

that the matter should be investigated and the results submitted to a scientific journal. It has taken more than half a century to convince the authorities that game destruction is a totally deplorable method of controlling the fly.

Throughout the years the Society increased in stature. It investigated the ivory trade; it sought for a codification of all game laws; in 1914 it strove to prohibit the use of silent, automatic weapons in hunting; it pointed out that rhinoceros horn had no aphrodisiacal qualities; it campaigned for more and more national parks; it suggested how reserves could be fenced off; it encouraged biological surveys, helped the surveyors and published their reports, ensuring that they were brought to the attention of the authorities concerned. Many famous naturalists and travellers were in constant touch with the Society. Some of their reports might have been written yesterday.

There are regrets about increases in cases of poaching, over-grazing, the destruction of forests and the reckless 'development' of land. As Mr. Buxton said more than half a century ago in one of his visits to the Colonial Secretary: "We are here in the interests of the preservation of species at large. The experience of the past shows that unless strong measures are taken in time, that happens which those who come after us can never restore . . .".

In more recent years, under the guidance of its present president, Lord Willington, the Society has striven for

the protection of innumerable animals. They include the giant panda, European bison, African and Asiatic species of rhinoceros, sea otters, seals in the Kerguelan Islands, gorilla in Congo and Uganda, the relic fauna of Madagascar, marsupials in Australia, threatened species everywhere. It has sent deputations to East Africa, where Prof. W. H. Pearsall investigated conditions in the Serengeti National Park of Tanganyika, a case which is regarded as the 'Crichel Down' of conservation.

The Fauna Preservation Society maintains a library of films which are lent to allied societies and to schools and institutions. It holds regular meetings, publishes the journal *Oryx* and acts as a clearing house for information from many parts of the world. This information includes threats to British species such as the red deer, the grey seal and the badger. Until recently, the Society's secretary, Lieut.-Colonel C. L. Boyle, supervised the lists of endangered species of animals for the Survival Service Commission of the International Union for the Conservation of Nature, an organization with headquarters in Switzerland. The Society also works in conjunction with the World Wildlife Fund. Present-day projects include help for the orang-utan in Sumatra and North Borneo and the leopard which is threatened with extinction by fur traders.

The address of the Society is: c/o The Zoological Society of London, Regent's Park, London. N.W.1.

## THE INSTITUTE OF PHYSICS AND THE PHYSICAL SOCIETY

THE business of the third annual general meeting of the Institute of Physics and the Physical Society, which was held on July 9, 1963, at the organization's headquarters, 47 Belgrave Square, London, consisted of the consideration and adoption of the report of the Council and the accounts and balance sheet for 1962; the declaration of the election of the honorary officers and other members of the Council; the election of auditors; and proposals for amendments to the Bye-Laws to increase membership fees and the retail prices and members' special rates of subscription to the Institute and Society's publications.

The annual report\*, which covers the period ending December 31, 1962, refers to the convention of the Institute and Society held at Harrogate during May 23-26, at which some 400 members and guests were present, and during which meetings and functions to mark the second anniversary of the amalgamation of the two bodies in May 1960 were held. In addition to the second annual dinner and soirée at the Majestic Hotel on May 24 and the second annual representative meeting on May 23, the 1962 Guthrie Lecture entitled "Physics in the Research Programmes at Jodrell Bank" (*Proc. Phys. Soc.*, 81, 385; March 1963) was delivered by Sir Bernard Lovell, and lectures on Fermi surfaces, the physics of space research and the retrieval of information were given by Prof. A. B. Pippard, Sir Harrie Massey and C. W. Hanson respectively. A special lecture for local sixth-form pupils entitled "Seeing the Very Small" was given by Dr. V. E. Cosslett before an enthusiastic and appreciative audience of 850 boys and girls. Symposia on X-ray microanalysis and on devices based on superconductors and an exhibition of material to illustrate the lectures and symposia, together with a number of social functions and visits to local laboratories and beauty spots, also formed part of the convention.

