It speaks for itself.

The Hot Line

across the country

A Texas inventor says he has developed a long-life electrical power source generated by bacteria and rice hulls. The **organic battery,** called a current cell by its inventor, Lyle D. Atkins, produces ½ volt of direct current. More power can be produced by adding more batteries or adding more pairs of electrodes to one battery. Atkins says the current cell can easily last five years.

The bacteria come from the ocean and are the secret of the whole operation. Rice hulls work best with the bacteria because of their high cellulose content. Atkins says the bacteria react with the organic material in the cell to make electricity. He's still not sure why, even after 15 years of research.

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A study prepared for the joint House-Senate Economic Committee recommends that the **government enter directly into the production and distribution of energy.** W. N. Peach of the University of Oklahoma, author of the report said, "This is not meant to nationalize the existing petroleum industry. But it does mean that in this big industry, the U.S. government might carve out for itself a slice, say 20 to 30%." He added that the government now pays for most research and development, is one of the largest consumers of energy, and also owns much of the energy-producing lands.

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Sen. William Proxmire (D-Wis.) has urged **Attorney General William Saxbe** to initiate **antitrust action** against the major oil companies. "There may be ample evidence of joint efforts by the major oil companies to share markets, restrict outputs, raise prices, deny crude to independent refiners and deny products to independent marketers (which would) ... constitute an illegal conspiracy in violation of the Sherman (Antitrust) Act," Proxmire said.

Saxbe favors a different approach to the problem. He said on **Face the Nation** that what actually might be needed was relaxation of antitrust laws so the big oil producers could cooperate in helping to solve the energy crisis. Proxmire's subcommittee of the Joint Economic Committee will hold hearings on oil company practices this month.

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Geothermal energy exploitation may have come of age in the United States. At the first competitive leasing of geothermal resources, a high bid was offered of $6,821,559 for 23,441 acres of land in California. "This is a whole new ball game," said Frank G. Metcalfe, of the Geothermal Power Corp., "only 10 years ago companies were picking up leases on private land in that area for 20 cents an acre."

The leases are for 10 years, but can be extended a total of 80 years if there is commercial production of steam. Some tracts were offered in the Imperial Valley and the Mono-Long Valley but the greatest interest was shown in the Geysers Area of Northern California. The Geysers is considered to be the world's largest geothermal field.

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The U.S. will help finance construction of a $345 million **oil pipeline across Egypt.** The 42-inch pipeline will run for 200 miles across the Egyptian desert. **Bechtel Corp.** of San Francisco will design and construct the pipeline which will carry about 1.6 million barrels a day of crude oil.

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The Coal Research Bureau of West Virginia University has announced successful testing on a laboratory scale of a process to remove sulfur from powerplant emissions. The process combines lime with pulverized coal to trap sulfur in ashes during combustion. The "Sulfurtrain" process has removed from 90% to 95% of the sulfur on good runs. This figure meets current air pollution standards.

Sierra Club vs. Government and Industry

Comprehensive Coal Planning?

by Lee Catterall

WASHINGTON — A U.S. District Court judge last week heard arguments for and against coal development in the Powder River Basin and said he "soon" would rule on whether the federal government's role in the development should be at least temporarily frozen.

"Soon" could range from "one week to several weeks," said an assistant to Judge Barrington Parker.

The court action stems from the Sierra Club's contention that the government has violated a provision of the National Environmental Policy Act (NEPA) by failing to detail ways the coal development would affect the region's environment.

Until such detail, embodied in what NEPA terms an Environmental Impact Statement, is given, the government should not be allowed to engage in further action that would increase development, the court suit contends. At stake are such things as future mineral leases (which Sec. of Interior Rogers C.B. Morton has temporarily halted), mining permits, water contracts and land rights of way.

The government acknowledged that a program is planned and that an environmental statement will be completed before it begins the program.

"There is no existing federal program for coal development at all," said Herbert Pittle, a Justice Department lawyer who argued the government's case.

Francis M. Shea, a Montana Power Co. attorney, supported that position. "We don't know at this point. . . what (mineral lease) applications are going to be allowed and what are not," he said. "We don't know what the proposals are going to be. First of all, there has to be a proposal."

Sierra Club attorney Bruce Terris agreed that no formal proposal exists and, indeed, said that one should exist.

"The government has already set into motion a gigantic scale of development in that region," Terris said. He accused the government of "a totally laissez faire approval to development of this huge resource. That just doesn't make sense.

"The government can't go helter skelter with a lot of interrelated federal actions and say (as a reason for not making an Environmental Impact Statement), 'We don't have a plan.' "

James H. Kreiger, representing Peabody Coal Co., complained that the Sierra Club was "premature" in demanding an environmental statement. A court ruling requiring such a statement, he said, would "hasten the decision of what kind of plan should be used.

"There are so many variables at the national and international level," Kreiger said, mentioning the Mideast oil situation, air quality standards that are yet to be clarified, and development of different types of technology as examples.

"With these considerations, there is not going to be a rapid development of that area," Kreiger said.

Kreiger said "none of the water has been developed — not one drop" for use in coal development in the region, and none will be used "until all these other uncertainties are finally solved.

