NORTH AMERICA

Davy Jones's Dustbin

AFTER the death, apparently by poisoning with nerve gas, of 6,000 sheep in Skull Valley, Utah, the US Army can hardly be surprised that people are now up in arms about the decision to dump 27,000 tons of nerve gas in the Atlantic. Even if the operation can be managed without immediate catastrophe, the quantities involved are so great that people are bound to be apprehensive. The chance of accidental spilling as the materials are carried across the United States to the eastern seaboard between now and August may be small but it is not entirely to be neglected. The risk of polluting the sea and the marine life in it has roused a wider audience and a number of imponderable questions. One serious difficulty is that the authorities have not yet specified with any clarity just what materials they are proposing to dump. There are tear gas, mustard gas and certain nerve agents, but any independent assessment of the risks involved will require at least enough awareness of what the chemicals are for some estimate to be made of the lifetime of these substances. After all, the arguments which there have been in recent years about the use of the deep oceans as disposal grounds for radioactive waste were given some semblance of rationality because of the way in which the intrinsic half-life of each material was well defined. Is it too much to ask, on this occasion, that the US Army should provide the information on which an equally reliable estimate could be made of their durability as potential hazards? And is it too much to ask that there should be some means of anticipating what will happen when they react with water?

If the chemicals are unknown, there is at least a good deal of information about the machinery which the army will use for its disposal operation. The plan is to load four liberty ships with steel drums full of the gas and to scuttle them some 250 miles east of the military depot at Earle, New Jersey, in 7,200 feet of water. By all accounts, the army is counting on the slow speed of mixing between water at such a depth and that nearer the surface, and has calculated that it would take 400 years for material which escapes from the sunken liberty ships to reach the surface. That, of course, may be correct although it is perhaps somewhat optimistic of the army to expect that the pattern of ocean currents is as well defined as all that. Those who live elsewhere will still recall that a great deal of the rubbish from London used to be dumped at great cost in the Black Deep, thirty miles off the Thames Estuary, only to be carried back again with the tide. This, in other words, is a field in which over-confidence is not merely misleading but damaging, not least of all because it will seem yet another illustration that public authorities are prepared to take all kinds of risks for the sake of their convenience.

It is of course ironical that all this should happen when the United States is engaged in negotiations to design a treaty for governing the use made of the sea bed (see page 612). To be sure, the army may be somewhat puzzled to know how its earlier use of the sea for disposing of chemical weapons should have attracted no more attention than that of the British Government, which disposed of captured military material in this way during the early fifties, but this is only a measure of the extent to which people are now much more acutely aware of the need that problems of pollution should be dealt with on a common basis and responsibly. In this sense, the deep oceans have suddenly assumed the kind of status which common land possessed in the Middle Ages. The Treaty for the Exploitation of the North Sea to which the maritime European powers subscribe is a good model of how these matters should be regulated. It may be a long time before there is much to be made of the potential of the deep oceans and it is certainly true that too many people are too excited about them. Yet it is not too soon to make sure that the deep oceans are not needlessly misused.

TELECOMMUNICATIONS

Comsat Lives Another Year

THERE is nothing in the annual report of the Communications Satellite Corporation (Comsat), now published, to suggest that the corporation is embarrassed by the anomalous position which it occupies at the centre of the growing web of activity in international telecommunications by satellite. To be sure, the report does say that "the year just past appears as a transitional year", but the context makes it plain that Comsat sees only steady growth in the years which lie ahead. Either the corporation is entirely unworried by the muttering there has been from some other partners in Intelsat about the way in which Comsat, titularly one of themselves, dominates affairs by its contract as manager, or it is whistling to keep its spirits up. In any case, the plenary meeting of the members of Intelsat in February at which the future relationship between Intelsat and Comsat might have been decided (*Nature*, **221**, 501; 1969) has been adjourned until November 18. Between now and then, a preparatory committee will be at work on detailed proposals for the future of Intelsat, its relationship with Comsat included.

There is no doubt of the technical flair which Comsat has brought to the international communications business. The report for 1968 is one long record of achievement. By the end of last year, for example,

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the number of Earth stations in the Intelsat network had grown to twenty-two, compared with fourteen at the end of the previous year. Voice circuits on permanent lease amounted to 941 by the end of 1968, thus loading almost to full capacity the Early Bird and Intelsat II satellites then in service. Further growth depends on the Intelsat III satellites, the first two of which, over the Atlantic and the Pacific, have each added 1,200 circuits to the capacity of Intelsat. The disappointment of the failure of the first launch of an Intelsat III satellite just before the Olympic Games in Tokyo has evidently not left too deep a mark. Comsat managed to sell 666 hours of television time during 1968, much of it during the Olympic Games, and thus multiplied by three its previous record for television.

