

to demonstrate the fact that cigarette smoke contains a foul catalogue of compounds, hydrogen cyanide, carbonyl sulphide, diethyl ketone and styrene among them. Also on show was the germ-free isolator, developed at Porton, in which a human baby was recently born and reared for a few weeks.

But such work is clearly the icing on the cake. The main business of the Chemical Defence Experimental Establishment continues to be the assessment of new weapons, the design of detection and decontamination systems, and the development of chemical therapies. One obvious difficulty is that if Porton is working on new chemical weapons, it would be expected to keep quiet about them. The only weapons revealed were the familiar triumvirate of nerve gas (cholinesterase inhibitors), tear gas (for example, chloroacetophenone) and psychedelic (for example, BZ, and perhaps LSD).

Two nerve gas detectors were on display. One, electrolytic in nature, depends on the reaction between cyanophosphonate nerve gas and an oxime, while another, more specific but rather temperature-sensitive, depends on the reaction between purified cholinesterase and the gas. Therapies for nerve gas poisoning seem to have made little progress for some time. A combination of oxime, to dislodge the nerve gas residue by nucleophilic substitution, and atropine, to block acetylcholine, is still the mainstay of treatment. But some nerve gas residues readily dealkylate into a form which is immune to oximes, while administering the highly poisonous atropine poses a few problems of its own. At the open days, Porton took some credit for showing that Russian accounts of antidotes to nerve gas are misleading. The clear implication, for Porton's chemical Kremlinologists at any rate, is that the Russian publications may be covers for more successful unpublished work.

More straightforward progress has been made in designing protective clothing, masks and the like, and the displays here were clear, and in the case of gas masks, striking. The open days made an unexpected contribution to social history by showing for the first time a film of a military exercise by a platoon of Commandos who had eaten 160 micrograms of LSD (200 micrograms of LSD tartrate). Discipline collapsed as the drug took its effect, and one hour after ingestion the soldiers were giggling, climbing trees and feeding the birds. The troop commander tried to maintain his authority but eventually he too abandoned himself to the effects of the drug. The metamorphosis of these highly trained men into a species of flower child was remarkable—and all the more so because it happened in 1963, years before there were any civilian experiments with the drug.

All in all, Porton's exercise in self-exposure can be counted a success. Three thousand people attended the open days, of every shade of opinion, and there were signs of suspicions being allayed on all sides. A booklet issued for the occasion caught the tone of the proceedings: its cover featured a painting of allied soldiers routed by a German chlorine attack in the First World War, and the painting was captioned: "Past sorrows, let us moderately lament them. For those to come, seek wisely to prevent them." Inside was another quotation, scarcely apt but still effective: "In full, fair tide, let information flow. That evil is half-cured whose cause we know."

ARCHAEOLOGY

Archaeology at Royal Society

THE announcement that the Royal Society and the British Academy are to hold a joint symposium on the "Impact of Natural Sciences on Archaeology" next December marks a further step in the changing attitudes at Carlton House Terrace. Traditionally the Royal Society seemed to have decided that archaeology was not a science and was therefore outside its purview. Whether or not archaeology is a science is still an open question, but in the past twenty years archaeologists have come to rely increasingly on techniques based on new developments in the natural sciences. Indeed, the December symposium is a celebration of the most important of these, the coming of age of the radiocarbon-14 dating method.

It is hoped that Professor W. F. Libby of the University of California, who discovered the carbon-14 technique, will open the symposium by reviewing radiocarbon datings of specimens from Egypt and Arizona and the discrepancies between these dates and those derived from astronomical evidence and analyses of tree-rings. The discrepancies may be the result of changes in the Earth's magnetic field, which will also be discussed by Professor Libby. Forty years ago nobody dreamed that changes in terrestrial magnetism were relevant to archaeology.

As well as Professor Libby, the symposium promises an impressive list of speakers from Europe and the United States; the British Museum and the Universities of Oxford and Cambridge are well represented with such people as Drs A. E. A. Werner, I. E. S. Edwards and M. J. Aitken and Professor H. Godwin; Dr I. Scolla from Bonn and R. E. Linington from Rome have been invited as well as Professor A. Sachs from Brown University, Professor B. Bannister from Arizona and Professor R. Berger and Dr V. Bucha from California. Their topics range from critical assessments of carbon 14 datings and absolute datings from Mesopotamian records to magnetic methods of prospecting, analysis of metals and magnetic field studies.

The symposium clearly promises to be of great interest to both scientists and archaeologists; it should also prove a great fillip to those who argue that archaeology needs to be classed as a science if only to put it under the wing of a research council—NERC is the obvious choice—and so guarantee respectable financial support. And perhaps once the archaeologists have proved their scientific mettle the Royal Society will open its doors to them more often.

