Science News.

Mr. P. K. Bose, Department of Botany, University of Calcutta, has, in an article appearing in the August number of *Modern Review*, made a critical survey of the problem of Water Hyacinth—the Terror of Bengal Water Ways. As in the case of the lantana and several other pests a plant which was introduced for ornamental purposes for the sake of its beautiful flowers has now become a menace to the cultivation of economical crops such as paddy and a menace to commerce through its paralysing the water ways. The credit of introducing it into Eastern Bengal goes to Mr. George Morgan, a resident of Narayangunj, and the plant is often humorously called Morgan's folly. The plant bears extremely pretty mauve or pale lilac flowers and the main mode of propagation is vegetative, the bladder-like leaf stalks acting like buoys and keep the plants floating. The plant is thus enabled to grow in deep as well as in shallow waters and being a native of tropical and subtropical South America has found Indian climate extremely suitable. By its abundance of leaves, dense vegetation and innumerable rootlets, it impedes flow of water, and has displaced many aquatic grasses which were so characteristic of Bengal paddy fields and so useful as fodder for cattle. It has overrun cultivated paddy fields to an alarming extent and has threatened jute cultivation. Tanks which supply drinking water have been covered by dense mass of water-hyacinth thereby rendering clean potable water scarce and by causing water stagnation in ditches, and shallow waters provide suitable breeding places for mosquitoes and other disease-carrying insects.

Attempts at economic utilisation of the plant have proved abortive. The fresh leaves have been used to some extent as cattle fodder and this has resulted in the deterioration of the quality of milk and a run down in the general health of the cattle. Trials were made to get potash on a large scale, but the process was too expensive and would not pay. The inferior quality of pulp obtainable from the plant renders its exploitation for paper manufacture impracticable. Attempts were made to prepare writing ink from the flowers but the colour did not appear to be fast, and the project was abandoned. The green plant contains about 95 per cent. water and it is highly doubtful whether any useful product can be obtained from the dry residue. Composting the weed for producing manure could be attempted but so far no organised effort appears to have been made.

The extermination of this weed has to be undertaken on a mass scale. Researches into Biological methods of extermination have to be carried out. Common salt and sulphuric acid have been found to be effective in killing the plant but the application over any extended area offers immense difficulties. Mechanical dredging and lifting operations could be carried out with some benefit. Simultaneous action should be taken in Assam, Bihar and Orissa and United Provinces to eradicate the plant as it is really astonishing how one single plant producing numerous offshoots which break away from the parent and grow independently, can be the cause of infecting large expanse of water.

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The Ninth Annual Report of the Geological, Mining and Metallurgical Society of India has reached us, as also a copy of the Presidential Address of Mr. K. Dutt, delivered at the Annual Meeting held at Calcutta on the 11th August. The Society records normal activities during the year 1932-33. Nine ordinary meetings were held at which 13 papers were read and discussed. Six issues of the Journal of the Society were published, comprising 22 original contributions, two of which refer to problems on Mining.

Mr. P. Sampat Iyengar, M.A., Director of Geology, Mysore Government (Retd.) was elected President for the year 1933-34. The other office-bearers and members for the Session 1933-34 are: Vice-Presidents: Dr. C. S. Fox, and Mr. M. M. Mukherjee; Joint Secretaries: Mr. N. N. Chatterjee and Dr. M. Chatterjee; Treasurer: Mr. S. L. Biswas; Librarian: Mr. B. N. Maitra; other Members of the Council: Prof. N. P. Gandhi, Dr. M. S. Krishnan, Mr. D. C. Nag, Mr. A. L. Ojha, Prof. S. K. Roy, Mr. Balaram Sen, Mr. K. K. Sen Gupta and Mr. D. N. Wadia.

In the course of the Presidential Address, Mr. K. Dutt dealt with the means and ways of putting on a sound basis the coal industry in India, which is the most potent factor in deciding a Nation's rôle in the field of manufacture. The problem of coal is closely linked with iron and although India is fortunate in possessing the necessary raw material, the Iron and Steel Industry is still in its infancy. The improvement of the metallurgical industries in India necessarily demands larger quantities of high class caking coal, and unless researches make it possible to use second class coal for caking purposes, a national calamity cannot be averted. The remedy for this lies in the manufacture of Petrol from coal which, thanks to intensive research in Germany and elsewhere, is now a practical possibility. In India a Fuel Research Board on the lines of the Imperial Council of Agricultural Research should be established forthwith to go into the question and investigate the possibilities of manufacturing petrol from coal.

The question of the soft coke industry also deserves consideration. Unless India produces soft coke of standard quality, suitable for fuel, by launching intensive research, the second class collieries will not be able to thrive. A permanent Fuel Research Board should be established immediately and the Government should be persuaded to take steps to utilize the surplus funds lying idle with the Coal Grading Board for maintaining the Research Board.

The lecturer suggested that the Society should try its best for establishing a research and statistical bureau with necessary financial aid from the Government and owners of metallurgical industries.