The Rutherford Memorial Lecture on March 26, 1962, was delivered by Prof. D. H. Wilkinson in London. He

took as his subject, "High Energy Nuclear Physics", and the text of an extended version of his address entitled, "Some Interrelations of Nuclear Structure with Elementary Particle Physics", has since been published (*Proc. Phys. Soc.*, 80, 997; November 1962). Dr. P. B. Hirsch was the recipient of the Charles Vernon Boys Prize for his work on X-ray spectroscopy and electron microscopy, and the first Maxwell Medal and Prize was awarded to Prof. A. Salam for his contributions to the theory of elementary particles. The Holweck Medal and Prize was presented during the Harrogate convention to M. Jean-François Denisse for his outstanding contributions to radio astronomy, and the Simon Memorial Prize of the Low Temperature Group, which was awarded to Dr. I. M. Lifschitz in 1961, was presented to him at the British Embassy in Moscow by the British Ambassador, Sir Frank Roberts, on June 14, 1962.

During the year under review, 1,101 applications for election or transfer to the various grades of membership were considered by the Membership and Education Committee. The total membership rose by 472 to 9,591, and in addition 358 persons were registered as Group Subscribers by the various specialist groups of the Institute and Society. Sixty-two technical colleges presented 1,038 candidates for the Ordinary National and thirty-five colleges 473 candidates for the Higher National Certificate in applied physics. Of the fifty-five candidates who entered for Part 2 of the graduateship examination, fifteen were successful, one with honours, and of the eighty-two candidates for Part 1 only eight were successful. Seven technical colleges applied for recognition or continuation of recognition as institutions having courses of study approved for the purpose of the membership regulations, and five were accepted. The two recognized for the first time were Rutherford College of Technology, Newcastle upon Tyne, and Watford College of Technology. The award of Bradford Institute of Technology was accepted as qualifying for exemption from the whole or part of the graduateship examination.

A new booklet containing selected question papers set in recent examinations for the Ordinary and Higher

\* Report of the Council of the Institute of Physics and the Physical Society for the year 1962. Pp. 24. (London: The Institute of Physics and the Physical Society, 1963.)



National Certificates in Applied Physics was published during the year. The *Monographs for Students* series, which was originally associated with the Higher National Certificate courses, has been broadened to extend to undergraduate and postgraduate students, and two volumes, *Automatic Control*, by A. E. DeBarr, and *Viscosity and its Measurement*, by A. Dinsdale and F. Moore, together with a third edition of *Errors of Observation and Their Treatment*, by J. Topping, were published. In October, Edward Arnold (Publishers), Ltd., issued for the Institute and Society the sixth compilation from the *Journal of Scientific Instruments* by Dr. Ruth Lang of *Laboratory and Workshop Notes 1959-61*. As formerly, the royalties from this volume are donated to the Institute and Society's Benevolent Fund.

A large portion of the annual report is devoted to the discussions and recommendations of the Publications and Finance Committees in relation to the three monthly periodicals, *Proceedings of the Physical Society*, *British Journal of Applied Physics* and *Journal of Scientific Instruments*, published by the Institute and Society. Certain changes were recommended, details of which have been noted (*Nature*, 200, 523; 1963). The annual volume of *Reports on Physics* for 1962 was not published until July, mainly because the articles received were somewhat longer than had been requested. The *Bulletin* contained 33 main articles and 143 book reviews. At the invitation of the Royal Society's British National Committee for Physics, the Institute and Society organized an international conference on "The Physics of Semiconductors". This was held at the University of Exeter during July 16-20, and the international conference on "The Ionosphere" to which the Physical Society had agreed before amalgamation was held at the Imperial College of Science and Technology, London, during July 2-6. The *Proceedings* of both these conferences have now been published and were ready for distribution by Chapman and Hall, Ltd., early in 1963.

