

Development of the Compound-nucleus Model". The after-dinner speakers at the joint banquet which followed, held in the ballroom of the Hotel New Yorker, were Prof. H. D. Smyth, and Mr. G. Bell, who gave an interesting description, illustrated by a film, of the 1954 expedition up the Himalayan peak, K-2. The banquet was also the occasion of the presentation of the third O. E. Buckley Solid-State Physics Prize to Dr. LeRoy Apker.

Twenty-four invited papers, in addition to the three hundred and thirty ten-minute papers, were contributed to the scientific sessions of the Physical Society. There were also two symposia: one of the Division of Fluid Dynamics, on fluid-dynamics problems in astrophysics; and the other of the Division of Electron Physics, in which three papers were read by R. E. Fox, M. G. Inghram and J. Kaplan, respectively, on measurements of ionization probabilities of mono-energetic electrons, mass-spectrometric analysis of ions produced in the field ion microscope, and upper-atmospheric studies during the International Geophysical Year. A group of four invited papers was devoted to hyperons and heavy mesons, in which investigations of the Bristol (England), Indian and Italian schools were described by M. G. K. Menon (University of Bristol), Y. Pal (Tata Research Institute, Bombay) and N. Dallaporta (University of Padua), respectively; and E. O. Salant (Brookhaven National Laboratory) discussed heavy mesons produced in the interactions of 2-3 BeV. particles. There were two papers on nuclear polarization, given by E. Segrè (University of California) and B. Rose (Atomic Energy Research Establishment, Harwell), and three papers on nuclear instrumentation, including one by D. A. Glaser (University of Michigan) on bubble chambers for use in experiments in high-energy nuclear physics. Papers on nuclear physics predominated, but there were sessions devoted also to discharges and ions in gases, metals, the liquid state and cryogenics. The complete list of papers, together with abstracts and minutes of the Physical Society meeting, are given in the May 15 issue of the *Physical Review* (98, 1144; 1955), where it is also reported that at the business meeting of the Society, the following were elected to hold office for 1955: *President*, R. T. Birge; *Vice-President*, E. P. Wigner; *Secretary*, K. K. Darrow; and *Treasurer*, G. B. Pegram.

The programme of the meeting of the American Association of Physics Teachers (*Amer. J. Phys.*, 23, 306; 1955) consisted of a conference on the role of physics in engineering education; a symposium on visual aids, including an address by Lynn Poole (Johns Hopkins University) on science demonstrations on television; a film session in which two films, one on the properties of liquid helium near the transition point and the other on superconductivity, produced by the United States Bureau of Standards, were shown; a session, consisting of five speakers, devoted to the problem of physics in the secondary school curriculum; a business meeting; and the joint sessions, already mentioned, with the Physical Society. There were nineteen contributed papers. At the business meeting, citations for meritorious service to the Association were voted to W. S. Webb and M. W. Zemansky, and it was reported that a new directory of the Association is to be compiled and distributed this year. The following were elected to hold office for 1955: *President*, R. R. Palmer; *President-elect*, W. C. Michaels; *Treasurer*, F. W. Sears; and *Secretary*, F. Verbrugge.

## COLONIAL TERRITORIES OF THE BRITISH COMMONWEALTH

REPORT FOR 1954-55

A RECENT Colonial Office report, "The Colonial Territories 1954-55"\*, retains its general title of previous years, although, as from October 1, 1954, effect was given to the proposals of the White Paper, "Reorganization of the Colonial Service", and existing unified branches of the Colonial Service became merged in H.M. Oversea Civil Service. During the year, thirty new appointments were made to the Research Branch of the Oversea Civil Service, and thirteen research studentships were awarded to train candidates for research appointments, while two research Fellows are making investigations on behalf of the Colonial territories. The total number of appointments to Colonial territories made through the Colonial Office again decreased, from 1,227 in 1953 to 1,135 in 1954, due to a reduced demand for recruits for some of the smaller branches and special types of appointment. The demand for recruits for administrative appointments was considerably higher. During the year 2,081 men and women employed by Colonial Governments went to the United Kingdom, as against 2,090 in 1953 and 2,013 in 1952, and 673 of them were of Colonial domicile.