"The Secretary of Interior is putting together the pieces he needs before he makes the final judgement," Kreiger said. The Sierra Club action, he said, is a "premature attempt to get the Secretary of Interior to do something NEPA doesn't require."

Terris sharply disagreed with Kreiger, saying there is "huge, immediate danger threatened" to the area.

NEPA, enacted by Congress four years ago, requires that environmental statements precede "major federal actions significantly affecting the environment." Terris argued that a single mining operation might not be regarded as significant, but all operations in the Powder River Basin are interrelated.

Peter J. Nickles, representing Kerr-McGee, and John E. Nolan, attorney for Atlantic-Richfield (Arco), disagreed. "Kerr-McGee's mine is not interrelated," Nickles said. "It's not dependent in any way to any federal program, to any regional program or to any other program."

Likewise, Nolan said Arco's activity, south of Gillette, is "obviously unrelated to any plan, program or development sited in the plaintiff's complaint."

Nolan said Arco has three contracts to provide coal for Nebraska, Oklahoma and Wisconsin. The coal will be mined at the rate of 60 to 90 acres a year from a seam Nolan said averages 68 feet thick.

However, Nolan said "nothing has been done" on the land since Arco acquired the lease in 1966, nor will it be until the U.S. Geogogical Survey completes a "detailed environmental impact statement . . . (that) will probably include other leases in the area."

Judge Parker is a Republican who was appointed to the bench by President Nixon. He is regarded as a liberal and has ruled in several previous cases on the side of environmental groups.

Terris, the young Sierra Club lawyer, won a major court victory last year before the Supreme Court, which ruled that the government may not allow air in rural areas to become as dirty as that in some urban areas.

Court Laughs at Thrift

by Lee Catterall

WASHINGTON — The Wyoming state government's thrift produced chuckles in the U.S. District Courtroom in which the Sierra Club was bringing suit last week to halt coal development in the Powder River Basin.

The laughter came after James H. Kreiger, attorney for Peabody Coal Co., responded to a question from Judge Barrington Parker about whether any state government wanted to intervene — be represented by an attorney — in the case.

Kreiger said Wyoming Attorney Gen. Clarence (Bud) Brimmer had written to the U.S. Justice Department expressing the state's desire to oppose the Sierra Club court action.

However, Kreiger said, the state "couldn't afford Washington counsel to be here."

The Brimmer letter says that, because the courtroom is "approximately 2,000 miles from the states of Wyoming and Montana . . . it would constitute a great financial burden as well as a great burden upon the time of its public officials for the State of Wyoming to intervene" on behalf of the federal government.

If the case were transferred back to Wyoming or Montana, the letter says, "such burdens would be substantially diminished" and the state would intervene.

Sierra Club attorney Bruce Terris said he had received "encouragement from two of the states" involved, but no formal support. The states named in the suit are Wyoming, Montana and the Dakotas.

Friends of the Earth Charge:

Nixon Plays Russian Roulette

Two of President Nixon's actions drew a sharp response from the environmental organization, Friends of the Earth. In an open letter to the President, Friends of the Earth criticized his impoundment of $3 billion which would have been used to clean up the nation's polluted waterways and his cutback of $10 million in the Atomic Energy Commission's safety program. Characterizing the moves as bordering on irresponsibility, the letter urged Nixon to reconsider, and restore to these programs their full appropriation.

Referring to the President's speech of November 17, 1973, Ann Roosevelt, a spokesman for Friends of the Earth said: "It is ironic that President Nixon wants to be remembered for his contributions to the energy field and the environmental area. By cutting the water treatment programs, the President is condemning the nation to dirty water well into the 1980's. Further, he is playing Russian roulette with the lives of millions of Americans who live near nuclear power plants.

"It is an outrage that the President, who is asking for a speed-up in the licensing of nuclear power plants is also robbing the vital AEC safety program of the funding that provides a measure of public protection against these hazardous plants.

"We sincerely hope that President Nixon will reconsider these rash cuts," Roosevelt concluded.

Bottle Bill Ruled Legal

A decision on Dec. 17 by the Oregon Court of Appeals has upheld the constitutionality of Oregon's "Bottle Bill." The president of the Crusade for a Cleaner Environment, N. E. Norton, said "National, state and local legislators have been maintaining a 'wait and see' attitude toward the Oregon Bottle Bill before taking action in their own areas. The clearcut ruling by the Court of Appeals should now remove any doubts about the enforceability of laws regulating beverage containers."

The three-judge Appeals Court upheld a Circuit Court decision in its entirety. The Circuit Court had said the regulation of beverage containers through a mandatory refundable deposit system and the banning of flip-top cans was "completely within the police powers of the State of Oregon." American Can Company, among others, had appealed the decision of the lower court.

Western Roundup

Ranch Wins Reprieve

The Wyoming ranch which illegally fenced public land and then illegally sprayed sagebrush on the fenced land has won a reprieve. The Department of Interior Board of Land Appeals said the Diamond Ring Ranch should forego two years of grazing on the sprayed lands beginning March 1, 1974. Now, the ranch has won a stay of the decision from U.S. District Court Judge Ewing T. Kerr.

