

## A chairwoman for the AEC

Appointment of Dixie Lee Ray to head the Atomic Energy Commission gives her the double honor of being the first woman to hold that position and being the highest ranking woman to head a Government science agency. The 58-year-old marine biologist has already established a reputation at the AEC for her informal life style and determination to establish closer contacts between installations in the field and the Washington bureaucracy.



AEC's Dixie Lee Ray

Her appointment comes at a crucial time for her commission, which is under fire from environmentalists striving to slow down further atomic reactor installation and to remove the AEC's regulatory power to an independent agency. While she has not commented publicly on these issues, the new chairwoman is expected to be active in public education aimed at increasing acceptance of atomic energy.

Meanwhile, she has busied herself with visiting various AEC facilities around the United States, accompanied by her two dogs, Jacques and Ghillie. At one stop on her tour, Ray, an honorary member of the Kwikseutaniik Indian tribe, told how the commission will encourage its contractors to hire more women and minorities by hiring promising, but untrained young people and then letting them pursue degrees on the job. More attention should be paid, she said, to "personal abilities and skills of candidates and a little less to formal qualification on paper."

A native of Tacoma, Wash., the new AEC chairman has enjoyed a 24-year association with the University of Washington. She has been particularly interested in public education in science and was director of the Pacific Science Center in Seattle. Despite her informality, she brings to her job a stubborn determination that, colleagues feel, will serve her well in the difficult time ahead.

## A new director for the NBS

Richard W. Roberts has become the seventh director of the National Bureau of Standards just as that once sleepy agency has gained new importance in the areas of consumer protection, technology coordination and the drive to convert the United States to the metric system of measurement. He succeeds Lewis M. Branscomb, under whose leadership the bureau gained much of its new prominence. Branscomb left last year to become chief scientist at IBM.



NBS's Richard W. Roberts

Roberts met the problems of metrication head-on during his confirmation hearings before the Senate in late January. He agreed with the concept that converting Government procurement specifications to the metric system should be sufficient to encourage the private sector to convert. In general he said no special loans or grants from the Government are needed to help industries with conversion, but that loans for small businesses "severely affected" might be "an effective way to help them over the hard period." Roberts, who supported General Electric's unilateral decision to go metric while he was manager of the company's Materials Science and Engineering R&D division, said private industry needs only "a little motivation" to go metric.

Roberts received a doctorate in physical chemistry in 1959 from Brown University and served a postdoctoral fellowship at NBS before joining GE's research laboratory. His experience in industry will help him lead NBS in two of its new obligations. Under a law passed last year, the bureau has expanded duties in research related to consumer product safety. The bureau has also just begun to work actively with the National Science Foundation in a new program to speed introduction of new technology into the marketplace. The bureau's chief responsibility is maintaining and improving national standards of measurement.

## When the black cloud strikes from the air

Air pollution has been accused of aggravating, triggering or actually causing health problems as diverse as cancer, bronchitis, pneumonia, emphysema, heart disease and psychiatric disturbances. Yet evidence to support these claims has been sketchy. Now more exact findings are coming to light.

Sulfur oxides are one of the major air pollutants. They result from coal and oil being burned as fuel by industries, homes and motor vehicles. High levels of sulfur oxides have been linked with deaths from acute or chronic respiratory illnesses.

Now the Environmental Protection Agency has linked moderate air levels of sulfur oxides, which people are exposed to on an everyday level, with

specific respiratory problems, such as asthma and chronic bronchitis. Carl Shy of EPA's Research Triangle Park in North Carolina reported this finding last week at a Washington seminar on the health effects of air pollution. Declared Shy: "Sulfates and sulfides, the breakdown products of sulfur dioxides, appear to be even more critical than sulfur dioxides in triggering respiratory diseases."

Sulfur dioxide and its products provoke respiratory diseases only under the proper meteorological conditions, Shy says. Cold weather serves as a catalyst in winter, humidity in summer. Barometric pressure changes, such as a cold front, appear to have little impact on the ability of air pollutants to set off respiratory attacks.

Sulfur dioxide air levels are drastically down in New York City, Chicago and some other cities, Shy says. How-

ever this does not necessarily mean that air levels of sulfates and sulfides are also being reduced. And what is it that really acts on nasal passages and lungs? Is it a certain size sulfate or sulfide compound, or perhaps a metal ion attached to a compound? Such questions, he stresses, are crucial if the effects of SO<sub>2</sub> and other air pollutants on respiratory functions are to be curtailed.

Many smokers wonder how much respiratory distress they suffer is due to smoking and how much to air pollution. The EPA now has what appears to be the first preliminary answer. Respiratory insults are due two-thirds to smoking and one-third to sulfur dioxide in Chicago, New York City and Salt Lake City, and about four-fifths to smoking and one-fifth to sulfur dioxide in Idaho.

A report EPA has not yet published also lists other evidence indicting sulfur as a cause of respiratory problems.

In four recent sulfur-pollution periods in Birmingham, healthy children suffered "significant increases" in eye and chest irritations. In one of the episodes "acute decreases" in lung ventilation were found, and during the worst of the four episodes an "excess of acute irritation symptoms" was seen throughout the population.

