University Grants Committee to advise further on the choice of a location. He indicated that decision regarding the structure of Government would be taken within a week or two, and in reply to questions on the following day regarding the recommendation for establishing six new universities, Mr. Hogg said the whole matter had been referred to the University Grants Committee. He also gave the figures for medical students registered at universities as follows: 1959, 12,314; 1960, 12,276; 1961, 12,254; 1962, 12,550; 1963, 12,890.

In opening the debate in the House of Lords, Lord Silkin referred to the recognition in the White Paper on *Industrial Training* that the number of new entrants to skilled occupations was insufficient for Britain's future needs, and also to the importance of securing the right quality of teachers and teachers of the right status. The Earl of Dundee, who followed, for the Government, apart from a closer review of the Newsom Report, added little to what Sir Edward Boyle had already said in the House of Commons. He pointed out that Britain's expenditure of £414 million on education in 1952 was just more than 3 per cent of her gross national product; £804 million in 1958–59 was 4 per cent; and the £1,300 million in the present year was 5 per cent of her gross national product. Later, the Earl of Bessborough referred to educational television, expressing the hope that this medium would be used to the maximum extent possible for educational purposes. He thought that ultimately it might be necessary for one or more channels to be devoted exclusively to education.

SCIENTIFIC RESEARCH IN SCHOOLS

THE question of teachers in schools undertaking research in science brings together a number of considerations which are nicely poised. One primary fact is that any research with a successful outcome is a contribution to the total stock of human knowledge. But many teachers can be good instructors even if they have nothing to do with research, provided that they take the trouble to keep themselves informed of new developments. They are not all capable of worth-while independent enquiry, and the courses they pursued before graduation may have fallen short of making them familiar with the spirit and techniques of experimental investigation. From this point of view the teachers most likely to succeed in research are those who after graduation stayed on for some time at the university, and then, perhaps finding prospects not up to expectations, took up appointments in schools. In the opposite direction, there is always a small movement of teachers who after a period of school experience return to university work.

Then there are different kinds of research which teachers can take up. Some are worth pursuing, although they do not carry enquiry very far; they can be 'pottered' with as occasions permit; they need not make any heavy demands on attention and may be looked on almost as a recreation. At the other extreme are research problems which take a big slice of a teacher's free time and mental energy. Indeed, it does not necessarily follow that a man who is competent at research is a good instructor, well versed in all sections of the sixth-form syllabus which he is required to teach. The project which he is pursuing may have scarcely any relation to his school work. Again, in so far as research constitutes an important element in his life, it may draw him away from the corporate life of the school, lower his social standing among members of the local community and debar him from higher educational posts. Typically, what he can hope for is to become head of his own department.

Among considerations of this nature the point of equipoise is slowly shifting, and mainly through help from the Royal Society an increasing number of science teachers are carrying out research. In 1957, taking the view that "the teaching of science in schools might be improved if those engaged in it were enabled to carry out some research work of their own choice, preferably involving participation by pupils", the Society set up a Scientific Research in Schools Committee. This Committee invites proposals from any teacher about a research project which he or she would like to carry out. If this meets with approval, the Committee appoints a suitable adviser—usually a Fellow of the Society or a senior member of a university department—with whom the teacher can keep in contact. The Committee is also prepared to consider applications for grants for the purchase of such materials and apparatus as may be required.

The sixth annual report of the Committee, which was issued in November 1963, shows that 84 science teachers were carrying out research with the help of the Royal Society, and that six original papers had, during 1963, been published. However, figures received more recently from the Royal Society indicate that by mid-January 1964, 94 science teachers are now participating in the scheme. The teachers concerned hold appointments in a wide range of schools: Secondary Modern, 4; Secondary Grammar, 42; Public and Private, 34; and others, 5. The spread of the subjects covered was: biology, 43; chemistry, 24; crystallography, 2; engineering, 1; geology, 6; physics, 14; radio-astronomy, 3; and time and motion study, 1. The grants supplied by the Royal Society for these projects totalled £619 in 1957–58, while the figure for the year 1962–63 was £4,450.

THE BRITISH ANTARCTIC SURVEY

THE British Antarctic Survey *Bulletin* * is intended to supplement the existing series of monographs, the British Antarctic Survey *Scientific Reports*, by providing a channel of publications for preliminary reports, short notes and papers including some which are not specifically scientific. The *Bulletin*, which is being edited by Dr. R. J. Adie and Miss E. Todd, will be published as necessary to cope with the flow of papers, probably two or three times each year.

The first two issues, June 1963 (pp. 54) and December 1963 (pp. 96), show that these objectives are being met. These issues contain four papers on biological subjects, three on glaciology, two on meteorology, two on geophysical surveys and one on geomorphology. "The Human Element in Polar Exploration", by Sir Vivian Fuchs, and the longest paper of 25 pages on "Polar Ships and Navigation in the Antarctic", by J. P. Morley, are more general papers of considerable interest. Summaries of four recent "British Antarctic Survey Scientific Reports" are given in the first issue, and the foreword indicates that correspondence concerning papers may appear in the future.

