

fessor of physics at the University of Michigan and Director of the National Physical Laboratory. According to Sir Gordon, European inferiority is the contemporary equivalent of a sense of inferiority among scientists in North America thirty years ago, and which has now "entirely disappeared". But because the United States, by virtue of its greater population and productivity, is bound to play a much more important part in the development of science and technology, it does not follow that countries such as Britain "should throw up the sponge"; rather, Sir Gordon said, scientists in Europe should reflect how it is possible to make small resources accomplish great things, from radio-astronomy to protein structure.

The reasons for the growth of confidence among American scientists are to be found, Sir Gordon believes, at least in part in the structure of the institutions responsible for higher education and for the management of public expenditure on science and technology. Among the sources of strength in American universities he cited the quality of postgraduate teaching, the flexibility stemming from the absence of a hierarchical structure in university departments and, in particular, the presence of several professors in many departments, the freedom of American universities to compete financially for good staff, the attachment to universities of research centres financed from outside sources, and the fact that university staffs in the United States "have never been ashamed" that research work can sometimes be usefully directed towards practical problems. In his comparison of the arrangements in Britain and the United States for providing public support for scientific research, Sir Gordon was somewhat less envious of arrangements in the United States, although he made it plain that he considers the existence of several government agencies able to spend money on science and technology an assurance that good ideas do not go begging for lack of money. At the same time, he admires the way in which the organization of the budget in the United States makes it possible for "a highly professional group of men" without departmental axes to grind to subject the whole pattern of spending to "central scrutiny and co-ordination". Sir Gordon Sutherland went on to hope that the Zuckerman Committee would emerge as the British equivalent of the Office of Science and Technology in the United States. Speaking of the brain drain, which may be considered a tangible expression of feelings of inferiority or otherwise, he said that "it should not be too difficult to devise self-denying ordinances in the form of quotas for permanent immigration"—a statement that will not easily win agreement.

What Next for Apollo?

WHETHER the United States Apollo programme will be delayed by the accident which killed the crew of the first spacecraft on January 27 is not yet known. The device, which was due to be launched on February 21 by a Saturn IB rocket, is presumably beyond repair, and statements from Cape Kennedy have suggested that at least three months would go by before another can be brought to the launching site and tested. But the most serious potential delay is that the enquiry now being conducted may make it necessary to re-design some parts of the Apollo system.

The past few months have been plagued by a number of technical troubles. The device in which the fire took place a week ago consisted of two of the three components of the spacecraft intended for the Moon. This has been at Cape Kennedy since October 1966. Early in the programme of testing, the environmental control system failed and a water heater had to be replaced. There has also been difficulty about the fuel cells, which had at various times threatened to produce less power than the project needs. The latest setback will no doubt take even longer to put right.

Even so, it is by no means impossible that the National Aeronautics and Space Administration will be able to land a man on the Moon before 1970—the original target. Indeed, towards the end of last year, some optimists were talking of 1968 as the year in which the first American might land on the Moon. The next step in the programme, which need not be delayed by the accident a week ago, is to launch the Saturn V booster rocket (with 7.5 million lb. of thrust). This test will provide valuable information about the rocket system and will also help to test the efficiency of the heat shields on the Apollo system. Later in 1967 it had been intended to carry out a complicated operation in which the lunar landing capsule would be put into an orbit about the Earth and then occupied, 24 h later, by one of three astronauts launched separately. This experiment will no doubt now be postponed.

Canadian Appointments

OPERATIONAL Research at Canadian Forces Headquarters in Ottawa has a new Director-General, Dr. George R. Lindsey. He succeeds Dr. R. J. Sutherland, who died recently. Dr. Lindsey graduated from the University of Toronto in 1942, and served with the Royal Canadian Artillery and in operational research with the British Army during the War. In 1946 he worked at the Cavendish Laboratory in Cambridge, and carried out post-graduate work in high energy physics, obtaining his doctorate in 1950. He has worked for the Canadian Defence Research Board, the Canadian Air Force, and the Department of National Defence, and in 1961 was for a year chief of the operations research groups at the NATO station at La Spezia. His work in recent years has been concerned with air defence and ballistic missile defence, and naval matters.

In the background is the question of what Dr. O. M. Solandt will do when his term as Vice-President in charge of Research and Development at Hawker Siddeley of Canada ends shortly. Dr. Solandt, who was a lecturer in physiology at Cambridge in 1939, has also been concerned with operational research. It has been suggested that he might become President of the National Research Council, or return to his old job as Chairman of the Defence Research Board.

New Radio-telescope

THE Science Research Council has awarded a grant of £45,000 to the University of Manchester for a design study for a new radio-telescope. At the Jodrell Bank Observatory, which will naturally be in the thick of the design process, it is hoped that the new instrument may be a telescope 400 ft. or so in diameter, and capable of high resolution. The cost could easily amount to £4 million—a sum which exceeds by a factor of more