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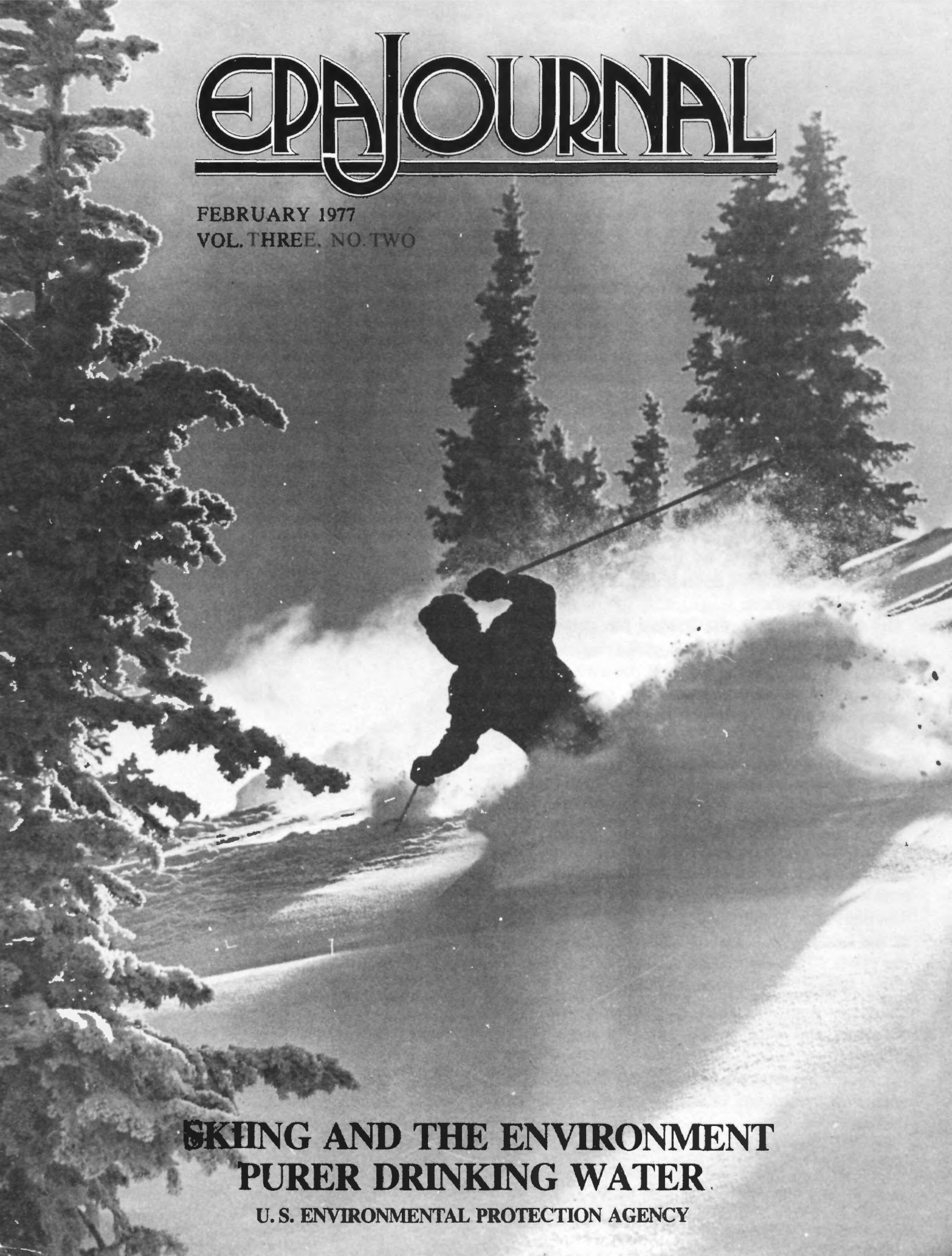


SKIING AND THE ENVIRONMENT
PURER DRINKING WATER

U. S. ENVIRONMENTAL PROTECTION AGENCY

THE GLOBAL QUEST FOR SAFE DRINKING WATER

In the United States and in other countries over the globe the effort to provide improved drinking water for people is being intensified. In this country industrialization and the development of thousands of new chemicals have required the development of improved technology to assure safe drinking water.

And countries around the world are striving to reduce waterborne diseases which kill an estimated 25,000 people daily.

These efforts are reviewed in this issue of EPA Journal. Also included are a report on the guidance provided to EPA by the National Drinking Water Council and an assessment of the value of home water purifiers.

On another subject, the Journal has a thoughtful article by John Jerome, a contributing editor of Skiing Magazine, on skiing and the environment.

One of the troublesome problems confronting an agency like EPA is guarding the safety of employees who handle dangerous substances in the Agency's laboratories. A report on steps being taken to improve laboratory safety conditions is given by Alvin L. Alm, former Assistant Administrator for Planning and Management, in an interview.

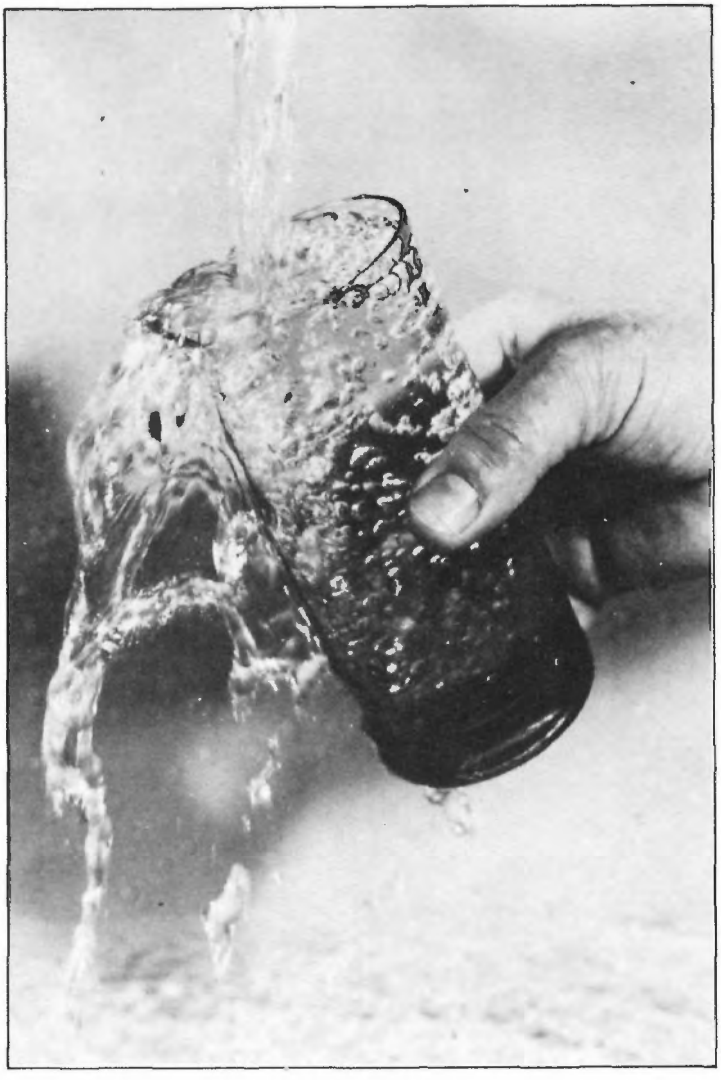
Two nuclear explosions in China last fall aroused public interest in EPA's nationwide radioactivity monitoring system. An article in the Journal describes this system and gives EPA's evaluation of the health effects in this country of fallout from the blasts.

Other subjects in this issue include:

Environmental Almanac—a glimpse of the world of nature and what is happening to some of our pine trees.

A report on improvements in air quality and a decline in the amount of wastes being dumped into the ocean.

An account of efforts being made by EPA researchers to help reduce the amount of salt used to help clear highways of ice and snow.



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COVER: Skier sends snow flying in Aspen, Colo.

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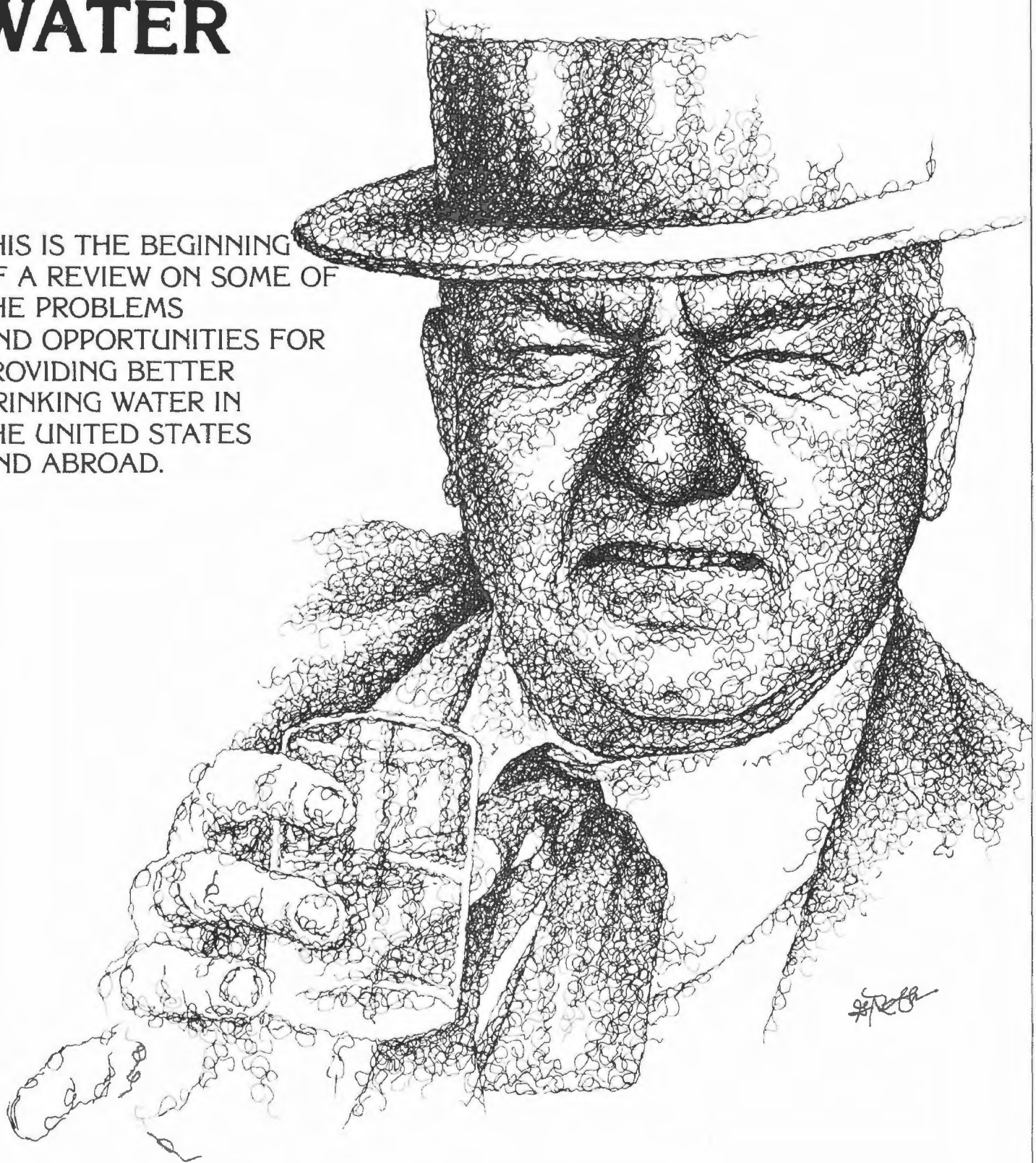
ARTICLES

DEPARTMENTS

YOUR DRINKING WATER

THIS IS THE BEGINNING OF A REVIEW ON SOME OF THE PROBLEMS AND OPPORTUNITIES FOR PROVIDING BETTER DRINKING WATER IN THE UNITED STATES AND ABROAD.



PURER DRINKING WATER

KEEPING YOUR WATER SAFE

An interview with Dr. Andrew W. Breidenbach, Assistant Administrator for Water and Hazardous Materials.

Q. Is our drinking water safe?

A. Generally speaking, yes. There are still about 4,000 instances of water-related illnesses reported each year, related to microbiological contamination. But you have to remember that the means for assessing how many people get sick because of poor water supply aren't as developed as we would like. Separating illnesses caused by water supply from those caused by breathing, food intake, or other sources is a difficult problem. We do know that the water that Americans drink is generally good. It compares most favorably with water supplies in other countries, as well.

Q. Why did Congress pass the Safe Drinking Water Act?

A. Congress and many others were concerned about deficiencies in existing systems and about the long-term effects of small quantities of organics and other contaminants in drinking water, some of which are suspected carcinogens.

Q. Why aren't the procedures which were used before passage of the Safe Drinking Water Act adequate to ensure public health?

A. Looking back over the last 25 years, you can see what has happened to our country, how much industrialization we've gone through, the number of organic chemicals which have been synthesized and brought into our society for use in very beneficial ways. You can see how the water treatment procedures that were established in an earlier time period can be very easily outdated, and become candidates for updating to the technology required to cope with today's contamination.

But for the most part, existing procedures will be used to solve today's problems. The Safe Drinking Water Act provides the incentive to apply such procedures as effectively as possible, while also providing for research into the need for and application of new technology.

Q. What does the Safe Drinking Water Act require?

A. Essentially it sets up two programs, the public water supervision program and the protection of underground sources of drinking water. The public water supervision program will focus on quality of water at the tap through the application of the contaminant limits of the Interim Primary Drinking Water Regulations. Later there will be Revised Drinking Water Regulations, to be based on a major National Academy of Sciences study of the health effects of the contaminants we were talking about earlier.

Q. What is the difference between the primary regulations and the secondary regulations mentioned in the Act?

A. Primary Regulations, which go into effect this June, prescribe monitoring procedures and maximum concentrations for contaminants that are health related. They have to do with controlling arsenic, barium, cadmium, chromium, lead, mercury, nitrates, silver, radioactivity, and other contaminants where we have information that these substances cause adverse effects on human health. In addition to that we have set standards for coliform bacteria which are an indication of fecal pollution from mammals in the water.

The Secondary Regulations are concerned with aesthetic factors such as taste, odor, and color. Since these are clearly secondary to public health concerns, they will not be mandatory Federal regulations. However, we anticipate that a number of States will adopt them as mandatory. They are important factors in the public acceptance of drinking water supplies.

Q. Whom will these regulations cover?

A. All community water systems regularly serving 15 or more customers or 25 or more people. Additionally, non-community supplies such as trailer camps, parks and recreation sites, roadside motels, and so on are also covered.

Q. How many water suppliers are there in America and how many will not be able to meet the standards?

A. There are about 40 to 50 thousand systems serving residential communities and perhaps 200 thousand smaller systems that serve non-residential systems. And as far as how many are not going to be able to meet the standards, that is very difficult to predict. With the advent of the monitoring program established under the Primary Regulations, we will begin to get an answer in the next year or so.

