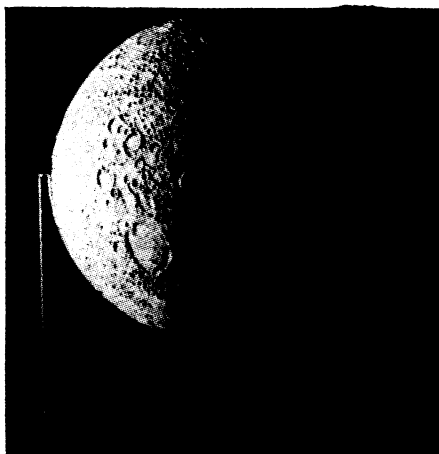


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phosphates in a river flowing past an industrial plant could be precipitated out of solution because of the waste discharge from the plant and thus never get to be used as a nutrient for algae or other plants.

Industry's favorite example for justifying the individual approach is Lake Tahoe in California, where nitrates rather than phosphates contribute to algal growth. Furthermore, experiments are cited in which the addition of phosphorus did not increase algal growth, but carbon dioxide did.

One solution presently discounted by the industry is the use of a substitute for phosphates. Says Buelman, "Although the industry is searching intensively for replacement materials, should they be needed, there is at this time no suitable phosphate replacement available for detergents."

Many candidates have been called but none elected. These include nitrilotriacetate (NTA), which although receiving considerable interest from detergent manufacturers, since it meets many of the requirements, is regarded not as a substitute but as an adjunct to be used with phosphates. One concern is that its environmental effects are unknown and dumping large quantities of it into streams could be dangerous.

Starch is another substance tried and found wanting by industry because, when modified to perform the functions of phosphates, it loses its biodegradability and so could build up in the environment.

Modified starches belong to a group of compounds called polyelectrolytes, polymeric compounds of large, organic molecules strung together in a chain made of carbon, hydrogen and oxygen atoms. Although the detergent industry feels that they show promise, they are scored because of performance weaknesses and their failure to meet the necessary biodegradability standards.

"It's a bunch of hogwash," charges Dr. Eldib. "They just don't want to do it." He says his firm has used polyelectrolytes, made principally from starch and cellulose, that perform as well or better than phosphates. Furthermore, he says, his firm has made a polyelectrolyte-based laundry detergent into a powder form for home use.

"The chainlike chemical structure of polyelectrolytes," he asserts, "allows us to try to vary the length of their chains and thus control their biodegradability to suit our needs."

However, they do pose an economic problem; they would raise the cost of detergents 13 to 21 percent, according to his own estimates. He feels, though, that volume production could bring their price down. □

BLACK LUNG

Action after a decade

Pneumoconiosis is a chronic lung inflammation caused by inhaling coal dust over a long period of time. The dust causes tissue changes that are often complicated by bronchitis, emphysema and cancer. If the lungs are unable to supply oxygen to the heart, cardiac problems can occur. In its simple form, the disease causes only slight disability, but in the complicated stage it causes irreversible, severe pulmonary disability. Because treatment cannot cure the disease but only relieve the symptoms, pneumoconiosis is often fatal. Studies have shown that, as a consequence, American soft coal miners have death rates twice as high as the general population.

Dr. Murray C. Brown, chief of the Public Health Service's Division of Occupational Health, says one of every 10 coal miners is afflicted with the disease, and among the retired and unemployed almost one in five shows evidence of the disease. Some 125,000 are handicapped to some degree by it, and at least 1,500 men die from it each year. Nevertheless, it has taken more than a decade—since the time physicians recognized that all forms of coal can produce anthracosis or black lung, a form of pneumoconiosis—for Congress to take action in connection with the disease.

Last week Congress gave overwhelming approval to the Federal Coal Mine Safety Act of 1969, strongest coal mine health and safety bill in history. The bill attempts to curb black lung disease by limiting levels of coal dust in mines and establishes safety provisions to prevent gas explosions.

But the bill also provides for the first time compensation to miners disabled by the disease; the cost of the program, however, is raising the threat of a veto from inflation-conscious President Nixon.

The bill provides that the Federal Government pay disabled black lung victims \$136 a month for disabled unmarried miners and up to \$272 a month for disabled miners with three dependents. Widows of victims would get \$136 a month. States would take over compensating new victims in two years, presumably by a tax on mine operators. According to the Administration, the cost of the bill would run as high as \$387 million a year. But Congressional leaders such as Rep. John Dent (D-Pa.) estimate the cost at no more than \$60 million a year to start, which would decrease as states take over payment.

The bill in its final form sets permissible limits on coal dust at a ceiling

of 3.0 milligrams per cubic meter of air within six months after enactment, and an enforced reduction to 2.0 milligrams in three years. An escape clause allows operation of a mine at levels of 4.5 milligrams, if a Federal panel allowed it, after which it must be reduced to 3.0 milligrams over three years.