Kerr will review the decision but if he does not render an opinion before the grazing season begins in May, the Bureau of Land Management will have to issue a grazing license. The Diamond Ring is suing the Department of the Interior and the State Director of the Bureau of Land Management to have the decision against it set aside.

The Diamond Ring Ranch sprayed some 3,600 acres of public land with the chemical pesticide, 2, 4-D in 1971. The ranch had not received permission from the government agency charged with the management of the public lands — the Bureau of Land Management. The ranch claims that it is being deprived of the use of some of its private land by being denied grazing privileges on the large fenced pasture. The 21,000-acre pasture is 85% publicly owned land.

Officials Charge "Outright Lies"

Jackson, Wyoming, officials said they want a last ditch meeting with Interior Sec. Rogers C.B. Morton to counter the "outright lies" of some environmental groups about the proposed airport expansion in Grand Teton National Park.

The latest environmental charge came from the National Parks and Conservation Association. The group urged Morton to scrap plans for the 1,600-foot runway extension which would enable the airport to accommodate jets. "An airport inside a national park is an irreversible commitment of park resources and represents a misuse of park land space," wrote the groups president, Anthony Wayne Smith.

Bob LaLonde, airport manager, said that in 1971 about one million autos ran through the park spreading an estimated 5,500 tons of air pollutants. He said the airport contributed only an estimated 78 tons that year, and the 737 jet would add only 10 more tons a year on top of that figure. Testimony on the draft environmental impact statement brought out that about one per cent of the visitors to the park come by air, planes pollute more than cars per passenger-mile and planes consume more than twice as much energy as a car per passenger-mile.

Feeling the great public opposition to a jetport in Grand Teton, Jackson Mayor Lester May said, "We may have to give up in the end on the runway extension, but we still hope to get some of the safety improvements."

May and LaLonde hope to meet with Morton in the near future. A final decision from Morton is expected soon.

Vail Housing Challenged

Vail, Colorado, has been plagued with an employee housing shortage since it first entered the ski business over ten years ago. To resolve this problem, county officials adopted a master plan which called for one unit of employee housing for every 7.5 units of tourist and ski housing. This provision is now being challenged by two developers in the area.

The developers, Benchmark and Snow Lion II, are proposing 1,960 new units. A group of county residents are worried about the lack of low cost housing and the pollution potential of new developments. "It is public knowledge that some 500,000 gallons of raw sewage were dumped into Gore Creek (which runs through Vail) each day during the height of the ski season. What guarantee is there that this same destructive pollution will not take place near the Snow Lion II or Benchmark developments?" asked a spokesman for the citizens.

The Eagle County Commissioners have approved the developers' plans. The citizens hope to force the commissioners to rescind their favorable recommendation.

Horse Roundup Planned

A wild horse round up will take place this spring and summer on Bureau of Land Management (BLM). National Resource Lands in Nevada. BLM spokesmen say ranchers in Eureka and White Pine counties will be allowed to round up horses and burros until Aug. 30. Ranchers are allowed to lure the animals with feed, trap them by fencing off waters or catch them on horseback. Captured animals will be examined by BLM and state officials to determine which are privately owned and which are wild. Ranchers will have to pay trespass fees on all animals they own which were captured on federal land.

BLM says there may be as many as 20,000 horses and burros roaming on National Resource Lands in Nevada.

Wyoming Rep. Teno Roncalio has recommended that the Upper Green River in west-central Wyoming be dropped from the study of potential rivers for inclusion in the Wild and Scenic Rivers System. Local opposition, as well as opposition from the Wyoming Stock Growers Association, brought about the recommendation. Segments of three other Wyoming rivers will remain in an omnibus bill authorizing study of potential additions to the System. They are the Snake River, the Clarks Fork and the Sweetwater.

Briefly noted . . .

If the Pacific Northwest states are allowed to use DDT against the tussock moth, Montana may also ask for permission. A spokesman for U.S. Plywood Co. said the company would like to use DDT on three sites near Missoula to control the moths. The company is trying alternative control measures, but "we want to ask that Montana be placed on the list" of states in which the DDT ban may be lifted, said the representative.

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The U.S. Supreme Court has refused to hear an appeal in the Rainbow Bridge case. The action lets stand the ruling of the 10th Circuit Court of Appeals which permits filling Lake Powell to a height where water would enter Rainbow Bridge National Monument.

The case, brought to court by Friends of the Earth and other conservation groups, hinged on language in the 1956 Upper Colorado Project Act. The act barred construction of reservoirs in national parks and monuments. The conservation groups held this also prohibited Lake Powell water from entering Rainbow Bridge.

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The Sierra Club has won a preliminary injunction preventing wildcat oil drilling in the Escalante wilderness. The injunction stops Trans Delta Oil and Gas Company of Denver from drilling and construction and use of a road to the drilling site in Glen Canyon National Recreation Area.

No environmental impact statement had been prepared, nor was any public notice given even though Congress has mandated that the area be studied for possible wilderness designation.

Utah chapter leaders said the successful action "could never have been taken without the existence of the Sierra Club Legal Defense Fund and without the willingness of SCLDF lawyer Anthony Ruckel to rearrange his schedule and fly to Salt Lake City on 12 hours notice."