Q. When will the public see implementation of the new regulations?

A. The Interim Primary Drinking Water Regulations become effective in June of this year. States and water suppliers are immediately involved but the public probably won't see the effects of the program until problems are uncovered.

Q. How will the public know?

A. The Act requires a supplier to notify his customers when contaminant limits have been exceeded. On that notice, the supplier of the water will, in addition to saying what contaminant limits have been exceeded, explain the significance of the problem and also what he is doing to ameliorate that condition. If customers are aware of the problem, they are going to have the tendency to support the changes in treatment that will be required. Knowledge by the consumer of what he is buying and what he is drinking is a very important keystone in getting the support that that water supplier needs to make such changes. Incidentally, suppliers will also be required to notify their customers if they fail to monitor their water according to the schedules set forth in the regulations.

Q. Who is going to see to it that water suppliers adhere to the regulations?

A. The Act is a "shared Act." Any State that wishes to accept the responsibility for the Safe Drinking Water Program as the Federal Government defines it in its regulations can apply. This also makes them eligible for grants to help with the cost of exercising "primary enforcement responsibility" or "primacy" as it is called. Following the intent of Congress, our goal is to have all States accept primacy. We feel that is the best organizational

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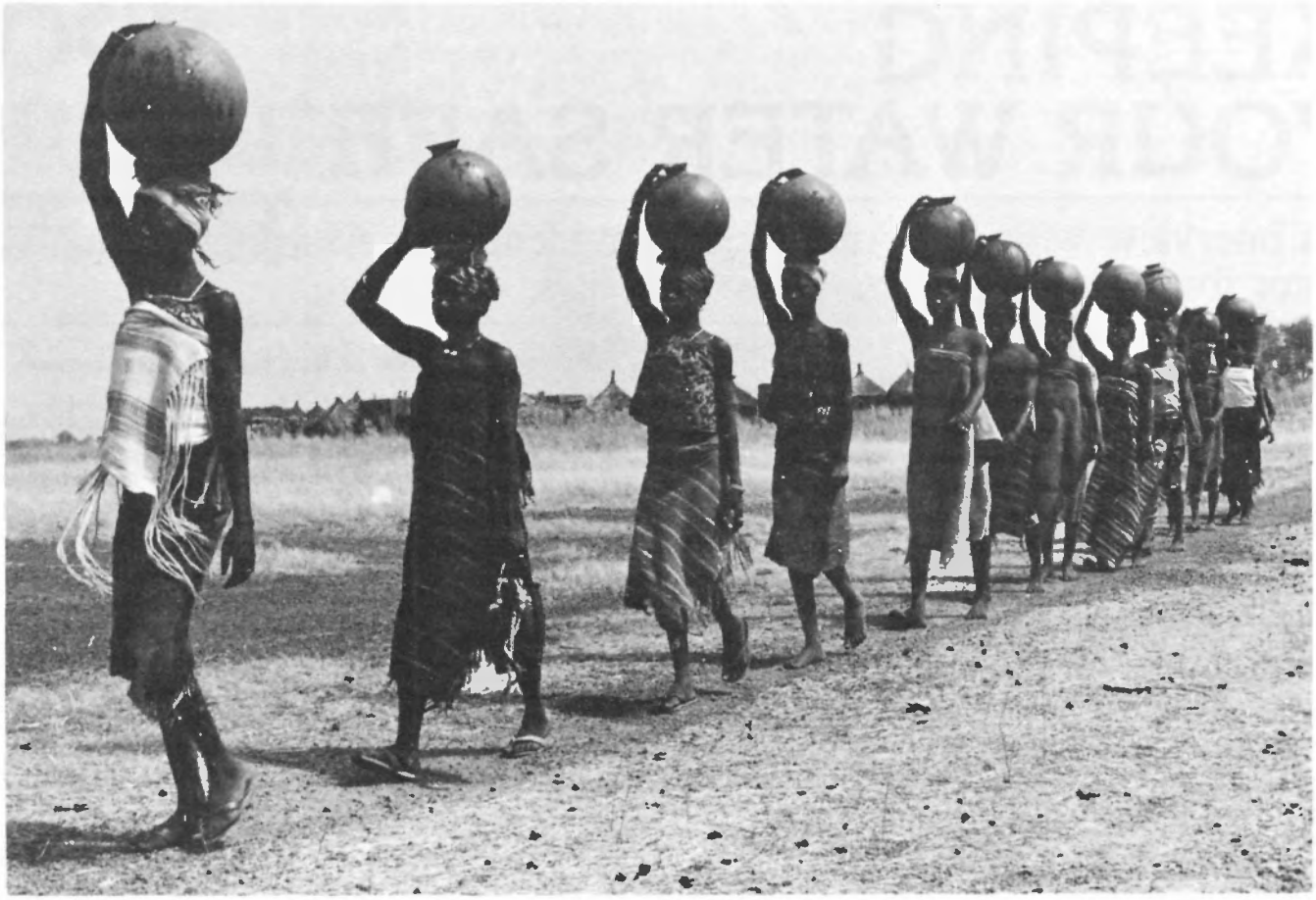


". . . the provision of adequate supplies of safe water has been termed the most important single factor for improving the well-being of the world's poor majority. Something like 40 percent of the human race does not have adequate access to safe water. Waterborne diseases are estimated to kill more than 25,000 people daily. Schistosomiasis and filariasis, the world's largest cause of blindness, affect—according to one estimate—some 450 million people in more than 70 nations. There are, [economist] Barbara Ward has said, cities in the developing world where 60 percent of the children born die of infantile gastritis before they are five. These and other waterborne diseases . . . are the main cause of infant mortality in the developing countries and, together with malnutrition, the main cause of low adult resistance to disease and early death."

Excerpted from remarks by former EPA Administrator Russell E. Train delivered before the Los Angeles World Affairs Forum, December 16, 1976.

From a nomads' camp in the northern desert of Africa, a woman leaves her tent. She carries with her an earthen jar, balanced on her head. When she finally reaches the small, mud-banked well, she must wait patiently while the other women fill their containers from the only source of water within hundreds of square miles. They know that the water will quench their thirst. They do not know that the water may contain disease-producing bacteria.

Ironically, the same water that is essential for sustaining life can also serve as an important agent for the transmission of cholera, typhoid, amebic dysentery, infectious hepatitis, and many other diseases. Lice, mites, and skin diseases spread when there is not enough bathing water. The use of common cooking and eating utensils without adequate cleansing also contributes to illness.

In parts of many developing countries, people have to purchase water from vendors or take untreated water from ponds and ditches, where it is often contaminated. A *1975* World Health Organization (WHO) study of developing nations showed that 23 percent of the urban population does not have access to public water systems within 200 meters of their homes—a distance of nearly two football fields. Over half of the remaining 77 percent receive water which is frequently contaminated. Of the rural population, 78 percent spend a "disproportionate" part of the day fetching water. (Of the remaining 22 percent of the rural population, little is known about the quality or quantity of their drinking water supplies).

It is usually the poor, both urban and rural, who suffer from such conditions. And in some cultures, the burden of hauling water falls disproportionately upon women.

Action on the problem of unsafe drinking water in developing countries around the world was recently taken at the U.N. Conference on Human Settlements in Vancouver. In the summer of 1976, the Vancouver conference produced a series of resolutions calling for a safe water supply in every settlement in the world by 1990 and recommended that this matter be discussed at the U.N. Conference on Water Resources to be held in Mar del Plata, Argentina in March 1977. The U.S. delegation strongly endorsed these recommendations.

Victor J. Kimm, EPA's Deputy Assistant Administrator for Water Supply, was given the responsibility of heading a task force on that subject. As a result, Mr. Kimm's group, the U.S. Task Force on Domestic Water, has written a paper entitled "Meeting Domestic Water Requirements of Developing Countries" which has been submitted to the U.N. Secretariat as a U.S. contribution for the Argentine conference.

The U.S. task force included experts and representatives from the Agency for

QUENCHING THE WORLD'S THIRST

International Development (AID); the Department of Housing and Urban Development; the Department of Health, Education and Welfare; as well as non-governmental organizations including the International Institute of Environment and Resources for the Future; and the Bolton Institute.

"The drinking water problems facing developing nations are huge, but they are impossible to ignore," Mr. Kimm said. "For instance, the Pan American Health Organization examined the deaths of 35,095 Latin American children—all under five years of age—in a recent study. The results indicated that the major underlying cause of death in 29 percent of those cases was diarrheal disease. That affliction is closely related to contaminated drinking water."

Normally, Mr. Kimm's responsibilities involve the administration of the Safe Drinking Water Act of 1974, which established a program to improve the quality of drinking water in the United States. But his understanding of water supply problems in the developing nations is not academic. Between 1962 and 1966 he was engaged in planning and implementing a variety of development projects in Latin America.

"Our task force faced a difficult problem in trying to generalize about the worldwide water supply problems of developing nations." Mr. Kimm said. "Our ability to understand the magnitude of the problem is severely limited due to the lack of consistent data, although persistent problems can be seen.

"Water supply improvements are not one-shot capital investments; they must be properly operated and maintained if the desired benefits are to be achieved. Similarly basic sanitation facilities must be installed and operated to protect water supply improvements.

"These requirements for ongoing operations require the creation of stable institutions, ongoing funding, and managerial and technical skills which are serious problems in industrialized nations and even more difficult problems for developing nations.

"Since much of the unserved worldwide population is among the very poor, each nation must deal with the questions of subsidizing some of the costs for those who can't pay full user charges. Since developing nations have limited capabilities to subsidize all types of development projects, they face very difficult allocation choices, and water supply activities must get into each nation's overall development priorities.

"However, the availability of adequate quantities of good quality water is a prime prerequisite for many types of economic developments and can contribute to quality and productivity of the labor forces. Happily, almost all developing nations have programs in water supply and related sanitation. Judging from available figures, the developing nations currently spend about $2.7 billion annually toward this goal of which about 15% comes from international sources as well as associated technical assistance.

"If current expectations for individual service connections are extended into the future a 15-year program to provide reasonable access to safe water for all human settlements by 1990 could cost $50-$100 billion; which is two to three times current investment levels.

"However, these huge figures should not mask the fact that millions of people could be provided more healthful water supplies through modest increases in international assistance and more efficient utilization of existing resources."

Mr. Kimm's task force has advised that the U.N. Conference recommend the following measures:

- That all countries recognize that reasonable access to safe and adequate drinking water is a fundamental right of all people.
- That all nations include realistic and specific goals for expanding and upgrading water supplies and related sanitation within their national development priorities.
- That all international assistance programs give added priority to training, technical assistance and funding water supply improvements as part of broader urban and rural development projects.

The task group is also working with the Agency for International Development to develop more specific U.S. commitments which might be put forth at the conference should the new Administration choose to do so.

The paper which Mr. Kimm's task force submitted on behalf of the United States does strike a hopeful chord: "Although the task is enormous, significant improvements can be made in the provision of safe drinking water to millions of people through more efficient utilization of existing resources, increased financial support, more local participation in planning such improvements and better application of technology which is appropriate to the place of application. Toward this end, the United States will continue to provide financial and technical assistance through the Agency for International Development." The U.S. international assistance program has already provided about $1 billion directly for water supply and sanitation activities. It is anticipated that AID will commit $275 million to such projects between July 1, 1975, and September 30, 1978. ■

A COUNCIL'S ADVICE

On February 26, 1975, Russell E. Train, then EPA Administrator, addressed the first meeting of the National Drinking Water Advisory Council. His directive was firm: "Your Charter calls, among other things, for practical and independent advice. . . If you are not independent, then there is no point in having you."

To date, there is ample evidence that the Council has followed that instruction. For instance the *National Journal* reported last summer that ". . . EPA has been praised by officials in government and industry for what they perceive as its unique reliance on its 15-member National Drinking Water Advisory Council in drafting standards and regulations. . . They maintain that the relationship between the agency and the council has broken the usual rubber-stamp role of most Federal advisory boards."

With the passage of the Safe Drinking Water Act on December 16, 1974, Congress created the Council and required the EPA Administrator to appoint its membership. The Act states that in proposing and promulgating regulations for safe drinking water activities, EPA must consult with the Council. This means, for example, that the Council's actions can assist EPA in developing new safe drinking water regulations. The first standards under this act for ensuring a high quality of drinking water for all Americans go into effect in June. Also, the Administrator must consult with the Council before awarding any demonstration grants to determine if the project will serve a useful purpose to improve safe water for the public for drinking.

Since its inception, the Council's chairman has been Charles C. Johnson, often referred to simply as "C.C." by friends and colleagues. Mr. Johnson was recommended as chairman by the Council members. His interest in safe drinking water and public health is long standing. He entered the U.S. Public Health Service in 1947 as a second lieutenant, working his way up to Administrator for the Consumer Protection and Environmental Health Service. Mr. Johnson retired in 1971 as Assistant Surgeon General. He is currently the Washington, D.C. resident manager for Malcolm Pirnie, Inc., a consulting engineering firm.

"Everybody on the Council, and I wouldn't have it any other way, is willing to speak their part," Mr. Johnson explained.

C.C. Johnson

"I think we are 15 very capable people who are active in our own professional areas and interested in sharing our capabilities and experiences with EPA. We actively get involved, using a lot of voluntary time to acquire information which is brought to Council meetings for discussions. Anything less than this level of commitment would soon produce a dormant Council.

"If our meetings produce a consensus, we pass our proposals on to the Administrator. A substantial amount of those recommendations have been incorporated into the activities and actions of the program people.

"The Council has won far more than it has lost in terms of a 'yes' or 'no' response. Our recommendations are in the 70 to 75 percent area of acceptance. And we are satisfied with that on the whole. After all, if we knew everything, we'd be EPA and EPA would be the Advisory Council."

Several specific examples can be cited where Council activities and recommendations have contributed to the shaping of EPA's safe drinking water activities. One such area has been in public communications activities, which appeared to the Council to be limited in scope. Based upon the Council's concerns and recommendations, EPA developed a water supply public affairs strategy, began developing brochures and other informational items concerning safe drinking water, and is in the process of developing a documentary film for public television.

Concerning the review of regulations, the Council examined EPA's proposed primary standards in detail and recommended specific actions to be taken.

The Council meets about every other month, and all meetings are opened to the public. "The fact that our meetings are open adds a certain special flavor," Mr. Johnson said. "I don't think that all government advisory groups have always been open to the public. There is also a strong view among the Council that we need to meet outside of Washington, D.C. periodically so that we get different viewpoints.

The Act provides that five Council members be appointed from the general public, five from State and local agencies which are concerned with public water supply and hygiene, and five from representatives of private organizations or groups demonstrating an active interest in the field of water hygiene and public water. The term of membership is three years, although the Act prescribes that the initial appointments be set up on a staggered basis (five members serving for one year, five for two years, and five for three years.)

For additional information on the activities of the Council, write Patrick Tobin, Executive Secretary for the National Drinking Water Advisory Council, Office of Water Supply (WH–550), Environmental Protection Agency, 401 M Street, S.W., Washington, D. C. 20460. ■

UNDERGROUND WATER

The Nation's biggest potential supply of drinking water is not its rivers, lakes, and reservoirs. It is water in the ground, often overlooked by the public and largely unused.