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In a communication entitled "The Filtrable Phase of the Tubercle Bacillus" (*Ind. Med. Gaz.*, **68**, 456, 1933) Dr. Soparkar has discussed the results of his experiments with suspensions of tuberculous sputum and tissues of animals in saline, filtered through Chamberland L_3 candles and inoculated subcutaneously into guinea-pigs. The passage of emulsions of lymph glands and spleens of previously inoculated animals, which were killed at regular intervals, revealed, on careful examination, acid-fast bacilli in 66 out

of 190 cases, the positive results being obtained with different stages of the passage. These acid-fast bacilli could be cultivated successfully, but the interesting fact observed was that the resulting strains differed culturally and in pathogenicity from the strains of bacilli present in the original material used for filtration. The conclusion, therefore, appears irresistible that there exists a filtrable phase of the tubercle bacillus when it can pass through a Chamberland candle, but a biological change is brought about so that the organism cultivated from the "filtrate" is *avirulent* for the animal and in some cases behaves like the avian bacillus.

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In a paper entitled "The Case for the Electrochemical Fixation of Atmospheric Nitrogen in India" (*Madras Agricultural Journal*, **21**, 1933) Viswanath has pointed out the urgent need for manufacturing in India nitrogenous fertilizers through the fixation of atmospheric nitrogen. With all the facilities available, it is indeed surprising that the problem has not been investigated on a scientific basis in India particularly as it is so essential for the development of agriculture and increased food-production. The question was examined by the Royal Commission on Agriculture (1926-27) who reported that the prospects of producing synthetic nitrogenous fertilizers were not encouraging. It should, however, be noted that the world's production of nitrogenous fixation products is still below demand. The Sugar Committee, who had also examined the question, expressed the opinion that the introduction of synthetic process for nitrogenous fertilizers was a matter of great importance. Further, a close examination of India's food position shows that for feeding her ever-growing population the available natural supplies are inadequate and the artificial utilization of atmospheric nitrogen is necessary. India produces at present food sufficient for the proper feeding of only two-thirds of her population. It is, therefore, clear that every effort must be made to increase our food supplies. Although recent work has established the importance of organic manure in the soil, both for quality and quantity of food crops, yet it would be necessary to augment our natural resources of organic manures by artificial fertilizers. There is no doubt that there is at least a case for the "immediate institution of nitrogen research laboratories in which chemists and electrical engineers should work in close collaboration and co-ordination and tell us definitely what the position is."

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At a meeting of the British Medical Union, South Indian Branch, held at Madras on the 22nd September, Dr. C. Muthu delivered an interesting address on "Some Biochemical and Sociological Factors in Health and Disease". The lecturer pointed out that the close study of the life's processes in the light of modern biochemistry and psychology has shown that for normal health fresh air, sunlight and well-balanced food are essential, and the internal organs receive from these sources materials necessary for the elaboration of harmones, enzymes and other secretions. The man's environment and social condition also profoundly influence his health and disease. Almost all diseases can be traced to deficiency of some food factors, proteins,—which are primarily body builders, vitamins—which in minute quantities are essential to life and for the growth and development of the body, endocrine secretions, and mineral salts. It has been amply demonstrated in recent years, that more could be done to maintain health through dietary reform by supplying deficiencies in diet than by drugs or any other agency we know of. The study of the nutritive values of Indian foodstuffs is of the utmost importance to-day and the medical man would have great success in the treatment and "prevention of disease if he gave more attention to man's nutrition and the sociological factors governing his every-day life."

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In a paper entitled "Lethal Properties of Aqueous Extract of Young Bamboo Shoots" (*Indian Med. Gaz.*, 1933) Stewart and Moorthy give an account of their preliminary observations on the active principles of young bamboo shoots responsible for the larvicidal and insecticidal properties. It has been shown that free hydrocyanic acid is liberated due, probably, to the enzymic hydrolysis of cyanogenetic glucosides present in the bamboo shoot and the observed toxic effects on guinea-worm embryo, cyclops, maggots of the house-fly, adult flies, adult mosquitoes and eggs of *A. stephensi*, may be due to the hydrocyanic acid so liberated. There appears to be a second substance also responsible for the toxicity, the nature of which is being investigated.

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An ordinary meeting of the Association of Economic Biologists, Coimbatore, was held on 4th September, for discussing original papers. Mr. T. S. N. Singh gave a paper on "Chromosome Numbers in the Genus Saccharum and its Hybrids," describing the chromosome numbers, both interspecific and intergeneric. The various forms now grouped under Saccharum spontaneum showed chromosome numbers varying from 27 to 64. In the case of Saccharum hybrids, the doubling on the mother side noticed by Dr. Bremer was not found in certain of the hybrids with Indian canes. A series of four bud sports obtained from Co. 213 showed different numbers from 46 to 62; the one with 46 being apparently a degenerate type.

Messrs. T. V. Ramakrishna Ayyar and S. Ramachandran gave a very interesting paper on "Bees and Bee-keeping in South India". A brief account of the honey bees we have in S. India and the native methods now in vogue all over India in artificial bee-keeping and honey gathering were described. The paper also gave a short account of the attempts which are being made by the Entomology section at the Agricultural Research Institute, Coimbatore, to demonstrate and popularise the modern methods of bee-keeping as is practised in many of the Western countries.

