all the wastes can be stored for a number of years on site," Arnold says.

But on-site storage could become hotly controversial because the wastes could amount to the equivalent of 600 to 1600 truck loads, which would remain on the island indefinitely. "We don't want Three Mile Island to become a waste disposal site," says Thomas M. Gerusky, Pennsylvania's top radiation protection official. "Who wants all that radioactive material to be sitting, for a considerable time, on an island in the middle of the Susquehanna?" he asks.

Bernard J. Snyder, the NRC official who is overseeing the cleanup, shares this concern. In his view, temporary storage of wastes on the island is acceptable. But, he says, referring specifically to the first-stage zeolites, "We want commitments made for their removal." Without some assurance that the hot zeolites will be removed from the island, Snyder believes that GPU's plans to operate the demineralizer unit that would generate them should not be approved. Arnold, too, wants to see commitments made, but he observes: "Progress on the cleanup should not be held hostage in the regulatory process."

If plans for disposal of all the wastes from the cleanup are to fall into place, two things appear to be needed:

- An early commitment by Pennsylvania and other northeastern states to establish a burial ground for low level waste generated within the region. Congress could encourage this by passing legislation already pending which would allow states of a particular region to establish a burial ground open only to wastes generated in those states alone.
- A speedy commitment by NRC, DOE, and Congress to a plan for disposal of the first-stage zeolites, even if this means that DOE must prepare the waste for disposal or accept custody of the waste itself.

Prospects for prompt action are dim. Last year's flap over the closing of commercial burial grounds even to medical wastes lent currency to the concept that the states of each region should establish their own disposal sites. Governor Dick Thornburgh of Pennsylvania and other members of a radwaste task force helped persuade the National Governors Association to urge the states to assume this responsibility.

Last year, Pennsylvania's Department of Environmental Resources quietly began looking for suitable areas for a burial site for medical wastes. But the state geologist, Arthur A. Socolow, says no plans are afoot to establish a burial

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African to Head International Council

Platitudes about expanding the leadership role of scientists from developing countries, heard at many an international meeting, are giving way to action, at least in one case. The International Council of Scientific Unions (ICSU) recently elected its first president from the Third World. Daniel A. Bekoe, 52, a chemist and vice-chancellor at the University of Ghana, will hold office for 4 years.

ICSU is a 60-year-old club that currently has 18 scientific unions as members and historically has a strong track record for encouraging international projects, such as the Global Atmospheric Research Program. For the past several years, ICSU has increasingly encouraged the application of science and technology to developing countries. With the ascendancy of Bekoe, this trend is expected to expand.

Case of the Missing Milk Bottles

A dearth of half-pint milk bottles has slowed the march of science, but the captains of U.S. industry are indifferent. Outlines of the problem were seen decades ago, but it is only now, with the situation in crisis proportions, that constructive moves are under way. And, as is too often the case, Yankee ingenuity has produced no answers and the worried parties are looking overseas for a solution.

In the early decades of the 20th century, geneticists hit upon an ideal subject for the study of the laws of Mendelian genetics—the lowly fruit fly, *Drosophila melanogaster*. Using the materials at hand, they housed their bugs in the ubiquitous half-pint milk bottle. The choice was ideal. The bottles were cheap, convenient, clear enough so researchers could see how the flies were doing, and strong enough to take a beating when being cleaned and handled.

The study of fruit flies boomed, but supplies of the bottles did not. With the advent of waxed and then plasticized milk cartons, geneticists started buying up stocks of the old milk bottles, a particularly rich source proving to be abandoned dairies. Those supplies, however, are now almost exhausted, and the search is on for a new source.

"I've called ten major glass companies and with some of them I couldn't even get past the secretary," says David J. Remondini, executive secretary of the genetics study section at the National Institutes of Health. "They like to talk in terms of millions, but it's not that kind of number."

Of late Remondini has heard much from worried geneticists about the bottle crunch and has decided to do something about it. Not a milk-bottle entrepreneur, he is a middleman, trying to find a supply of the bottles and then alerting the U.S. genetics community through a newsletter he puts out, the *Drosophila Information Service*. It turns out, however, that U.S. manufacturers do not want to make the expensive molds for the old bottles, and Remondini is now looking overseas. "I estimate that we're looking for 50,000 to 100,000 of these things," he says. "I think I've unearthed a manufacturer who still makes them. But there's a possibility they're going to switch to these paper cartons, so they're rather interested in knowing the potential market for these old bottles."

Remondini is currently surveying the U.S. genetics community to gauge the extent of the demand.

Why not another type of bottle? Many of the special-order laboratory bottles are too expensive and too thin, says Remondini. Few are the right size to hold the sterilized media on which the flies feed. (The media mimics rotting apples and peaches.) The cheap plastic bottles manufactured by scientific supply houses are not clear enough so that the health of the flies can be easily determined. "We do use vials for certain types of experiments," says Remondini, "but the production of progeny per female is less than it is in the bottles. Apparently there's a certain amount of space or microecology that is better in a bottle." A factor, he says, may be evolution. Some of the strains of fruit flies are 60 and 70 years old, and selection pressures during this period have killed off those flies that could not adapt to the bottles.