The U.S. Geological Survey estimates that 220 trillion cubic meters of drinkable water lie within a few thousand feet of the surface of the 50 States. In a more common measure of water volume, the acre-foot (enough water to cover an acre of ground to the depth of one foot), the Nation's ground water totals 180 billion acre-feet. That would fill a tank as big as Lake Superior to a depth of 8,872 feet, or more than a mile and a half.

This would be enough to supply our needs for several hundred years at current rates of withdrawal, says M.S. Bedinger, Survey hydrologist.

Four out of every five gallons of water now used in the United States come from surface sources: rivers, lakes, and reservoirs. Only one gallon comes from wells or springs, although they supply about half the population with water for drinking and domestic purposes. Industrial and commercial uses account for most of the consumption of surface water.

The ground water supply is widespread as well as enormous. At almost any point in the Nation ground water may be tapped for single-family use. One-third of the country has ground water enough to supply 100,000 gallons per day to an individual well.

Fresh water has been found in rock formations of the continental shelf as much as 60 miles off the coast in some areas. However, the converse also occurs, with saline water under many areas inland. Fresh and salt water often occur in the same area at different levels.

In the Southwest and the High Plains country, where surface supplies are scarce or highly seasonal, ground water is widely used, for municipal supplies, for irrigated farming, and for the operation of mines, smelters, and other industries. California pumps more than 18 billion gallons per day from wells and Texas more than 6.2 billion, compared to 2.6 billion for the Mid-Atlantic region and 640 million for New England.

In arid regions ground water can mean the difference between life and death, as many a Western ballad recounts.

Even in the well-watered Eastern, Southern and Central States, government planners

are becoming more interested in ground-water development as the cost of treating surface water increases and land for new reservoirs and their protected watersheds gets scarcer and more expensive.

EPA's Office of Water Supply is well aware of ground water as a potential resource that will undoubtedly be more widely developed soon. Although the Office's most pressing task is to set nationwide drinking water standards and encourage States to carry them out, it is also required by the Safe Drinking Water Act to take steps to protect the Nation's ground water.

The Office's Ground Water Protection Branch, headed by Thomas E. Belk, is concerned with guarding ground water from contamination by industrial wastes, salt water intrusion, and injection practices that could affect its purity and availability. Regulations have been proposed establishing minimum requirements for State programs to assure this protection.

Ground-water supplies are known as "aquifers," distinct geological strata that contain water. When a shaft is dug or drilled into an aquifer, water flows into it from the surrounding earth or rock and can be pumped to the surface. In some cases water in the aquifer is under enough natural pressure to spout without pumping; such a well is called artesian, after Artois, a region in northern France where many up-flowing wells were drilled in the 18th century.

Where are the aquifers? How much water do they hold? How is water withdrawn from them replaced?

Such questions are easy to answer for surface waters that can be seen and readily measured. For aquifers the answers are harder to get, but hydrologists (geologists who specialize in water studies) can define the boundaries of an aquifer and estimate its storage capacity and flow rate with considerable accuracy, although the measurements are indirect.

Information about the earth and rock formations under the land surface, test drillings, data from existing wells, and laboratory tests all contribute to the hydrologist's knowledge of the aquifer.

Some southwestern States have strict regulations to prevent oil and gas wells from contaminating the aquifers: oil wells must be sealed off from the aquifers they penetrate, and close monitoring is required to spot and promptly repair any leaks. The injection of water, brine, or gas into an oilfield to spur production can be done only with careful safeguards to protect aquifers from harm.

One of the best-known aquifers in the country is the Edwards limestone formation in south central Texas. It contains about three million acre-feet of high-grade water flowing slowly southeastward under the City of San Antonio. Rainfall on its northern outcrop and drainage from higher land recharge it, chiefly in the winter months. More than one million people depend on it for drinking water. The aquifer discharges water along its southern and eastern edges through springs and local streams that maintain their flow even in the dry season.

EPA last year declared the Edwards Underground Reservoir as the sole source of drinking water for the area. This action under the Safe Drinking Water Act brings the Reservoir under Federal, as well as State and local, protection rules. No Federal aid may be given for any project that EPA determines might contaminate the Edwards Reservoir.

Almost everything men do affects ground water. The spread of cities, with their impermeable streets, buildings, and parking lots, reduces the natural surface recharge. On the other hand, water- and sewer-pipe leaks, cesspools, and septic tank fields tend to increase the recharge, but not always with water of desirable quality. The practice of deliberate recharge, pumping excess water and treated wastewater into the ground instead of letting it drain to a stream, is being tried in many areas where ground water levels are declining.

The great volume and extent of the ground water resource make it a factor in all planning for the improvement and control of the environment. Under the Safe Drinking Water Act, EPA is acting to protect this vital resource. ■

ARE WATER PURIFIERS WORTHWHILE?

John Harrison's morning coffee didn't taste good. His evening highball didn't seem quite right either. And his mother-in-law, in from the country on a visit, was complaining again about the city water.

"All that chlorine, ugh!" she said. "Water's not like that up at the farm."

Wasn't there something in the papers recently about chemicals in drinking water? Organics, some suspected of causing cancer? Tiny amounts, nothing to be alarmed about, but the authorities were looking into it.

Then Mr. Harrison recalled a disturbing detail: chlorine that kills the germs might be combining with harmless chemicals to form dangerous ones.

So he bought a home water treatment unit.

There were lots of them advertised in the newspapers and magazines. Wide range of prices, from less than $10 to more than $250. Some claimed the ability to remove bacteria and organic chemicals; others included suspended microscopic particles, even asbestos fibers. All said they would remove odors and bad tastes.

Mr. Harrison bought one from the bottom of the price range: $39.95 plus tax, and installed it himself. It had a cannister that mounted under the kitchen sink, copper tubing hitched to the cold water line, and an extra faucet for tapping the treated water that came through the unit.

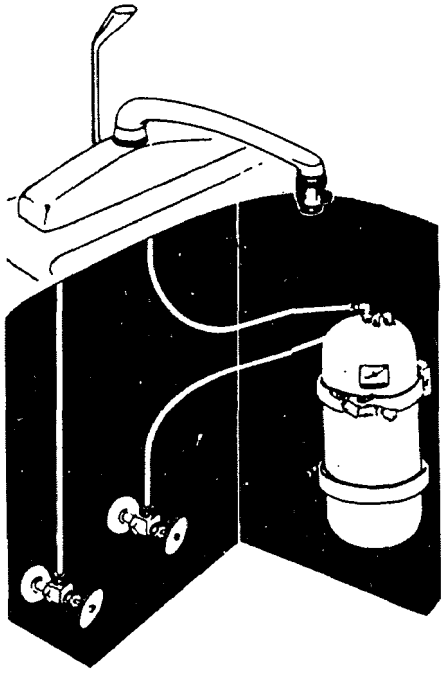
Did he get his money's worth? We asked this question of Frank Bell, an engineer in EPA's Office of Water Supply. Mr. Bell, a specialist in water treatment, has been fielding questions about home treatment devices for nearly two years.

Mr. Bell said "I can't tell you if Mr. Harrison got his money's worth, because there are three big ifs. I'll take them one at a time:

"First, if he likes the taste of the water, and he probably does. Any charcoal filter will take the chlorine out and improve the taste of coffee, tea, frozen juice, things like that. You can get a charcoal filter for less than ten dollars that you just hold under the tap and let the water run through into your glass or coffee pot."

The second big if, Mr. Bell explained, is maintaining the treatment. No device is worth the money if its beneficial action stops while the user thinks it's still working.

Filters get clogged after a while and must be replaced or rejuvenated. Some can be "back-flushed" with water to remove the gunk that has accumulated. Charcoal filters work by adsorbing chemicals onto the microscopic, honeycomb surface of the charcoal. The organic chemicals cannot be flushed or blown away, but they can be driven away by heat and the charcoal made ready again to adsorb unwelcome odors and tastes. "This can't be done at home," said Mr. Bell. "The customer will have no way of knowing when his filter ceases to remove chloroform or other volatile organics. He won't know when his filter needs regeneration or replacement."



The third big if with home water treatment devices lies in their action on bacteria in the water. All devices tend to collect bacteria, he said, and therein lies a danger.

"City water supply operators take great pains to reduce the bacteria in water. And they succeed. Your city water is safe to drink, which means the bacteria count is below a certain level. No water system in the world is entirely free of bacteria.

"When you get a few bacteria trapped on a filter along with the organic material they feed on, they can multiply tremendously. After a while it's possible for a batch of bacteria to break away from the filter and give you a glass of water with a very high bacteria count. Chances are you wouldn't notice; the water would taste all right, but it might be harmful."

To prevent bacterial build up, many manufacturers use silver in their filters. The level of silver applied doesn't kill the bacteria, but it inhibits their growth. Silver ions adhere to the microorganisms and stop them from growing. This is called "bacteriostatic" action, and scientists don't yet fully understand how it works.

The bacteriostatic action, like filtration, has a limited time of effectiveness, which will vary for different devices and different rates of use. Well before that time is up the silver-impregnated filter must be replaced.

Any device advertised as effective against microorganisms must be registered by EPA's Pesticide Office, since bacteria qualify as pests. Court decisions have held that merely calling a device a "purifier" implies an anti-pest claim. Elijah F. Brown Jr., who heads the Disinfectants Branch, is in charge of water treatment pesticide registration. Registrations are issued only for pesticides that are effective and properly labeled, which includes instructions for timely replacement. At the end of 1976 about 30 home water treatment devices had been registered as pesticides by EPA, and about 40 applications were under consideration, Mr. Brown said.

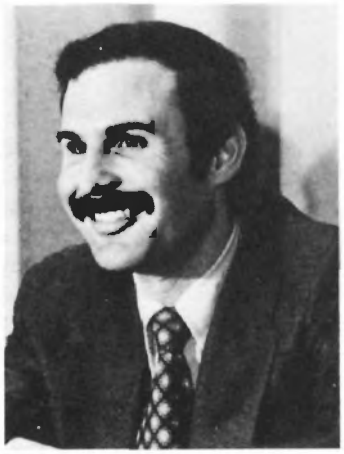
When no bacteriological action is involved—that is, when the device is designed to remove only non-living substances, dirt, discoloration, etc.—it does not have to be registered.

"At the present time," said Mr. Bell, "we don't recommend the use of home filters because of the unknowns. It is usually safer and cheaper to rely on public water supplies."

The Water Supply Office nevertheless keeps close watch on all water treatment devices and on their labeling and advertising claims. The Office is planning a scientific study of how well the common types of home water treatment devices succeed in removing trace organic compounds.

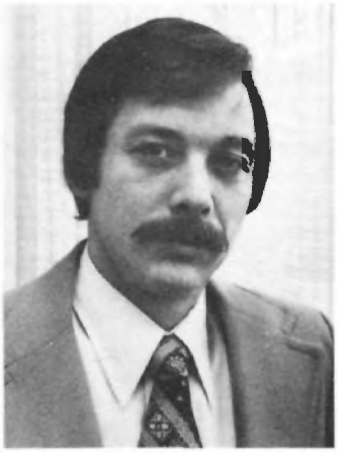
Mr. Bell is drawing up detailed specifications for the 15-month study that would be performed by an independent testing laboratory under an EPA contract. The study, due to start this summer, is expected to be the most thorough and definitive of its kind ever made. ■

PEOPLE



Roger Strelow has resigned as Assistant Administrator for Air and Waste Management and has accepted a position in the Washington, D.C., law firm of Leva, Hawes, Symington, Martin & Oppenheimer.
During his three-and-one-half-years at EPA, Mr. Strelow played a leading role in the administration of programs in the areas of air, solid waste, noise, and radiation.
Mr. Strelow joined EPA in September, 1973, after having served as Staff Director for the Council on Environmental Quality. His first Agency position was as Executive Assistant to the Administrator. In January, 1974, he was named Acting Assistant Administrator for Air and Water Programs, and became head of the Office of Air and Waste Management the following April under an EPA reorganization. His environmental work with the Federal Government began in 1969 as an Assistant to the Secretary of Health, Education and Welfare.

Three appointments in Region II, New York, were announced recently by Regional Administrator Gerald M. Hansler:



George Meyer, Chief of the Federal Facilities Office. He had been a sanitary engineer in the Region's New York Construction Grants Branch. He joined EPA in 1975 after having served with the Public Health Service in Boston. He is a 1965 graduate of the Polytechnic Institute of New York with a degree in civil engineering.

William Mansfield, Chief of the Municipal Permits Section, Facilities Technology Division. He served as a civil engineer with the Corps of Engineers before joining EPA as a sanitary engineer in 1970. He won a Sustained Superior Performance Award in 1974.

Steven Dvorkin, Chief of the General Enforcement Branch. He had served three years with the Region's Enforcement Division, working on air, pesticides, marine, and discharge permit actions. He earned a law degree at New York University in 1973 and is continuing graduate study there. He replaces **Thomas Harrison,** new Regional Counsel in Region V, Chicago.

Peter L. Cashman, Director of the Office of Regional and Intergovernmental Operations, has resigned from his EPA post to accept a position with York Research, Inc., an environmental consulting firm. York Research is located in Stamford, Conn., Mr. Cashman's home town.
Mr. Cashman joined EPA in January, 1975. His responsibilities included establishing liaison programs with the Nation's governors, mayors and other State and local officials. He was also in charge of communicating Agency policies to the Regional Offices. From 1973 to 1975 Mr. Cashman served as Lieutenant Governor of Connecticut.

SKIING AND THE ENVIRONMENT

By John Jerome

Skiing is a clean and invigorating sport, a healthy recreation pursued in scenes of sublime natural beauty and unspoiled grandeur. That environmental damage can result from it therefore seems almost contradictory. But skiing has tremendous ecological impact, particularly in its most popular form: lift-served, downhill skiing that requires installation of substantial ski resorts as service areas. An awareness of the nature of that impact can help all skiers cooperate to keep additional impact to a minimum, and to understand better the limitations that their sport may very well have to face in the future.

Mountain terrain is among the most fragile in all of nature. Very thin soil, short growing seasons, severe weather conditions, steep slopes which can hold neither moisture nor nutrients—all these conditions make the very places that we want for our skiing also the places where we are apt to do the most environmental damage by our intrusion. It takes roughly a hundred years for natural processes to create an inch of topsoil at high altitude; a poorly designed or poorly maintained ski trail can wash out acres of that topsoil, to a depth of several feet, in a single spring downpour. The plant life that holds the soil in place must fight ferocious battles against uprooting winds, long periods of killing cold and brief blasts of overstimulating heat, a water supply that seems to vary only from too much to too little, destructive weights of ice and snow, too little atmosphere and too much radiation. Every hundred feet of altitude is the rough equivalent of another day of winter in the annual growth cycle. Sometimes it seems a miracle that anything green survives in the mountains at all.

