

REORGANIZATION OF THE FORESTRY COMMISSION

IN a written answer in the House of Commons on May 10, the Minister of Land and Natural Resources, Mr. F. Willey, stated that he and the Secretaries of State for Scotland and Wales had comprehensively reviewed the organization of the Forestry Commission, taking account of the recommendations made by the Estimates Committee in its seventh report for the Session 1963-64, with which they found themselves in wide agreement. Among other changes, they had decided that the Commission should be reconstituted with four full-time executive members and only five part-time Commissioners, chosen for their knowledge and experience of commerce, the timber trade, trade union matters, and forestry and the countryside. There will be a part-time chairman as at present, and the staff will be reorganized functionally under the full-time members responsible for forest management, harvesting and marketing, and administration and finance, respectively, and there will be greater delegation to the Conservancies, with headquarters staff in Scotland and Wales. Mr. Willey added that the chairman of the Commission, Lord Waldegrave, was in full agreement with their proposals, and to facilitate the reorganization he and the other Commissioners had placed their offices at the Government's disposal.

These proposals and the other Government observations on the Committee's proposals are set forth in the eighth Special Report from the Estimates Committee*. Responsibility for forestry has been transferred to the Minister for Land and Natural Resources and the Secretary of State for Wales, who will seek advice from their senior officers, as well as from the Forestry Commission on the broader aspects of forestry. The Forestry Ministers have discussed with representatives of the private woodland owners, and of the timber trade, arrangements to make themselves accessible to a direct formal approach. It is confirmed that the Commissions should continue to be responsible for promoting the interests of private as well as of State forestry, and the production and supply of timber. However, it is suggested that development of the position of the Home Grown Timber Advisory Committee would ease the dilemma of the private woodland owners and the timber trade. They accept that the administrative staff in the Commission's headquarters, and particularly the Commissioner in charge of administration and finance, should play a full part in determining

* Eighth Special Report from the Estimates Committee, Session 1964-65. *The Forestry Commission—(Departmental Observations on the Seventh Report from the Estimates Committee in Session 1963-64)*. Pp. 8. (London: H.M.S.O., 1965.) 9d. net.

policy, and it is recognized that the higher posts should not be limited to any one class or profession. It is believed that the new functional organization will provide improved prospects of promotion for the executive class. A system of valuation for the Commission's forests, which is under discussion with the Treasury and the Comptroller and Auditor-General, will be introduced experimentally for the next two or three years. The recommendations that a brief explanation of the most significant items of income and expenditure should accompany the summary of the financial results in future annual reports, and that the Commission should establish a new Costings Branch, are also accepted.

On the recommended study of the present procedures for acquiring land for forestry purposes, the Ministers express the opinion that close consultation with the agricultural departments is essential concerning the change of use from farming to forestry, which is inherent in the forestry programme. They are satisfied that adequate machinery exists for resolving speedily, if necessary at Ministerial level, any conflict that may arise. In England the Forestry Commission is already undertaking a pilot survey of agricultural and forestry land use with the Ministry of Agriculture, Fisheries and Food in Northumberland and Cumberland, and possibilities of similar surveys in Wales are being explored. The Ministers also agree that Parliament and the public should be informed both of the planting programme to which the Government is working and of the considerations on which it has been formulated. However, they decline to commit themselves as to the frequency with which it would be appropriate to review the programme, or the means to be used to furnish information to Parliament. The position of marketing within the Commission will be strengthened by the appointment of a Commissioner as full-time head of harvesting and marketing, and a new branch has already been added to the Marketing Section. The Commission is also discussing with the Civil Service Union a revised grading structure and scales of pay for the forester class which, it is hoped, will significantly reduce the wastage of trained foresters. In the reorganized Commission it is proposed to amalgamate the Education and Training Branches, vesting responsibility for them in the Commissioner for Administration and Finance. In consultation with other Departments, the Forestry Commission is reviewing the procedure for making Tree Preservation Orders, and the Forestry Committee of Great Britain and other interests concerned will be consulted at the appropriate time.

THE AUSTRALIAN DEFENCE STANDARDS LABORATORIES

THE Australian Defence Standards Laboratories with their establishments at Maribyrnong (Victoria), Alexandria (New South Wales) and Finsbury (South Australia) provide a scientific service for all branches of the Defence Service, Civil Defence and the Department of Supply. The Laboratories deal with problems which arise in the provision and use of defence material, within the fields of chemistry, physics, metallurgy and engineering.

On July 18, 1963, 'Operation Blowdown' was successfully carried out at Iron Range in North Queensland, and a reproduction in colour of the fireball produced by the trinitrotoluene explosion forms the striking cover illustration of the annual report of the Laboratories for the year ended June 30, 1964*. As predicted, the blast of the

explosion produced extensive damage to the forest. Trees were uprooted and broken and there was a substantial pile-up of debris far from the seat of the explosion. A high order of spherical detonation was achieved, but the Mach stem of the explosion was severely distorted by the forest, an effect previously unknown. Army personnel stationed within the area of the operation assessed the tactical implications of the debris and the displacement hazards to troops were determined by articulated dummies placed at appropriate positions. Other scientific data of value were collected by instruments, some of novel design, placed on trees within the forest. The combined results provide a sound basis for the assessment of nuclear weapons effects in a tropical forest area.

