

tories, Pasadena, California, operated jointly with the California Institute of Technology.

Research in the astronomical field during the year included the discovery of more information about quasars, and the discovery of a probable physical inter-galactic connexion between our galaxy and the Magellanic Clouds—scientists from the Instituto Argentino de Radioastronomía working at the radio telescope constructed by the institution at La Plata, Argentina, investigated what seems to be a bridge of neutral hydrogen between the Milky Way and the small Magellanic Cloud.

Workers at the Department of Terrestrial Magnetism have found that the Earth's crust is very thin around Washington, DC. They have constructed a map showing the thickness of the crust from North Carolina to central Pennsylvania. The map shows that the crust varies in thickness from 30 to 60 kilometres, with the thinnest area underlying Washington and adjacent Virginia, and the thickest areas beneath the Appalachian Mountains. The Biophysics Section of this same department is interested in the biochemistry of evolution. It has reported work on the search for repeated DNA sequences in different species representing all the main forms of life, from viruses to humans. The investigators found that fifty-five different DNAs from plants and animals showed DNA sequence repetition. In other words, in each case, a large fraction of the genetic material consists of many copies of short DNA sequences or packets of genetic information—only bacterial and viral DNA failed to show sequence repetition. It is believed that the repeated DNA sequences are slowly mutated or changed during the course of evolution. Thus the copies (members of families of repeated sequences) do not remain identical. The degree of divergence may be a measure of the age of the family of nucleotide sequences—this divergence may be very relevant to evolutionary history. From time to time certain segments of DNA are copied and new families of many identical members are produced.

Among other research reported is the discovery at the Department of Plant Pathology of the way to make some common plants double their growth by reducing the amount of oxygen in the air surrounding them.

## New Research Rocket

THE proving trials of a new British research rocket have been completed and a series of test flights have started in which scientific experiments are carried. The rocket is the Petrel, a small solid fuel vehicle designed to provide high altitude research facilities, mainly for universities, at low cost. It was developed for the Science Research Council by the Ministry of Technology's Rocket Propulsion Establishment, the Atomic Weapons Research Establishment and Bristol Aerojet Ltd. Petrel can reach altitudes of up to 140 km and can carry a payload of 13 kilograms, which has to be reduced if telemetry facilities are required.

The first of the series of test flights was launched successfully on February 3 and a second firing took place on February 29, both from the South Uist range in the Hebrides. The experiments carried on these flights were designed by the Radio and Space Research Station at Slough to investigate high speed electrons



from space bombarding the atmosphere. The flights were tests in the sense that their purpose was primarily to evaluate the behaviour of the rocket rather than to gather scientific information.

Several more Petrel rockets are planned to be launched from South Uist this spring, carrying experiments for university research groups. These include payloads from Birmingham University to investigate ions and electrons in the atmosphere, from Southampton to study sporadic layers of ionization and from Sheffield to study fine structure effects in the ionosphere.

## Rules for Heart Transplants

THE Board on Medicine of the US National Academy of Sciences has issued a set of guidelines for heart transplants. In a statement published on February 28 it says that because cardiac transplantation in man cannot yet be regarded as an accepted form of therapy, but only as a scientific exploration of the unknown, the operation should only be carried out in institutions where a special set of criteria can be met. The surgical team, the statement says, should have extensive laboratory experience of heart transplantation and a thorough understanding of the biological processes involved in rejection and its control—immunologists should be readily available to collaborate in the operation.

The statement goes on to say that the primary justification for transplanting hearts, with respect to donor and recipient, is that the knowledge so gained will be of benefit to other members of society. The ethical issues involved are part of the whole problem of the ethics of human experimentation, which are at present being studied intensely, as the statement says, by a number of well-qualified groups in the United States and other countries. Until some ethical guidelines are available the Board on Medicine can only advise every institution to assure itself that it has protected the interests of all parties involved to the fullest possible extent. The donor, the board says, should be unanimously

selected by doctors who are not directly involved in the transplantation effort. Their opinion as to the acceptability of the donor should be based on crucial and irreversible bodily damage and imminent death. The prospective recipient should also be examined by an independent group of doctors, including a cardiologist and an immunologist. Their decision should be based on all the evidence, including the presence of advanced, irreversible cardiac damage and the likelihood of benefit from the procedure.

## School Leavers

VOLUME 2 of *Statistics of Education*—one of at least five volumes covering different educational subjects—has been published this week by HMSO (price 20s.). This particular volume deals with General Certificate of Education examinations, Certificate of Secondary Education examinations, and school leavers.