The skier's concern for the environment must primarily be for that greenery, even though in ski season it is so seldom in evidence. In fact, it is the snow that hides the greenery—the snow that is the primary signpost of both winter and altitude—that is the savior of the high-mountain terrain. Snow insulates and preserves, holds the water supply in place and releases it gradually, reflects the sun's radiation back into space so that the killing effects of that radiation's penetration of thin mountain air is reduced to safe levels. If it weren't for the stabilizing presence of the snow we ski on, the mountains would in summer be rocky deserts, and would erode away into unskiable flatness at a much more rapid rate than they now do.

In view of the precariousness of that snow-covered environment, it seems almost unfair to put ski resorts into it. The initial shock of such an installation—heavy construction, clearing of mountain forest, provision of power supply, sewage disposal, and other "civilized" services—is severe, but it is relatively controllable. These impacts are reasonably well understood, and if approached with care and concern for the environment can be substantially minimized. The secondary effect is the one of concern to the thoughtful skier: a ski resort by design brings great numbers of people, and their unavoidable impact, into that precarious high-mountain environment. Again, within design limits, the effects are controllable. But the best-designed ski resort in the world will become destructive to the environment if it operates continuously beyond its design capacity. Not so incidentally, it'll also be a miserable place to go skiing while operating at that overload.

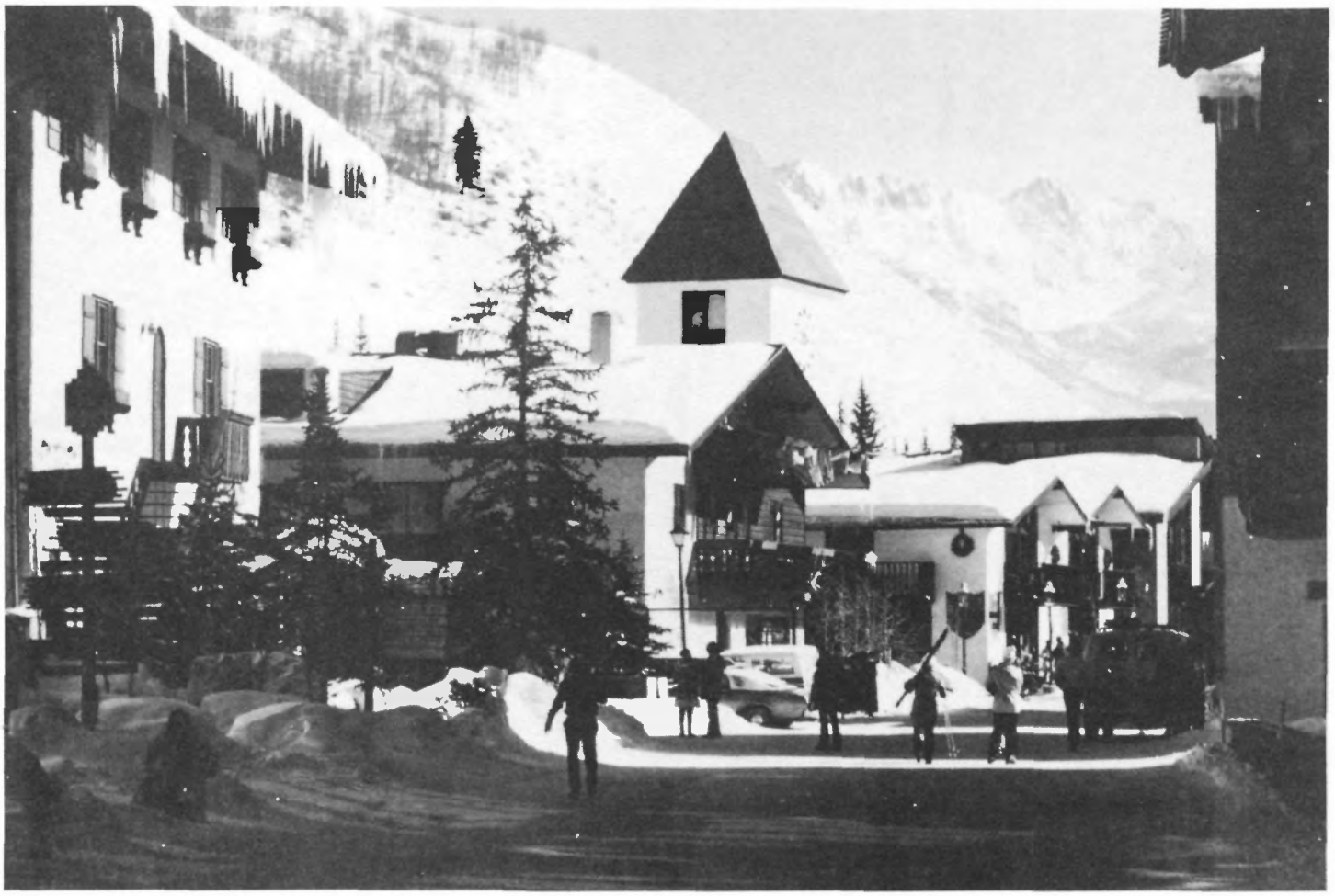
The prime responsibility for environmentally sound ski-resort skiing must inevitably lie in the design and management of the ski resort itself, about which the consumer skier can't do a great deal. But the first step a skier can take to help preserve the skiing environment is to recognize sound environmental management on the part of the resort; to ski at resorts where it is practiced and to avoid those where it is violated; and to let ski resort management know that these considerations influence your patronage. The following points can help you spot sound environmental management of ski areas.

John Jerome is a contributing editor for Skiing Magazine and his writings cover everything from snow, mountain geology, and alpine fauna to trees.

AIR QUALITY. Most ski resorts lie in narrow mountain valleys where the thin air is subject to temperature inversions and temporary stagnations. Everyone loves a cheerful fire in the fireplace, particularly after a hard day's skiing, but six thousand fires in six thousand condominium unit fireplaces—in a tightly enclosed valley—is an invitation to emphysema. That's one place where an individual skier *can* do something for the environment, simply by refusing to contribute to the smoky pall. Similarly, huge influxes of weekend traffic in private cars can turn the valley that holds a major ski area into a smog-filled disaster. Automobile engines run richer (more gasoline, less air) and therefore emit more unburned hydrocarbons at high altitude; a tune-up for altitude before your ski vacation is a good investment as well as a public-spirited act. Ski resorts and individual skiers that encourage car pooling and bus and rail transportation to ski areas are acting in the public interest. Similarly, use of your car within the ski resort vicinity should be kept to an absolute minimum. Cold engines generate more emissions, waste a great deal of fuel, and suffer unusually heavy wear, so short-hop use of your car on a ski vacation is a particularly bad idea. Most responsible ski resorts have worked out systems of shuttle buses or other conveyances to help reduce unnecessary car use.

Many ski resorts generate their own power to run the ski lifts—and, in fringe snowfall areas, to make artificial snow—by means of hydrocarbon-fueled power plants which generate noxious emissions. The choice of power sources is often dictated by short-run economies, but in the hitherto clean mountain air, any substantial addition of pollutants becomes quickly and distressingly apparent. At best, a responsible ski resort will use electric power, generation of which affects air quality far from the sensitive mountain region. At very least, a responsible ski resort will make sure it has the cleanest-burning power sources available, with adequate emission controls.

All ski resorts use over-the-snow tracked vehicles for maintenance, snow-grooming,



and rescue work. These entail legitimate environmental trade-offs: maintenance and snow grooming help reduce erosion and other damage to the mountain, and increase safety—and nobody wants to cause rescue work to be slowed. But a responsible ski resort uses quiet, well-maintained service vehicles, in as unobtrusive a manner as possible, aware that these vehicles are air and noise polluters of the worst sort.

WATER QUALITY in the mountains is inextricably tied to erosion. However long the skier may want the season to last, and in spite of anything the ski resort can do about it, there comes a time each season when the snow melts and runs down the mountain. When it does, it causes problems. The ski resort's primary battle often seems to be to hold the snow up there on the mountain and to get it put into the right places on that mountain—a battle that goes on all season long. But when the snow starts to go—melting from parking lots and ski-lodge roofs as well as from the slopes themselves—it results in spring freshets, minor flood-stage washouts, structural damage. Even when that runoff is well controlled, it can still cause considerable siltation and deterioration of stream quality.

The steeper the slope, the faster the runoff; the faster the runoff, the more abrasive material that can be carried downstream. No ski slope can ever be as stable as the undisturbed mountainside that it was in its original form, but the responsible ski resort designer must strive for all the stability he can achieve. A great deal more is involved than merely cutting down trees and stringing ski lifts beside the resulting trail. A properly drained and landscaped slope will get rid of its snow load slowly and in gentle fashion, with minimum damage to itself and to downslope vegetation, soil, and structures. An improperly designed slope is simply a disaster waiting for the temperature rise that will light its fuse: when the snow starts to go, it will take most of the slope with it. Skiers can spot a well-designed slope by the evenness of the snow-grooming, which usually indicates a healthy growth of ground-cover beneath the snow, by water-bars making regular hashmarks across the slopes to divert water into wooded areas where strong root structures can handle the erosion, and by drains and culverts to handle the eventual runoff.

Mountains generally get a lot of moisture, and where there is enough snow for skiing, there should be plenty of ground water in all seasons. Artificial snow-making can make inordinate demands on local ground water supplies, however. Snow-making water is usually pumped from a nearby pond or lake, but if none is available the ski resort may take water from mountain streams. The requirements are so large that stream flow can be completely used up in wintertime. A great deal of that water will be put back into the stream during the spring melt-off, but at that time, and at those rates, erosion and siltation will be massively increased. The interruption of the natural flow—pulled down too far during periods of snow-making, jumped back up to flood-stage during

Continued on page 12

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the spring—seriously affects water quality in the area. Downstream water uses can be drastically altered.

SOLID WASTES represent a tremendous problem for ski resorts. The thin and rocky soils that prevail at most ski-area altitudes are not particularly suitable for septic systems under the best of conditions, and almost by definition those soils stay frozen—totally impermeable—during the very times when usage is heaviest. Most ski areas are located too far from municipal systems to permit hooking in, and the cost of extensive mountain sewerage to reach those systems is invariably prohibitive.

The expensive alternative is a self-contained treatment plant for the ski resort, or in some cases the sharing of such a plant with a nearby mountain town. This too is a very expensive course, and great care must be taken in the design. In more than a few unfortunate circumstances it has been found—after the fact—that ambient temperatures at the mountain location are too low to support the kind of bacterial action necessary to make the treatment plants function. The only alternative, however, is the even more expensive and extremely limiting practice of using holding tanks for solid waste storage, then hauling the waste by truck to a working lower-altitude plant. (A sensitive nose can immediately recognize a ski area that has been forced to seek this stop-gap solution.)

NOISE pollution is a peculiar ski resort problem. The sport of skiing itself—the act of riding skis over the snow, more or less at high speeds—is almost totally silent, and that is one of its principal charms. Yet the machinery that makes that sport so handily accessible to millions of Americans can put up an ambient noise level that comes as a rude shock. Ski lifts don't have to be noisy, but too many of them are. The aforementioned service and rescue vehicles are particular offenders in the area of noise. The worst offenders, however, are the snow-making installations. From the huge compressors—usually mounted well behind the base lodge but still within audible range—to the snow-guns themselves, up on the slopes, which spew compressed air and frozen water-vapor into the air, snow-making is consistently noisy. On-slope the snow-guns represent an unpleasant adjunct to the skiing day, so ski resorts elect to do most of their snow-making at night—lower temperatures make the operation more productive then anyway. Unfortunately, the disruption that is thereby removed from the ski hill by day is turned into a sleep-interrupting nuisance at night, and a tight little mountain valley that holds a ski resort in full snow-making operation can sound like a factory site in full industrial production. It's a level of noise pollution that hardly fits anyone's concept of what the mountains should sound like in winter.

Surprisingly, few skiers complain. Perhaps they realize that there's little the consumer skier can do about the problem: snow-making noise is another trade-off, the price we pay for having consistent skiing in marginal areas. It is up to the skier to decide whether he wants to pay the price in noise irritation—or go a little farther into ski country, where snowfall is more dependable, for his recreation. But there are various snow-making techniques, and some of them are quieter than others; a responsible ski resort is one that chooses the quietest and least environmentally disruptive method. Skiers might consider making their feelings known about this to the management of their favorite ski area—particularly if and when new snow-making equipment is anticipated, or snow-making capacity is being expanded.

Cross-country skiers and ski tourers penetrate some otherwise unviolated countryside,

and there is some risk of disturbing wildlife on those forays. It is easy to assume that both plant and animal life is safely dormant, beyond serious disruption or disturbance, during the winter months, but this isn't necessarily so. Deer, for example, are particularly vulnerable in winter months. They don't hibernate, but they do "yard up," gathering in small areas well back in the woods where there is a dependable food supply, and sinking to a very low level of metabolism. Ski tourers can often ski right into the midst of such a deer yard, thanks to the silence of their approach. But if the deer are disturbed and take flight, they rapidly burn off more energy than they can readily replace on the available winter diet. The ski tourer will go on about his business thinking he's only momentarily disturbed the deer's quiet winter existence; yet by merely startling the deer, he may have set in motion a chain of events that can lead to the deer's eventual starvation. Back-country skiers must maintain a firm respect for the flora and fauna among which they ski. Similarly, they should take care to carry out what they carry in, leaving no litter to foul the snow and the mountains.

Nevertheless, skiing, in and of itself, must be considered an environmentally benign recreation. Even the compaction of the snow that results from the passage of skis over its surface is environmentally beneficial—within limits—because it helps hold the snow in place, thus making the spring melt-off more gradual. The severe environmental problems that skiing *does* cause are the result not so much of skiing but of the wildly uneven rates of demand that are put on ski facilities. The greatest load on the ski resort sewage system, for example, comes between four and six p.m., at the end of the skiing day, and it comes not from the solid wastes that one might expect to be the problem, but from soap and water. It's caused by all those shower baths, as all those skiers come down off the mountain when the ski lifts close for the day, and jump into the shower to freshen up. If that demand for sewage capacity could be spaced out over the entire 24-hour day, most ski resorts could substantially reduce their investments in sewage treatment and still do a more responsible job of handling solid wastes.

Multiply that unevenness of demand by the weekend recreation patterns we seem to be unable to change in this country, and by the built-in imbalance of the brief winter season. What happens in miniature during the skiing day happens more emphatically during the skiing week. While ski areas may run at full capacity (or beyond) on weekends and on some winter holidays, most of them—particularly in the East and Midwest— are only running at about twenty to thirty percent of capacity during the week. The facilities are grossly underused in midweek, yet are still often inadequate for the heavy weekend and holiday loads. The skiing industry has been happy to overbuild in ski lift capacity and in all other service facilities—to the limits of capital availability and the removal of environmental restraints—to attempt to handle the overload on weekends. But the environmental impact from that overbuilding is thus much greater than it need be, to solve a problem that really exists on fewer than about ninety days a year.

