

firm to install mechanically controlled machine tools and operate them for a period on approval. This project, the report points out, was undertaken at the specific request of the Ministry of Technology. Other new projects include plastic sacks for tropical produce, a new tower fermentation process, and transducer production, in collaboration with George Kent Ltd, for measuring instruments for the process control industry. That project, too, has the stamp of the Ministry of Technology. The corporation is also helping to develop microfilm equipment, and a high torque motor developed at International Research and Development in Newcastle upon Tyne. Although the report does not say so, it would be fair to guess that the motor makes use of superconducting magnets to produce a high torque at low speeds.

Promotion without Obligation

MORE scientists working in Government establishments in Britain have been awarded "special merit" promotions. These promotions, awarded to scientists who have produced a very high standard of original work, enable them to continue their research work without the administrative responsibility normally associated with their new grades. The promotions follow recommendations by a special committee which each year reviews the work of scientists doing research in Government and other public service establishments.

Of the twenty-six research workers awarded promotions this year, Mr K. C. Bowen, Dr J. Croney, Dr C. Hilsun, Dr O. Kubaschewski and Dr E. H. Mansfield have been promoted to Deputy Chief Scientific Officer. Dr G. H. Byford, Dr P. Dean, Dr A. Franks, Dr H. A. French, Dr P. H. Greenwood, Mr H. V. Hempleman, Dr J. M. Linke, Dr E. G. S. Paige, Mr P. H. Parkin, Dr E. R. Pike, Mr W. J. G. Pinsker and Mr D. E. Weston have become Senior Principal Scientific Officers and Dr J. H. Darbyshire is now a Senior Research Officer, Grade I. A number of promotions have also been made within the United Kingdom Atomic Energy Authority. Thus Dr P. G. Burke and Dr R. J. N. Phillips have become Senior Scientific Officers. In the Agricultural Research Council, Dr L. W. Mapson has been promoted to Deputy Chief Scientific Officer. Dr J. Bligh, Dr P. N. Hobson, Dr Daphne J. Osborne, Dr F. W. Robertson and Dr C. R. W. Spedding are now designated Senior Principal Scientific Officers.

Sad Gas

FOR an industry which has just found unexpected new wealth on its doorstep, the British gas industry is singularly long-faced. The annual report of the Gas Council (HMSO, 16s. 6d.) reveals that this year's surplus has fallen sharply from £11.1 million last year to only £3.9 million this year. In the days before natural gas was found beneath the North Sea, the council did much better—in 1964–65, profits were as high as £15.2 million. This year's results mean that the council has failed to maintain its running target of a return of 10.2 per cent on capital invested; the figure now stands at 9.1 per cent.

In fact these depressing results are understandable. The need for extensive re-equipment to cater for

natural gas has combined with economic conditions to give the Gas Council a tricky year. Transitional costs have not yet justified themselves in increased revenue, and the Government-imposed standstill on prices has aggravated the situation. The council is now discussing with the Ministry of Power what its financial objectives should be over the next few years, and the report points out that future financial objectives must strike a balance between the transitional burdens in the short term and the undoubted benefits in the long term.

Research, testing and development cost £2.65 million in 1966–67, the report reveals, and the area gas boards spent a further £1.26 million on development. The basic research group has been working on catalysis, adsorption and chemisorption and reaction kinetics. The conversion to natural gas has involved the development of a natural gas substitute which can be burned in the same burners during the period of conversion and for peak loads later. Several underground storage sites have been investigated for porosity, permeability and pore-size distribution, and attempts are being made to assess the risk of contamination of gas held underground by hydrogen sulphide or bacterial origin.

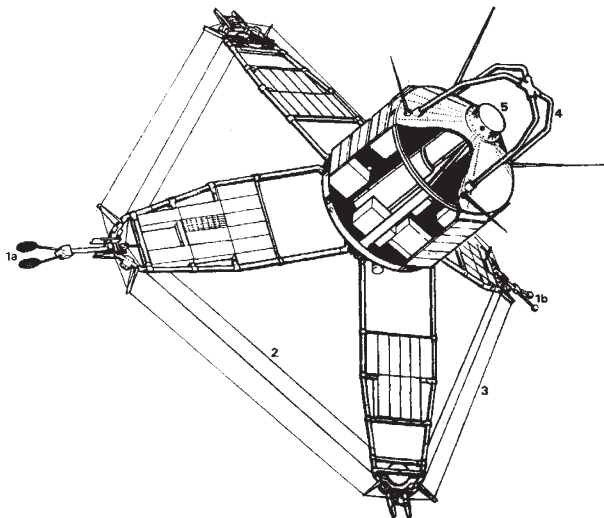
Snags in Space

ARIEL III, the first all-British satellite, has been a mixed success. Although all the sub-systems—power, data handling and telemetry—have worked well and show every sign of fulfilling their design life of one year, the data they have been sending back have been confused. One experiment, from the Nuffield Radio Astronomy Laboratory at Jodrell Bank, has so far yielded only interference.

