shared among six working groups with titles such as Terrestrial and Planetary Atmospheres and Ionospheres and Radio Propagation. A seventh working group used to be concerned with technical facilities, and this has survived intact. The other six have been compressed into an astrophysics working group and a geophysics working group. (For these purposes, geophysics does not include the Moon or the planets but only the space within the Earth's magnetosphere, but what happens when the Moon passes within the tail is uncertain.) One result, of course, has been to cut down the number of scientists who are party to working group discussions, and there have been complaints of the way members of the old working groups heard almost out of the blue that their services were being dispensed with.

It is even beginning to look as if the streamlining which was the chief reason for the reshuffle is going to be blunted. Because of the debate about the future of the lunar and planetary sciences in Britain, and the need speedily to take up American offers of participation in sample analysis, there has been a move to set up a sub-group along the lines of the old working group on the Moon, planets and interplanetary matter. This seems to have succeeded, and it could yet happen that all the reorganization has done is to replace a two tier structure by a three tier structure.

Because the new working groups were formed after the period covered by the most recent SRC annual report, the report does not contain a list of members, who are appointed for not more than four years: Geophysics Working Group, Professor F. G. Smith (chairman), Professor W. J. G. Beynon, R. Dalziel, Professor J. W. Dungey, Dr J. T. Houghton, Dr J. W. King, D. G. King-Hele, Professor P. L. Marsden, Dr R. J. Murgatroyd, Dr J. J. Quenby, Dr W. J. Raitt, Miss P. Rothwell and Professor S. K. Runcorn (secretary, Dr G. Clarke); Astrophysics Working Group, Professor R. L. F. Boyd (chairman), Professor D. J. Bradley, Dr H. E. Butler, Professor P. H. Fowler, Professor W. R. S. Garton, Professor G. W. Hutchinson, Dr K. A. Pounds, Professor J. Ring, P. W. Sanford, Dr D. W. Sciama and Dr R. Wilson (secretary, Dr J. H. Price); Facilities Working Group, Professor H. Elliot (chairman), Dr H. E. Butler, Dr E. B. Dorling, R. Dalziel, Dr H. G. Hopkins, A. C. Ladd, Professor J. Sayers, D. B. Shenton and E. G. Warnke (secretary, Dr G. Clarke).

RESEARCH GRANTS

Money for Polymers

THE Science Research Council is prepared to provide special support for research in polymer physics and technology following the recommendation of its Polymer Panel (*Nature*, **222**, 209; 1969). Universities and other academic institutions are invited to apply for these special grants (without having to fill in the standard grant application forms) before January 15, 1970, and particular areas of research will be given priority. To begin with, proposals based on an interdisciplinary team approach will be sought; the panel suggested that a typical research team should contain a chemist, an engineer, a physicist and a polymer scientist, but, even where an integrated team cannot be formed, the SRC will favour the fullest possible collaboration between departments or institutions. Money will also be concentrated in areas where successful research could show immediate practical benefits, particularly in polymer synthesis, including three dimensional polymers; thermally stable polymers from cheap starting materials; inorganic polymers and new methods of polymerization leading to predetermined structures; the physical and mechanical properties of polymers and of composites based on polymers; and engineering aspects, such as design with polymers and their processing.

The SRC may make grants available for longer than the usual three year period and, as recommended by the panel, the funds will be open to small specialized groups as well as for the five or six main centres where research is now concentrated. The panel considered that there might, in the long term, be a case for a central polymer research institute but that at present the most effective support will be increased direct grant support through the normal channels. A committee under the chairmanship of Professor C. E. H. Bawn has been set up to assess these applications and to keep the research under regular review. Two other committees which have recently been established to encourage research in interdisciplinary fields are for control engineering and for enzyme chemistry (*Nature*, **222**, 209; 1969).

HUMAN SCIENCES

Postman's Knock at Oxford

THE fate of the proposed Human Sciences course at Oxford still hangs in the balance. The course has already been accepted by faculty boards and by the University's General Council, but although the motion calling for withdrawal of the decree which set up the course was rejected by 153 votes to 122 in the Hebdomadal Council last month, more than fifty members of the council called for a postal vote. The result is that the rejection cannot be confirmed unless the postal vote swings the same way. Voting papers must be returned to the registrar by 4 p.m. on Monday, December 8.

INSTRUMENTS

Set Fair at Siding Spring

from our Astronomy Correspondent

WITH the mirror blank for the Anglo-Australian telescope at sea between the United States and Britain, the workshops of Grubb Parsons at Newcastle upon Tyne are preparing to grind their biggest mirror yet. At a diameter of 155 inches, the blank is more than half as big again as the 98 inch 'Pyrex' blank now in the Isaac Newton Telescope at Herstmonceux. The 155 inch mirror is cast in 'Cer-Vit', the new glass developed by the Owens Illinois Company of Toledo, Ohio, which has become the wonder material of optical astronomy. The almost negligible coefficient of expansion is not the only advantage—the glass is also quicker to prepare and cast than conventional 'Pyrex' and the blank is easier to figure. Preliminary shaping of the 24-inch thick mirror and the drilling of the central hole for the Cassegrain focus have already been done at Toledo. Grinding and polishing at Grubb Parsons begin on December 10, and will last a good two years.