The capacity is still strained on those ninety days, and there is a considerable amount of environmental damage as a result: overloaded lift systems, restaurants, motels, lodges, condominiums, sewage systems, parking lots, mountain eco-systems. It is skiing's prime dilemma of the seventies, and it is not entirely an environmental one. How can the skiers who are already devoted to the sport be provided with adequate facilities without an excessive amount of additional environmental damage? And perhaps more important, how can the sport and industry maintain a healthy rate of growth—which the industry, at any rate, feels it must have to survive—with increasing environmental restrictions, and with rapidly dwindling areas of mountain terrain that are suitable for development?

It is an interesting question in skiing's future. If you are rattling around at midweek in an almost-empty ski resort, wondering at the necessity for all that unused capacity—or if you are stuck for half an hour or so in a ski-lift line on weekends, waiting for the crowd to move on so you can get onto the mountain to do some skiing—you might give it a little thought. In the meantime, the most positive contribution you can make to help improve skiing's environment is to restrict your skiing, whenever possible, to mid-week. Besides, you'll have more fun then. ■

Safety In The Laboratory

Alvin L. Alm,* Assistant Administrator for Planning and Management, explains in an interview what is being done to reduce the risk of handling dangerous materials in EPA's laboratories.

Q. What sparked the current concern for the health and safety of employees at EPA's laboratories?

A. Last year the General Accounting Office reviewed EPA laboratories to determine whether laboratory employees were protected by EPA's occupational health and safety program, and also whether we had an adequate health monitoring program.

The GAO investigators found that EPA laboratory employees performed various operations that could expose them to toxic and hazardous substances. They noted a number of deficiencies in our laboratories, and they also indicated that most laboratories were not covered by a comprehensive health monitoring program.

As I indicated in a letter responding to the report, EPA is both concerned about GAO's findings, and committed to a very strong occupational health and safety program. Even though our accident and illness reporting system has not indicated any unusual rate of harmful exposure, we are very concerned that the potential for harmful exposure is significant. Because of research work that will grow out of new statutory authority, the potential for harmful exposure will be growing. In the past few years, the frequency and volume of hazardous materials handling in our laboratories has grown steadily.

Our mission requires that we deal with a wide variety of toxic substances. We conduct virology and bacteriology studies, cancer research studies, analysis of pesticides, reference standard preparation, toxicity studies, emissions testing, and air and water sampling.

Most of our laboratories test potentially harmful substances in fulfilling their missions.

Q. What have you done to correct the problems?

A. Last summer, even before the GAO report was issued, I ordered on-site inspections of all EPA laboratory operations. We used these inspections to identify the extent and nature of problems in specific laboratories, and to establish priorities for industrial hygiene and occupational health surveys.

These inspections revealed numerous health and safety deficiencies in the 55 laboratories at 40 locations that we visited. About 65 percent of the nearly 500 deficiencies identified were in the category of poor housekeeping. Over half of these deficiencies were such things as improper flammable liquid storage, lack of proper protective clothing and devices, and improper use of compressed gases.

These items were reported to the laboratories' supervisors, and most were corrected immediately. About 35 percent of the problems were caused by deficiencies in the laboratory buildings. These take longer to correct, but are now being worked on. The reason that they take longer is that GSA must approve and make new facilities available for the Agency.

We have begun a series of hygiene surveys in the laboratories to determine the actual and potential hazards the employees face, so that protective and preventative standards can be applied and enforced. The hygiene surveys also assist the occupational health physician in developing a prevention-oriented health monitoring program.

We are developing a comprehensive health monitoring program for all EPA laboratory employees. About 650 employees are now covered by medical monitoring programs.

In another six months, we expect to have virtually all of EPA's 2,000 laboratory employees covered.

We are asking for designations of laboratory health officers for each laboratory site. They will be responsible for assuring the day-to-day observance of approved health and safety procedures. We are developing an inventory system so that each laboratory will maintain strict control on the stocking, labeling, dispensing, and disposal of hazardous chemicals and materials used in the laboratory.

Organizationally, we have upgraded the occupational health and safety program. That program will now report directly to the Assistant Administrator for Planning and Management and will be headed by a supergrade official.

We are following up with frequent but unannounced inspections to assure compliance with Occupational Safety and Health Administration, (OSHA) and EPA standards and regulations.

I might add that the GAO indicated in their review of EPA's program that the steps taken indicate a strong commitment by the Agency to upgrading and improving its occupational health and safety program.

As far as I am concerned, EPA's program should be a model for the rest of the government, and not merely meet minimal standards.

Q. I understand that you have closed some labs. Could you tell me which ones?

A. First we closed the Pesticides Laboratory at the Denver Federal Center based upon preliminary information GAO provided to me and to Jack Green, Region VIII Regional Administrator. Jack Green took the initiative and has undertaken a number of corrective actions to bring that laboratory up to standards. As a result, it has been reopened.

In June the pesticides laboratory at the South Agriculture Building here in Washington was closed permanently. Its activities were moved to Beltsville, Md. I ordered the closing of that laboratory because of overcrowding and numerous facility-related deficiencies. These are being corrected.

The Region III Laboratory at Annapolis was closed in August. It reopened in November on a restricted basis.

Q. Do you plan to close any more?

A. We don't have any current plans to close any laboratories. We are strongly committed to closing any laboratory where there is any significant health or safety risk to employees.

Q. Are most laboratory employees now covered by a medical monitoring program? If not, when will they be covered?

*See News Briefs, Page 25.

A. About one-third of the laboratory staffs are covered by some form of medical monitoring. The laboratories in Duluth, Minn.; Gulf Breeze, Fla.; and Bay St. Louis, Miss.; have had excellent programs for some time. Other laboratories, including those at Cincinnati, Ohio, and Research Triangle Park, N.C.; are in the process of establishing monitoring programs.

Early this year, we will be issuing guidelines to all laboratories on basic standards and procedures to be followed in establishing medical monitoring programs. Also, we will provide professional occupational medicine and industrial hygiene specialists to assist in setting up individual programs. We expect that within six months virtually all laboratory personnel will have had a baseline medical examination and will be covered by a comprehensive health monitoring program.

I believe that a health monitoring program is critical both to protect individual employees, and to assure the laboratory operations are continually safe.

Q. What are we doing now about training?

A. We have found there are no existing courses relevant to the needs of our laboratory personnel. The American Industrial Hygiene Association and the National Institute of Occupational Safety and Health offer a few courses which are partially relevant. In cooperation with NIOSH, however, we are developing a curriculum specifically designed for our laboratory professionals and supervisors which we will be offering in the spring. First priority for enrolling in this course will be given to designated laboratory health officers and laboratory supervisors. According to the NIOSH officials, this will be the first course specifically designed for Federal agency laboratory personnel.

We also have other specialized safety training programs under development. For example, we have programs for such high-hazard activities as stack sampling and scuba-diving. This fall and winter we have been offering through an interagency agreement with the U.S. Army Special Force a pilot 40-hour course in emergency treatment of injuries. This year an improved 32-hour version of the course will be offered at 15 EPA locations around the country.

Q. Can our laboratory operations ever be safe?

A. With the proper precautions, our laboratory operations can be made at least reasonably safe. There is always an element of risk in any occupation. In the laboratory, the potential risk may be high particularly in the presence of flammable, toxic, pathogenic, or carcinogenic materials. The purpose of our program is to reduce the potential risk to an absolute minimum, and to eliminate it if possible. We can do this with the proper use of physical facilities, protective safety devices and clothing, containment, isolation, and dilution of hazardous substances in the lab, and above all, through the use of operating procedures designed to reduce exposure and to prevent accidents.

If I may use an analogy, driving a car in heavy traffic is a statistically low-risk activity if the driver is alert, and if the car is in good working order. If all of these things are not present, the statistical chance of an accident goes up.

Our challenge is to make our laboratories as safe as possible, and that challenge we are taking very seriously.

Q. What are the respective responsibilities of the health and safety staff and line management in implementing the health and safety program?

A. The primary responsibility for occupational health and safety within EPA falls on the line managers. The occupational health and safety staff is responsible for issuing standards and regulations to meet OSHA and other health and safety requirements. It is also responsible for collecting information, for monitoring implementation of the program, and for conducting inspections to assure compliance.

I view that staff's role as one of providing a prod to upgrade EPA's health and safety activities across the country. Ultimately, we have the authority and responsibility to close the laboratories or take other necessary steps if laboratories pose health and safety problems. But if the program is to work correctly, the occupational health and safety staff's role will be one of assisting laboratories in meeting standards.

Line management has the primary responsibility for providing safe and healthful working conditions. This line includes Assistant Administrators, Deputy Assistant Administrators, laboratory directors and individual supervisors. These people supervise day-to-day operations of which occupational health and safety is an important component. In the final analysis, line managers are responsible for the failure or success of our health and safety program.

Q. What responsibilities do the employees have?

A. Employees have a very significant responsibility to be alert and observant for their own protection and for that of their coworkers. They have to be informed about the actual and potential hazards, to participate in developing and implementing health and safety procedures, and to identify and report the existence of unsafe and unhealthful conditions. Their rights and responsibilities are spelled out in simple language in the OSHA brochure, entitled "About OSHA Programs," and in considerable detail in the OSHA Regulation entitled "Occupational Safety and Health for the Federal Employee." We have distributed this regulation to all EPA employees.

Q. Are we in compliance with OSHA requirements?

A. The simple answer is no. We have as a matter of policy adopted all of OSHA's standards and regulations, but we are not in full compliance primarily because of insufficient implementation. By the end of this fiscal year we plan to be in compliance with all OSHA requirements.

Q. Are there any special benefits available to me if I suffer a job-related accident or illness?

A. Yes. Under the General Employee Compensation Act, you are entitled to up to 45 days of administrative leave, and you may be entitled to continuation of pay for certain types of job-related injuries. Additional information about these benefits can be found in a pamphlet "When Injured At Work," available from your personnel office. Detailed information on obtaining benefits is contained in the "Federal Personnel Manual."

Q. How do you feel about how the Agency has handled and is going to handle this problem?

A. Frankly, in the past I don't believe occupational health and safety had a high Agency priority. At the working level our employees understandably were concerned with accomplishing EPA's mission. Within the Office of Planning and Management, the function was buried at a fairly low level, which impeded the ability of some very dedicated and talented people to carry out the function adequately.

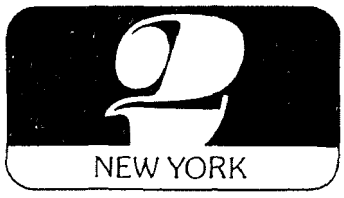
I think we now have under way a series of actions that can make EPA's occupational health and safety program the best in the government. There is a sense of commitment and purpose. I also believe there is an awareness by managers and employees that the Agency has a problem that has to be dealt with aggressively.

My one concern about the future is that the Agency continue the momentum of this program. Often a concern is raised and a very vigorous response is initiated but as time passes implementation tends to drop off as new priorities emerge. I am hopeful that what has been set in motion will continue to have the strong support of top management, of middle management, and of EPA employees. If that level of commitment continues, EPA could have one of the best, if not the best, occupational health and safety programs in the government.

legislation roundup

Lawmakers in Massachusetts and Connecticut will be considering mandatory inspection and maintenance of automobile emission controls when they meet for the 1977 legislative sessions. Proposed bills provide for annual inspections by private firms under contract to the State. Rhode Island's inspection system, adopted last year, will go into effect this summer.

Bills requiring deposits on beverage containers to encourage reuse and recycling have been filed in Massachusetts, Connecticut, New Hampshire, and Rhode Island. Vermont already has such a law, and Maine voters approved a "bottle law" in the November election. A similar referendum was narrowly defeated in Massachusetts.



water recharge

Nassau County, N.Y., has called for bids on a demonstration project designed to conserve the supply of ground water on Long Island. A full-scale (5.5 million gallons per day) wastewater treatment plant will inject the treated water into the sandy ground to prevent the intrusion of salt water in the county's wells. An EPA grant of $24.6 million will help build the plant, which will treat water from Nassau County Sewer District 3, which serves portions of the towns of Hempstead, North Hempstead, and Oyster Bay and the village of Freeport.

hudson sampled

Region II personnel have been sampling bottom silt and mud from the lower Hudson River to check on the levels of polychlorinated biphenyls (PCB's), industrial compounds suspected of causing cancer. Sampling began in mid-December, using a specially equipped helicopter, at the request of the N.Y. State Department of Environmental Conservation.

Primary source of the PCB's has been General Electric Co. plants at Hudson Falls and Fort Edward, about 165 miles upriver from New York City. The company and the State are jointly sponsoring a $7-million PCB cleanup program for the Hudson.

toxic oil

Experts from Region III are working to prevent waste oil containing a toxic chemical, pentachlorophenol, from entering a creek that empties into the Delaware River near the Tinicum National Wildlife Refuge, the last freshwater tidal marsh in Pennsylvania.

The problem started more than 14 years ago when a manufacturer of the wood-preserving chemical disposed of the waste oil by injecting it into the ground at the plant near Haverford, Pa. The practice was stopped by State authorities in 1963, but the wastes had already begun to saturate the soil and enter Naylor's Run, a small creek only eight miles from the wildlife refuge.

Region III's Emergency Response Branch supervised the digging of holes and trenches to collect the oil and keep it from the stream. Several test wells have been dug to locate the main underground reservoir of oil. EPA's mobile treatment unit, a self-contained pumping and filtering apparatus, was brought in to remove the pentachlorophenol from the oil. Cleanup operations are expected to take several months.

deadline upheld

The U.S. Third Circuit Court of Appeals has upheld the deadline set by EPA for the Bethlehem Steel Corporation to comply with its wastewater discharge permit schedule. The company had asserted that the mid-1977 deadline was impossible to achieve and appealed to EPA and then to the court, which ruled that the deadline date in the Federal Water Pollution Control Act was "intended by Congress to be a rigid guidepost." Regional Administrator Daniel J. Snyder III said, "The decision provides us with a precedent for future cases."

court rulings

A Federal judge has ruled that Region IV overstepped its authority in setting water quality standards for Alabama more stringent than the State had set. District Judge Frank McFadden said EPA's order to upgrade all Alabama streams to a "fish and wildlife" classification was arbitrary and based, not on Federal law, but on an internal memorandum that did not go through proper channels and "does not say what EPA contends it does."

The court action against EPA was filed by Associated Industries of Alabama and was later joined by U.S. Steel Corporation. Agency attorneys are considering an appeal.

In another court action, Region IV requested and received a summary judgment against Velsicol Chemical Co. of Memphis, Tenn., for permit violations. Velsicol was charged with discharging endrin and heptachlor into the Mississippi River in violation of the permit. The maximum potential fine is $3.6 million.

power plant suit

A suit to prevent the startup of a new coal-fired electric power plant in Gibson County, Ind., has been brought at the request of Region V Administrator George R. Alexander, Jr. The suit alleges that the Public Service Company of Indiana's boiler will emit five times the allowable amount of sulfur dioxide. The company has announced no plans for emission controls at this unit or at another scheduled to start up in January 1979 at the same plant.

fine buys fish

Region V recently arranged to turn over a portion of a river polluter's fine to help restock the river with fish. A $55,000 settlement was obtained by Region V attorneys from the Williams Pipe Line Co., Tulsa, Okla., for damage to the Embarras River in Jasper County, Ill., by a leaking pipeline. The sum of $24,000 was turned over to the State Department of Conservation for restocking fish in the river.