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The Magnetic Interference Balance originally developed in Prof. S. S. Bhatnagar's Laboratory at Lahore has been put on the market by Adam Hilgers. This is a refinement of Oxley's magnetic balance in which the change in the inclination of a glass plate suspended by a bifilar suspension in one beam of a Rayleigh Interferometer is made evident by the movement of a system of Interference bands. The sensitivity of the balance is very high, as it is possible to read changes in the interference pattern up to a fraction of a fringe. A compensation arrangement is provided in the

instrument by which the fringes could be brought back to their original position and readings taken in terms of the movement of a graduated drum-head. The instrument is very compactly made and easy to set up. The balance is especially suitable for the investigation of weekly dia- or paramagnetic materials and for comparative measurements on closely related substances, but for work not demanding the great sensitivity of the interference method arrangement is provided whereby the original Oxley method may be employed.

With the growing importance of the subject of magnetism the balance fulfils a great need of the research worker in the field of magnetism.

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We have received from Messrs. Bailliere, Tindall and Cox, 8, Henrietta Street, Covent Garden, London, W. C. 2, a catalogue of their latest publications in Medicine and Science. The catalogue is arranged in four sections: (1) Medical, Dental and Nursing, (2) Veterinary Foods and food inspection, Botany and Agriculture, (3) Science and Miscellaneous, and (4) Periodicals and Reports. The catalogue also includes subject and author indexes, and will prove useful to Libraries, Government Departments, Institutions, Hospitals, etc., requiring latest publications in these progressive sciences.

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We acknowledge with thanks the receipt of the following:—

"Nature," Vol. 132, Nos. 3328 to 3332.

"The Chemical Age," Vol. 29, Nos. 737 to 741.

"Canadian Journal of Research," Vol. 9, No. 1.

Do. do. Vol. 8, Index.

"The Journal of Chemical Physics," Vol. 1, No. 8.

"Experiment Station Record," Vol. 69, No. 1.

"Communications from the Kammerlingh Onnes Laboratory of the University of Leiden"—217 to 221.

Do. Supplement No. 69 to Nos. 205-216.

Do. do. No. 70 to Nos. 217-228.

Do. do. No. 71 to Nos. ,,

Do. do. No. 72 to Nos. ,,

Do. Vol. 19, Nos. 205-216.

"Journal de chimie Physique,"—Tome. 30, No. 7.

"The Mathematics Student," Vol. 1, No. 2.

"The Review of Scientific Instruments," Vol. 4, No. 8.

"The Scientific Indian," Vol. 10, No. 56.

"The Indian Forester," Vol. 59, No. 9.

"The Quarterly Journal of the Geological, Mining and Metallurgical Society of India," Vol. 5, No. 1.

Do. Index to Vol. 3, Nos. 1 to 4.

"Bulletin of the State College of Washington, Agricultural Experimental Station," Nos. 282 to 285.

"Contributions from the Boyce Thompson Institute," Vol. 1, Nos. 1-8; Vol. 2, Nos. 1 to 10, Vol. 3, Nos. 1 to 4; Vol. 4, Nos. 1 to 4; Index to Vols. 1 and 2 and Profession Papers 1 to 22.

"Indian Journal of Physics," Vol. 8, No. 1.

"Transactions of the Mining and Geological Institute of India," Vol. 28, No. 2.

Reviews.

THE MEASUREMENT OF AIR FLOW. By E. Ower, B.Sc. (Lond.), Hons. I., A.C.G.I. Second Edition, Revised and Enlarged. (Chapman and Hall, Limited, London, 1933. Price 15*s*. 6*d*. net.)

The second edition of this book dealing with the theory and technique of the measurement of air flow will be welcomed by all hydrodynamicians, who are interested in practical application of their subject, by engineers engaged on matters, such as fan engineering and ventilation of mines and buildings, and by meteorologists in connection with the theory of anemometers.

For the purpose of fluid measurements, direct methods are inapplicable, and it is therefore necessary to resort to the measurement of some physical effect arising from the motion. Three such effects have been found by experience to be suitable, namely, pressure changes associated with the motion; mechanical effects, such as the rate of rotation induced in light vanes suitably placed in the stream; and lastly, the rate of cooling of a hot body, such as an electrically heated wire introduced into the air current. The author describes in successive chapters the general principles of the pressure tube anemometers, design of pitot and static tubes, the flow of air in pipes, measurements of flow and resistance with pitot-static tubes, the plate orifice, Venturi tube, and shaped nozzle, the vane anemometer, miscellaneous methods of flow measurement depending on pressure observations, manometers, and methods of flow measurement based upon the rate of cooling of hot bodies. In the last chapter, a few typical examples have been given, from practice of the methods of measuring air flow.

The author's own researches have contributed largely to the theory of the vane anemometer and have led to important practical conclusions. For instance, it is shown theoretically that the angle at which the vanes of an anemometer must be set in