

carriers of the spores instead of the lower layer? Lower layers should not be neglected in such problems.

Dr. Nehru suggested that the electric cultures might be useful in checking the disease. A baby cine on a flying machine may be useful in collecting data of the spore distribution in the upper layer of the air.

Dr. Bagchi said that there should be more intensive research in differentiating physiological forms. At present very small difference was deemed sufficient for forming a new strain. This practice should be discontinued and only after detailed study and recurring major differences should the division into physiological strains be made.

Dr. Mehta replied to the various points raised in the debate and said that he was not prepared to affirm at this stage that the alternate hosts had no part in the annual cycle of black and brown rusts. Circumstantial evidence, however, showed that the air currents laden with uredospores from the hills were mainly responsible for the disease in plains of India.

That loss of viability of uredospores was complete in the plains has been shown by experiments at his research station. Seed borne infection was non-existent. Greater humidity near lower leaves favoured spore germination; hence these are attacked in preference to top leaves. Differential host studies are in progress.

S. V. DESAI.

Easter Session of Scientific Societies, held at Bangalore. 18th—22nd April 1935.

WELCOME ADDRESS.

IN welcoming the delegates, Dr. Gilbert J. Fowler emphasised the need for co-ordinating the forces and facilities at our disposal and referred to a formal agreement between the London Chemical Society, the Institute of Chemistry and the Society of Chemical Industry to set up a body to be called the Chemical Council. This was to consist of representatives of the three bodies, together with representatives of industry nominated by the Association of British Chemical Manufacturers. The object of the Chemical Council was to administer a joint fund for such common purposes as the maintenance of a library and for the co-ordination of scientific and technical publications.

He briefly indicated the characteristic activities as he saw them of the various bodies represented at the session. Few words from him were needed to support the high aims of the Indian Academy of Sciences with its President Sir C. V. Raman. It knew no limit to its scientific activities and strived to scale the peaks of human knowledge. Many of its publications were beyond the present understanding of the lay public who were content to await with interest the news brought from those high altitudes.

The Institute of Chemistry of Great Britain and Ireland concerned itself with maintaining a high scientific and professional status of the chemical profession throughout the British Empire, by holding examinations and by scrutinising very carefully the claims of applicants for its Associateship or Fellowship.

The Indian Chemical Society (Madras Branch) looked after the interests particularly of Pure Chemistry in India, a worthy daughter of the present Chemical Society of London.

The comparatively new science of Biochemistry was represented by the active body known as the Society of Biological Chemists, India, having its headquarters in Bangalore where it was a matter of pride to him that Biochemistry was first systematically taught in India.

Finally, he referred to the South Indian Science Association which fulfilled a very useful function in holding meetings for the discussion of matters of scientific, technical and general importance, but which could hardly find a place in more purely specialist societies. In this way it should serve as a very necessary link between the more recon-

dite activities of scientific laboratories and their exposition to the general public.

INAUGURAL ADDRESS.

In the course of his inaugural address, Sir C. V. Raman referred to the possibility of classifying the main species of nacreous shells on the basis of their internal structure as revealed by the nature and distribution of the halos when they are examined by transmitted light. The X-ray studies of the shells carried out in the laboratory supported the above results.

The reflection colours of nacreous shells, classified into transferable and non-transferable types by Brewster, were in fact found to be due to one and the same type, the result of diffraction phenomena. Microscopic examination revealed the intersections of the oblique layers of the material of the shell at the surface, which was responsible for the intense and variegated colours observed.

RECENT ADVANCES.

Structure of Molecules: Dr. M. A. Govinda Rau.—An important consequence of the newer wave-mechanical theories of the structure of molecules is that the actual state of a complex molecule cannot be represented in general by a single chemical formula but only by a superposition of several states. These states have frequently nearly equal energies and on account of their superposition give rise to an energy of resonance and hence to a stability. There are other consequences of resonance, such as on the dipole moment and notably on the steric properties of molecules. The application of wave-mechanics has been generally very successful in explaining several of the finer details of structure of molecules.

Chemistry of Rubber: Mr. B. Sanjiva Rao.—After briefly referring to the work of Faraday and Tilden who established the relation of rubber to isoprene and of Weber and Harries who developed methods for its purification and studied many of its reactions, the recent work of Staudinger and Pummerer was reviewed. They improved the methods of purification and showed that rubber owes its characteristic properties to its chief constituent the rubber hydrocarbon and specially Staudinger by his fundamental work on the viscosity of high molecular weight substances showed that rubber consists of very long molecules in which over 1,000 isoprene molecules are bound

by means of main valencies into chains. The elastic properties are closely associated with the length of the chain. The saturated rubber obtained by hydrogenation is also elastic and is stable in air unlike the ordinary rubber which becomes brittle being attacked by oxygen. A reference was made to the excellent synthetic rubber from 2-chloro-butadiene and the great impetus which synthetic rubber research would obtain from Staudinger's work.