Comsat is plainly bursting with new plans, almost as if the $130 million of shareholders' money still held in short-term investments is burning a hole in its pocket. The scheme which it prepared in 1967 for a domestic communications system within the United States, thirty-five ground stations strong, could obviously use up a great deal of capital. So could the stations in Alaska and South America for which Comsat has already submitted applications to the Federal Communications Commission. Much will depend on the outcome of the new administration's study of the report of the task force set by President Johnson to study the future pattern of domestic telecommunications, but it is hard to see how any government would be able to deny some room for growth to this energetic child which is, after all, the product of an earlier compromise with Congress. In terms of simple money, Comsat has in any case performed respectably enough for a growth industry, although money in the bank still provides $8·5 million of revenue compared with $30·5 million from operations. The surplus on the operating budget is comparatively small—less than $1 million or just about 3 per cent, so that the money in the bank is a necessary way of keeping the shareholders happy. Whether the countries which belong to Intelsat are equally happy with a state of affairs in which Comsat enters communal property on its books under the simple heading "assets", and then pays federal income tax on the investment, is another matter which may receive some attention between now and November 18.

STUDENT OPINIONS

Harvard in Waiting

from a Correspondent recently in Cambridge, Mass.

HARVARD awards about twenty per cent of its bachelor degrees each year in science, yet science students were a smaller percentage of the political activists who precipitated the recent crisis. The political inactivity of scientists is of course legendary, but it does now seem that the behaviour which is expected of them, still superficially in evidence, may be wearing thin. To be sure, they work harder than other students, tend to be less social and, in general, accept the values of scientific and scholarly achievement, but this is the surface and it is thin. Although few science students are politically active—but a small group of mathematicians is identified as members of Progressive Labour, the left wing of SDS—they seem no longer to be politically inert. Rather, two strong and conflicting trends emerged from my interviews with them. One was expressed by a student when he said: "I think these last few weeks will push people into rather than out of science. This has been a harrowing experience. People seek stability and science is more stable."

This student, as well as others, spoke of the order in science which has often accounted for the science student viewing many political disorders as transient and outside his higher goal of the search for truth. That this vision still retains its power is shown by the fact that, during the course of the strike and the general upheaval, not one of 280 biochemistry undergraduates missed his tutorial. But for many, this stability now represents isolation, and the isolation comes about largely through the demands of long hours in the laboratory. Typical responses were "Lab. courses are destructive to undergraduate life. I always wonder whether I shouldn't be doing something else when I'm in lab." or "Labs. turn me off. I like the thinking part of Chemistry . . . the thought of a lab. for life . . . very depressing."

Undoubtedly the complaints about laboratory work are not new. Although desire for more social life and for more involvement was always present, the laboratory offered itself as a sanctuary which overrode those considerations. Now one hears the phrase "social relevance". How does one justify the time spent in the laboratory? The upswing in enrolment in biochemical sciences reflects the attempt to link chemistry with doing something for mankind. In the post-Sputnik phase, science was its own justification. As one young man said: "During that period in my high school, if you were smart, you were smart in science". But now he, like many others, is torn.

The science student is being affected by the premium on individuality and "doing one's thing". As a non-active SDS sympathizer said somewhat wistfully, "The burden of strikes falls unevenly on science and non-science students". The scientist is faced with the new burden of guilt if he opts out of the moderates' strikes following police busts. But beyond that he, as an undergraduate, is forced to face the conflict that arises between his work and what it means to others.

The Harvard bust seems to have forced an early maturation on its science population. The two themes, "the holiness" of the laboratories and the drive for social relevance, are not resolved but remain in conflict.

AWARDS

Lawrence Memorial Award

THE Ernest Orlando Lawrence Memorial Award for 1969 has been presented by the US Atomic Energy Commission to the following: *Dr G. F. Chew*, head, theoretical physics, Lawrence Radiation Laboratory, Berkeley, and professor, University of California; *Dr D. T. Cromer*, leader, Crystal Chemistry Section, Plutonium Physical Metallurgy Group, Los Alamos Scientific Laboratory, Los Alamos, New Mexico; *Dr E. M. Gelbard*, consultant, Reactor Theory Department, Bettis Laboratory, Westinghouse Electric Company, Pittsburgh; *Dr F. Newton Hayes*, leader, Molecular Radiobiology Section, Biomedical Research Group, Los Alamos Scientific Laboratory; *Dr J. H. Nuckolls*, associate leader of "A" Division, Lawrence Radiation Laboratory, Livermore, California. The award consists of a citation, a medal and $5,000.

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