

Twenty-second Session of the Indian Science Congress

THE twenty-second session of the Indian Science Congress was held at Calcutta on January 2-8. The session was memorable for the foundation of the National Institute of Sciences of India, which it is intended shall perform for India some of those functions which the Royal Society discharges with regard to science in the United Kingdom. The foundation of this Institute forms a land-mark in the organisation of scientific research in India. The inauguration ceremony of the National Institute was performed on January 7 by His Excellency Sir John Anderson, Governor of Bengal, when Dr. L. L. Fermor, president, delivered his presidential address.

His Excellency Lord Willingdon, Viceroy and Governor-General of India, opened the session on January 2. In his speech, Lord Willingdon referred with satisfaction to his being the first Viceroy to be present at its meetings, and mentioned briefly the importance of the contribution to Indian science being made by Government through scientific services and scientific departments, and through the agency of bodies like the Imperial Council of Agricultural Research and the Indian Research Fund Association. After mentioning the munificent endowments for scientific research created by men like the late Sir Jamshetji Tata, the late Sir Tarak Nath Palit and the late Sir Rash Bihari Ghosh, he mentioned specially the growing contact between scientific research and the practical demands and requirements of industry, of which the assistance given by the Burma Oil Company to the foundation of the College of Engineering at Rangoon, and the recent donation of Messrs. Steel Brothers for research in oil technology at Lahore, are examples. In concluding, he referred to the necessity for scientific workers to organise themselves so as to ensure the maximum of achievement that is possible with the resources available.

In his presidential address, Dr. J. H. Hutton referred briefly to the work of the Academy Committee appointed at the Bombay session and recommended the scheme for the foundation of a National Institution of Sciences of India for adoption by the Congress. He then referred to the vast field available in India for the organised efforts of science, and cited rural economy, food reform and town planning as matters in which science may and should be utilised and directed for the benefit of the community. Speaking of the vast field India offers to anthropologists, containing as it were a veritable museum of living physical types, of social organisations, cultures and religious beliefs, he pointed out that the question of race in India requires very careful and detailed examination by trained anthropologists. He directed attention to the numerous sites of archaeological interest awaiting excavation and to the great need for systematic linguistic research in southern India. The necessity of studying the symbolism of dreams, folk-lore proper and religious beliefs and practices was emphasised and an appeal was made to concentrate more on the organised collection of facts than on their interpretation.

In his presidential address to the Section of Agriculture, Dr. F. J. F. Shaw laid stress on the necessity and importance of systematic breeding work for resistance to disease. In this connexion he mentioned the production at Pusa of new types of Rahar (pigeon pea—*Cajanus indicus*) resistant to the wilt disease caused by *Fusarium*. He also mentioned that

a comprehensive scheme for breeding rust-resisting types of wheat has recently been undertaken by the Imperial Agricultural Department, from which it is hoped fruitful results will be obtained. After referring to breeding work done on linseed, potato and sugar-cane in India, he pointed to the necessity of a cytological study of these crops. He hoped for co-operation in this sphere from the universities of India.

At a joint meeting of the Sections of Agriculture, Mathematics and Physics, Chemistry, Botany, Geology and Zoology, it was decided to start an Indian Society of Soil Science.

The presidential address by Prof. N. R. Sen to the Section of Mathematics and Physics was a general review of the development of theoretical physics from the early stage of classical mechanics to the present state of quantum mechanics, laying special stress on the difficulties of the existing theory. The viewpoints of the two rival schools of thought, namely, of a continuous field theory being able to describe correctly the entire scheme of Nature, or of discontinuous quantum processes ultimately finding a solution to the problem of matter and radiation, were analysed and discussed.

Among the papers read at the meetings the following may be mentioned: (1) atomic arrangements in anthraquinone crystals, by Dr. K. Banerjee, (2) aerial waves produced by meteorites, by Dr. S. K. Banerjee, (3) meteorological papers on nocturnal cooling of the atmosphere by radiation, by Dr. K. R. Ramanathan and Mr. Ramdas, (4) Heilbronn's class-number, by S. Chowla, (5) some boundary problems in non-linear parabolic equations, by R. Siddiqi, and (6) two hydrodynamical papers, by N. Bose and S. Sen Gupta.

In his address to the Chemistry Section, Dr. A. C. Sarkar gave a review of recent work on high coal-tar hydrocarbons, especially acenaphthene, fluorene and phenanthrene. Symposia were held on chemical aspects of light absorption and cellulose chemistry.

The presidential address of Diwan Anand Kumar to the Zoology Section dealt with the spicules and classification of Tetraxonida, an order of non-calcareous sponges. Apart from the papers read, the Section discussed at its meetings the question of "Standardisation of the Courses in Zoology for the University Examinations" and at a joint meeting of the Botany and Zoology Sections the "Teaching of Elementary Biology in Secondary Schools in India". The Section adopted a resolution stressing the need for the establishment of a station for marine and estuarine biology in Bengal. A committee was also appointed to organise a Zoological Society for India.

Prof. J. H. Mitter, in his presidential address to the Botany Section, dealt exhaustively with mycological and plant pathological research in India. He laid stress on the need of co-operation between universities and the plant pathologist, who has not always much time at his disposal to carry out the purely scientific work on the life-history of the pathogen. He further pointed out the desirability of establishing a bureau of stock cultures of fungi and the publication of an up-to-date textbook on mycology for India.