Colloid Chemistry of milk in relation to infant feeding and humanisation: Mr. M. Sreenivasaya.—The condition of the casein micellæ in its natural environment varies with different milks, the degree of its dispersion and its state of hydration being largely influenced by the content of (1) Lactalbumin, (2) the non-protein nitrogen and (3) the other crystalloidal constituents like lactose and salts. Milks having higher percentages of the components, in general, exhibit a higher degree of dispersion of their suspensoids and emulsoids and are more easily digestible. The fact that the digestibility of cow's milk can be enhanced by the addition of 0.5 to 1.0 per cent. urea, is a significant advance in the humanisation of milk.

The problem of humanisation was not merely a question of reduction and stabilisation of the colloidal particles of milk. The nutritive value of the dispersing and stabilising agents had to be considered in that connection. Attention was drawn to the limitations of humanisation imposed

by an imperfect knowledge regarding the composition of the caseins and lactalbumins from various milks.

ORIGINAL PAPERS.

21 papers were presented before the Session:—Physics, 8; Inorganic and Physical Chemistry, 4; Organic Chemistry, 2; Biochemistry, 1; and Industrial Chemistry, 3.

PUBLIC LECTURES.

Rao Bahadur Prof. B. Venkatesachar, M.A., F.Inst.P., gave a Lecture illustrated by lantern slides on "Transmutation of Elements", a subject of great theoretical importance. Dr. V. K. Badami delivered an address on "Sugarcane in Mysore", a subject of high economic interest. The lecturer exhibited several specimens of improved canes.

SOCIAL EVENTS.

Sir Venkata and Lady Raman were "At Home" to the delegates and the elite of Bangalore, on the 18th April. On the 20th April, there was another "At Home" arranged by the Societies participating in the Session, at the premises of the Industrial and Testing Laboratory.

VISITS.

Visits were arranged to the Government Transformer Factory and Government Industrial and Testing Laboratory. A whole-day excursion was also arranged for visiting the Mysore Iron Works, Bhadravati. At all the places excellent arrangements were made for the reception of the delegates.

Science Notes.

A Study of the Boundary Lubricating Value of Mineral Oils of Different Origin. (Lubrication Research Technical Paper No. 2. H. M. Stationery Office, Price 9d.).—This Report discusses the results of a more extended investigation on the lines described in Lubrication Research Technical Paper No. 1. That paper attempted to analyse the properties of commercial lubricating oils under boundary conditions but as two oils only (of unknown origin) were employed it was thought unsafe to base general conclusions on the results. In the present investigation oils of known origin have been employed and their properties as lubricants under boundary conditions have been correlated with what is known of their chemical constitution, particular attention being paid to the influence of wax. The results of a few preliminary experiments on the specific effect of the bearing surfaces are discussed.

The Evaluation of Glare from Motor Car Headlights. (Illumination Research Technical Paper No. 10. H. M. Stationery Office. Price 1s. 6d.).—The present paper applies the results of previous research undertaken by the Illumination Research Committee, to the practical problem of assessing the actual glare arising from powerful motor car headlights. By the method described in the paper a "figure of merit" with respect to freedom from glare can be obtained for any proposed headlight system. No attempt is made in the paper to lay down an ideal distribution of light nor to prescribe an actual anti-glare headlight. The practical aim is to help designers of headlights and others interested to assess the merits of

various distributions of light, without necessarily having to construct actual headlights to produce such distributions.

* * *

Atmospheric Pollution (Twentieth Report). (H. M. Stationery Office. Price 5s.).—Smoke pollution affects us in many ways—the cleanliness of our homes, the air we breathe, the state of preservation of our historic and other buildings, the sunlight we enjoy and so on. Data regarding deposited impurity, suspended impurity, destructive gaseous impurity, obstruction of light are therefore of close interest. It is the purpose of the investigation of Atmospheric Pollution, the Twentieth Report of which is now available, to supply such data.

* * *

Scientific Results of the Dutch Expedition in Karakorum and the neighbouring areas in the years, 1922, 1925 and 1929-30.—The first volume which has recently been published, comprises the scientific results dealing with Geography, Ethnography and Zoology collected during Dr. Visser's three expeditions. The results referring to the other branches of science will be incorporated in the subsequent volumes. According to a notice appearing in the *Sunday Statesman* dated 31st March, the most thrilling pages of the book will possibly be those in which Dr. Visser describes the history of the discovery of Karakorum with dramatic simplicity. Mrs. Visser has given an account of her ethnographical studies. Dr. Sunder Lal Hora of the Zoological Survey of India, has described the 118 specimens of fishes collected by Dr. Visser and his friends. 87