From the numerous lists of figures, a rising trend in the number of students qualified in GCE can be seen. In fact, during the ten years ending in 1966, the number of passes at O-level almost doubled. The biggest increases were in economics (and associated subjects)—490 per cent—and in the other social science and vocational subjects group—200 per cent. Naturally enough, the greatest number of entrants were in English and mathematics, with geography and French not far behind. Physics also seems to have been popular, with an average of 54.7 per cent passes. Successes in the A-level examinations showed an increase of nearly 150 per cent during the last decade and the only decrease was in botany which fell by 9 per cent. English literature and physics were the two most popular subjects. The total of 140,000 CSE candidates for 1966 was more than twice the number for 1965, with entries for boys averaging 4.3 subjects each and for girls 3.2 subjects each.

In 1965–66, 38.5 per cent of all leavers attempted O-level, and of these 21 per cent obtained five or more passes. Of over 15 per cent who attempted A-level, 11 per cent obtained two or more passes. The data also show that 16.5 per cent of leavers went on to further education: 7.5 per cent each to universities and to other full-time further education, and 1.5 per cent to colleges of further education.

Regional statistics show that the proportion of all leavers going to full-time further education was above the national average in Wales and in the south of England except Greater London, and that the number leaving with two or more A-levels was highest in south-east and south-west England. A similar trend was shown for those leaving with five or more A-levels, with a percentage of 24.7 per cent for Wales closely following the figures of 26.8 and 26.4 for the south-east and south-west respectively.

## Committee on Education

THE British Parliament has now proceeded with the plan to set up a specialist committee of the House of Commons to deal with educational topics. The membership of the committee, announced last week, includes ten Labour members, seven Conservatives and no others, a source of some frustration to the dozen Liberals in the House of Commons. As well as being large, the select committee is also eminent. It

includes a former Conservative Minister of Education, Sir Edward Boyle, and a former Labour Minister, Mr Fred Willey, who was Minister of Land and Natural Resources until that ministry disappeared. Before that he was for many years a Labour spokesman on education. The Labour Party, with almost as many teachers in the House of Commons as the Conservatives have lawyers, ran the risk of turning the committee into little more than a teachers' lobby. This seems to have been resisted, although several of the members are former teachers—Mr Christopher Price, Mr Trevor Park and Mr Richard Mitchell have all taught at schools, and Mr Stanley Henig is a former university lecturer. Among the Conservatives there are no former teachers, except Mr Richard Hornby, who taught for two years at Eton. There is, however, Mr Esmond Wright, who until his election as member for Glasgow Pollock was professor of modern history at the University of Glasgow.

The final terms of reference of the committee are a compromise. In its original form, the motion establishing the committee put down by Mr Richard Crossman, Leader of the House of Commons, did not mention Scotland, and the committee had no Scottish members. This was later changed, and the committee is now empowered to examine the activities of the Scottish Education Department as well as the Department of Education and Science. It now has two Scottish members. But this has not satisfied members from Scotland, who are hard to satisfy. They say, quite truthfully, that Scotland has an entirely separate system of education, and deserves a committee to itself—a committee empowered to examine the work of the Scottish Office as a whole.

Mr Crossman has made it quite clear that the committee is not a committee on education. Rather, it is a committee charged to examine the activities of the Department of Education and Science and the Scottish Education Department—it is a departmental rather than a subject committee. Mr Crossman already seems halfway to admitting that it was a mistake to establish the committee on this basis. "It is arguable that subject committees are, on the whole, better and easier to work. . . . It may be in the final resort that we come only to subject committees; but we were pledged to try out a departmental committee." There is now a select committee on agriculture and one on education, both organized on departmental lines. This has been done, it is thought, because Mr Anthony Crosland and Mr Fred Peart were the two ministers initially most enthusiastic about specialist committees. Mr Crosland has now moved on to the Board of Trade, leaving Mr Patrick Gordon Walker, still having an unhappy time as a minister, to handle the select committee as best he can. Mr Peart, still Minister of Agriculture, is probably finding the committee on agriculture more of a problem than he bargained for.

The committee will be meeting in public, and its chairman will be Mr Fred Willey. As its first subject, it has chosen to examine the Inspectorate of Schools. This is the body which certifies the standards of all schools in Britain, and is likely to prove a tepid subject politically. The committee has clearly decided to play itself in gently, and is likely to start the examination by summoning civil servants rather than ministers from the Department of Education and Science.