

eral major recommendations that he still hopes will be put into effect. For example, one called for establishment of a cabinet-level council to be responsible for determining the United States' major needs and policies in the field of mineral resources. Another urged that a national minerals reference center be set up in the office of the Assistant Secretary for Mineral Resources to keep statistics on minerals supply and demand.

Osborn's predecessor, John F. O'Leary, observes that, whereas many people in the mining industry distrust economists (such as himself), the industry is preoccupied with problems involving geology and the mineral sciences and it respects physical scientists. Therefore, he says that the fact that Osborn is such a scientist will give him a "real leg up" in dealing with the industry.

Also, Osborn has the advantage of being a registered Republican and a Nixon appointee, whereas O'Leary was a Democrat and a carry-over from the Johnson Administration. Furthermore, the fact that Osborn is taking the \$36,000-a-year Bureau of Mines job at a cut in pay and almost under forced draft from Secretary Hickel and other officials should make it easier for him to resist pressures from either the mining companies or Tony Boyle's United Mine Workers.

Some of the Best Have Left

In O'Leary's view, Osborn is taking over a bureau personnel team that is good at the "third echelon" and lower levels, but is ragged at the echelon immediately below the director. Some of the best people, he says, have left, including Thomas E. Howard, formerly director of mining research, whom O'Leary credits with virtually creating the science of rock mechanics.

Appointees to a number of important jobs in the office of Assistant Secretary Dole, to whom Osborn will be reporting, have been identified in the past with the minerals industry. Dole himself was formerly state geologist in Oregon, a position in which he naturally worked closely with mining companies. One of Dole's deputies was formerly an oil-industry lawyer; another assistant used to be a lobbyist for the American Mining Congress, and still another was manager of the Colorado Mining Association. Some observers familiar with the Bureau of Mines' recent difficulties believe that Osborn, if he attempts strict enforcement of the

Coal Mine Safety Act or tries to initiate far-reaching policies of environmental protection, can look for trouble from Dole's staff if not from the Assistant Secretary himself.

It is difficult for people who have never lived in a mining region to know the extent to which mining can result in polluted streams, land subsidence, smoldering refuse banks that pollute the air, and even the desecration of vast landscapes through strip mining. More than a year ago, Ralph Nader charged that Dole was suppressing a Bureau of Mines staff report on the environmental effects of underground mining and minerals processing. This report was to have been a sequel to an earlier one by the Department of the Interior on the effects of surface mining. It never has been issued, however, and requests by newsmen for copies of it have been denied, although a copy finally was made available for public inspection at the Bureau of Mines.

Survey of Damage

While the report does not single out specific mining companies for criticism, the statistics which it contains about the environmental damage already caused by underground mining, especially coal mining, are astonishing. For instance, an estimated 9000 miles of streams and 22,000 acres of lakes have been polluted by acid mine drainage and other wastes from mines and mineral processing plants. About 2 million acres of land surface, nearly all of it over coal mines, have undergone subsidence as the result of underground mining—sometimes with devastating results when the land undermined has been occupied by a town or suburb.

And, as of 1966, the solid waste generated by underground mining and the processing of materials from surface as well as underground mines totaled 18.5 billion tons and covered 1.8 million acres of land surface. It was estimated that, by the year 2000, solid wastes from these sources will be accumulating at the rate of 3.6 billion tons a year.

In the coal mining regions such wastes are piled up in huge refuse banks, which sometimes catch fire from spontaneous combustion or other causes. In 1966, there were 250 such refuse bank fires, some of which had been burning for years and some for decades. Uncontrolled fires in coal mines also are a problem, and at the time of the preparation of the report there were 131 such fires and another

106 fires in virgin coal deposits. One fire in an underground mine, at New Straitsville, Ohio, has been burning continuously since 1884.

The report recommended that the federal government intervene in the correction and prevention of damage from underground mining if the states failed to meet their responsibilities. It called for federal financial help and technical assistance to the states, for more research, and for federal agencies such as the Tennessee Valley Authority to demand better environmental protection from their suppliers of coal and other minerals.

According to O'Leary, the report's conclusions were unassailable but Dole, taking a protective view of the mining industry, "thought it was a horrible report." Clearly, the job of director of the Bureau of Mines is one that calls for missionary fervor, and at the moment Osborn has got it. Now the question is whether he will make enough converts to bring religion to the mining industry and to some of its high-ranking overseers in government.

—LUTHER J. CARTER

RECENT DEATHS

Fred D. Ayres, 64; professor of chemistry, Reed College; 12 July.

Alan M. Belfort, 43; product manager for international sales of Avicel products, FMC Corporation; 9 September.

George M. Belknap, 51; former professor of political science, University of California, Berkeley; 7 September.

Virginia L. Block, 68; professor of education and psychology, San Francisco State College; 14 September.

Agnes M. H. Byrnes, 90; professor emerita of sociology, Hunter College; 29 August.

Giuseppe Cirincione, 88; former professor of dermatology, New York University; 27 August.

George A. Derbyshire, 52; executive secretary, space science board, National Academy of Sciences; 15 September.

W. Wallace Dyer, 64; professor of clinical medicine, University of Pennsylvania; 14 September.

Dan M. Gordon, 63; former professor of ophthalmology, Cornell University; 17 September.

Alice Hamilton, 102; assistant professor emerita of industrial medicine, Harvard University; 22 September.