The company agreed to halt all pumping of chemicals through the worst section of the line until repairs are made. Thereafter it will upgrade the remaining sections of the pipeline.

$25,000 penalty

A civil penalty of $25,000 has been assessed against the duPont Company for failing to report production increases at its chemical plant at LaPorte, Tex., and thereby violating its discharge permit. The consent agreement, reached in Federal District Court Dec. 28, modified the plant's permit to discharge ammonia nitrogen and extended the compliance deadline by two years, to Jan. 1, 1979. The company said it was unable to develop the necessary treatment methods before the old deadline.

208 seminar

A seminar was held in Dallas Jan. 12–13 to acquaint State and local officials with the areawide planning process and the public education called for under Section 208 of the Water Pollution Control Act.

joint sewer plan

A joint sewer system serving part of Johnson County, Kan., and Kansas City, Mo., has been recommended by EPA's Region VII, after a detailed study and cost analysis. The Mid-America Regional Council, with funding by EPA, is now studying the steps necessary to organize a regional sewer authority, which would require intergovernmental agreements and proportionate user charges to qualify for Federal aid.

EPA officials believe the regional concept is the best way to meet the wastewater needs of the Big Blue River basin, which crosses the Missouri-Kansas boundary. They estimate that monthly charges to Johnson County residents under the proposed joint system would be about half what an independent system would cost. They also believe the joint system would eliminate long-standing complaints of sewer odors and esthetic degradation in the Indian Creek basin in Johnson County.

high-altitude cars

Special legislation to assure that autos operated in Colorado's high altitude control their exhaust emissions has been proposed by the State's Air Pollution Control Commission.

The proposed law would require the annual inspection and corrective maintenance, if necessary, for all cars registered in 10 Colorado counties, including the Denver area and the "Front Range," where altitudes average a mile or more above sea level. The program would start in 1979 and apply to all cars of the 1977 model year and later.

This is the first model year for which EPA's emission standards for carbon monoxide, hydrocarbons, and nitrogen dioxide specify tuning for the altitude where the car is to be sold and used, rather than the altitude at the manufacturer's plant. Autos are responsible for about 90 percent of the carbon monoxide and 85 percent of the hydrocarbons in the Denver area's air, the Commission said, and they contribute significantly to air pollution in other Front Range communities.

fresno aquifer

Region IX is cooperating in a study of the public water supplies in Fresno County, Calif., to determine if they need special protection under the Safe Drinking Water Act. The area gets most of its water from aquifers, or underground sources. The study being made by EPA and other Federal, State, and local agencies will decide whether ground water is the sole or principal source of drinking water for the area and whether contamination of the aquifer would be a significant hazard to public health.

monoxide boiler

Regional approval has been given to the Lion Oil Co. to construct a carbon monoxide boiler at its refinery at Bakersfield, Calif. The unit will have no adverse effect on air quality, according to Richard O'Connell, Enforcement Division Director.

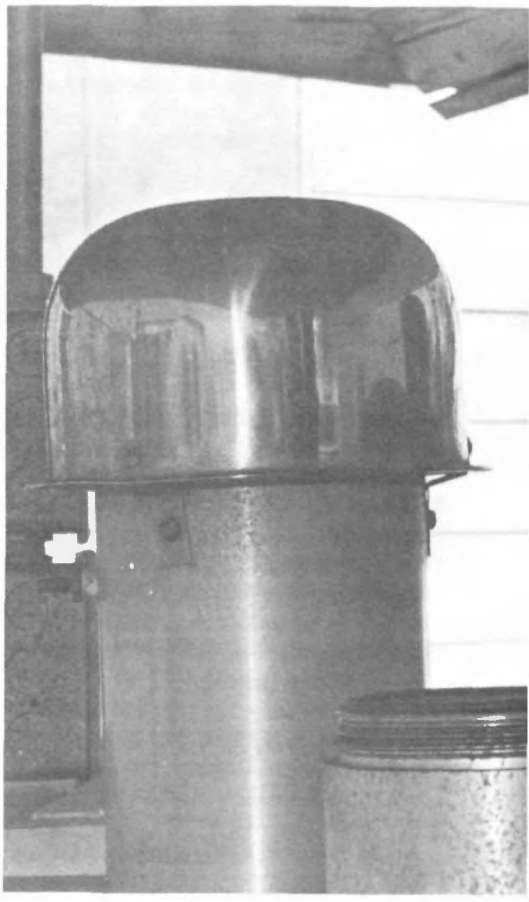
permit penalty

Armour and Company has paid a $5,000 civil penalty for violating the wastewater discharge permit for its meat processing plant at Nampa, Idaho.

EPA monitoring teams discovered last summer that the plant was dumping more ammonia into Indian Creek than its permit specified, and referred the case to the U.S. Attorney. The penalty was entered in U.S. District Court in Boise. The permit called for the Nampa plant to limit ammonia in its wastewater to a daily average of 15 pounds by Dec. 1, 1975. EPA found ammonia levels of more than 100 pounds per day. Regional Administrator Donald Dubois said low levels of ammonia can stimulate algal growth in a stream and high levels can kill fish and other animal life.

In the settlement, Armour agreed to meet the effluent limitations no later than next July.

MONITORING NUCLEAR EXPLOSIONS



Betty Sedinger of EPA's Montgomery, Ala., laboratory removes filter from an ERAMS air sampler to test it for radioactivity. This is one of 67 such monitoring stations throughout the country.

Two nuclear explosions in the air over China last fall called public attention to the vital EPA service of providing nationwide monitoring of radioactivity in the environment and assessing the potential impact on the American people.

EPA reported that its fallout surveillance indicated that the first explosion on Sept. 6 would have "only limited adverse health effects" on the U.S. population. The Office of Radiation Programs estimated the fallout could result in three or four extra cases of thyroid cancer in the United States over the next 45 years, during which about 380,000 cases of this disease can be expected from other causes. Thyroid cancers are rarely fatal.

Nevertheless, EPA noted the potential additional cancer cases dramatize once again "the seriousness of atmospheric radiation" and the "need for an end to atmospheric testing of nuclear weapons."

On Nov. 17 the Chinese tested another and more powerful nuclear device in the air. Fallout in the United States from this blast was still being analyzed as this story was written, but preliminary indications point to a lower potential health impact than the first explosion's fallout, according to Dr. William D. Rowe, Deputy Assistant Administrator for Radiation Programs. This is because very little fallout was brought down by rain after the second explosion.

A detailed report on the U.S. fallout from both blasts and their potential health effects is being prepared and will be published next month, Dr. Rowe said.

Riding herd on environmental radiation is a function older than EPA, but many people are unaware of it until some event occurs to arouse public concern, as did the two nuclear tests in the People's Republic of China.

The Agency's Environmental Radiation Ambient Monitoring System (ERAMS) operates continuously in all parts of the country, measuring radiation levels in air, water, human bone tissue, and milk. (Milk is monitored in cooperation with the Food and Drug Administration). Most sampling stations are located at and operated by State health departments or local health agencies.

The air monitoring portion of ERAMS includes 21 stations that normally sample ground-level air continuously and take radiation readings twice a week. In addition 46 standby stations can be mobilized by telephone for radiation alerts, and all 67 stations in the network then take readings daily as needed.

The Chinese test of Sept. 26 was detected by the U.S. Government and announced by the Energy Research and Development Administration. ERDA routinely announces nuclear explosions anywhere in the world, giving the location of the blast, whether it was underground or in the atmosphere, and its approximate "yield" or energy released. This time ERDA said there had been an atmospheric detonation, at the Lop Nor test site in the Mongolian desert, with a yield of 20 to 200 kilotons. (One kiloton equals the explosive power of 1,000 tons of TNT.)

Radioactive gases and particles spewed into the air over China drift eastward with the prevailing winds across the Pacific Ocean. As it moves, the contaminated air mass can be detected and followed for many days as it travels around the world, although it is constantly expanding and dispersing.

The National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce tracked the cloud of radioactivity and made daily predictions of probable path and speed. All of EPA's air monitoring stations were operating to detect fallout when the cloud reached this country on the fifth day after the explosion. The EPA readings—augmented by readings from ERDA facilities and laboratories and by nuclear power plants reporting to the Nuclear Regulatory Commission—showed only slight increases over normal background

radiation that corresponded to the passing of the radioactive cloud.

At no time, said Dr. Rowe, were the increases significant enough to cause EPA to recommend that States take protective actions.

Samples of rain and snow taken by the ERAMS precipitation monitoring stations also showed no cause for alarm.

The most likely hazard was that rains in certain localities might deposit enough radioactivity onto pasture lands to raise the levels of radioiodine in milk. EPA's milk monitoring system, operated jointly with the Food and Drug Administration, collected its regular monthly samples of pasteurized milk during the first week in October, and then additional milk samples were collected through Oct. 29. Special attention was given to the Northeast, where rains had occurred while the radioactive cloud was passing. As expected, some milk measurements showed increased levels of radioactive iodine. In Massachusetts and Connecticut, State officials ordered some dairy herds to be taken from pasture and put on stored feed.

Altogether, the EPA sampling after the Sept. 26 detonation included 1,124 samples of airborne particulates, 293 of pasteurized milk, and 39 of rainwater. More than 1,600 radiation measurements were made on these samples at the Agency's Eastern Environmental Radiation Facility at Montgomery, Ala. Air filter readings are first made at the sampling stations, for early indication of fallout and then are sent to the laboratory for more detailed analysis. All milk and rainwater samples require laboratory measurement.

"All these monitoring actions were handled according to long-established procedures," said Dr. Rowe. "We've had a lot of experience with radioactive air masses, starting back in the 1950's, when the United States was doing tests in the atmosphere, and since then with tests by Russia, China, France, and India."

The next Chinese nuclear test was a four-megaton explosion on Nov. 17. A megaton equals one million tons of TNT, so this yield was at least 20 times that of the Sept. 26 test.

Again the contaminated air mass was tracked as it drifted across the continent, and EPA's monitoring system swung into action. This time the Agency announced the activation of the standby air monitoring stations and the milk monitoring network and informed the public of the predicted arrival time and path of the radioactive cloud. EPA issued nine press releases in 16 days after the November blast.

Although the second explosion was more powerful than the first, the hazard was again expected to be slight unless rainfall occurred as the contaminated air mass moved over the U.S. The bigger blast produced more radioactivity, but not more fallout in this case, Dr. Rowe explained, probably because the harmful products were carried to higher altitudes where they avoided being washed out by low-altitude rains.

Results were as expected: most radiation measurements were within normal background fluctuations. "We judged the danger would be low and would require no action by individuals," said Dr. Rowe, "and that proved to be the case."

In addition to concern for possible ground-level contamination, there was concern for the high-altitude portion of the cloud, at 40,000 to 80,000 feet, because of some commercial air traffic in this zone. Special precautions included placing monitoring equipment on flights that might pass through the contaminated air, and some aircraft were checked for radioactivity on the planes' metal surfaces. These actions confirmed that there was no need to reroute flights or to wash off radioactive particles from the planes.

"The fact that the Chinese nuclear tests had limited impacts here does not diminish our concern with the long-term effects of such atmospheric testing, Dr. Rowe said. "We will continue to monitor radiation levels in the environment, and keep our system flexible, to zero in quickly on areas of special concern.

"We will also continue to keep the public informed of the results of our monitoring."

Environmental radiation monitoring began in 1956—14 years before EPA was established—as a Public Health Service function under the Department of Health, Education, and Welfare. The responsibility was transferred to the new Agency when it was organized in December 1970.■

Continued from page 3

arrangement between the two levels of government since the States already have a relationship with their water suppliers. Primacy expands their role, of course, but the point is that we want to build on existing institutions, not create new ones.

The States will have to go to their legislatures in some instances to get the necessary authority to meet the requirements for achieving primacy, but we have hopes that the great majority of States will ultimately accept this responsibility.

Q. What will happen if certain States are unwilling or unable to assume primacy?

A. If a State does not take on the job—and the Act is very specific about this—EPA must set a program up and implement it in that State.

Q. How much additional manpower will be needed on the State level to implement the Act?

A. There will probably be some additional manpower needed, but there are many people now concerned with water supply at the State level, county level and community level, and we think that this existing resource can be made stronger. We are developing curricula which the States can use to train such people.

Q. When the program goes into effect this June, will it create added costs for the consumer?

A. Probably, to a greater or lesser extent. If larger systems incur additional costs and pass them on to the consumer, the per capita increase will not be a serious concern, probably no more than a dollar per year. It is in the smaller systems that we expect difficulty. They have fewer customers to share the cost increases and, typically, they are the ones which have not kept pace with the technology required to treat today's water and to meet the new standards.

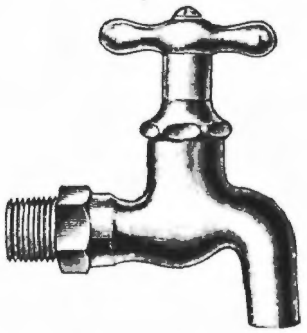
The Act takes this problem into account and provides for variances and exemptions, which give a system time to solve its technical and economic problems. Whenever this is the case, the State and the supplier must keep the public informed through public hearings and other means and also develop a reasonable compliance schedule. Of course, no variance or exemption can be granted where the public health would be threatened.

Q. That takes us back to the kinds of contaminants to be concerned about. EPA has issued regulations limiting the amount of radioactivity in drinking water. Where does this radioactivity come from?

A. This is mostly natural radioactivity in some areas of the country but there is also man-made radioactivity as from atmospheric fallout. For the most part we are concerned with how it impacts the quality of water. We don't see at the present time any major problem with radioactivity. We do, however, feel that this potential danger requires eternal vigilance because the use of radioactivity is here to stay. Nobody is going to stop using it and when you use it there is always the possibility of mishaps and contamination. So vigilance is really the key to that problem.

Q. What does the term "organic chemicals" mean with regard to safe drinking water? Why must we be concerned about them?

A. That's a big question requiring a careful answer. The science of chemistry is usually divided into two major parts: inorganic and organic. Back in the early 1800's when chemistry was in its infancy, it was thought that "organic" chemicals were all related to and could only be produced by living organisms and the inorganic chemicals were not related to living things. Actually, organic chemicals are those chemicals which are based on carbon when it is in combination with a few other elements like hydrogen, oxygen, nitrogen, chlorine, etc. An infinite variety of these organic



chemicals can be produced either naturally or in the laboratory. Almost every substance we encounter has some kind of "organic" chemical in it—food, medicines, plastics, petroleum, and pesticides.

Some of them are hazardous when ingested or inhaled. As our analytical technology becomes more and more sophisticated we are finding some of these chemicals in water. Most of the organic chemicals that are being detected in water are from natural sources (like humus) and they undoubtedly have been in water since the beginning of time. However, some of the chemicals are from man's activities. In addition, there are some chemicals that are formed in the water in the process of treating it for human consumption. For example, chloroform and related trihalomethane compounds are being produced by the reaction of some of the natural humus with the chlorine that is added to disinfect the water at the treatment plant.