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A bill to open up Montana's five million acres of state leased land to general recreational use is meeting stiff opposition in the state legislature. Opposing the measure is a strong coalition of farmers, cattlemen and sheep growers who currently use the land. The bill, HB 568, would open up state lands leased for grazing or forestry "to recreational use of the general public at all times," except for safety reasons. There are more than 20,000 parcels of state land scattered in a checkerboard across Montana.

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Salt Lake City merchants are showing that adapting to the energy crisis and protecting the environment are not mutually exclusive. A cooperative plan between the Downtown Retail Merchants Association and the Utah Transit Authority will result in a downtown shopper getting a free return trip on the bus if he makes the minimum $5.00 purchase at a participating store. The program was designed to encourage shoppers to leave their cars at home and take the bus.

Thoughts from the Distaff Corner

by Marge Higley

It's funny, what a bit of rhyme and rhythm can do to put a point across. For instance, Dorothy Parker's comment on human behavior would hardly have been memorable had she merely stated that men are not attracted to bespectacled women. But her terse "Men seldom make passes at girls who wear glasses" has become a classic.

Conservationists often bemoan the fact that the importance of making a profit seems, for many, to overshadow the importance of protecting the environment. Two of our readers have commented on this fact, and I'd like to use this space to share their thoughts with you.

From Tohatchi, N. M., Richard Snearly has this to say about oil:

OIL

Across the land is greed for oil,
To suck the black ooze from the soil,
To sink a well beneath the rock,
That holds the precious black gold stock.

Texas to Utah, Alaska too,
Inland and offshore they drill for goo.
It's pumped from storage to ships out at sea,
And men of business seem to agree,
That oil is needed in vaster amounts,
A spill is hardly a matter that counts.

Drill on! Drill on! The voices all cry.
More pipe! More land! The profits are high.
On they drill ignoring our plea;
STOP! You know you're killing the sea.
The birds, the fish, the arthropods too,
Can't live in gook, and neither can you.

From Basin, Wyo., reader Laverne Rison speaks of her feelings about a river:

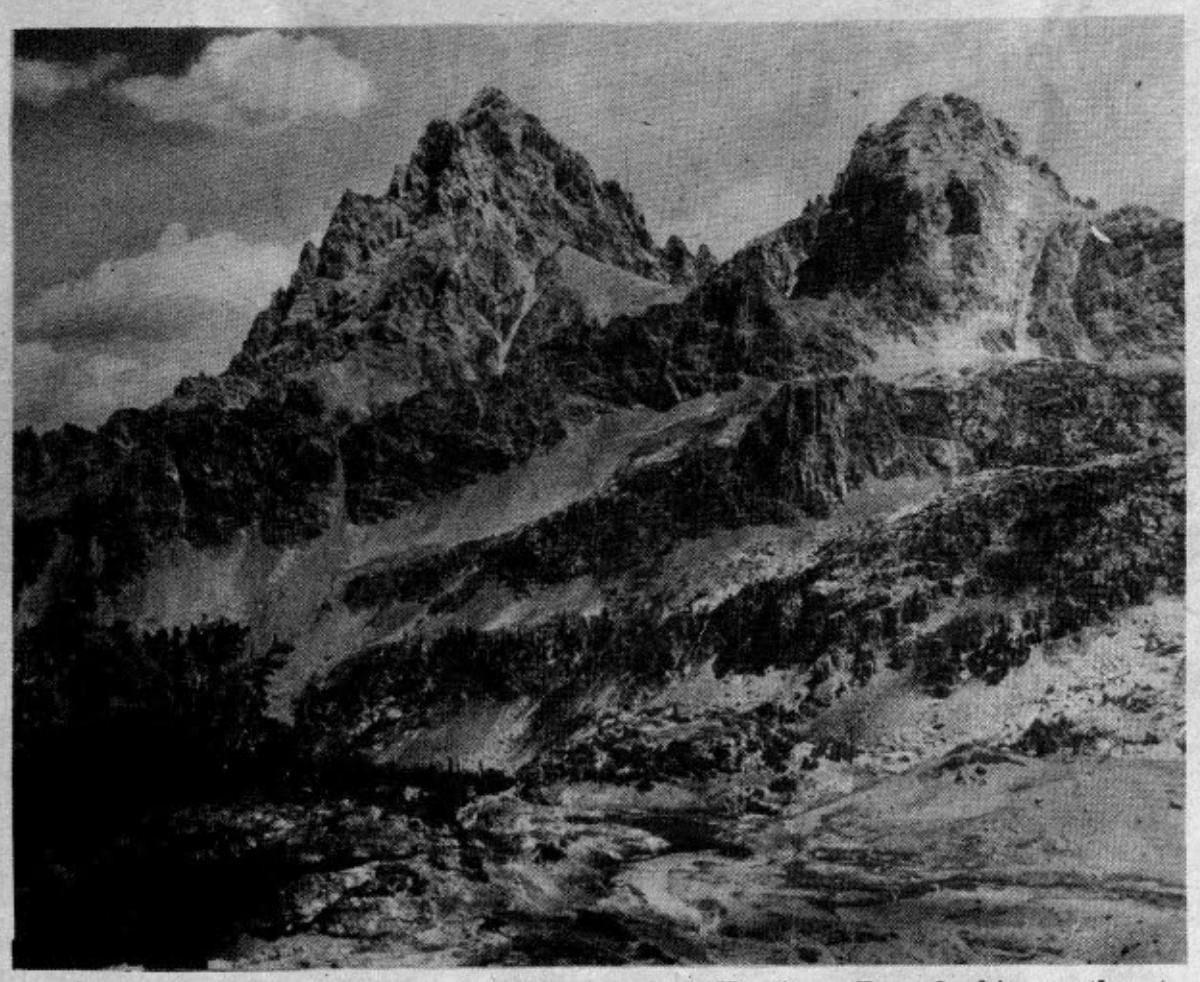
WHO NEEDS IT?