The report follows the pattern of previous surveys; it provides an admirable conspectus of political, economic, financial and social developments in the Colonial territories and, apart altogether from the chapter on research and surveys, gives the man of science the essential background against which the achievements recorded in greater detail in another report, "Colonial Research 1954-55", are to be considered. In like manner it provides the essential background for discussion of other particular topics such as the provision of technical assistance to these under-developed areas, the development of higher education, and the recommendations of the East Africa Commission; while its clear presentation, the diary of outstanding events and summary of events and developments in individual territories, with the list of Parliamentary and non-Parliamentary papers of Colonial interest published in 1954-55, go far to make it an indispensable reference work for all interested in Colonial affairs. Indeed, all the essential information seems to be collected here for that popular exposition required to remove the alarming indifference and ignorance among the British people of their Colonial territories upon which Political and Economic Planning commented so strongly in its recent inquiry into Colonial students in Britain.

Nor is matter of scientific interest confined to the chapter on research and surveys. That headed "Constitutional and Administrative" refers to the expansion of the activities of the Falkland Islands Dependencies Survey at bases in the Dependencies in the Antarctic to include *inter alia* geophysical observations at the most southerly base, and for the year 1954-55 a grant of £85,650 was made from United Kingdom funds. The account of economic and financial developments, which reports a more favourable financial year than was expected, as the forecast drop in revenue did not occur, records a rise in expenditure of Colonial Development and Welfare Funds from £14 million in 1953-54 to £15.6

\* Colonial Office. The Colonial Territories 1954-55. (Cmd. 9489.) Pp. ix+186. (London: H.M.S.O., 1955.) 6s. net.

million in 1954-55. Colonial Governments have continued efforts to improve agricultural efficiency by surveys, research, development work, and especially by spreading a knowledge of modern techniques among their peasant farmers. The staffs of Departments of Agriculture are being steadily strengthened, and in territories such as Cyprus, Nigeria, Nyasaland and Zanzibar research work has reached the point where definite recommendations for the use of fertilizers by farms can be made and schemes to encourage their use have been initiated. Much, however, remains to be learned about the best use of fertilizers and of trace elements, and research work continues in all territories. Much attention is also being given to the development of water supplies and of irrigation, where possible. Both in the Gold Coast and in Nigeria the campaign against swollen-shoot disease continued. Staff shortages were no longer a limiting factor, and good progress was made with cutting-out and with the periodic re-inspection of the affected areas. In Nigeria the sealing-off policy continued to be only partly successful, with new foci of infections being discovered in the disease-free belt around the area of mass infection. It has been decided to inspect all cocoa farms in Western Nigeria once every six months, and the establishment of field overseers has been increased from 143 to 603. Increasing attention is also being paid to the depredations of the capsid bug and of the fungus disease known as black pod, which between them are estimated to destroy up to 20 per cent of the crop each year. In Nigeria, the control of epizootic diseases, such as rinderpest and pleuro-pneumonia, has been most effective, and more than 4.5 million vaccinations were carried out during the year. In the north some 250,000 cattle were treated for trypanosomiasis. Rinderpest control has been a major duty in East Africa, and production of rinderpest vaccines for the East African territories has been transferred to the East African Veterinary Research Organization Laboratories in Kenya. Effective disease-control measures in Uganda gave the main stock-rearing areas an exceptionally productive year in 1954. Interest in fish farming is growing. The preservation of fish is of prime importance in tropical areas. The usual techniques of smoking, drying and salting are practised, and successful pilot experiments in the production of edible fish-meal have been conducted in the Gold Coast and Uganda. Uganda has also been experimenting with killing of 'weed' trees by spraying with hormone preparations instead of the toxic sodium arsenite.

