

D.S.I.R. SUPPORT FOR UNIVERSITIES AND COLLEGES

D. *S.I.R., Universities and Colleges, 1956-60** reviews the support given by the Department of Scientific and Industrial Research to research and postgraduate training in universities and colleges from August 1956 to December 1960. An introductory chapter outlines the functions and organization of the Department and summarizes the growth of support of this kind from 1929-30 to 1959-60. The two main chapters of the report, covering the training awards, studentships and fellowships, and the research grants are discussed on p. 605; a separate chapter reviews the support given to the human sciences, particularly the work of the Human Sciences Committee, and its sub-committees, which in 1958-60 considered 75 applications and by July 1960 had recommended more than 38 awards at an estimated cost of £193,000. Besides the figures given in the report itself appendices, numbering some 100 pages, include, besides particulars of membership of the Council and its Committees and Sub-committees, statistics of studentships, fellowships and of research grants for the period.

In 1960 the Department awarded 942 research studentships, 274 advanced course studentships, 77 first-year studentships and 39 fellowships. Of the research studentships 13.3 per cent were in biology and biochemistry; 7 per cent in chemical engineering and metallurgy; 25.7 per cent in chemistry; 4.2 per cent in electrical engineering; 7.6 per cent in other engineering; 6.6 per cent in geology; 2.4 per cent in

human sciences; 11.6 per cent in mathematics; and 21.5 per cent in physics. Over the period 1957-60 the corresponding percentage figures for new advanced course studentships are: 8.8; 9.9; 1.5; 7.3; 15.0; 10.2; 7.7; 22.6; 17.2. Only 20 students and 17 Fellows from the United Kingdom held their awards abroad in 1959-60 and 26 and 30, respectively, in 1960-61, but over the period 1957-60 there was a slight but steady increase in migration of research students between universities and in 1960, 19 per cent of research students and first year students migrated on taking up an award in Britain. There was a marked movement away from the colleges of advanced technology and the technical colleges and the likelihood of migration varied with the subject of research. Of 467 research students whose awards terminated in the year ended September 30, 1959, 99 took up overseas posts; 91 posts in industry, 79 research posts and 57 teaching posts in universities, 25 posts in the Scientific Civil Service and 18 in technical colleges.

Of research grants awarded during October 1956-September 1960, £409,783 was in astronomy, £400,139 in biology, £750,820 in chemistry, £326,267 in geology, £640,169 in low-temperature and solid-state physics, £10,125 in mathematics, £2,655,108 in nuclear physics, £288,501 in other physics, £627,812 in technology, £225,326 in human sciences and £297,543 in space research. Of the total of £6,631,943 all except £189,493 was to universities.

A section of the chapter in the report dealing with research grants reviews some of the results obtained from the Department's support of research in the various fields during the past four years.

* Department of Scientific and Industrial Research. *D.S.I.R., Universities and Colleges, 1956-60: a Report on D.S.I.R. Support for Research and Training in Universities and Colleges, 1956-60*. Pp. viii+232+15 plates. (London: H.M.S.O., 1962.) 15s. net. (see also p. 605 of this issue.)

REPORT OF THE GOVERNMENT CHEMIST FOR 1961

IN his recently published report*, Dr. D. T. Lewis, the Government Chemist, describes the wide range of work done in his Laboratory during 1961. During that period an average of more than 1,000 samples were analysed or otherwise examined every working day. These included such materials as manufactured fabrics, tobaccos, wines, spirits, drugs, foodstuffs, and a wide variety of inorganic and organic chemicals, which might, for example, occur in chemical formulations of pesticides, fertilizers and animal feeding stuffs. Almost all the work has been done at the request of various Government Departments in the United Kingdom, but some Commonwealth countries and Colonial Administrations have also availed themselves of the services offered by the Laboratory.

A great deal of the Laboratory's time is spent on various statutory duties, principally in collaboration with H.M. Customs and Excise; this is a reminder that the Laboratory was originally created by the Board of Inland Revenue in 1842 for the purpose of aiding the revenue authorities to detect and prevent infringements of the various Customs and Excise

regulations which deal with dutiable commodities such as tobacco, beers, wines and spirits, and sugar. Although this basic work of the Laboratory changes little from year to year, nevertheless alterations and additions to its general work have to be made in accordance with the changing laws of the country. The Laboratory has constantly to be on the look-out for new forms of tax evasion, intentional or otherwise, on materials where the duty liability, particularly to purchase tax, is more readily avoided. New fiscal measures can, of course, create new problems for the Laboratory which must be ready to help with the implementation of the new laws by providing suitably accurate and reliable methods of analysis for the materials in question. An example of this is given in the Finance Act of 1960, which requires certain marker substances to be added to gas oils sold for purposes other than road use. The Laboratory has had to develop analytical methods for the detection and determination of these additives (furfural and quinalizarin) in this type of fuel oil, and satisfactory procedures have recently been published.

A small but increasing amount of forensic work is done principally for the General Post Office and mainly involves the examination of questioned

* Department of Scientific and Industrial Research: Laboratory of the Government Chemist. *Report of the Government Chemist, 1961*. Pp. v+89+3 plates. (London: H.M.S.O., 1962.) 6s. 6d. net.

documents, of which British Postal Orders suspected of alteration are by far the most numerous. Betting letters have also been examined for reasons which Dr. Lewis gives as follows.