Go, babling brook.
Run down to the sea.
Carry this carrion
Down there for me.
Run, rushing river,
Race for the shore.
When you're done with that
You can carry some more.

Why sulk, sluggish water?
I don't ask a lot.
As long as you're on your way,
Why not be a sport
As you run for the port,
And carry our garbage away?
A little soil,
A little oil,
A boil upon your nose.
Hear tell you yell
About the smell. . .
Who promised you a rose?

Youth's all too fleeting.
Before we're aware,
Old age has caught up
And we are there.
Observe that old river:
So turgid, so dank. . .
It seems only yesterday
We swam and we drank
From that same old river.
Too soon we've grown old.
But who needs water,
When we can have gold?

Our thanks to Readers Snearly and Rison. No further comment is necessary — the words speak for themselves!



A sample of Teton back country. This view from Hurricane Pass, looking northeast, shows the head of the South Fork of Cascade Canyon in the foreground, the Grand Teton on the left and the Middle Teton on the right.

National Park Service Photograph

Book Review

Hiking in the Teton Backcountry

by Paul Lawrence, A Sierra Club Totebook, 208 pages, $4.95.

Review by Verne Huser

Paul Lawrence, who in 1970 discovered the true source of the Snake River in the Teton Wilderness, is an ideal person to write a guide book to the Teton backcountry. But he had some doubts about it. He didn't want to see his favorite wilderness overrun with too many people.

As he says in his preface, "It is not for everyone to hear what the wilderness has to say. If you are someone who needs wilderness, go to it soon. It may not be there much longer."

Then why write a book that is almost sure to bring more people into the backcountry of Grand Teton National Park, which is already becoming crowded with use during a short summer season? Why turn the elitist experience into the commonplace and create a situation that may tend to accelerate the disappearence of wilderness?

Perhaps to educate the public, to try to teach them how to use the area with care and avoid abusing it. Lawrence devotes several pages of his **Hiking the Teton Backcountry** to a discussion of the backcountry use regulations in force in Grand Teton National Park and adjacent national forests. He also has an excellent section on safety and a vital section on back country etiquette, perhaps as important as the regulations. He says that "a guide book is not a substitute for experience and common sense," but his text provides just about everything short of the hiker's common sense and the boots he wears. Lawrence talks of clothing and equipment, both of which may become major safety factors for ventures into the Teton back country if weather conditions turn against the hiker. And he deals with weather, maps, food and fishing — even gives the reader camera tips.

The first content chapter is "A Natural History of the Teton-Yellowstone Region," common to both this book and the Sierra Club's **Hiker's Guide to the Yellowstone Backcountry,** since the areas are so nearby and complement each other.

The meat of the book is "Trail Descriptions," which provides maps and trail information. There is also a section on connecting trails in adjacent Targhee National Forest and in Teton (now Bridger-Teton) National Forest. The **Guide** mentions many of the secondary trails maintained by climber use rather than by the Park Service, but Lawrence warns: "Do not attempt; check at Jenny Lake Ranger Station."

Having hiked most of the Teton trails myself, I find the description accurate and informative; the organization of the book logical and useful.

Appendices include backpacking recipes, campground and campsite information, fishing information, and several blank pages for field notes (not an oversight but rather a planned part of the book).

At this point I'm tempted to say: the weather's lousy, there may be grizzly bears, it's too cold at night and too hot and dusty during the day, the surface water may be contaminated, and all sorts of other things to discourage people from hiking the Teton backcountry — and all of them may be true.

Here's what Paul Lawrence says in the closing paragraph of his preface: "When Thoreau said 'In wildness is the preservation of the world,' he could not have forseen how quickly his words would become a desperate cry. In the very near future the battle will be won or lost. We cannot afford to remain uninvolved. The stakes are too high."