There was an appreciable increase in the assistance given to Colonial Governments under the Expanded Programme of Technical Assistance: in 1954 the Technical Assistance Board approved projects in fourteen territories providing sixty-four experts and twenty-three fellowships at an estimated cost of 528,000 dollars. Technical assistance from the United States included American specialists giving technical assistance to British Guiana and a programme of grassland and pasture research in West, Central and East Africa. Under the 1953-54 Mutual Security Act, a sterling sum not exceeding the equivalent of five million dollars has been set aside for financing projects for economic development in British territories in Africa. Experts provided by the Food and Agriculture Organization of the United Nations have been working during the year on surveys of the Rufiji Basin in Tanganyika and the Accra Plains in the Gold Coast, while other experts

from the Organization are engaged on livestock research in British Guiana and on irrigation problems in Trinidad and Jamaica. Projects initiated or carried forward during the year in co-operation with the regional offices of the World Health Organization include malaria control in Northern Nigeria, North Borneo, Dominica and East Africa, insect control in St. Vincent, yaws control in Jamaica, Grenada, St. Vincent and Fiji, and tuberculosis control in the Somaliland Protectorate.

In December the International Federation of Workers' Educational Associations, in conjunction with Unesco, held a seminar on "Adult Education in a Changing Africa" at the University College of the Gold Coast, while under the Expanded Programme for Technical Assistance Unesco provided the Government of Trinidad with the services of a principal for the San Fernando Technical Institute and the Government of Sierra Leone with an expert on teacher-training. The Commission for Technical Co-operation in Africa South of the Sahara set up a new Inter-African Committee for Social Sciences and convened during August 1954 the second session of the Inter-African Soils Conference at Leopoldville, Belgian Congo. Under the Colombo Plan, thirty-six experts were provided in 1954 and a hundred and seventy traineeships, while requests for forty-eight more experts and seventy-seven more traineeships were under negotiation. Progress in the international co-ordination of the campaign against the desert locust (*Schistocerca gregaria*) in the Arabian peninsula was much slower than expected, and locust swarms produced in Arabia spread to East Africa and reached Nigeria in the west. By the end of 1954 Kenya and Tanganyika were very heavily invaded, the resources of the Desert Locust Control Organization and of the local administration were strained to the utmost, and the further outlook was very grave. The African migratory locust and the red locust continued to be kept under control in their outbreak areas.

Under social services the report records encouraging academic progress in the four Colonial university colleges, the opening of new library accommodation at the Royal University of Malta and an increase in university students from 3,639 to 4,010. Contracts were signed for the erection of most of the major buildings of the Nigerian College of Arts, Science and Technology at its headquarters at Zaria, while the third branch was being built at Enugu in the Eastern Region. Good progress was also made towards the completion in Nairobi of the new buildings of the Royal Technical College of East Africa. In Malaya a six-year programme of controlled expansion of education is expected to bring expenditure to £16,800,000 by 1960, when there will be more than a million children in all types of school; and a second training college for Malayan teachers in the United Kingdom was being established at Brinsford Lodge in Staffordshire. The most spectacular event of the year in education was the provision of primary education for all who desire it in Western Nigeria, and some four hundred thousand children were registered; a large number of secondary schools was also opened in January. In the Gold Coast the emphasis of expansion is now on secondary rather than on primary education, while large-scale educational development in Uganda included the expansion of technical education as well as of primary and secondary schools. Educational exchanges under the Fulbright Act included two lecturers, six research scholars and one graduate student from the United

States to institutions in Colonial territories, while five awards to teachers from the United States working at schools in the Colonial territories were renewed.

Generally, there is evidence of growing mastery in the Colonies over preventable diseases and of increased public understanding of their causes and the logical basis of measures taken against them; but the freedom from major epidemics was marred by outbreaks of acute anterior poliomyelitis in Jamaica and Trinidad, both of which have also had to combat typhoid in endemic form. Abnormal social conditions caused by overcrowding increased the incidence of communicable disease in Hong Kong, and falling infantile mortality and general death-rate, together with a high birth-rate, make it difficult to provide a medical service in Singapore adequate for the needs of a rapidly increasing population. Famine conditions were again present in the Mayoni, Dodoma and Mwapwa districts of Tanganyika, an invasion of the army worm destroying crops which had survived the drought. A striking feature of the year was the extent to which large-scale operations of the health departments was assisted and promoted by the World Health Organization and the United Nations Children's Fund, the scientific backing, financial support and material aid of which permitted many schemes to be carried out that would have been beyond the unaided resources of the territories. Malaria has ceased to be a public health problem in Cyprus and Mauritius, and for the first time the total number of deaths from malaria in the Federation of Malaya fell below a thousand, attributable to the protection in rural areas alone of more than half a million persons by house spraying. The death-rate from malaria in Trinidad is also steadily falling, but the hyperendemic areas of tropical Africa still constitute a great challenge. Research and experiment have continued extensively, and in western Sokoto in Northern Nigeria control is being attempted in an area of six hundred square miles containing a population of 124,000, with a controlled residual spraying technique which has already been used in eighty thousand huts and houses. Recruitment of nursing sisters from the United Kingdom and Commonwealth countries remained difficult; but many more Colonial student nurses are now in training in hospitals in the United Kingdom, and the training of nurses in the Colonial territories is developing rapidly.