In the Chemistry Division work has continued on the application of mass spectrometry in the structural analysis of organic compounds and a grating infra-red spectrophotometer has been used to obtain high-resolution

* Commonwealth of Australia: Department of Supply. *Annual Report of the Defence Standards Laboratories, 1963-64*. Pp. 50. (Ascot Vale, Victoria: Defence Standards Laboratories, 1964.)

vibration-rotation spectra of small molecules containing phosphorus. A rapid and accurate photometric method, based on the reduction of dichromate, was developed for the determination of the excess of zinc in zinc oxide. Zinc oxide is of interest as a photoconductor in electro-photographic processes. Measurements were made with a low-frequency torsion pendulum of the dynamic modulus and internal friction of irradiated samples of polytetrafluoroethylene at temperatures between -180°C and 150°C in order to obtain new information about the effects of γ -radiation. The results indicate that irradiation under high-vacuum conditions produces some random chain scission, but cross-linking also occurs and together with an unusual increase in crystallinity the polymer becomes more rigid and brittle.

The Metallurgy Division was mainly concerned with the investigation of chromium alloys with the object of developing strong high-temperature alloys. Metallographic investigations of the surface-damaged layer on abraded surfaces of germanium previously reported on have been extended to other semiconductors, in particular silicon and indium antimonide. It has been established that an extensive arrangement of cleavage cracks, each associated with an array of dislocations, is a common feature. In indium antimonide, the damaged layer also contained glide dislocations and twins. The general mechanism for abrasion seems to be that a system of cracks develops about the indentation made by the contacting abrasive particles, a fragment of the surface being removed whenever a number of the cracks intersect appropriately. Tests made on single crystals of germanium, polished and then etched with CP-4, showed that Griffith cracks did not appear until after the test pieces were stressed. Once the cracks formed they become preferred sites for the nucleation of dislocations and when

the cracks reached the critical Griffith size brittle fracture of the material occurred.

A new group was set up in the Physics Division to carry out research, under the supervision of Dr. P. W. A. Bowe, on the physics of lasers. The spatial and spectral coherence of a small ruby laser is being investigated. Pumping efficiency using a high-power Q -switch device is also being investigated and a Pockel-cell light switch with a rise time of less than 10 ns has been developed. A long-term programme of research on laser materials with initial emphasis on organic complexes has been initiated. In metrology, a screw-pitch measuring interferometer has been used to measure pitch over a 2-in. length to an accuracy of $\pm 6 \times 10^{-6}$ in.; new techniques for flatness measurement and for the measurement of large jigs and components have been developed; and the accuracy of the frequency standard has been improved by the installation of a quartz crystal oscillator of the Warner type and a phase tracking receiver, for comparison with standard very low frequency transmissions.

Various other investigations and devices described in the annual report include a probe to detect the passage of a pressure front; photoelectric fuse-timing equipment; a rapid action dilatometer, based on the type used at the British Welding Research Association, to obtain continuous cooling transformation diagrams of low-alloy steels using heating and cooling rates appropriate to welded joints; the welding of thin-wall titanium tube; the tearing of textiles; the varnish-holding properties of timbers; and the detection and determination of toxic gases. The report concludes with a list of the various personnel and their status, the publications of, and lectures given by, members of the staff of the Laboratories and the names of the Governmental and other committees on which the establishment is represented. S. WEINTROUB

TEXAS INSTRUMENTS, INC.

AT the annual meeting of Texas Instruments, Inc., on April 22, in Dallas, the president, Mr. P. E. Haggerty, reported on the activities of the company during 1964 and explained the principles and system of management. He mentioned that key personnel were deliberately and consistently moved from one job category to another and upward from one level of management to the next. During the nineteen years since the Second World War the company had grown to more than 150 times its original size, but it had not been necessary to go outside the company in order to fill any principal managerial position. The demand for highly trained personnel with advanced degrees continues, and if the growth rate of degree personnel—both first degree and higher degree—of 1960–64 is maintained, Texas Instruments will require some 12,000 college-trained personnel by 1974, including about 750 of Ph.D. status.

New record levels in both sales and products were achieved during 1964. Net sales, which totalled some 327.5 million dollars, were up by 18 per cent, and approximately one-fifth of the sales were from operations conducted outside the United States. The organization for the distribution of industrial supplies expanded its activities into international markets by the establishment of branches in Stuttgart, Germany, and in London. Branches in the United States are in Dallas, Houston, Kansas City, Tulsa and Boston.

Most of the company's products stem from investigations of materials at the fundamental structure-of-matter level, and a great variety of metals and non-metallic elements, including semiconductor materials, are refined and processed before fabrication into electrical or electronic components, or assembly into electronic systems. Zinc-clad aluminium for rotary-press printing plates, and copper-clad materials with performance characteristics

equal to or superior to those of solid copper, were two new developments during 1964. Semiconductor-grade silicon, and silicon-carbide clad parts, were in increased demand, and the company continued to be the main supplier to the U.S. Navy of fabricated nuclear fuel.

More than 200 new semiconductor and electronic component products were introduced during the year. Transistors for television receivers, and plastic-packaged silicon transistors for low-cost applications, were in growing demand for the industrial and domestic market. New components for the space and defence industries included an advanced series of silicon planar-epitaxial power transistors, a unique glass silicon rectifier with very high-voltage capability, and super-sensitive silicon-controlled rectifiers of reduced size and weight.

The semiconductor integrated circuit was first introduced in the Texas Instruments Laboratories during 1958, and now 86 standard circuit types are manufactured. A recent order for integrated circuits by North American Aviations Autonetics Division amounts to 11 million dollars. The circuits are to be used for the guidance and control system of the U.S. Air Force *Minuteman II* intercontinental ballistic missile. Texas Instruments semiconductor plant at Bedford, England, began the production of monolithic circuits during 1964 and the integrated circuits have been designed for the European six-nation space exploration effort called ELDO-ESRO*, for a new hearing aid, and for several industrial programmes.

During 1962, Texas Instruments introduced, on a limited scale, a completely new approach to seismic exploration. It consists of the application of statistical communications theory to seismic data processing, and

* European Launcher Development Organization—European Space Research Organization.