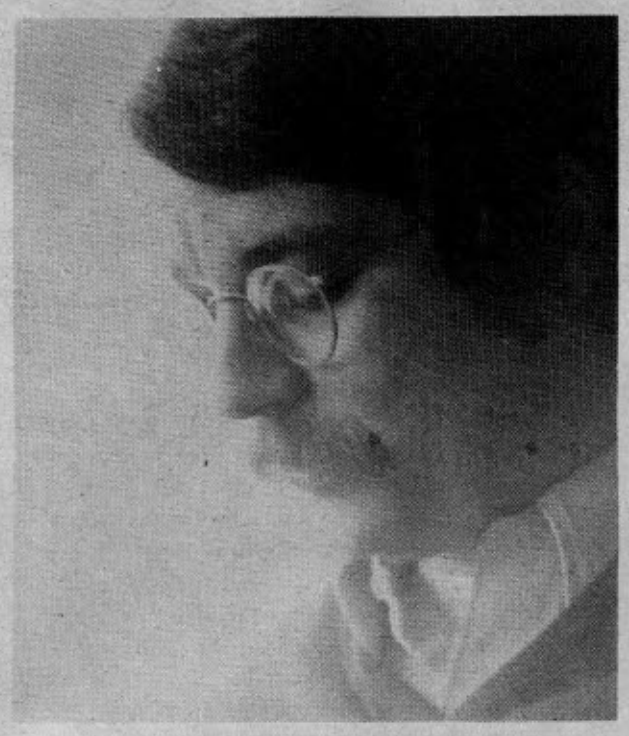
If I read Lawrence right, he wrote the book to get more people involved in the movement to preserve wild places. And he's not trying to bring in masses of people, large groups — even conservation groups — but rather to help individuals and two's and three's get to know the Teton backcountry better, understand it, and join in the on-going battle to keep the wild places wild. If that is his purpose — and I believe that it is — then I hope he succeeds. His book succeeds with me.

A CONSERVATION PORTRAIT:

Pat Sweeney and the Northern Plains Resource Council

The Northern Plains Resource Council (NPRC) was recently recognized as the outstanding citizen conservation organization of 1973 by the Rocky Mountain Center on Environment. The award was well deserved. NPRC has been largely responsible for alerting the populace of eastern Montana to the impacts of impending energy development. Consequently, eastern Montanans have expressed a resistance to uncontrolled strip mining that has earned national press coverage. NPRC's accomplishments are due in no small part to Pat Sweeney, staff member, newsletter writer, lobbyist, and occasional Washington representative.

In January, Sweeney spoke at the Farmers Union Western Regional Conference on Strip Mining held in Rapid City, S.D. **High Country News** interviewed Sweeney at the conference.



HCN — Can you give our readers some background on NPRC?

Sweeney — NPRC was set up as an organization in April, 1972, basically by Montana ranchers and farmers. The group met around an environmental communications conference that had set up a panel on strip mining in Billings. They decided at that time to get together as a group, rather than fighting as individuals, such issues as strip mining and power plants. There were people from the Bull Mountains, people from the Birney-Decker area, people from the Colstrip area and the Sarpy Basin — all with the same concerns about strip mining. But none of them had ever gotten together as a group to see if they could show a united front.

Until about Sept., 1972, NPRC was a fairly loose organization, but then they decided to file a lawsuit against Montana Power Co. over Colstrip Units 1 and 2. The suit was concerned with the lack of an impact statement and for not having proper permits from the state to construct a power plant.

At that time NPRC incorporated in order to file the lawsuit, and organized under a new set of bylaws with a board and a staff.

HCN — How large is the staff and the board?

Sweeney — We started with a four person staff and have enlarged it to its present size of eight full-time people and two part-time people. We have an 11 person board of directors — all ranchers and farmers from Montana with one rancher from Wyoming, from the Powder River Resource Council. Each board member represents an indigenuous grass-roots organization within a local area.

HCN — How does your funding work?

Sweeney — Our money comes mostly from memberships. We started out with just a five dollar membership but in the last year we have raised it to $10. A lot of that goes into publishing our newsletter, the **Plains Truth**, which we put out once a month. Last year we raised quite a bit of money and most of it has come just from the local area — individual donations to the council. We've also approached foundations, but because we are a lobbying group we cannot accept tax deductible donations for most activities. There are certain activities that we can accept deductible contributions for and we're working on that angle right now.

We are set up around 1) communications, 2) organization, 3) advocacy, and 4) research. Those are basically the functions of the council.

HCN — How did you become involved with NPRC?

Sweeney — I'm a native of Montana. I was born and raised in Billings and graduated from the University of Montana at Missoula in History and Political Science. After I graduated, I came back to Billings and got started working with the staff of NPRC.

I started out working with Dick Colberg, the vice-chairman of NPRC for the last year. Dick was running for the state legislature and had already won in the primary election. He wanted to run for the legislature because no one had made strip mining an issue at the state level. Dick decided that this issue had to be brought up in the legislature, and that one of the ways he could bring it up was to run for the state House of Representatives.

I got involved in Dick's campaign, involved in the strip mining issue, and involved with NPRC all at the same time. I've been with Northern Plains ever since.

HCN — The latest issue of the **Plains Truth** has a good deal of information on the impact of transmission lines, what is your concern about the lines?

Sweeney — If the energy companies are going to mine the coal in the Northern Plains and burn it in the Northern Plains, then just one of the consequences of doing that is long-distance, high-voltage transmission lines running out of the region to the load centers. In the case of Colstrip 3 and 4 they will be running the power from Colstrip all the way across Montana, 450 miles to the substation at Hot Springs, Mont., where it will tie into the Bonneville power system and then be shipped to Idaho and Washington. Colstrip 3 and 4 are 700 mw each and that will bring the total generating capacity of Colstrip to 2100 mw (units 1 and 2 are 350 mw each). Three quarters of that power is for out-of-state consumption. That means they need a maze of transmission lines.