NORTH SEA GAS

Shore Terminal

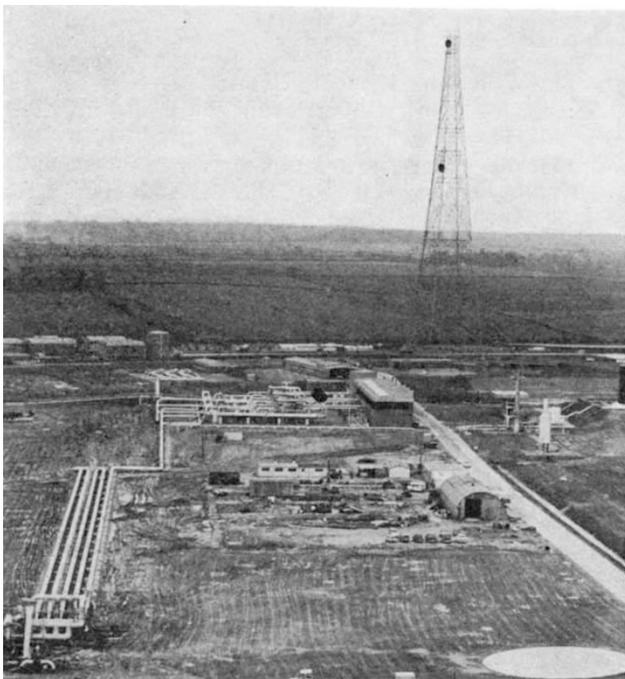
THE processing plant at Bacton, Norfolk, for purifying up to 4,000 million cubic feet a day of North Sea gas was officially opened on Tuesday, June 3. By 1972, the Gas Council estimates that the plant will be handling about 2,000 million cubic feet a day of natural gas, about twice the present average consumption of the whole of Britain, and by 1974 the rate of flow is expected to reach the maximum capacity of the plant of 4,000 million cubic feet a day.

The Bacton site has two functions. The gas piped to shore from the North Sea rigs has to be purified to

meet the specifications of the distributors, and there are three purification plants at Bacton operated by the production companies with rigs in the Leman, Indefatigable and Hewitt gas fields. Clean natural gas from each of the three plants is then passed on to the Gas Council terminal, where it is filtered, metered and blended so as to remove variations of composition.

There are also facilities for odorizing the gas and for injecting methanol to prevent the formation of methane hydrate. North Sea gas contains about 95 per cent methane.

The purification process is straightforward, involving the removal of water, liquid hydrocarbons and dust particles, mainly sand. Most of the gas piped to Bacton is free from sulphur, but one of the fields which the Phillips-Arpet group is exploiting contains sour gas from which the hydrogen sulphide has to be removed by conversion to sulphur dioxide. The hydrocarbons will be separated from the water and refined for sale as a light oil.



The North Sea gas installation at Bacton, Norfolk.

With so much of the British gas supply being channelled through Bacton, precautions are being taken against mishaps. The Gas Council terminal is equipped with two independent power supplies, one underground, and each has a back-up system in case of failure. There is only one feeder main leading to the national grid near Rugby, but four others are planned for full operation in 1974.

LINNEAN SOCIETY

Journals Redesigned

At their anniversary meeting on May 24, Fellows of the Linnean Society heard that the appeal for redevelopment has already exceeded the target of £55,000 now that the anonymous benefaction of £25,000 can be claimed. This gift was conditional on the society

itself raising an equivalent sum, and it now has promises of £34,000. But in spite of this good news, the society is still living above its income. The treasurer, the Earl of Cranbrook, prescribed three remedies. An increase in subscriptions is the least desirable, and leaves the possibility of increasing the number of fellows—there are not even twice as many as a hundred years ago—and making the society's publications pay.

The third remedy is already in hand, and for the second time the publications have made a small profit this year. An important contribution to the efforts has been the redesigning of the society's journals. The *Botanical* and *Zoological Journals of the Linnean Society*, with new covers in the old colours of green and orange, replace the *Journal of the Linnean Society (Botany)* and the *Journal of the Linnean Society (Zoology)*. A new journal with a yellow cover, the *Biological Journal of the Linnean Society*, replaces the society's *Proceedings*. Domestic information will now be published annually as a pamphlet for insertion into the *Biological Journal*.

The journals have the same page and text size as before, but a clearer modern type is being used. Appreciating the value of good illustrations, the society is prepared if necessary to use a very fine screen (175 instead of the usual 150) for half-tone illustrations, and will accept colour pictures that are essential and suitable for publication. There are two colour plates in the first issue of the *Biological Journal*, a double number just out containing the proceedings of the symposium on speciation in tropical environments, held jointly with the British Ecological Society last November. Although this issue contains both numbers one and two of the *Biological Journal*, the three journals will normally all appear quarterly.

The Society's first journal, the *Transactions*, was published from 1791 until 1955. The *Proceedings of the Linnean Society of London* was published between 1838 and 1857 before it split into the *Journal of the Proceedings (Botany)* and the *Journal of the Proceedings (Zoology)*. In 1857 these two became the *Journal of the Linnean Society (Botany)* and the *Journal of the Linnean Society (Zoology)* and the *Proceedings* were published separately. Towards the end of its 111 years the *Proceedings* no longer truly recorded the proceedings and activities of the Society and often contained papers that had not been read at a meeting.

Since its foundation in 1788, the Linnean Society of London has tried to meet the growing demands of biology. In its publications it achieved this by publishing varying volume sizes at irregular intervals. This is no longer appropriate and the present arrangement of regular annual volumes gives authors quicker and more reliable publication of their scientific work. The journals, published for the society by Academic Press, contain original papers in experimental and descriptive biology, palaeontology, systematics and taxonomy, and by so doing fulfil the society's aims laid down in its Royal Charter of 1802—the "Cultivation of the Sciences of Natural History in all its Branches".

TECHNOLOGY

Tungsten-coated Carbon Fibres

THE Fulmer Research Institute has jumped on the carbon fibre bandwagon by successfully coating carbon