

the first Moon landing, economizing on time was the essential feat. An outstanding engineer such as Mueller was a logical choice.

But even with the second manned Moon landing, speed begins to take second place. Quality of results is becoming the criterion. Indeed, the lunar strategy review of the National Academy of Sciences Space Sciences Board (see *Nature*, **224**, 529; 1969) specifically urged that there should be longer intervals between missions to give time for results to be digested and fed into the programme of future flights and that more time should be spent on the Moon with more selectivity in data collection. Several of these points have already been adopted for this week's Apollo 12 mission. Twice as long is to be spent on the surface, and twice as much material is aimed for, with emphasis on sample selection. Six experiments are being performed instead of three.

Dr Mueller's successor has yet to be announced, but most of the other personalities behind the Apollo 11 flight have already been replaced. There was even some speculation about how the Apollo 12 mission would get on with so few of the old familiar faces.

SCIENCE RESEARCH COUNCIL

Shoe Pinches in Physics

THE Physics Committee of the Science Research Council, responsible for dispensing roughly £1 million a year on physics research in British universities and institutes, has produced a modest echo of the complaint elsewhere that other sources of support "for good fundamental work" have diminished. The committee has carried out and now published a review (to be had free of charge from the Science Research Council) of the fields in which it is at present engaged and of the directions in which it may find its work developing. It says that "on the national level . . . support from sources other than the SRC has decreased rapidly" chiefly because various government agencies have lost enthusiasm for various projects. The committee says that solid state physics and plasma physics have suffered most, no doubt because of the concentration of the defence research laboratories on practical applications of electronics and because of the decision by the UK Atomic Energy Authority to cut down on work at Culham, the laboratory particularly concerned with thermonuclear research. The committee estimates that it would take an extra £200,000 to £300,000 in the next two to three years to make sure that the national effort continues at "a reasonable though reduced level". One of the ironies of which the committee complains is that the short commons for solid state physics and plasma physics have come about precisely when the importance of these subjects is growing and when it is clear that "it is precisely from these fields that new technologies can confidently be expected to emerge".

The Physics Committee is not concerned with support for high energy physics or for astrophysics in the strict sense. In its review of the opportunities available, it has given prominence to the need for better facilities for neutron beam research, and spells out the advantages which may be obtained by a fuller exploitation of neutron beam experiments. Neutron diffraction in crystallography is already widely used, but the committee points to possible applications to crystals

of biological molecules and the determination of magnetic structures. But there are also benefits to be won from studies of dynamical processes in crystals—phonons, magnons and the vibrations of polymer chains, for example. The committee says that the importance of this work "cannot be overemphasized" and that there is an urgent need of a high flux beam reactor.

The committee seems also to have been captivated by the potentiality of synchrotron radiation in the study of gases and solids and has spent £150,000 on a national facility for synchrotron radiation at the Daresbury Laboratory. Elsewhere, the committee promises more help for ion implantation studies in semiconductors and other solids, the study of the amorphous state and new developments in surface physics. It also seeks to encourage the use of on-line computers as a part of the general improvement of laboratory facilities. Further ahead, the committee is proposing to look carefully at opportunities in collisions between atoms and heavy particles at low energy, principally on account of their interest in chemistry and astrophysics; the development of dye lasers, in part because of the way in which such tunable lasers can provide selective excitation in atomic physics; energy transfer processes in solids; mode locked lasers which give pico-second pulses; ferro-electric materials and what is called "technological magnetism"; electronic structures in alloys; spectroscopy by laser scattering and non-linear optics; the electronic properties of polymers; inert gas solids; critical phenomena at low temperatures and tunnelling in superconductors. On the whole, the Physics Committee gives a convincing impression that it knows where it would like its pensioners to go. The review deals also with matters such as the growth and supply of crystals for research in solid state physics, now helped along by work supported by the Science Research Council at Oxford, Strathclyde and Birmingham as well as by the Electronic Materials Unit of the Ministry of Technology at Malvern. The committee promises to pay attention to the development of instruments. On training, it says with pride that "very nearly 50 per cent of our postgraduate students are working on applied rather than fundamental physics" and promises to foster cooperative research and training between industry and universities by directing something like 20 per cent of new research studentships towards work of this kind.

COMMUNICATIONS SATELLITES

Skynet Ahoy

from a Correspondent

THE logic of providing a communications satellite system for defence purposes just as Britain is completing its withdrawal of forces east of Suez is not immediately obvious. The chief object of the Skynet satellite, of which the first of two was successfully launched on November 22 by the American Thor-Delta, is to maintain instant interference-free voice communication between Whitehall and forces in the Middle and Far East. It may, however, provide Britain with valuable experience in designing and building advanced communications satellites components, and this is certainly an expanding technological field with substantial export possibilities.