We have been involved with transmission lines because many of the wheat farmers in Montana are upset with the possibility of having a 500 kv transmission line going across their property.

HCN — How would it affect their property?

Sweeney — There are several ways. First of all, from an environmental standpoint you have corona discharge and electrostatic leakage that are emitted from these lines. There is documented evidence of other 500 kv lines in the U.S. that have caused problems with people

(Continued on page 16)

Eavesdropper

LOONEY LIMERICKS

by Zane E. Cology

Said Senator Puffin to Citizen Stout,
"We need nuclear power, without a doubt.
Is it safe? Don't you worry —
We're in such a hurry
We may **never** have time to find out!"

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An Atomic Energy Commission researcher has found that rubber from discarded tires can be used to remove mercury from streams. The researcher, Edward L. Albenesius, grinds up old tires and installs them in a stream of processed water exiting from the plant. The tires are a natural source of sulfur. Sulfur and mercury merge together in an insoluble compound when exposed to each other.

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Researchers are working to forecast the effects of ocean pollution in the year 2000. They'll use microscopic sea life trapped in plastic underwater tubes as their guinea pigs. The organisms will be fed small doses of heavy metals, pesticides and petroleum hydrocarbons over long periods of observation. The study is funded by the National Science Foundation and includes teams working in the U.S., Great Britain and Canada.

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Population growth is "the greatest problem" to humanity, and the United States should lead a worldwide drive to limit the number of earth's inhabitants, says the new head of the Council on Environmental Quality. The council head, Russell W. Peterson, added "The protein shortage is of crisis proportions and ranks well ahead of the oil crisis in many countries." Peterson made the comments at a conference sponsored by the National Science Foundation.

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Daylight savings time has made moose a problem in Jackson, Wyo. School superintendent J.W. Wimberly worried that students might meet up with wandering moose while waiting in darkness for their morning busses. He's avoiding conflicts by starting the schools one-half hour later than usual.

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Caribbean skies have taken on the hazy conditions of an industrialized area as a result of dust blowing from Africa. Hot, desert winds blowing across the drought-stricken continent are carrying large quantities of topsoil out across the Atlantic Ocean. Research indicates the dust may be affecting tropical weather.

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Research done for the Navy between Dec., 1968, and May, 1969, indicated the air over California "is rapidly being converted to an atmospheric cesspool." In the words of the report to the Navy, "The increase in particulate concentration is serious, not only from the viewpoint of atmospheric physics, but just as importantly from the viewpoints of public health, agricultural modifications, and human behavior."

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Phosphorus removal may be made easier by a process that substitutes natural biological activity for much of the "brute force" required by other methods. The process, called PhoStrip, removed 91% of the total phosphorus from sewage in a full-scale installation at Seneca Falls, N.Y. Micro-organisms are already active in sewage. The process makes the microbes "latch onto" the phosphorus.

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The National Aeronautics and Space Administration (NASA) is funding research on a hydrogen-fueled car that is practically pollution free. The experiment involves the use of a conventional internal combustion engine with a different fuel mixture — a combination of hydrogen gas and atomized gasoline.

Pat Sweeney . . .

(Continued from page 15)

who live under or near the lines from shocks, ozone crop damage, and things of this nature.

The second aspect is the most obvious — the visual impact. Here we are talking about towers over 100 feet tall with a 40 foot base. Two of them run side-by-side in a corridor 300-400 feet wide.

Then there is the question of property value. The lines lower your property value. Weeds under towers concern many of the wheat farmers. If you have a large steel tower in the middle of your field, weeds and running farm machinery can be a problem.

The other thing is that once you allow the corridor to be established, the possibility of Colstrip units 5,6,7 and 8 means that you may be faced with an even larger corridor in the future.

It's kind of like once you permit a dirt road through your land you have the potentiality of a two-lane highway. And then these days you have the potentiality of a four-lane interstate. Lord knows, 10 years from now it may be a six-lane interstate.

It's the same kind of thing with transmission lines. Right now they're only talking about two 500 kv lines. But the Energy Planning Dep. of the Dept. of Natural Resources has seen internal memos from the Bonneville Power Administration which show five and six 500 kv lines at Hot Springs, meaning that there may be that many lines from Colstrip to Hot Springs. They are planning a big energy park at Colstrip. Even gasification plants. I've heard talk about maybe 5,000 mw there someday.

HCN — What power does a landowner have to stop a transmission line?

Sweeney — I should point out that Montana Power Company (the firm behind Colstrip) has been threatening landowners with condemnation through eminent domain. The question we have raised is whether the power company can use the power of eminent domain before it has a permit to build the lines.

The lines are governed by the Utility Siting Act which says that you cannot construct a line until you have a permit from the state government and Montana Power will not have a permit, if they get one at all, before this summer or next fall.

HCN — Once they have a permit, do they have the power to condemn land?