The chapter on research and surveys deals with work and investigations which are covered more fully in "Colonial Research 1954-55", and it is unnecessary here to refer to more than a few outstanding features of the year. It is expected that some £8 million will be available for expenditure on research during the period 1955-60; but there is still a shortage of scientific staff both in the United Kingdom and in the Colonial territories, and a very definite improvement in recruitment will be needed if the new annual ceiling of expenditure is to be approached. During the year fifty-two research schemes, estimated to cost £533,548, were approved, and increased assistance to Colonial research projects was also given by extending the arrangements for visits overseas by specialists from the United Kingdom and by strengthening the pools of entomologists, plant pathologists and soil surveyors whose members are available for short-term assignments. The East African Agriculture and Forestry Organization is well established, and its investigations into maize rust-

resistance promise early control of this disease. The work is closely linked with that of the Maize Rust Research Unit in West Africa. The second of a series of Anglo-French Research Conferences was held at Bambey, Senegal, to discuss work on groundnuts and millets. The research team of the Joint Fisheries Research Organization for Northern Rhodesia and Nyasaland continued the survey of Lake Nyasa from the Nkata Bay base and has revealed remarkable formations on the lake floor. A site in Malacca was selected for the Fish Culture Research and Training Institute, and it is hoped that the building will be complete by the end of 1956. In the Federation of Malaya intensive investigations into filariasis were in progress in the State of Pahang, and heavy doses of dieldrin were effective for six months against the *mansonii* species of mosquitoes, the main vectors in this region. Notable progress was made by the Regional Virus Laboratory, Trinidad, in the study of the viruses of the East Caribbean region. The Central Trypanosomiasis Laboratory at Sukulu, Uganda, was completed and partly occupied, and at Mariakani in Kenya cattle exposed to attack from tsetse but treated with injections of 'Antrycide' pro-salt every two months for more than two years acquired and maintained resistance to strains of *T. congolense*. The review includes some strong criticism of the attempts at the United Nations General Assembly to discredit the work of the Trusteeship Council and castigate the administering authorities, and its clear factual statements amply indicate the unrealistic nature of such attempts.

## ROYAL GREENWICH OBSERVATORY

### ANNUAL REPORT FOR 1954-55

THE annual report of the Astronomer Royal for the period May 1, 1954-March 31, 1955\*, deals with the Royal Greenwich Observatory under the headings of Greenwich, Abinger, Herstmonceux and Hartland.

The main mirror of the Yapp 36-in. reflector was removed during the winter and sent to Messrs. Cox, Hargreaves and Thomson for a test of its figure, but none of the suspected 'patchy errors of figure' or astigmatism was found. If, however, colour-temperature work is resumed, re-figuring would be an advantage.

The instruments and equipment of the Physics and Optics Laboratory at Abinger are in course of transfer to Herstmonceux. The Admiralty Civilian Hospital at Feldemore, Holmbury St. Mary, which provided accommodation during the past nine years for many of the Abinger staff, was closed on February 13. It is intended to use some of the rooms for stores and other official purposes.

At Herstmonceux, repairs to the west tower of the south gateway are nearing completion, and portions of the stonework which had been badly weathered have been rebuilt. The unsafe upper portion of the tower was dismantled and has been rebuilt. In the Meridian Group of buildings, the painting of the Cooke reversible transit circle building is completed and entrance steps have been provided. The small pavilion to house the Bamberg small

\* Report of the Astronomer Royal to the Board of Visitors of the Royal Greenwich Observatory. Pp. 33. (Herstmonceux: Royal Greenwich Observatory, 1955.)