We don't know precisely yet (and perhaps we never will) what the significance of these trace contaminants is in terms of human health risk. Some of them have been shown to be carcinogenic in tests conducted in animals at higher exposure levels. A few chemicals that have been detected in some water supplies are implicated in human cancers from, again, higher levels of exposure. Then again, some of them merely impart tastes and odors to the water. Persistent chemicals are of particular concern. Many of these are chlorinated compounds like pesticides and industrial solvents, and they are not readily broken down to carbon dioxide and water by the natural processes that recycle most of the chemicals in the environment. That means that the likelihood of human exposure is considerably increased. At any rate, many of those chemicals are undesirable and unnecessary contaminants in drinking water, and there are ways of either limiting the contamination of the water or removing them in the water treatment plant, and this is what we are trying to accomplish through the Safe Drinking Water Act and the Federal Water Pollution Control Act.

Q. Why has it taken so long for the Agency to establish standards for organics?

A. We did write standards for six organic pesticides in the 1975 Interim Primary Drinking Water Regulations. We are now writing standards for trihalomethanes (e.g., chloroform) and expect to propose them in the Federal Register before this interview is published. The fact that there are so many different chemicals is a major problem. Although some generalization can be made, each compound does have an individual personality. The health effect studies are an expensive and a slow process in which we must use animals, and then go to the difficult process of transferring that information into some sort of an estimate of what that means in terms of human exposure. We also have to be sure that treatment processes for removal are available, and that those treatments don't impart new risks to the public.

Q. The chlorine that is used to sanitize most

drinking water supplies has also been associated with chloroform, a contaminant considered to be carcinogenic. Can you elaborate on this situation?

A. This is really a scientific dilemma. For years we have used chlorine to kill the bacteria and hopefully the viruses in water which were suspected of causing disease. But we have learned in the past year or two that chlorine, in reacting with the natural organic material in the water will produce chlorinated hydrocarbons, such as chloroform (trihalomethanes). Earlier this year, the National Cancer Institute reported that chloroform caused tumors when fed to rats and mice in high doses. The possibility of harmful effects from the presence of very low levels of chloroform in water must be weighed against the great benefit that chlorine provides. Transmission of serious disease in disinfected drinking water is now virtually unheard of. We are developing technical procedures that would allow us to continue to use chlorine and other disinfectants without generating harmful amounts of undesirable chemicals. A great amount of progress is being made in this area.

Q. There have been problems about organic contaminants in the drinking water supplies of Cincinnati, New Orleans and some other places. How do you evaluate the dangers there?

A. We are doing several national organic monitoring studies and we are reviewing the data on them. In fact, the raw data have been given to the cities and communities in which the samples were taken and some are already taking action. The studies have identified the existence of certain organic compounds in the water supplies of some cities. We want to do two things in order to evaluate this data now. First of all, the National Academy of Sciences is reviewing the whole organics problem for us to assess the associated risk.

Secondly, last July we published an Advance Notice of Proposed Rule-Making on organics, with several options. We have received public comment on that from all quarters and are now writing regulations for trihalomethanes in drinking water. The National Academy of Sciences report is due on March 1, 1977. That, in conjunction with other studies will help us decide what the level of danger is and what should be done in various cities.

Q. Let's turn to the other major program of the Act, the Underground Injection Control program. What is underground injection and why should we regulate it?

A. Man uses the crust of the Earth for many purposes. In some cases, we inject things like steam or other pressurized fluids to force out a needed resource. This is done, for example, in solution mining and in oil production. If there is water in the area where an injection process is operating, one must have some degree of protection to ensure that the process doesn't impact the quality of water, even if it is only a potential water supply. Part C of the Act is fully devoted to underground injection concerns. We have published our proposed regulations for preventing possible contamination from underground injection so the public, and particularly the States and affected industries, can become involved in developing the program. We expect these proposed regulations to be revised and to become final in the spring of 1977.

Q. Just how widespread and serious is the problem of underground injection?

A. It varies from place to place, from State to State. Obviously, wherever oil and gas are being produced, protection of ground water is a concern. In other areas, we find waste disposal wells, salt water intrusion wells, and so on. There are eight kinds of wells covered by the regulations, so there are few areas not concerned to one degree or another. The proposed regulations define a well as any man-made hole in the ground that is deeper than it is wide. There are hundreds of thousands of such wells around the country and if they are used for the emplacement of fluids—for storage, disposal, or any other reason—they will be covered by the regulations. So we are talking about a practice that is truly widespread. As for seriousness, keep in mind that about half the population of the country depends upon ground water for its drinking water. Should that source be jeopardized, how would we ever replace it?

Q. You mentioned that the States have been involved in developing the Underground Injection Control Regulations. Are they to have "primacy" in this program, too?

A. Yes. But the process begins with the designation by the Administrator of which States are to be covered this year and which next year. Eventually all will be involved, but not at the outset.

Here again in this program, State agencies have to meet certain requirements to be given primary enforcement responsibility. The regulations governing this aspect of the program have also been proposed and commented on. The final version will be promulgated soon. And as in the drinking water program, grants are available to States that apply, and EPA will conduct the program where any designated State does not take on the job.

Q. Would people be better off drinking either bottled water or water treated by home purification devices?

A. This is a hard question for me to answer because the quality of water depends on the site and its desirability is subject to individual preferences. First, bottled water or home treatment units can never be a substitute for a safe, adequate public water system.

However, some citizens object to unesthetic characteristics of different waters, such as high mineral content, chlorine tastes, and the possibility of other contaminants, and these people have a right to resort to home treatment or bottled water. Home treatment units can be designed to handle a variety of esthetic water quality problems but they may also present bacterial or endotoxin problems or they may deteriorate if not properly maintained. We also suspect they may have limited effectiveness in comparison to the advertising or sales claims that are made for them. We are currently initiating a research contract to look into these matters.

The Food and Drug Administration has responsibility for bottled water control, but FDA bases its standards on the EPA Primary Drinking Water Regulations. Our own studies in recent years have shown that bottled water may not be a panacea since it is subject to a variety of contaminants and to bacterial aftergrowths.

Q. In your opinion, is the Safe Drinking Water Act itself adequate to ensure safe drinking water?

A. Although the Act is a very good piece of legislation, no. In addition to the legislation we must have the cooperation of the citizens and people in the country—the State officials, the Federal officials, the community people—working as a team with the legislation as a base. If we receive this type of support then we will have a system which has a great chance of making drinking water safe. It's best to look upon the Safe Drinking Water Act as part of a comprehensive legislative/regulatory program to control contamination of the environment. That program includes the Federal Water Pollution Control Act, the Resource Conservation and Recovery Act, and the Toxic Substances Control Act. With the collaboration of State and local officials, industry, and the public, these four statutes offer great hope for the protection of drinking water and the public health.■

ENVIRONMENTAL ALMANAC
FEBRUARY

Suffering from a touch of "cabin fever" one February day we decided impulsively to escape the snowy slush of city streets and head for an old farm largely overgrown now with pine trees.

We've always found pines a comforting reminder that life endures and that the green world of spring will return as it always has.

The dirt road leading to the farm was covered with a blanket of snow. Parking the car on the shoulder of the blacktop we began slogging through the snow which had drifted to a depth of two feet in some hollows.

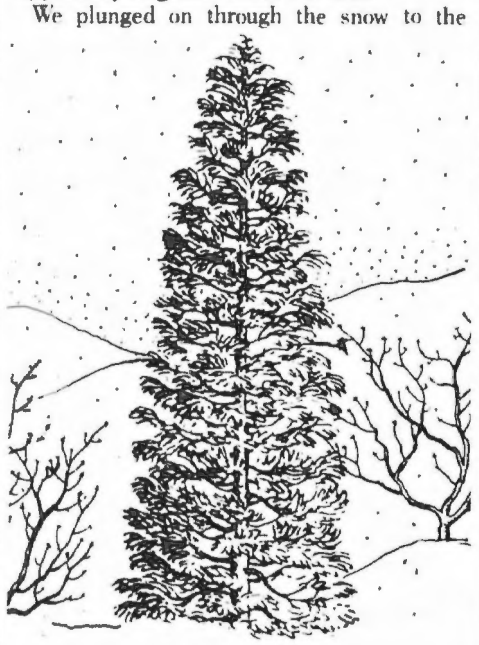
After about a half mile we came to a curve in the road through the woods. There stood a young pine that had been stripped of its bark.

This was the site where a few winters ago, as city folks more interested in seeing than in hunting deer, we had placed a block of salt after hearing from old-time residents that deer loved this substance.

Some animals found it promptly and began giving it vigorous licks. While we never actually saw the deer consuming the salt we did find numerous deer tracks around the lick. In a few months not only had the salt entirely disappeared but the ground beneath it had been torn up by angry hooves and the nearby tree debarked by the frustrated animals who refused to accept the fact that the salt supply was exhausted.

By the time the hunting season came around in the fall the deer fortunately had apparently forgotten about the salt.

We plunged on through the snow to the old farm house and found it with icicles dripping from every eave under the morning sunlight.



To ease the chill we picked up some logs from the pile on the front porch and laid them on newspapers and kindling already in the fireplace.

Rummaging through our pockets we found that our only matches had become partly soaked. Recognizing suddenly that we were several miles and tons of snow away from the nearest store, we began to strike the matches with growing uneasiness.

Finally a spurt of flame ended the suspense. Fire shot up from the kindling and sent the first faint wisps of smoke curling through the chimney. Inefficient or not, a hearthside fire can still provide heat for those willing to drag up a chair.

* * * *

Thoroughly warmed, we walked out to the front porch and inspected the snowscape outside.

There where the tree line met the meadow was a grove of Virginia pines, their green vivid against the background of snow and leafless hardwood trees.

The pines are slowly advancing in a field where we had found mowing the grass was too much of a burden on our brief weekends. Competing with the Virginia pine in the race to take over the field were some pitch pine, sumac and thorny locust.

Elsewhere on the farm graceful hemlocks were clustered on a small island in the stream deep in the lower woods, and sweeping over a nearby hillside was a grove of white pine.

Even under a dusting of snow the shiny green foliage of the pines brightens the drab and bare winter landscape. The softly waving boughs give protection from the winter winds and provide cover for chickadees, whitebreasted nuthatches and other hardy winter birds.

Yet in many areas pines are now endangered by pollution.

Growers of Christmas trees, for example, have become acutely aware that the increase in the number of coal-burning power plants might hurt them financially unless adequate pollution controls are provided. They have been warned by scientists that the uncontrolled discharge of sulfur dioxides from power plants can deform their conifers. The problem is caused when the trees are bathed in acid rain formed when the sulfur dioxide mixes with rainwater and is converted to sulfuric acid.

Some owners of Christmas tree farms a few hours' drive from Washington filed suit a few years ago against a power company and were able to collect substantial damages in an out-of-court settlement. Much of the evidence in the case had been developed at a pollution abatement proceeding brought by EPA against the power plant.

The white pine, the unsurpassed timber tree for most of this country's early history, is so sensitive to pollution that doubts have been expressed as to whether it will be able to survive in industrial regions in the future. Meanwhile, it makes an excellent pollution monitoring device.

The cone-bearing evergreens have been on earth for an estimated 250 million years, long before such relative newcomers as the oaks, elms and hickories. Yet longevity is no protection against the world's most destructive animal—man.

* * * *

Night falls early in February and the jar of water brought in from the spring may be frozen when first light appears on the eastern horizon.

Meanwhile, it is good to crowd closer to the fire before dashing to bed. In summer this is the time when the whippoorwill would be plaintively calling its name over and over again. Now only the mournful hooting of an owl is heard.

As slumber approaches, you can hear the murmuring of the wind in the pines and their graceful forms are silhouetted in the pale light of the moon slowly climbing the night sky.—C.D.P.

GAINS ON THE AIR AND OCEAN FRONTS

AIR

The National Air Quality and Emissions Trends Report, which was released recently by EPA, says that fewer Americans were exposed to unhealthy levels of air pollutants last year. In addition to the improvement in ambient (outside) air quality, emissions levels of five major air pollutants also declined over the last five years.

The report examines progress in achieving ambient standards that were set by EPA in 1971 under the Clean Air Act: primary standards to protect public health, and secondary standards to protect public welfare.

The report compares pollutant measurements with primary standards for long (annual) and short-term (24 hours or less) exposures. It measures the impact of changes in air quality, which resulted from emission control plans, and points out the changes in the number of people exposed to air quality levels above the national standards.

The report examines emission reduction in each of several categories of sources that have resulted in ambient improvements over the five-year period for each major pollutant.

Average national ambient air levels of particulates have improved about four percent per year. The Northeast and Great Lakes areas have exceeded this rate of improvement. The West has not followed this pattern because of regional differences in the nature of the problem; wind-blown dust is a major factor in some areas, and around Los Angeles photochemical particles contribute to the pollution. Neither of these problems responds well to ordinary particulate control measures.

Less burning of coal by factories, installation of control equipment by industries and coal burning utilities, and less burning of solid waste have all contributed to the reduced levels. Production curtailment by some industries because of economic recession during 1974-75 also helped cut the amount of particles in the air.

Urban ambient levels of sulfur dioxide have decreased by an average of 30 percent since 1970.

Carbon monoxide levels in the ambient air are closely tied to use of motor vehicles. Nationally 75 to 80 percent of the carbon monoxide emissions are attributed to transportation; in some major metropolitan areas vehicles may contribute as much as 99 percent. Depending on the concentration of traffic, the problem may be localized on a few street corners or it may extend the length of a commuter route. The control of carbon monoxide is directly related to motor vehicle emission controls. This is reflected by the seven percent per year improvement in emissions in California compared to the five percent figure for the rest of the Nation. California has more stringent standards on carbon monoxide emissions than those applied to the vehicles sold in other parts of the country.

Although levels of photochemical oxidants have been recorded in California for many years, most parts of the country have less than three years of data about this pollutant, too short a time to determine national trends. In California, there has been a general improvement.

Summertime oxidant levels in eastern cities seem to be lower over the past three years. But no firm conclusions can be drawn from the limited data.

Insufficient data on nitrogen dioxide ambient levels also hampers attempts to evaluate national trends. Scattered monitoring shows mixed results.

Estimated national total emissions of nitrogen dioxide increased 7 percent between 1970 and 1975, but suspended particulates were reduced 33 percent, sulfur dioxide 4 percent, hydrocarbons 9 percent, and carbon monoxide 15 percent from the 1970 level.

The results in the report are based on data submitted to EPA from the State and local air pollution control agencies. The report was written by William F. Hunt, Jr. (editor), Thomas C. Curran, Neil Frank, William Cox, Robert Neligan, Norman Possiel, and Charles Mann, with assistance from Joan Bivins and Willie Tigs.

Copies of National Air Quality and Emissions Trends Report, 1975, are available from the Monitoring and Data Analysis Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, N.C. 27711.

