

ture gradients near soil surfaces, remained wet for nearly the same time as standard climatological measurements indicated that relative humidity was at least 90 per cent. Among annual crops with dense foliage extending down to the soil, large differences occur in the persistence of water films at different heights and depend partly on whether the deposits result from rain or dew. A third source of water deposits is 'guttation'; its possible importance was much discussed following a suggestion that water exuded at stomata was often the site of spore germination. Although this remains to be fully established, there was general agreement that guttation is too seldom measured and, on plants, is difficult to separate quantitatively from dew.

The biological foundations having been laid, the meteorologists played an increasing part in the discussions. Usually their approach had to be scaled-down to meet the biologists, who often started from the microscopic size of the pathogens, an exercise probably good for both groups. The biologists were guided through the intricacies of instrumentation, with many warnings of common inaccuracies; reminded of the wealth of past weather records and the information waiting in this treasure chest for anyone who can pose the right questions. The discussions ranged from the microscopic scale of radiation effects at all stages of the dispersal and infection processes, through microclimatology and the effect of local topography on air movement in calm conditions, to the characteristics and importance of various synoptic weather situations in favouring disease development.

Meteorologists, like biologists, are exponents of a still inexact science in which experience is important, but at this meeting their training helped them to guide biologists towards an understanding of the mathematical approach to the theory of epidemics. Despite their efforts, a gap still remained between mathematicians bent on wholesale integration and biologists still in the phase of patient analysis. In *Nature*, success is so often exceptional that many think attempts to define the average behaviour of a hypothetical pathogen are of limited usefulness while they still depend on so many reckless assumptions. How-

ever, none seemed to doubt that the two schools must eventually be united and that such meetings are the best means of doing so.

The section concerned with the technicalities and practice of plant-disease forecasting provided a natural opportunity to synthesize most of the previous discussions. Contrasting the criteria used in various countries for a single disease stressed how different was the weather limiting fungal development in hot, cold, damp or arid climates and explained why meteorological forecast criteria are seldom applicable in all countries. Usually the development of diseases is predicted from recent weather. The feasibility of giving earlier or more precise spray warnings by using weather forecasts was considered but seemed limited, both by their inaccuracy and the time required to take action, to sounding an 'alert' when particularly careful spray timing is required.

There can be few examples where the 'end justifies the means' so often as when forecasts of plant diseases are accurate. Usually the forecasts are partly subjective, sometimes purely empirical or depending on associated but otherwise quite unrelated phenological happenings. Damage can be avoided by forecasting seed infection and then selecting stocks from healthy areas, or even by accelerating the development of symptoms on many harvested samples so that the least affected can be selected for longest storage. Most forecasters experienced difficulty in communicating with the public and in assessing the acceptance or the value of their predictions. There was therefore much admiration for the success attributed to warnings of vine mildew in North Italy, where the alarm given by ringing church bells had caused the wholesale abandonment of political meetings in favour of spraying machines.

It would be improper for me as one of the organizers to comment on the success of the meeting. Nevertheless, it was encouraging that a lively interest persisted to the end of the long programme and that participants left hoping that progress within the next five years would justify holding another meeting, probably in the Netherlands.

J. M. HIRST

THE FAUNA PRESERVATION SOCIETY

ON December 16, the Fauna Preservation Society celebrated its diamond jubilee with a dinner in the rooms of the Zoological Society of London. During the sixty years of its existence the Society has been closely identified with most of the efforts which have been made to preserve and conserve the diminishing fauna of the world. In recent years the Society sponsored the survey of the Serengeti National Park in Tanganyika; it largely financed "Operation Noah", the animal rescue project at Kariba on the Zambesi and it sent an expedition to southern Arabia in what promises to be a successful effort to save the Arabian oryx from extinction.

Under a slightly different name, the Fauna Preservation Society was founded in 1903. In that year a number of people heard that the authorities in the Sudan were proposing to convert an important game reserve north of the Sobat on the Upper Nile into a hunting ground for serving officers. Protests were lodged. Thanks largely to the exertions of Mr. Edward Buxton, a deputation of distinguished men went to see the Colonial Secretary. They included the Duke of Bedford, Lord Avebury, Sir Edward Grey, Prof. Ray Lankester, Mr. P. L. Selater and Mr. F. C. Selous. The reserve was saved. In a circular issued shortly afterwards, the members of the deputation said that their intervention seemed to be "a good example of bringing the public opinion of persons at home who are interested in the preservation of the fauna of Africa to the

notice of officials on the spot. It seems desirable", they said, "that those who have taken an interest in the matter should continue to act together". They thought that "a small association should be formed for the purpose of disseminating among its members information which is to be found scattered in a great number of official reports and in other sources, dealing with game reserves, game laws, the amount of game killed, the gradual disappearance of species, etc."

The association became the Society for the Preservation of the Wild Fauna of the Empire, and eventually, the Fauna Preservation Society. In many ways the Society's records reflect the changing history of man's attitude towards the rest of Nature. In 1906 Lord Cranworth reported that the Boers were slaughtering game on a prodigious scale, exporting the sun-dried flesh (biltong) and selling the hides and horns. Efforts were made to stop the killing. The Society was equally concerned about the threat to shoot wild animals to feed workmen engaged on the construction of the new railway to the Victoria Falls. Men of the calibre of Sir Harry Johnston and Major Stevenson-Hamilton, founder and later warden of the Kruger National Park, were quick to note danger to wild life, and the Society acted on their reports. Early in its existence (in 1906) the Society became deeply conscious of the significance of trypanosomiasis, the diseases of men and animals transmitted by tsetse flies, and urged

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.)