The agency has acknowledged that insofar as it has been able to determine up to this point, the refinery will meet all applicable effluent and emissions standards. The EPA recommendation that the Corps of Engineers permit be denied is based on a judgment that the regional environment is already "stressed" and that the refinery can only contribute to its further degradation, especially in light of the potential for oil spills.)

In a letter to the Corps of Engineers at the end of the year, Virginia Governor Mills E. Godwin, Jr., gave the refinery project his approval a few weeks before completing his term of office. But Godwin indicated he was not approving it out of a sure conviction that no serious harm would come to the seed oyster beds, although he said the environmental safeguards for the refinery would be "stringent and meticulous." His purpose was to ensure that the Corps of Engineers review and decision process would run its full course and not end with the Norfolk district engineer, Colonel Newman A. Howard, Jr., making the final ruling. Howard could himself have killed the project had the governor taken no position. Further, he would have had really no choice but to kill it had the governor—who had been told confidentially of the colonel's inclinations in the matter—recommended that the permit be denied.

Thus, Governor Godwin left it to General Morris to face the dilemma that became unavoidable once HREC selected the refinery site near the oyster beds and set the state and federal permitting process in motion. Although the environmental impact statement issued by the Corps of Engineers discusses the possibility of building the refinery elsewhere, this discussion of alternatives comes after the fact (HREC invested $6 million in the site 4 years ago) and appears to be largely from the permit applicant's point of view. Furthermore, it is so brief as to appear pro forma. No mention whatever is made of the pros and cons of building such a refinery at an inland location well away from Chesapeake Bay, with the crude oil and refined products to be transported to and from the facility by pipeline.

Is there no better way by which sites for refineries and other major energy facilities could be selected and approved? Under the 1976 amendments to the Coastal Zone Management Act of 1972 the coastal states are receiving federal financial help to develop a capability for assessing the need for energy facilities and the impact that energy development would have. But there is no statutory requirement for the states to decide where various facilities should go. Also, while the 1976 amendments authorized planning grants for interstate bodies, actual appropriations for this purpose have been nil.

The Carter Administration is now developing some new legislative proposals having to do with energy facility planning and siting. But land use planning and regulation is politically explosive and the Administration does not intend to set off a battle in Congress by proposing to have the federal government direct the states to prepare energy facility siting plans and rewrite any state plans that are found wanting.

The federal role would be limited to having DOE offer the states grants and review their plans on a purely advisory basis. But, even if many of the states respond to energy planning grants held out

Briefing

Xylitol: Another Sweetener Turns Sour

When the National Institute of Dental Health (NIDH) announced last November that it was abruptly ending a study of the artificial sweetener xylitol because of preliminary data in England indicating that the substance caused cancer, there was at the Food and Drug Administration (FDA) in Washington a strong sense of déjà vu. Similar findings by foreign researchers only 8 months earlier had prompted the FDA to announce a ban on saccharin (*Science*, 10 June 1977), provoking a public outcry, protracted debate in Congress, and an eventual—if temporary—emasculation of the FDA's authority to remove saccharin from the marketplace.

The NIDH-sponsored experiment, which was designed to determine if xylitol helped to prevent cavities in school children, was halted because of unknown possible risks to the participants. Since the study's end, the FDA has been briefed by the English researchers with an eye toward determining how extensive those risks might be. The English work is still going on at Huntingdon Research Center there, under the sponsorship of Hoffman-La Roche, the Swiss pharmaceutical manufacturer. But several FDA officials have said that the preliminary results they were shown did little to suggest that the case of xylitol would be much different from that of saccharin. The data showed that several mice in a group fed a diet of 10 to 20 percent xylitol developed bladder stones and tumors, and some of the group of rats fed xylitol developed tumors in their adrenal glands.

The results were announced just as the FDA was about to limit its previous general approval of xylitol to the only current domestic use—in chewing gum. According to Charles Kokoski, the chief of the FDA's food additives evaluation branch, the limitation would have been the result of a compromise between Hoffman-La Roche, which wanted to use the sweetener in jams, jellies, candy, and other products, and the FDA, which had wanted to ban the substance entirely in 1971 after it caused several deaths in Australia and New Zealand following intravenous administration as a glucose substitute. There was no indication, Kokoski added, that digestion of the substance from chewing gum, and at lower dosage levels, was harmful.

If the final report from England confirms the preliminary findings there, the FDA will not have the opportunity to go through with its compromise. The Delaney clause of the Food, Drug, and Cosmetic Act is firm about substances shown to cause cancer in animals at any dosage. Under Delaney provisions, Orbit, a xylitol-sweetened chewing gum now marketed by the Wrigley Company, would have to be taken off the market.

Wrigley, however, does not think that is going to happen. "We think it is a good sweetener and have no intention of stopping the use of it in Orbit," a spokesman told *Science*. "We believe the press has panicked. The researchers used massive, too-high doses that clearly exceeded the toleration limit."

