

Observations at the Magnetic Observatory, Abinger, are so disturbed by the local electric railways that the Board of Admiralty has approved, in principle, its removal to a site near Hartland, North Devon. It is highly desirable that observations in the new site should begin not later than the middle of 1957, and an overlap of observations with those at Abinger of at least a year will, it is hoped, include the International Geophysical Year. If it does, the magnetic data for that year would then include results from two observatories in the south of England and from the two northern observatories at Lerwick and Eskdalemuir.

While substantial progress in the removal to Herstmonceux has been made, it is disappointing that delays in the construction of the meridian group of buildings have taken place; the transit circle building is still unusable, and the photographic zenith tube building has only reached the foundation stage. The decision by the Admiralty that no official houses for the observing staff will be provided at Herstmonceux increases the need for close co-ordination between the building programme at the Observatory and the provision of houses for the staff through the local Rural District Council. The delay in the completion of the consulting architect's plans for the buildings to house the Time Department, the Nautical Almanac Office and the workshops will still further postpone the date of the removal.

Mr. J. Evershed has presented the Observatory with the principal parts of his solar spectroscope from his private observatory at Ewhurst; these include a coelostat for a 15-in. mirror, a train of three large liquid prisms and many accessory items. He had previously presented the Observatory with a pair of large solid glass prisms of 45° angle and a 21-ft. collimator lens. The large reflecting prism of 30° angle which the Royal Society had lent him has been transferred to the Observatory.

Cosmic ray recording with the Clintel apparatus has been continued, but some of the data obtained were unreliable: some modification of the apparatus has, in consequence, been done. The investigations of the atmospheric cosmic-ray Čerenkov effect have been discontinued because the slit in the solar dome was found to be too narrow for a satisfactory arrangement. A project of high-energy shower recording has been given some consideration.

The "Nautical Almanac" for 1955, which was published in April, contains a list of observatories, the first it has given since 1941, and, generally speaking, the list is confined to those observatories of which the work demands a knowledge of accurate values of the geographical co-ordinates. To comply with the recommendations of the International Astronomical Union made at the Eighth General Assembly in Rome in 1952, the first part of the "Nautical Almanac" for 1960 has been completely redesigned, and preparations of copy for 1960 will soon be started. Good progress has been made in the calculation of the ephemerides of the sun and planets for the years 1960–80. In the report of the Observatory for 1952–53, reference was made to the preparation of illustrative examples for the use of different methods of calculating perturbations of comets and minor planets for the third volume of "Planetary Co-ordinates", and Encke's method has been completed, while Hansen's method is nearly finished. Some progress has been made with the method of variation of elements and with Herrick's method of variation of parameters. In connexion

with the "Star Almanac", the 1955 edition of which is expected to appear in June, it is interesting to know that it is now an established success and that reprints have been necessary in 1953 and 1954 in spite of printing increased numbers.

The figuring of the 98-in. disk of the Isaac Newton telescope has been suspended pending further tests in August during the works holiday period, when there will be an absence of vibration from heavy machinery. The broad features of the design of the mounting have been decided: it will be an offset fork mounting with polar axis in the form of an inverted and truncated cone.

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

ANNUAL REPORT FOR 1953–54

THE annual general meeting of the Indian Association for the Cultivation of Science was held on July 30 at Jadavpur, Calcutta. Prof. P. Ray, acting director, in presenting the annual report on the Association for 1953–54, said that the six research departments, the library, the workshop and the administrative office continued to function actively for the third year in the new research laboratory building at Jadavpur. The Association has prepared a five-year plan of development, covering the financial years 1954–59, which envisages, for the existing departments, the expansion of facilities with respect to equipment and staff so as to consolidate the present research activities and also improve the level of efficiency, but does not involve establishment of any new department. For the five years 1954–59, the non-recurring requirements of the Association for equipment, standard reference books, etc., have been worked out at Rs. 1,138,200, and the projected development under land and building would involve an expenditure of Rs. 1,771,393. During the same period the normal recurring grant for running the Association will have to be increased from Rs. 465,630 in 1954–55 to Rs. 777,415, thus requiring a total sum of Rs. 3,227,592 for the entire five-year period. It is expected that the Association's non-recurring demand will be met by the Government of India and the Government of West Bengal in the proportion of 2 : 1. The present recurring charges will continue to be borne by the Government of India, and it is expected that the additional requirements will be also borne by the Governments of India and of West Bengal in the proportion already mentioned.

Prof. Ray reported that the Association has under operation four research schemes of the Council of Scientific and Industrial Research of the Government of India, three research schemes under Prof. S. R. Palit and one under Prof. B. N. Srivastava. The Government of India, through the Ministry of Natural Resources and Scientific Research, has established a number of senior and junior scholarships for providing research training to deserving students at the Association under the Scientific Man-Power Committee Scheme.

During the year the Association started a publication section and undertook the publication of a number of books and monographs, including a book on the history of science in Bengali, "Bijnaner