The *Bulletin* is printed on art paper and is copiously illustrated by photographs, maps, line drawings, etc. The quality and interest of the scientific papers are similar to

* British Antarctic Survey. *Bulletin*, No. 1; June 1963. Pp. 1–54. (London: British Antarctic Survey, 1963.) 10*s*. net.

those of the specialist journals covering the appropriate fields. It will therefore be necessary in future for those wishing to cover Antarctic aspects of subjects to ensure that they are aware of any papers in this *Bulletin*. The paper on "The Snow Accumulation Budget at Halley Bay and Associated Meteorological Factors", by D. W. S. Limbert, will be of interest to many glaciologists and meteorologists, while that on "The Sheathbill, *Chionis alba* (Gmelin), at Signy Island", by N. V. Jones, is the best general account of this species which is available. "Vector Mean Winds at the Argentine Islands", by B. D. Giles, although limited to visual theodolite observations during the period 1954–58, provides a useful summary of upper winds. "Geophysical Investigations in the Scotia Arc and Graham Land", by D. H. Griffiths, is a preliminary paper outlining observations made so far which indicate that a most thorough and useful monograph should appear in the future.

Although the new series will mean yet another journal to be kept under review by interested scientists, the effort should be well worth while and it should serve to direct attention to the accomplishments of the British Antarctic Survey. The Editors are to be congratulated on the quality of presentation and at having kept the price down to the very reasonable level of 10*s*. per issue.

G. de Q. Robin

PETROLEUM CHEMICALS: BULK DETERGENTS

THE familiar idea of detergent production in the United Kingdom is the washing powder or dish-washing fluid sold over the shop-counter and glaringly advertised in every available medium. This, however, is by no means the whole story. There are made available in the petroleum industry many chemical compounds which qualify as detergents and specialized products are designed for particular applications. In this field a considerable annual tonnage of detergents is sold in bulk, either direct by manufacturers connected with the petroleum industry or through local distributors, for industrial or non-retail consumption. Much of this material is in liquid form and is marketed in anything from a 1-gal. tin to a 15-ton road-tanker load. Such has been the extraordinarily rapid advances made in formulation, perfection and manufacture of these surface-active agents (known in the United States as 'surfactants') since the end of the Second World War that it is now claimed, not without good reason, that, as cleansers, detergents are more versatile than soap. Certainly this fact is clearly demonstrated in an article appearing in a recent issue of the British Petroleum Company's *B.P. Magazine* (Winter issue, No. 10; 1963), wherein several kinds of detergents and their diverse industrial and social applications are discussed.

One of the largest users of detergents is the textile industry. For example, raw wool, either used alone or blended with synthetic fibres, must be scoured to remove dirt and wool fat before, by a complicated process. it can be converted into yarn; formerly this was done with soap and alkali; detergents are now used for the purpose. Wool for carpets is often twice scoured with detergent before it reaches the loom. The finished article used to be cleaned by the laborious use of carpet soap, but the job is now done more effectively and thoroughly by appropriate 'shampooing' or cleansing detergents.

Laundries still rely to a large extent on soap in their operations, but detergents are widely used in certain cases, especially where softened water is not available or where a particular form of soiling of the fabric is not susceptible to the use of soap. Examples of this occur from ordnance factories where woollen protective clothing gets liberally splashed with trinitrotoluene, and butchers' overalls covered with fat and other persistent stains. Again, the detergent can be used as an emulsifying agent and advantage is taken of this property in the production of 'waterless' types of handcleaner commonly used for cleansing the hands from grease, oil and other substances implicit in certain factory processes; the principle here is that the detergent mixes with greasy soiling, emulsifies in water, thus removing the contaminant from the skin. In the same category comes the invention and use of a special type of detergent concerned with removal of fuel-oil spillage at one of the British Petroleum Company's refineries, subsequent rinsing with fresh or sea-water completing the cleansing operation. This has had repercussions in the solution of problems raised by major spillages of oil in coastal waters and particularly on beaches. "The largest operation of this sort was probably the cleaning of oil from nine to ten miles of foreshore on the Isle of Wight resulting from a collision between two vessels in the Solent." This involved complete removal of oil from shingle beaches, rocks, concrete, wooden jetties and even beach huts where the gales had splashed them with the oily scum. It is stated that after this treatment, which took three months, people commented that they had never known the beaches so clean.

Finally, the use of special detergents for cleaning aircraft, both internally and externally, is now established practice in the maintenance programmes of many air-line corporations. Taking the overall picture of the detergent industry as it is now, in the United Kingdom the ratio of soap production to detergents is about 55 : 45; in the United States it is 30 : 70. There is still great research activity in Britain concerned with new products and new applications in the field of petroleum chemicals in which the properties of surface-active agents derived from petroleum figure prominently.

H. B. Milner

'NUCLEAR' AND CYTOPLASMIC RIBOSOMES IN *B. MEGATERIUM*

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IT has been shown in recent papers[1,2] that on lysis with a neutral detergent, lubral *W*, protoplasts of *B. megaterium* yield: (*a*) nuclear fraction containing all the DNA with some 'nuclear' ribosomes as well as the cytoplasmic membranes of the cell; (*b*) a cytoplasmic fraction containing most of the cell ribosomes and soluble RNA. The nuclear fraction can be divided by methods described[2] into the nuclear (DNA-containing) material, 'nuclear' ribosomes and membranes. It was shown[2] that with short times of incubation with a radioactive RNA precursor,