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The crisis in milk bottles has been aggravated in recent years because more geneticists than ever are doing experiments on fruit flies. The principles of molecular genetics, worked out first on bacteria and viruses, are now being increasingly studied on higher organisms.

"People have been recognizing for some time that there was going to be a shortage," says Remondini. "Caltech, for instance, buys up many gross of these things whenever they find them. But everybody's starting to get worried. They're dipping into the last of their stockpiles."

Federal Review of DNA Research to Shrink

Several proposals that would substantially shrink the overview of recombinant DNA research by the National Institutes of Health were agreed to in early October by the NIH committee that authored the guidelines. If approved by the NIH director, the upshot would be that 97 percent of all recombinant DNA research will be reviewed by local biosafety committees in academia and industry. Previously, about 80 percent was reviewed by biosafety committees.

The only research to remain under federal review are projects for which containment levels are not clearly specified. "We couldn't anticipate every experiment when we wrote the guidelines," says William Gartland, director of the NIH office of recombinant DNA activities. "So there is a chunk of virology and certain host-vector systems where we will still require case-by-case NIH approval."

A related relaxation involves the NIH review of containment hardware used by industry. Although it is not required by law, most major companies voluntarily submit their work to NIH for review. If the new proposals are accepted, only the biology of large-scale industrial systems will be reviewed. "In the past we looked at the blueprints of fermenter design and wanted validation studies to show that the cells were being killed," says Gartland. "Now we're making it analogous to the academic community. If somebody says they have a P-3 lab that is certified by the local biosafety committee, then we take their word for it. That's essentially what we're doing for industry. We're turning over the responsibility for meeting containment requirements to their local biosafety committees."

Third World Science Vies for Petro Dollars

Some of the oil billions that have been marshaled by the tough bargaining of the Organization of Petroleum Exporting Countries (OPEC) are slated to be spent on the development of Third World science and technology. The question for some time has been how. One answer now seems to be emerging in Venezuela.

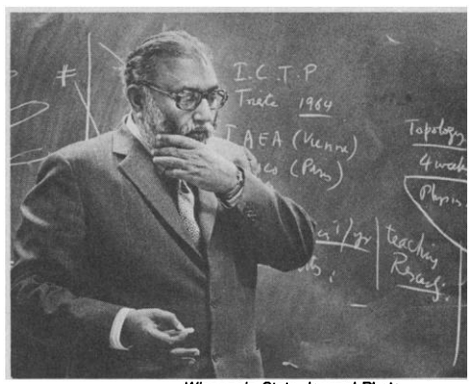
With an initial grant of $50 million, Venezuela announced in September the creation of an International Institute for Advanced Studies, a center to be located at Simón Bolívar University in Caracas where researchers from Latin America and the Caribbean will study science and technology for development. The budget after 1 year will expand to $200 million, according to Venezuelan science attaché Rogelio Valladares. To fuel this expansion, Venezuela, a leader in OPEC affairs, is currently wooing the organization for petro dollars. The president of Venezuela, Luis Herrera Campins, for example, recently made several visits to OPEC headquarters in Vienna.

Voicing their intention to fund such a center, the OPEC ministers in June instructed the Secretariat to carry out a feasibility study of an institute to "help other developing countries in forming and promoting highly qualified scientific and technological development of human resources, scientifically and socially. The institute is to be oriented and financed by OPEC Member Countries and directed towards research and development." OPEC has not officially announced a site, but many observers feel that Venezuela is a good bet.

An OPEC-funded, $200-million center for Third World science in Venezuela would mean that the United Nations, which has also been vigorously lobbying for OPEC funds, would have lost the race. The UN Conference on Science and Technology for Development, held in August 1979 in Vienna, proposed a UN-controlled fund of $250 million to build up the science-based capacity of poor countries (*Science*, 2 May, p. 475). The realities of world politics, however, made deep cuts into the rhetoric of the Vienna accords. Total pledges made in March 1980 at a UN meeting came to a mere $36 million. Until this fall, UN officials still held out hope for a sizable contribution from OPEC, but the poor performance by the developed countries seems to have squashed those hopes. The latest bout of U.S. indifference came in August when the House Appropriations Committee cut from the 1981 budget $10 million that the Carter Administration had grudgingly proposed for the UN fund. The committee says it took the action because the Administration failed to provide adequate information on the activities of the fund.

In lieu of supporting a UN-controlled fund, OPEC nations are looking into individual centers. In Rome, for example, the Arab Organization of Petroleum Exporting Countries is currently discussing a proposed Italian-Arab international institute for research on new sources of energy.

Behind much of the worldwide drive for Third World institutes is one man, Nobel Laureate Abdus Salam, who



Wisconsin State Journal Photo

Abdus Salam

runs the International Centre for Theoretical Physics in Trieste, Italy. It was Salam, for instance, who met with Venezuelan President Campins in January 1980 and talked him into starting an institute. "As we see it from the outside," says Salam, "there is a faltering will for the United States to help in these matters. We have therefore taken an initiative to get OPEC nations to undertake something along these lines."

William J. Broad