The EPA is now analyzing data on ambient carbon monoxide levels and their effects on various respiratory functions. Carbon monoxide is another major air pollutant. The EPA will then take a look at everyday levels of other major air pollutants and their effects on respiratory activities.

Physicians are beginning to consider air pollution in treating patients for respiratory diseases, the Washington seminar also revealed. For example, Henry J. Palacios, a Washington general practitioner, has noted that many of his patients come down with asthma, coughs, bronchitis, colds and other respiratory problems during periods when air pollution is at its highest in Washington and most other cities in the United States. Palacios is also seeing more and more young adults who cough, have chest tightness and skin problems and are extremely tired. He suspects they may be suffering from lack of oxygen and other spinoffs of high air pollution.

Bertram Carnow of the Lincoln School of Medicine recommends that if air pollution levels are high, physicians should instruct patients with critical respiratory problems to stay in bed until the "black cloud" has passed. □

## Pipeline delayed on width technicality

What was billed as the great constitutional confrontation between environmentalists and oil companies proposing to build the trans-Alaska pipeline snagged to a halt last week on a technicality of a 53-year-old law.

The U.S. Court of Appeals in Washington, D.C., ruled that the Alyeska Pipeline Service Co., owned by a consortium of seven oil companies, violated the right-of-way provisions of the Mineral Leasing Act of 1920, which would allow a maximum of 25 feet on either side of the four-foot-wide pipeline. Originally, the consortium had requested an additional 146 feet for construction purposes and access roads, but eventually asked for "temporary use of such minimum amounts of land" found to be "reasonably necessary" once construction began.

The oil companies and Department of Interior officials remain undecided whether to appeal the case further. Legislation to grant the additional right-of-way space for the \$3 billion project seemed certain. □

## With Cousteau in the Antarctic (by satellite)

Jacques Cousteau is exploring the Antarctic in true space-age style. Aboard his ship, the Calypso, are a helicopter for ice reconnaissance and photography, a two-man submersible for underwater exploration, a hot air balloon for altitude photography, instruments for oceanographic measurements and equipment for communications to and from earth-orbiting satellites.

Last week, reporters in London, Washington and California talked with Cousteau via satellites about the data-gathering he is doing for NASA on biological productivity in ocean waters around Antarctica.

The purpose of the measurements is to evaluate the capability of the existing satellites to delineate productive ocean regions. As the ship cruises north and south of the Antarctic Peninsula, the crew daily takes measurements of ocean surface temperature, chlorophyll concentrations, water transparency and types and abundances of marine plants and animals. Daily reports, photography and navigational data are sent through ATS-3 (Applications Technology Satellite) to NASA's Ames Research Center in California. Working with John Arvesen at Ames is Ellen Weaver, a professor from California State University at San Jose. They have developed sensor systems to monitor chlorophyll concentrations from aircraft. Eventually similar systems will be used on satellites.

Now they are correlating the Calypso tests with Nimbus 4 and NOAA 2 satellite imagery. From this imagery they can pinpoint sea ice and get surface temperatures. It is the relationship between surface temperatures and chlorophyll concentrations as measured on ship that is the key. Cooler waters usually indicate upwellings that bring nutrients to the surface. One puzzle Weaver would like to solve is why Cousteau got readings of chlorophyll 100 times higher over the caldera of the partially submerged volcano at Deception Island. It is possible that the volcanic activity stimulated the productivity. The water is laden with nutrients.

Weaver calls Cousteau's trip to the Antarctic a "bonanza" for NASA. The Antarctic is abundant with life and Cousteau describes it as perhaps the most productive he has seen. The whole region depends on krill. These are tiny shrimp-like biota that eat the microscopic algae and are themselves the prime source of food for penguins, seals, fish, squid and whales.

But Cousteau is concerned. The ecological equilibrium of the region was

extensively altered by the killing of most of the whales. About six percent of the whales remain. "This area has been exploited in a rather ruthless way," he says. The lower forms of life have now taken over the abundant food supply once consumed by the whales. There are not a lot of different species there, but what is there is abundant. "The abundance of life at the level of primary production of vegetation is enormous," he says.

Now he is worried about future expeditions to hunt seals. "The seals are hardly recovered from previous hunting seasons." He also sees the region as the prime target for mineral exploitation because it is isolated and difficult to patrol. The Antarctic experience has shown him, he says, the value of monitoring resources as well as pollution from space. "The satellites have opened a whole new dimension. Once interna-



*Cousteau: How fares the ocean's life?*

tional agreements are made, the space laboratories will be really badly needed sheriffs of the ocean." But first, he says, the Geneva Conference which stated that the open oceans belong to nobody has to be modified radically. "That's the biggest mistake that was done. There is no place in this world for a no man's land."

The satellite imagery he receives on board has helped Cousteau and his crew of 29 (including his son, Phillippe and his wife) avoid the fierce storms that occur in the region, and large areas of sea ice. David Nace and Locke Stuart of Goddard Space Flight Center who placed the satellite equipment aboard were busy this week just helping Cousteau navigate his 141-foot wooden ship. He had lost a shaft of a propeller and was in the midst of a big storm. "We are working night and day to get weather imagery to him," Stuart says. To return he must cross for the fourth time Drake's passage where the Atlantic and Pacific Oceans converge. □