OCEANS

Despite a slight increase in sewage sludge disposal, the overall total of wastes dumped into our oceans has decreased, according to the Fourth Annual Report to Congress on Ocean Dumping in the United States, which was recently issued by EPA.

The amount of industrial wastes dumped annually dropped from over 5 million tons in 1973 to under 3.5 million tons in 1975. Further decreases can be expected, the report said, as individual dumpers are phased out and alternate methods of disposal are found.

As more municipal waste treatment plants are built, the amount of sludge—the residue left after sewage treatment—increases and much of it is disposed of in the ocean. The report notes that pressure to dump more of these wastes in the ocean may be a major problem in the future.

Under the Marine Protection, Research, and Sanctuaries Act of 1972, commonly called the Ocean Dumping Act, ocean disposal of radiological, chemical, or biological warfare agents, and high-level radioactive wastes is banned. The only material that the law allows to be discharged into the ocean without a permit is fish wastes, and then only when the disposal does not endanger a harbor or other protected area. Permits for dumping dredged material are controlled by the Army Corps of Engineers. Permits to transport materials for dumping and permits to dump all materials except dredged material are controlled by EPA.

The law provides for both civil and criminal penalties for violations unless materials are dumped as an emergency action to safeguard life at sea. The Coast Guard, which is responsible for surveillance of ocean dumping, reported eight violations of the Act to EPA in 1975. Civil penalties were assessed and paid in six of those cases, and the other two are still pending, according to the report.

EPA is trying to find and use the least environmentally damaging site and disposal method for each waste, said the report, whether it involves land, air, or water.

The Act authorizes the National Oceanic and Atmospheric Administration (NOAA) to conduct research to find ways to minimize or to end all ocean dumping within five years of enactment. EPA is requiring all holders of ocean dumping permits to explore and implement other methods of disposal. The report notes that Philadelphia, Pa., and municipalities in the New York-New Jersey metropolitan area must stop dumping sewage sludge into the ocean by 1981.

Those cities are working to meet the deadline. Philadelphia has a sludge giveaway program, and is pursuing land application of sludge to pastures, strip-mined areas, and marginal land on a trial basis. The cities in the New York-New Jersey Metropolitan area are studying land-based alternatives for sludge disposal.

EPA has over $11 million obligated for pilot studies into new ways of utilizing sludge so that it won't have to be dumped into the ocean.

Copies of Ocean Dumping In the United States-1976 are available from EPA's Marine Protection Branch (WH-548), Washington, D.C. 20460.

INQUIRY

Would you pay more to make sure your drinking water is safe?

Richard Kotelly, Acting Director, Water Programs Division, Region I, Boston, Mass.: "I live in Burlington, a small town, north of Boston and I am well aware of the problems and costs of drinking water. The rapid growth of this town, from about 3,000 in 1940 to 25,000 now, put an enormous strain upon its water supply, which until about five years ago came from town wells. A major highway, Route 128, was built through the town and the State's over-salting of the road, and seepage from salt storage areas further complicated the water problem.

"Our drinking water tasted, smelled, and looked terrible; doctors were concerned about its high sodium content and the effects upon people with high blood pressure and heart conditions. We were ashamed to serve it to our guests, and its awfulness was the recurrent subject of angry letters to and articles in the newspaper. When water gets as bad as ours, everyone is willing to spend money. After a town referendum, Burlington floated a bond issue of four million dollars to pay for improvement of its water supply.

Burlington now has very good water, and the newspaper no longer runs feature stories on the horrible state of the town's water."

Robert Burd, Director, Water Division, Region X, Seattle, Wash.: "Some while back we had an interesting controversy going on here in Seattle about whether our reservoirs should be covered or not. Seattle drinking water is of high quality for it comes from the foothills of the Cascade Mountains and is mostly snow melt-off. It requires no treatment other than chlorination and it is stored in open reservoirs. When one of them, located near where I live, was cleaned out, I noticed with some alarm that an old pay phone booth, dead birds and animals, and various other oddments of unsavory debris surfaced. These reservoirs are also home for many seagulls.

"So I wrote a letter to the editor, proposing that city reservoirs be protectively covered, and since I'm an avid tennis buff, I suggested that this surfacing be made into tennis courts. But this improvement, which I'm sure would not have raised Seattle's water rates by much, was rejected by the city fathers.

I will be happy to pay more for good water at any time that the necessity arises."

Roosevelt Rollins, Electrical Engineer, Environmental Sciences Research Laboratory, Research Triangle Park, N.C.: "As far as I know, Durham's drinking water supply is safe and I find it esthetically pleasing as well as good to drink. It comes from Lake Michie and the city has several treatment plants. The water charge rates are moderate, compared to those for other utilities, and I pay my water bill without complaint. I would be willing to pay considerably more for good water, if for any reason I became convinced that Durham's water supply needed more sophisticated or better treatment."

Linda Mendez, Secretary, Water Programs Branch, Region VI, Dallas, Texas: "I like our drinking water, it tastes and looks good and as far as I know it is safe and poses no health danger. I don't know how its cost to consumers compares to that of other cities, but I would guess that our water charges are about average. There is talk about upgrading Dallas's water treatment system, and a possible 10% hike in water rates if this happens. I will be happy to pay extra money to ensure good water, and I think most of the people of Dallas share my feeling."

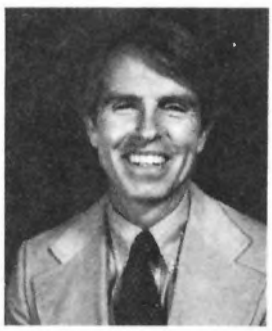
Dr. Gary Glass, Senior Research Chemist, Environmental Research Laboratory-Duluth, Duluth, Minnesota: "If you live in Duluth, you talk about drinking water and its cost from a special perspective. Our city's water comes from Lake Superior, and it has the world's highest concentration of asbestos fibers. On the average our drinking water contains about 100 to 200 million fibers per quart, but in extreme storm conditions the concentration can go as high as one-and-a-half billion fibers per quart. In addition, an EPA study indicates that our water contains a measurable quantity of chlorocarbon contaminants such as chloroform.

"In one way or another, either in cash or in effort, most of us have been paying more for our drinking water. Since June of 1973, when people were made aware of the presence of asbestos fibers in their water, and the possible health danger this posed, many citizens have installed membrane filtering systems in their homes at costs ranging from about $100 to $300 and with yearly maintenance costs averaging $60. Others go to firehouses, schools, hospitals, and other public places to fetch filtered water for drinking and cooking purposes.

"Reserve Mining Company, the source of the asbestos fibers, began its dumping of taconite tailings into Lake Superior at the present rate of 67,000 tons a day in the early 1960's; this means that part of Duluth's population has been exposed to a known carcinogen for about fifteen years—half the estimated response time for the development of asbestos-caused diseases.

"A demonstration water filtration plant designed to take out the fibers is being built. EPA paid for the pilot plant study in 1974 that preceded its construction. If successful, this plant will relieve the individual of the burden of securing good water, but of course it will increase each household's water bill. I believe that most people are willing to pay more for 'safe' drinking water if they are made aware that 'unsafe' water can and does pose a very real threat to their health."

Richard Kotelly



Robert Burd

Roosevelt Rollins

Linda Mendez

Dr. Gary Glass

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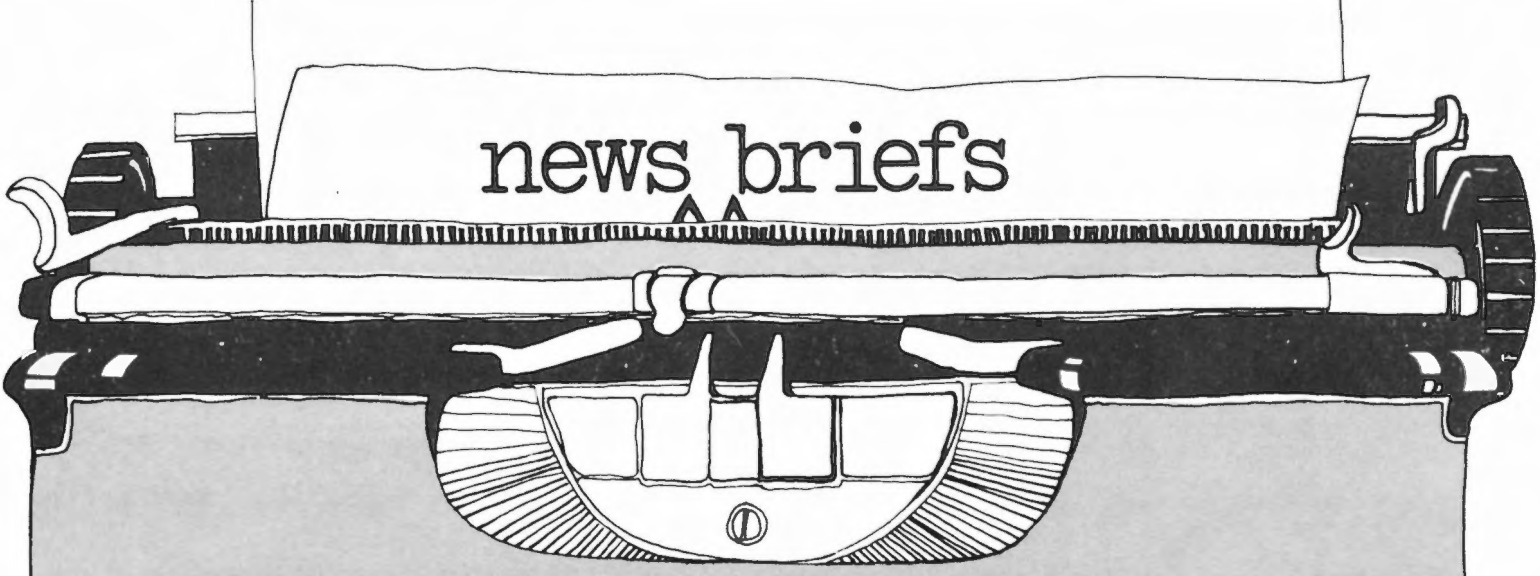

ALM ACCEPTS ENERGY POSITION

Alvin L. Alm, formerly EPA's Assistant Administrator for Planning and Management, has accepted a position under James R. Schlesinger, President Carter's chief energy advisor. Mr. Alm will be helping to develop a National Energy Policy and to plan a new Department of Energy. His responsibilities will include building environmental quality considerations into the new energy plan.

ALLIED CHEMICAL PLANT BARRED FROM FEDERAL CONTRACTS

Allied Chemical's Semet-Solvay Division, Ashland, Ky., has been placed on EPA's List of Violating Facilities, which prohibits it from Federal contract renewal and makes it ineligible to receive future Federal contracts, grants or loans. The corporation was convicted of violating an agreement to bring two coke batteries at Ashland into compliance with Federal Clean Air standards. This is the first facility to be listed for an air pollution violation. Del Monte de Puerto Rico, Inc., and Star Kist Caribe, Inc., were listed earlier for violations of the Federal water pollution standards.

EPA BANS DISCHARGE OF PCBs

EPA has issued final regulations which totally prohibit the discharge of polychlorinated biphenyls into the Nation's waterways by certain industrial plants. Plants which use the highly toxic, persistent compound in the production of electrical transformers and capacitors, as well as PCB manufacturers, must meet the standards within one year. Indirect PCB discharges through municipal sewage treatment plants will be dealt with in "pretreatment" regulations now being developed.

CINCINNATI INFORMATION CENTER ESTABLISHED

A new Environmental Research Information Center for EPA's Research and Development program has been established in Cincinnati under the direction of Robert E. Crowe, the former director of the Agency's Technology Transfer Staff. Under this reorganization the information center includes personnel from the Technology Transfer and Technical Information staffs. The center was established to improve distribution of information about EPA's technology findings.

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EASY ON THE SALT By Peter Acly

Since winter driving can often be hazardous, we expect highway authorities to do all they can to make icy streets safe. Their response is usually to apply large amounts of road salt to melt the ice and snow. Although this practice is relatively cheap and may make driving safer, the widespread use of salt costs Americans billions of dollars each year in damages to the environment, vehicles, and human health.

EPA researchers in Edison, N.J., have been examining some of these problems. Members of the research team, which is part of the Municipal Environmental Research Laboratory in Cincinnati, Ohio, believe road deicing techniques could be modified to lessen the damage caused by salting.

One problem familiar to car owners is corrosion. According to a study done for EPA by Abt Associates of Cambridge, Mass., rust damage to vehicles costs an estimated $2 billion annually. A further $500 million in damage is done each year to road surfaces, bridges, elevated highway structures, and roadside utility equipment such as power, phone, and water lines.

In addition, annual environmental damages total another $300 million, primarily through the addition of large amounts of salt to drinking water supplies. This can present a serious problem to people on low-salt diets by rendering some water supplies unusable.

Damage is also done to roadside crops and vegetation. The total dollar damage is estimated at nearly $3 billion each year. Another problem is that some materials added to road salt mixtures may have severe toxic effects about which little is yet known.

Salt is usually applied at rates varying from 400 pounds to 1,200 pounds per mile for each application. That can work out to over 100 tons of salt per mile each season on some multi-lane highways, depending, of course, on the severity of the weather.

Peter Acly is an EPA Headquarters Press Officer.

Annual nationwide use figures are even more startling: a 1971 EPA report showed that highway authorities used over 9 million tons of sodium chloride—familiar to all as "table salt," and also the most widely used deicer. About 300,000 tons of another common deicer, calcium chloride, were also used. Since that time the annual tonnage used has shown a steady increase, although consumption is now levelling off.

The reason so much salt is used is that it is cheap, easily available, and efficient in getting the job done.

EPA's research has led to the formulation of new techniques and ideas to improve deicing practices. Some of these are still under development; others have been accepted and put in use.

Michael White, 4, son of Mr. and Mrs. Melvin White, plays with salt stockpiled in Washington, D.C. Michael's mother is an EPA secretary.

The Edison researchers believed that an effective way to promote improvement in the methods used to store and apply road salts would be to increase awareness by highway officials of the problem. To do this,they prepared a detailed study of damage costs, as well as a pair of technical manuals which present the latest ideas on how road salts could best be stored, handled and applied. The manuals turned out to be instant best-sellers.

The manuals recommend such things as the construction of storage sheds to keep salt stockpiles from being eroded during wet weather, the training of road crews on how to avoid excessive rates of application, and the development of sound policies on when and how often salt should be applied when the snow starts falling.

EPA research has also led to the development of an alternative that could replace road salt for use in certain environmentally sensitive areas. This is a hydrophobic (water-repellant) coating for highway surfaces.

These hydrophobic substances are semipermanent silicone rubber-base liquids that, when sprayed on a road surface, prevent the formation of a bond between ice and the pavement. Although they do not melt ice and snow, the new substances allow ice to be broken up easily and brushed or blown to the side of the road. Scientists also believe that clearing roads this way with broom and blower systems would cause less damage to road surfaces than now results from the use of heavy plow blades.

EPA scientists believe that the combination of better salt handling practices and the selective use of harmless substitutes can reduce the annual damage to water supplies, highway structures, vegetation and vehicles. ■