The bill also tightens controls on safety standards for preventing mine explosions—like the Farmington, W. Va. blast (SN: 3/22, p. 278) that sparked the present action.

The bill requires that all mines, including those now classified as non-gassy, install antispark mining equipment to guard against gas explosions caused by the combination of coal dust and methane when ignited.

Although the bill was tied up in a House-Senate conference for a month, the House showed it could probably override a veto by passing the bill 333 to 12. The Senate gave the measure voice-vote approval. □

CERN'S ACCELERATOR

Delay and growing despair

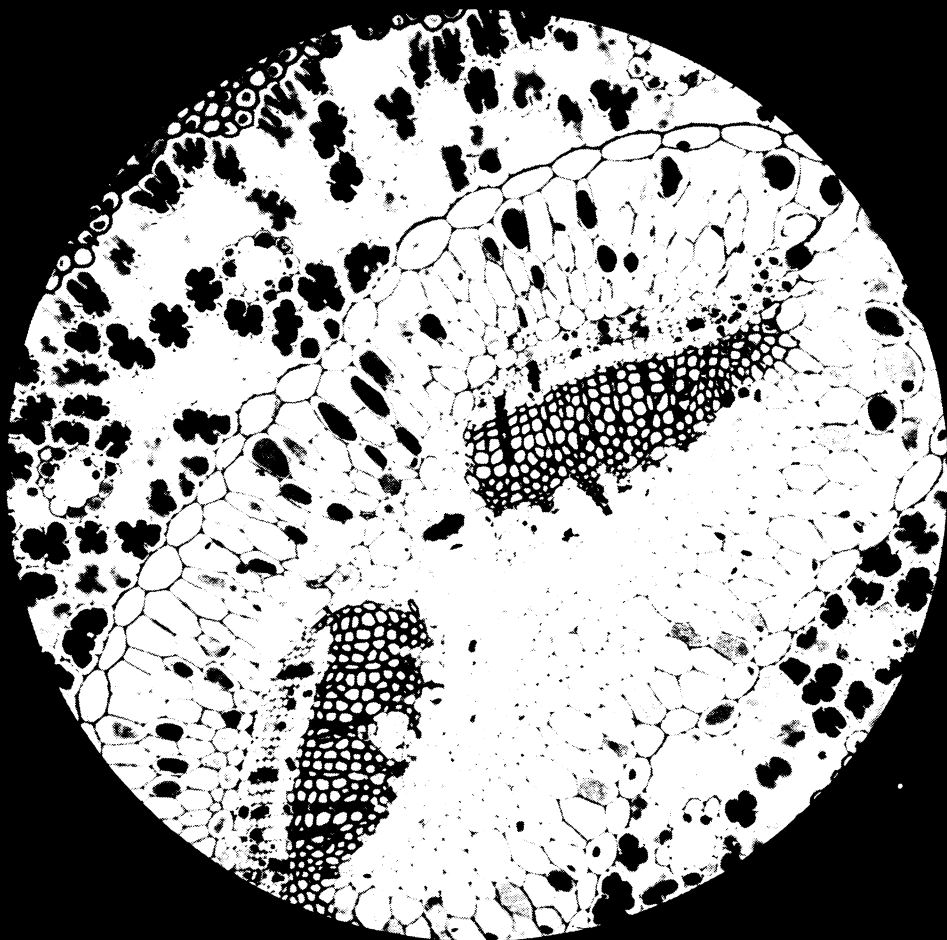
It is rapidly reaching the point where the biggest danger to the giant proton accelerator planned by the European Organization for Nuclear Research (CERN) is the delay in getting it started.

The latest blow, ironically struck at a meeting last week that might have produced a major speed-up by picking a construction site for the project, is West Germany's announcement that it will not pay its share of the cost unless a site is selected within its boundaries.

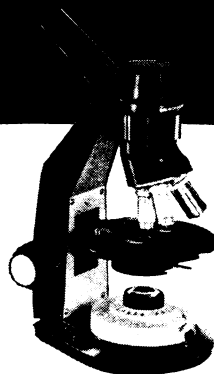
The problem concerning the CERN member nations is that to make the \$334-million investment pay, the project must be started in time to keep the United States' 200-400 billion-electron-volt National Accelerator Laboratory from getting too big a technical lead.

"The time scale for the development of radically new techniques," says a commentary in a recent issue of the CERN COURIER, the group's house organ, "added to the time scale for political approval, added to the time scale for construction of a large, new laboratory could then mean as long as 15 years before Europe is ready with its next generation accelerator."

The accelerator survived a major setback 18 months ago when Britain decided to pull out of the project (SN: 7/13/68, p. 30), leaving the other members to make up its share of more than \$19 million. The competition for the site has been severe, but France seemed to have lightened the load in November 1969 when she announced that she would contribute



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