"Every year disillusioned punters conclude that betting would be profitable if conducted after results of races were known and the rule that postal book-makers accept bets postmarked before starting times tends to spur some misguided individuals to ingenious action". Most of this forensic work involves examination of documents by ultra-violet radiation and often requires that members of the Laboratory staff must act as witnesses in those cases which come before the law courts.

Certain matters of public health are also referred to the Laboratory, which undertakes examinations of water and sewage for various authorities, but principally the Ministries of Health, and Housing and Local Government. One particular national problem concerns the disposal of some 11 million tons of household refuse each year in England and Wales—equivalent to 5 cwt. per person per year. The tipping of this refuse in disused gravel pits and other dumping grounds can lead to pollution of underground and surface water supplies. The Laboratory has made careful studies of the degrees of pollution which can occur and its results have been passed to the Ministry of Housing and Local Government, with recommendations for a continued study of the problem in collaboration with local authorities and water undertakings.

An increasing part of the work of the Laboratory is concerned with long-term research work on specialized matters such as radioactive fall-out and effluents from nuclear power plants. The develop-

ment of new analytical methods using physical techniques such as X-ray diffraction and X-ray fluorescent spectroscopy is also continuing. These physical methods have advantages where a non-destructive examination is required.

There has, however, been a need in the Laboratory for a group to undertake research on problems of a more general nature. With this in mind, a new division of the General Methods Research Committee has been formed the purposes of which are to review existing methods of analysis and to develop new ones for the variety of materials with which the Laboratory is concerned in its day-to-day work. In this connexion, excellent work has been done on the detection and identification of a large number of organic pesticide chemicals using mainly the techniques of paper chromatography and infra-red spectroscopy. Each year the Laboratory has to undertake an appreciable amount of investigatory work connected with the possible hazards not only to humans but also to wild-life which arise from the extensive use of pesticide chemicals in agriculture; the wide range of these chemicals now commercially available must be readily identifiable in all sorts of animal and vegetable matter.

The reports of the Government Chemist are always of considerable interest and the present one is no exception. For sheer diversity of content there is little with which to compare it; for where else could one find an account of the detection of the pesticide 'Aldrin' in a sample of rice pudding, or the involved radiochemical investigations arising from nuclear fall-out. The Laboratory exists to safeguard the public; this report leaves no doubt that it is work well done.

W. I. STEPHEN

FIFTH INTER-AMERICAN SYMPOSIUM ON COSMIC RADIATION

IT was perhaps rather fitting that the staff of the world's highest cosmic ray laboratory should play host to the experts of the fourteen nations who contributed to the Symposium on Cosmic Radiation in La Paz, Bolivia, during July 17-27. This laboratory, situated at Mt. Chacaltaya some 35 km from La Paz, is rapidly becoming one of the foremost centres of high-altitude research. The altitude of the laboratory is 17,600 ft., and as such affords an ideal site for recording cosmic radiation and observing the night sky. Among its equipment is a cosmic ray air shower-recording array the central detector of which has an area of 60 m² and is shielded by 400 tons of lead ore.

After the formal opening by the President of Bolivia, whose speech stressed the contribution that this scientific endeavour was making in combating the conditions of under-development in the country, inaugural speeches by Prof. Vallarta from Mexico, Dr. Establier of Unesco and the rector of the University of La Paz, emphasized the amount of international co-operation involved in the work going on in Bolivia. Scientists from Brazil, Bolivia, Great Britain, India, Japan and the United States are now working in the Chacaltaya Observatory. Thanks to aid from Unesco, the U.S. Office of Scientific Research, and the International Union of Pure and Applied Physics, it was possible to gather in La Paz some of the foremost authorities on cosmic radiation for the Fifth Inter-American Symposium.

It is not possible in such a short summary to do justice to the enormous amount of interesting and significant contributions made by the various speakers in the symposium. Sixty-four papers were presented, and covered such fields as the measurement of the prehistoric cosmic radiation flux to the latest satellite measurements made by the U.S. National Astronautical and Space Administration. Russian speakers described experiments going on in the Crimea for the detection of Čerenkov radiation produced by γ -rays coming from other galaxies. The subject of γ -ray astronomy was well covered by the Massachusetts Institute of Technology groups working in New Mexico and their associates working in Chacaltaya in conjunction with colleagues from the Universities of Tokyo and La Paz. The subject of time variations was well covered by the speakers, and in this field, as well as geomagnetism, one appreciated the tremendous activity now going on in Latin America in the realm of geophysics. South America to-day supports a number of flourishing research organizations, all of which made significant contributions to the Symposium; among them may be mentioned the time-variation groups in Rio de Janeiro, Buenos Aires, geomagnetic observatory in Huanacayo, Peru, and the emulsion work at São Paulo, Brazil, and Tucuman, Argentina. The Symposium illustrated the enormous increase that has been made in our knowledge of the conditions in the space surrounding the Earth as well as the conception of the universe as a whole.