The problem of cereal rusts in India was discussed at a joint meeting of the Botany and Agriculture

Sections. Dr. K. C. Mehta, Dr. U. N. Pal, Dr. F. J. F. Shaw, Mr. P. K. De and Dr. B. B. Mundkur took part in the discussion.

The presidential address to the Geology Section by Dr. M. S. Krishnan dealt with the classification of the Dharwar system of Pre-Cambrian rocks. A three-fold division was suggested in which the lowest consists of a metamorphosed complex, while the middle division is characterised by manganese ores (gondite type) and marbles, and the upper one by banded ironstones. The origin of some of the types of sediments in this system was discussed in the latter part of the address.

In addition to the papers which were contributed to this Section, there was a symposium on the Bihar earthquake of 1934, jointly with the Physics Section, in which Drs. A. C. Banerji, S. K. Banerjee, C. W. B. Normand and S. C. Roy and Messrs. D. N. Waida and W. D. West took part. S. K. Banerjee touched upon some general facts and exhibited a model of a seismograph of his own design suited for recording severe shocks near the focal region; A. C. Banerji discussed the inter-relationship of the cooling of the crust and the distribution of radioactive material in the earth, and also the influence of the tidal attraction of the sun and the moon in precipitating an earthquake in an unstable crust. Roy illustrated his remarks with actual seismograms and the various phases found therein. According to him the focal depth of this earthquake was about 13·5 km., and the speed of one phase coincided with that in dunite. Normand emphasised the necessity for more seismographs and especially damped instruments in the Indo-Gangetic valley adjoining the Himalayan seismic belt. Wadia dealt with the geological aspects and on the possibility of the existence of fractures parallel to the 'Main Boundary Fault' underneath the Ganges valley in Bihar, while West from geodetic considerations thought that the earthquake might have been produced by the conversion of the rocks of the eclogite and dunite shell into those of less density.

Major K. R. K. Iyengar devoted his presidential address to the Section of Medical and Veterinary Research to the consideration of the problem of rabies in India. He pointed out that all attempts to cultivate artificially the organism causing it having failed, it is not possible to improve upon the somewhat crude methods employed at present to prepare the

serum and to devise more efficacious means of prophylactic treatment. Certain improvements in the technique of preparing serum adopted during the previous year at Coonoor were described. It was further pointed out that although a number of institutes for anti-rabies treatment have been established in India, no preventive measures are being taken to deal with the disease at its source. Referring to the example of Germany, Australia and the British Isles where rabies has been eradicated by strictly controlling dogs and their movements, Major Iyengar pressed for co-operative efforts for the destruction of stray ownerless dogs, and for the compulsory registration and licensing of dogs in all municipalities and district boards. He advocated destruction of jackals as well in rural areas. Quarantine methods against imported dogs, in his opinion, would not be effective unless the local dog population is properly controlled. He recommended that anti-rabies treatment should be decentralised to the utmost extent possible, so that persons bitten by dogs could have treatment near their homes.

A symposium on vitamins was held at a joint meeting of the Sections of Chemistry and Medical and Veterinary Research.

Dr. G. S. Ghurye took "Anthropology and our Educational System" as the theme of his address to the Anthropology Section. If anthropology is to serve as a guide to better social conditions, a study of the social and cultural history of the various races of mankind, primitive as well as advanced, is very necessary. Such a study would help in suggesting solutions to many pressing social problems. It was therefore suggested that anthropology should be included as a subject in all courses of study prescribed for students wishing to take up public life in one form or other as their career.

The Section adopted a resolution to start an Anthropological Society for India, if possible by enlarging the scope of the Bombay Anthropological Society.

In his address to the Psychology Section, Dr. S. C. Mitra dealt with the relation of psychology to problems of life. After pointing out the various ways in which a knowledge of psychology can be utilised to solve social problems, he pressed for the establishment of an Institute of Applied Psychology.

S. P. AGHARKAR.

Underground Water Supplies

ALTHOUGH the title of his paper, read before the Royal Society of Arts on February 20, was "Water Supplies from Underground Sources", Lieut.-Col. J. D. Restler gave it a rather wider scope by including some preliminary notice of water supplies in general. He pointed out that the problem of water supply is very different from that of the supply of gas and electricity, because gas and electricity can be manufactured for all practical purposes at any point where it is desired to do so, and electricity can be transmitted in bulk over long distances with comparative ease and relatively high efficiency, whereas in the case of water, serious engineering difficulties arise if large quantities are to be delivered over long distances. The capital cost becomes very heavy and the efficiency, due to pipe friction and other causes, is exceedingly low.

Dealing more particularly with the subject of

subterranean supplies, Col. Restler described the conditions under which they have to be obtained. In sinking a well, or boring, in many localities, it is quite usual to pass through a large number of strata yielding water of an entirely different character, separated in some cases by comparatively few feet. The classes of water met with vary to such an extent that some may be so soft as to attack lead pipes, and others so hard as to be entirely unsuitable for steam raising or domestic purposes. Others again, right in the centre of England, may be quite salt. As a general principle, if underground water of suitable quality can be found in sufficient quantity at a convenient depth and within a reasonable distance of the locality where it is required, such a source, from a water undertaking point of view, has great advantages over a surface or river source. Underground sources of supply are less liable to