There seems no doubt that the two experiments designed at the University of Birmingham are the cause of the interference. One measures electron density in space by means of a parallel plate capacitor consisting of two circular grids carried at the end of one of the solar cell paddles, and the other, attached to another paddle, measures electron temperature. Both these experiments are working well, according to Dr J. H. Wager of the University of Birmingham, who described them at a symposium organized by the Institution of Electronic and Radio Engineers on October 13. Unfortunately, both experiments interfere with the Jodrell Bank experiment, which is designed to measure absolute values of cosmic noise in space. Dr P. C. Gregory from Jodrell Bank has identified two distinct types of interference, one caused by the density probe and the other by the temperature probe. The first type is the more severe, saturating receiver output under all conditions, but the second is not quite so severe, and Dr Gregory philosophically hopes for at least some results from his experiment.

The Birmingham experiments have also upset the attempt by the Meteorological Office to measure the concentration of molecular oxygen in space. Dr P. J. L. Wildman described the experiment, in which the attenuation of the light of the Sun is studied as the satellite enters and leaves the Earth's shadow. In addition to the Birmingham interference, which in this case is not too severe, the experiment is sending back a spurious signal from the shadow side of the Earth, when it should be silent.

Professor Sayers from Birmingham is unrepentant. Other experimenters, he said at the symposium, paid too little attention to the problem of integrating their experiments into the satellite. Only the University of Sheffield was worried about possible interference from Birmingham; as a result, changes were made, and the Sheffield experiment has worked perfectly.



ARIEL III SATELLITE. 1, University of Birmingham: (a) electron density sensor; (b) electron temperature sensor. 2, University of Sheffield: VLF loop antennae. 3, University of Manchester (Jodrell Bank): galactic noise loop antenna. 4, Radio and Space Research Station: terrestrial noise loop antennae. 5, Meteorological Office: oxygen distribution scanning mirror.

In all probability the interference could not have been predicted, except by testing the satellite with all experiments going in an ionized gas, a facility not available. A much simpler solution would have been to provide switching so that all the experiments could be turned on and off, instead of all operating all the time. NASA, which launched Ariel III for the Science Research Council, advised against this, because it increases complexity and all-up weight (Ariel III was already 25 per cent heavier than the target weight). Professor Sayers, however, believes that it would have been quite easy to switch off his experiment without increasing the number of commands. This is not the first time that interference of this sort has occurred, and clearly it would be convenient if experiments could be switched on and off. The British Black Arrow launcher should be able to offer more commands, space scientists hope.

Waiting for Answers

ALTHOUGH the Austrian Government has now declared its willingness to participate in the construction of the 300 GeV proton accelerator to be built within CERN, there is as yet no sign that the potentially important contributors to the cost of the project will make up their minds before the next meeting of the council of CERN, due to take place in Geneva on December 14. The British answer to the request by CERN for promises of contributions from the thirteen members of the organization is likely to come late in the day. Arrangements have apparently been made for a period of consultations within the Government, and it is unlikely that these will be completed much in advance of the timetable laid down by CERN. At the last

meeting of the CERN council at the end of September, the British delegation raised the problem of how to modify the draft convention for the construction of the 300 GeV machine in such a way that it would not be possible for countries making small contributions to the cost of the new machine to force an unwanted escalation of cost on the big subscribers. In the original version of the convention, as in the conventions which regulate the operation of the Meyrin Laboratory and of the proton storage rings which accompany it, the principle of one country one vote has been adopted. The British view that this might lead to irresponsible decisions in certain circumstances seems to have been accepted as an honest attempt to solve a common problem.

British fear of an escalation of cost seems to be shared by other European countries. At the last council meeting, the British delegation appears to have emphasized that its proposed contribution to the new CERN machine, estimated to amount to £37.5 million in the next ten years, is a substantial part of the annual budget of the Science Research Council. In circumstances like that, the argument goes, escalation would take funds from other fields of science and would for that reason be intolerable. So far, Belgium has agreed to participate, even on the original basis. So now has Austria. In spite of vigorous protestations of support by scientists among the French delegation to the CERN conference, however, there has so far been no official statement by the French authorities.

The eagerness the planners have shown has, however, been strengthened by reports of the speed with which the planning scheme under Professor R. Wilson for the 200 GeV machine being built in the United States is making progress. It is also now known that the proton accelerator at Serpukhov has been operated successfully to produce protons at an energy of 75 GeV. This is somewhat greater than the maximum design energy of 70 GeV, but, at the extreme energies reached in the past weeks of commissioning, the intensity of the beam has been such that each pulse has produced 10^8 protons—one-thousandth of the number of protons in a pulse when the machine is operating successfully. Full operation cannot be long delayed. In spite of the agreement between CERN and the Soviet Union that will give European physicists access to the Russian machine, the news from Serpukhov will no doubt strengthen the sense of deprivation at Geneva.

European Physical Society

AGREEMENT has been reached on the formation of a European Physical Society and it is planned that there should be an inaugural meeting in Florence in the last week of September 1968. This will be a fitting tribute to the enthusiasm of the Italians for the new venture and, in particular, to that of Professor G. Bernardini, who is chairman of the steering committee. The draft constitution of the proposed society, which has already been circulated to the councils of national physical societies, is to be discussed and—no doubt—approved at a meeting of the steering committee due to take place early in 1968.

The view that the new society should begin as a loose federation will appeal not merely to those of