The activities of the Australian, New Zealand, Malayan and nine Great Britain branches, together with those of the ten specialist groups of the Institute and Society, are summarized in the report. With the support and encouragement of the Council, the Australian branch became the independent Australian Institute of Physics

during the year. The inaugural meeting was held on August 21, 1962, and the Institute was duly incorporated on February 21, 1963. The Australian branch was dissolved on February 28, 1963, and its assets were handed over to the Australian Institute. Following a request by members of the Institute and Society resident in New Zealand, the Council approved the formation of a New Zealand branch. The Liverpool and North Wales Branch joined with the Education Group in arranging a two-day conference on "The Teaching of Solid-state Physics" during Easter at the University of North Wales, Bangor. The Group also held a one-day symposium on "The Teaching of Medical Physics". The Electronics and Optical Groups collaborated in a joint two-day conference on "Optical Masers" at University College, London, and in November the Electronics and Low Temperature Groups held a half-day meeting devoted to solid-state masers. The Electron Microscopy Group changed its name to that of Electron Microscopy and Analysis Group to take into account increased interest in electron probe microanalysis. Consideration was given to the training of electron microscopists and in consequence two summer schools on electron microscopy have been planned. The Materials and Testing Group included in its programme four one-day symposia and the Spectroscopy Group held a two-day conference in July at Buxton on "Spectroscopy in the Metallurgical Industry" with eight invited speakers. This was followed by an October meeting on "Space Spectroscopy" with two of the invited speakers coming from the United States.

The forty-sixth annual exhibition of scientific instruments and apparatus was held in the Royal Horticultural Society's Halls, London, during January 15-19, 1962. It is hoped, by refereeing exhibits submitted for future exhibitions, to ensure that the exhibition is an important scientific occasion rather than a commercial display. It has been arranged to hold the exhibitions from time to time outside London, and the first of these will be in 1965 when the exhibition will be in Manchester. During the year under review the Council decided to dispose of its collection of scientific periodicals, and the offer made by the University of Leicester for the whole collection was accepted.

S. WEINTROUB

## RESEARCH AND DEVELOPMENT IN AMERICAN INDUSTRY

THE U.S. National Science Foundation has evolved a programme to obtain annual data on the volume of research and development as measured in terms of funds and manpower. These surveys cover all major sectors of the economy—industry, Government, universities and other non-profit-making institutions. A bulletin reports the findings of the latest survey of industrial firms (*Reviews of Data on Research and Development*, 40; September 1963).

The employment of research and development scientists and engineers in industrial firms, on a full-time-equivalent basis, totalled 339,400 in January 1963. This represented a 6 per cent increase over the comparable total of 319,800 in January 1962. Nearly all the individually reported industries showed increases in the employment of research and development scientists and engineers from January 1962 to January 1963.

In 1962, funds for industrial research and development amounted to 11.6 billion dollars, which also represented a 6 per cent increase over the 10.9 billion dollars reported for 1961. The 1962 total was more than three times as great as the 3.6 billion dollars total for 1953. Industrial firms accounted for nearly three-quarters of the nation's total research and development performance of about 16 billion dollars in 1962.

Federally financed research and development performed by industrial firms amounted to 6.7 billion dollars in 1962, almost five times the 1.4 billion dollars for 1953. These funds were 58 per cent of the total funds for industrial research and development performance in 1962. Federal funds for industrial research and development performance in 1962 were 7 per cent higher than the 6.3 billion dollars reported for 1961. The Federal Government, however, was expecting to increase its funds for research and development work performed by industrial firms at a faster rate during 1963. A substantial increase in Federal obligations for research and development to industry in the fiscal year 1963 over the fiscal year 1962 was envisaged. The Federal Government was also expecting to continue its heavy expenditures on research and development projects related to space exploration and defence throughout the remainder of the decade. A main portion of this Federal research and development would be conducted by industrial firms.

Of the separately reported industries, the aircraft and missiles industry and the electrical equipment and communication industry continued to play the predominant part in federally financed industrial research and development performance, although the professional and scientific