Ithas", by Sri S. N. Sen, which was subsidized by the Government of Bengal, "Nuclear Induction", by Dr. A. K. Saha and Sri T. P. Das, and a monograph, "Non-aqueous Titration", by Dr. S. R. Palit, Dr. M. N. Das and Sri G. R. Somayajulu. Of the lectures given during the year, Prof. G. I. Finch, who was awarded the Association's Jay Kissen Mookerjee Gold Medal for 1950, delivered a course of three lectures on electron optics and study of surfaces, crystal growth in electro-deposition and in surface reactions, and polish, mechanical wear and lubrication; and another course of three lectures was given by Dr. J. N. Ray, as Coochbehar professor for 1949, on carbohydrate metabolism and the role of some plant nucleotides in the phosphorylation of glucose, curariform drugs and their action and anaesthetics. The Ripon professorship lecture for 1950 was delivered by Prof. T. R. Seshadri, who spoke on a line of investigation in the field of plant drugs and insecticides, and Dr. S. K. Banerjee, Dr. M. S. Krishnan and Dr. D. S. Kothari, the Ripon professors of the Association for the years 1948, 1949 and 1950, delivered lectures on, respectively, Himalayan earthquakes; ancient Indian iron ore and its manufacture, the iron ore deposits in India, and the modern iron industry in India and its future prospects; and recent advances in statistical thermodynamics. Dr. Dilip Kumar Banerjee was awarded the Sri John Wood Burn Medal for 1950 and gave a lecture on steroid synthesis. Dr. J. C. Ghosh, the retiring president of the Association, delivered the Memorial Lecture, speaking on the petroleum industry with special reference to India, this being the occasion of the fiftieth anniversary of the death of the late Dr. Mahendra Lal Sircar, the founder of the Association. A symposium on high polymers, including rubber, resins and plastics and fibre, was organized during the year by the Department of Physical Chemistry of the Association, and was followed by a very successful three-day summer course on the subject.

In his report, Prof. Ray gave a brief review of the work carried out in the six research departments of the Association during 1953-54. In the Department of General Physics, X-rays and Magnetism, studies were made on transport properties of matter, thermodynamics of irreversible processes, low-temperature physics, X-ray crystallography, study of low-angle scattering, X-ray study of coal, X-ray study of glass, crystal magnetism, cryogenics, and semiconductors. Investigations carried out in the Department of Optics have related to ultra-violet absorption spectra of organic substances in the solid state at low temperatures, Raman spectra of some organic compounds in the solid state at low temperatures, Raman spectra of organic compounds in the vapour state, Raman spectra of liquids and solutions, relaxation time of polar molecules in the liquid state, absorption of ultra-high-frequency radio waves by organic liquids, absorption of microwaves by organic liquids, and cosmic rays. In the Department of Theoretical Physics, investigations were carried out in meson field theories and nuclear scattering, Born approximation and its connexion with covariant perturbation theory, capture of electrons by ions passing through gases, cosmology, and nuclear shell structure model. The Physical Chemistry Department has conducted its research activities under two broad headings: high-polymer chemistry, and general physical chemistry. Under high-polymer chemistry some of the problems investigated relate

to chain transfer in vinyl polymerization, copolymerization, kinetics and chain transfer studies in polymerization initiated by hydrogen peroxide, vinyl polymerization with metallic soaps, kinetics and chain transfer studies with substituted peroxide and azonitriles, synthesis of hydro peroxides and their use in polymerization, polymerization in the aqueous phase, physico-chemical studies on cellulose compounds, polyelectrolytes, studies on reaction kinetics, fractionation and distribution of polymers. Kinetics of the decomposition of peroxides, studies in cosolvency, non-aqueous titration, alkalimetric determination of mercury, and measurements of dipole moment constituted some of the problems of study under general physical chemistry during the year. In the Department of Organic Chemistry, work was carried out in diterpenoids, dicyclic terpenes, steroids, polynuclear aromatic hydrocarbons and related subjects. The chemistry of co-ordination complexes and analytical chemistry were the two broad subjects for investigation by the research workers of the Department of Inorganic Chemistry.

The complete Council of the Association is as follows: *President*, Hon. Sri C. C. Biswas; *Vice-Presidents*, Prof. S. K. Mitra and Dr. K. S. Krishnan; *Director*, Prof. M. N. Saha; *Members*, Prof. N. R. Sen, Dr. Atmaram, Dr. B. C. Guha, Dr. Triguna Sen, Prof. P. C. Mahanti, Sri Ramani Mohan Roy, Dr. J. C. Ghosh, Dr. Hiralal Roy, Dr. B. B. Dey, Dr. S. R. Bose, Sri J. M. Sen and Dr. D. N. Wadia; *Trustee Member*, Hon. Mr. Justice R. P. Mookerjee; *Nominees of the National Institute of Sciences of India*, Dr. K. N. Bagchi and Prof. D. S. Kothari; *Nominees of the Government of India*, the Secretary of the Ministry of Natural Resources and Scientific Research (or his nominee), the Educational Adviser to the Government of India (or his nominee), Sri C. S. Menon, and the Joint Secretary to the Ministry of Finance, Government of India; *Nominee of the Government of West Bengal*, Dr. D. M. Sen; and *Professor Member*, Prof. B. N. Srivastava.

MELLON INSTITUTE, PITTSBURGH ANNUAL REPORT FOR 1953-54

THE annual report of the president of the Mellon Institute, Dr. E. R. Weidlein, to the Board of Trustees for the year ended February 28, 1954*, refers to growth in the size of fellowships in operation and an increase in comprehensive fundamental projects. Almost a quarter of the Institute's expenditure of 4,375,712 dollars was spent on investigations in pure science in the Institute's six research departments and on eleven fellowships, 131 members of the Institute being engaged in pure science research projects. 383 members were engaged in the sixty-five fellowships in applied science, and, of forty-nine multiple fellowships and twenty-seven individual fellowships listed as in operation during the year, two had been proceeding for forty years, five for thirty-five, one for thirty, ten for twenty years and twenty-five others for more than ten years.

In the Department of Chemical Physics the Raman spectrum of dicyanoacetylene has been redetermined on a larger sample, using a new grating in the Raman

* Scientific Research of Mellon Institute, 1953-1954. (Annual Report Series, No. 41.) Pp. iv + 56. (Pittsburgh: Mellon Institute of Industrial Research, 1954.)