Sweeney — I think there is no question, yes they do have the power of eminent domain then. But right now they don't have a permit and so we feel they can't threaten condemnation to gain an easement. What we are talking about under the Utility Siting Act is looking at all the alternatives for rights of way. For a power company to be going out and acquiring easements for a particular right of way means we aren't assessing all the alternatives.

We have a letter that the power company sent to a landowner in Yellowstone County definitely threatening condemnation. We have written the Dept. of Natural Resources and the Attorney General for an opinion to see if this action is legal. The decision is pending.

HCN — What is the NPRC policy on power generation and transmission?

Sweeney — We are on record as an organization against energy conversion facilities within the state of Montana whenever the power is not used by the citizens of Montana.

HCN — Would all future facilities be designed for out-of-state power?

Sweeney — Montana is a net exporter of power. The state uses only 970 mw through production and purchase power in the Bonneville system. The Northern Plains region as a whole exports 49-52% of the power it produces.

HCN — Then what is your position concerning Colstrip 3 and 4?

Sweeney — We would like to see them denied a permit on the grounds that the energy is being used for out-of-state consumption. If the need in the near future is for coal, then they ought to ship the coal out to Seattle and burn it there. They are using our water — tremendous amounts, consumptively used. The air pollution from 2,100 mw of coal-fired power plants will rival the Four Corners area. As far as Montana consumers go, we're bearing a tremendous cost for few benefits. Our membership is basically farmers and ranchers that want to continue their way of life without competing with energy companies.

HCN — What do you see as the best way to try and control development?

Sweeney — I think the biggest immediate thing that we would like to see done is an overall assessment of the whole coal development picture. We are involved with the Sierra Club in a lawsuit because there has never been an assessment of the overall impacts or any rational comprehensive planning by states or the federal government. It's been piecemeal planning all the way.

HCN — I understand that the Bureau of Land Management has been working on such an impact statement. If it is adequate, would the lawsuit be settled out of court?

> **Water controls all activity in this semiarid region, and the industrial future of the Fort Union coal fields is no exception because coal-based development requires enormous quantities of water for cooling and conversion.**
> **Montana Coal Task Force**
> **January, 1973**

Sweeney — It won't be settled out of court in the sense that we're asking for an injunction against federal decisions that have been made or will be made between now and when the overall statement is done. Let me name a few...

One is the decision whether Westmoreland Resources gets a permit. They have filed an application for a permit with the Bureau of Indian Affairs to mine in the Sarpy Basin. The draft environmental statement has been filed and the final statement could be published at any time. We're looking for a decision by the BIA on whether to give Westmoreland a permit any day. Well this is a federal decision taking place in the region right now without an overall assessment of the impacts of coal development on the region.

Other decisions involve water. Energy companies have already been granted permits for thousands of acre-feet of water out of reservoirs in Wyoming and Montana for coal development. These decisions were also made without discussing the impacts of the diversion or the overall development that the diversions might be part of.

HCN — How does NPRC feel about the Mansfield Amendment?

Sweeney — We have been active since the very beginning and are on record completely supporting the Mansfield Amendment. We feel it is the only vehicle that will truly protect agriculture on the Northern Plains by withdrawing the federal mineral from strip mining when it is over private surface.

Many people have maligned the amendment because they say it takes away a surface owners' right to sell his surface for strip mining. Some say this is depriving him of a property right. We disagree.

The analogy has been made by Anne Charter from the Bull Mountains that if you have timber on your property and for some reason you want to get rid of your timber, you're not allowed to start a forest fire. That action could lead to destruction of your neighbor's property. Well the same holds true for strip mining. You just can't go out and strip mine your surface with the idea that it's not going to affect your neighbor's surface. You may destroy his ground water and render his whole piece of property useless.

HCN — How do you feel about taxing coal and then letting coal companies write off certain costs against the tax, like reclamation?

Sweeney — It remains to be seen as to how much the operators are going to attempt to write off legitimately. In Montana, with our Net Proceeds Tax, there is a provision that allows the operator to have credits for reclamation. The tendency is for the operators to find as many gimmicks as they can to write off. In fact, Peabody Coal at the Big Sky Mine is claiming $6,500 an acre for reclamation. If you ever go there you'll see it doesn't look like they've spent $20 an acre, because they haven't gotten a thing to grow there.

HCN — What do you see in the future for NPRC and Montana coal development?

Sweeney — As far as Montana goes, we're at a crucial turning point. I think the next six months to two years is going to be crucial for Montana and the whole region. The reason I say that is because in Montana we only have about 36,000 acres under federal lease. The federal government has temporarily frozen leasing. But the government is developing a new coal leasing program that they want to start in July. EMARS (Energy Minerals Allocation Recommendation System) is a five year leasing program being developed by the Interior Department. If this program starts on schedule in July we're going to see the beginning of a real full-scale development. So far Montana has had little announced development compared to Wyoming and North Dakota because of our fairly good laws. But if EMARS goes into effect you're going to see Montana opened up to long range massive development.

NPRC at this point is going to be concentrating on slowing down or stopping the rate of federal leasing in the whole Northern Plains area. This is a crux issue because once the federal government gives up its option on the coal then they've turned over the options to the energy companies and that's something that is going to be coming too soon. —B.H.

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