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In Australia, the site of the new telescope at the Siding Spring Observatory of the Australian National University has been levelled. The project is run by a Joint Policy Committee consisting of Sir Richard Woolley, Professor Fred Hoyle and Mr J. F. Hosie on the British side and Professor O. J. Eggen, Mr K. N. Jones and Dr E. G. Bowen from Australia. During the coming months the committee will take several decisions which could prove crucial. First, tenders for the telescope building are to be invited shortly and the contract is expected to be let early next year. Second, the committee is mulling over the choice of an all-British telescope to be set up alongside the Anglo-Australian telescope, and will probably reach a decision in January or February. Third, the design of the Cassegrain and Coudé spectrographs—essential instruments which will have to be available when the telescope goes to work sometime in 1974—will have to be settled soon. Each spectrograph could take several years to build. It seems likely that the designs will be essentially the same as the Herstmonceux spectrographs, but modified in the light of experience.

The Joint Policy Committee is also thinking hard about how the telescope is going to be administered, and in particular how observing time is to be apportioned. It is probable that the British half share will be in the hands of the SRC Large Telescope Users' Panel which was set up chiefly to administer time on the Isaac Newton telescope. A similar panel will be in charge of the Australian share, and the worst problem is likely to be coordination between the two committees. One solution being considered is for the director of the proposed British telescope at Siding Spring to be a go-between.

The incentive for the establishment of an all-British facility alongside the Anglo-Australian and purely Australian telescopes is of course that it provides back-up observing time for British visitors when the joint telescope is not available as well as a base for the British support contingent at the observatory. As far as the distribution of observing time on the smaller telescope is concerned, the situation is not unlike that at Kitt Peak National Observatory where a resident staff is in charge of telescopes run by a consortium of United States universities. The resident staff are allotted forty per cent of the observing time, and it could be a similar arrangement for the resident staff of the proposed British facility at Siding Spring.

TECHNOLOGY

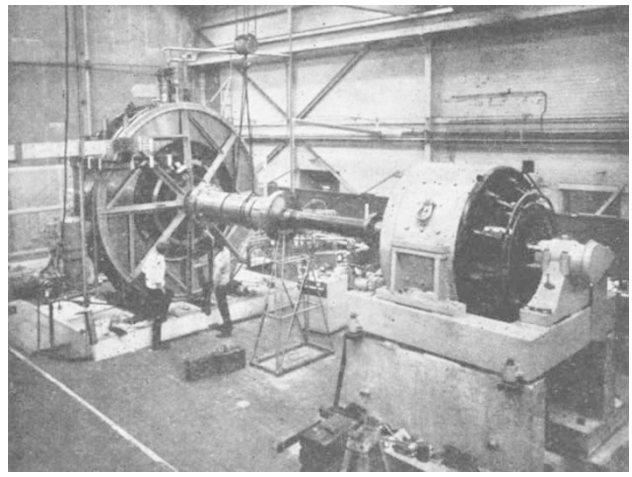
Superconductors at Sea

from a Correspondent

Newcastle upon Tyne, November

FEW technological enterprises in recent years can have met with as much good fortune as the application of the superconducting principle to electric motors and generators. Four years ago, the Ministry of Defence (Navy) placed a small contract with the Newcastle company International Research and Development Ltd to build a small experimental homopolar d.c. motor with a superconducting liquid helium cooled field coil. The design was to develop, initially, a total of two horsepower. Design improvements during the construction of this prototype were such that the finished model was able to produce no less than 50 hp; and this early promise led the National Research Development Corporation to present IRD in 1966 with a £500,000 order to build a full-scale motor for use in an industrial environment.

Last week this finished motor was put on display for the first time. The machine, which runs at 200 r.p.m., develops a total of 3,250 hp (although the display run was carried out at about 20 per cent load) and is to be moved, as soon as tests are completed, to the CEGB's Fawley power station, where it will drive one of the station's four cooling water pumps. The leader of the team responsible, Mr Anthony Appleton, thinks that the motor will be ready for installation at Fawley in mid-January.



Motor during final stages of assembly, with part-load on the right.

The most encouraging piece of news from the day's proceedings was the fact that the Navy has once more placed a contract for a further close study of the system's applications. The new contract asks IRD to construct a one megawatt superconducting generator, and Mr Appleton confirmed that work on building this machine should start as soon as the Fawley motor is out of the way. As the motor took only 18 months to construct, it seems likely that the generator should be ready by mid-1971 at the latest.

Naturally enough, the Navy's interest in the project has been generated by the seemingly ideal application of the motor to ship propulsion. As well as having the obvious advantages of lightness, compactness and economy, the fact that an electrical connexion between power source and propeller drive can supplant a bulky shaft connexion means that enormous space savings could be achieved in a vessel's engine compartment. The prime mover—a gas turbine has been suggested—and the generator could be mounted on an upper deck, while the motor itself could be accommodated in a relatively minute space right astern. The motor's infinitely variable speed and reversibility will also endear this form of propulsion to naval architects. The Navy is not alone in its enthusiasm for superconducting d.c. generators. The chemical industry—in particular the aluminium smelters—have shown a keen interest, and in a recent speech IRD's managing director, Dr Hyman Rose, suggested that a 200 MW, 1,000 volt generator could cut the costs of an aluminium smelter such as that at present under construction at

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