Should officials at the FDA be forced to initiate regulatory action as a result of the English study, it will be interesting to see how they do it. After the agency abruptly announced its proposed ban on saccharin in a statement that noted the high dosage used in the Canadian tests, there were widespread charges that it had misrepresented the validity of the experiments in order to set up the Delaney clause for a fall in Congress. The agency's actions on xylitol under Commis-

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by DOE and officials of the coastal zone program, there will be no assurance whatever that their individual plans will constitute, in the aggregate, a workable national plan to guide industry in facility siting.

As chairman of the Council on Environmental Quality in the early 1970's, Russell E. Train, who later became head of EPA, put forward the idea that the federal government itself should take the initiative in drawing up a list of suitable locations for major energy facilities such as deepwater ports and refineries. But he met with an ideological stone wall. "The reaction within the Administration, as I recall, was that that kind of approach was just totally opposed to the free market approach to decision-making," Train says.

He still thinks that the idea is sound and that, even without new legislation, much could be done. For instance, he says, DOE, with the cooperation of the oil industry, could assess the need for additional refining capacity to serve particular geographic markets and then draw up a list of possible coastal and inland refinery sites. At this point, the DOE list, which would reflect largely economic criteria, could undergo review by other agencies, state and local government, industry, environmental groups, and other interested parties.

"From all this, you would come out with a range of possibilities that would merit positive consideration by industry," Train says. "It seems to me that, with such a process, you would have a far better chance at expeditious siting."

As Train is well aware, the approach he proposes would not free energy facility siting from controversy even if it led finally to a list of alternative sites that were widely acceptable. What it would no doubt do is bring on the controversy earlier, at the stage during which various sites or regions are being considered for facilities of a particular kind.

But, once the controversy at this stage was basically resolved through a determined sorting out and refining of alternatives, the worst might be over. The permitting agencies would not have to worry that, from an environmental and resource management standpoint, the sites chosen are all wrong.

An energy company could choose to ignore the list of recommended locations and select one that either had been rejected or not considered at all. But if a bitter controversy over the appropriateness of the site then flared during the permitting process, the company could find itself in a position difficult to defend.

Train is perhaps optimistic in thinking that, without new legislation, the government could marshall the analytical competence and carry out the elaborate process of interagency and public review necessary to arrive at a list of widely acceptable energy sites. Nevertheless, what he suggests, or something like it, appears worth a try. Such an initiative could be especially timely inasmuch as the impending exploration and development of the OCS oil and gas provinces will surely lead to demands for numerous major new energy facilities. As Train points out, to continue with the present purely "reactive" system, in which industry selects the sites and the state and federal regulatory agencies merely respond to permit requests, is inefficient, not very rational, and conducive to delay and the shaping of awkward, uncomfortable choices.—LUTHER J. CARTER

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sioner Donald Kennedy could either add fuel to those charges or put them to rest for the immediate future.

Weather 5, Government 0—So Far

In the midst of numerous snowstorms and bitter cold across much of the nation in the past few weeks, including what the National Weather Service termed an "extra-tropical cyclone" that swept across the Midwest on 26 January, the superlow temperatures of last winter may no longer seem that significant. Last winter *was* abnormally cold, however, and a lack of preparation for it led to shortages in natural gas and other disruptions of the economy.

This year, the government has resolved to increase its efforts to understand and predict such seasonal climate variability, and one of the major cross-agency initiatives highlighted in the President's budget proposals for 1979 (*Science*, 3 February 1978) was a national program on climate research.

Next year will not be the first that climate research has been undertaken: Five federal departments (Defense, Commerce, Agriculture, Energy, and Interior) and three federal agencies (the National Science Foundation, National Aeronautics and Space Administration, and the Environmental Protection Agency) will spend $76 million on it this year. But next year will be the first time that the research will be coordinated under a national plan by a single agency; the White House has designated the National Oceanic and Atmospheric Administration (NOAA) as the lead agency for climate research. Moreover, the level of spending on climate research is slated to rise 37 percent—or 32 percent above inflation—to $104 million in 1979.

The framework under which NOAA will coordinate the research efforts is the "U.S. Climate Program Plan," which was developed in June 1977 by a subcommittee of the Federal Coordinating Council for Science, Engineering, and Technology. The issue was initially taken up because of concerns in Congress and elsewhere that climate variability was increasing, and that such climate-related problems as the wheat shortage in the Soviet Union, the famine in Southeast Asia, and the drought in the American West might have been minimized by early understanding.

The program that NOAA will be coordinating is four-pronged:

- The relationship between climate variability and national activities will be assessed through studies of carbon dioxide, crop yields, land and water resources, and coal use.
- Efforts to provide early warnings of short-term climate fluctuations will be made through a variety of observation systems.
- Basic research to gain a better understanding of climate processes will be carried out on the oceans and the atmosphere.
- Long-term climate variations will be studied from space, and by monitoring subsurface ocean temperatures and snow levels.

NOAA will not have the authority to approve or reject the climate program proposals of participating agencies, but it will be empowered to consolidate them into a single budget proposal to be reviewed by the White House each year. Because the way this is done by NOAA officials will undoubtedly carry special weight with OMB budget analysts, as one NOAA official pointed out, the agency can properly be characterized as having "a heightened influence" in the climate research area.

R. Jeffrey Smith