either side of the hepatic portal vein and the formation of a peculiar looped chain. A separate splenic artery and the presence of a complicated arterial circuit in connection with the female reproductive organ and a pair of small arteries called "the arteria complexa" are the other interesting features of this form.

Science Notes.

A Study of the Atmospheric Horizontal Visibility at Bangalore.—By A. Ananthapadmanabha Rao (*Science Notes of the Ind. Met. Dept.*, 1934, **5**, No. 60). Visibility observations taken at Bangalore during a period of two years at 8, 10. 12 and 16 hours have been analysed and the monthly, seasonal and annual variations of visibility frequencies have been determined. Visibility is generally fair to good; bad visibility is a rare occurrence except in the mornings, when it is largely associated with mist, fog or haze; the frequency of bad visibility is greatest in winter and summer reaching a maximum in March, and is least in the South-West Monsoon with a minimum in August. A study of the association of bad visibility with relative humidity, wind velocity, wind direction and Cumulus or Cumulo-Nimbus clouds, shows that:—(1) bad visibility is a minimum with values of relative humidity between 61 and 80 per cent.; (2) frequency of bad visibility decreases with increase in the velocity of the surface-wind; (3) bad visibility is most frequent with southerly winds and least frequent with northerly winds: and (4) bad visibility is less frequent in the presence of Cumulus or Cumulo-Nimbus clouds than in their absence.

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The nature and germination of seeds of Tinospora cordifo ia *Miers.*—Messrs. S. L. Ajrekar and J. D. Oza of the Gujarat College, Ahmedabad, write: "With reference to the note on fruit and seed development in *Tinospora cordifolia* Miers. without fertilisation and embryo formation published by A. C. Joshi and V. V. Raman Rao (*Curr. Sci.*, 1934, **3**, 62) and the subsequent note on Exembryonate seeds by B. Sahni (*Curr. Sci.*, 1934, **3**, 109) it may be of interest to record that in the course of an investigation of the fungus parasites of *Tinospora cordifolia* Miers. which we have been carrying out at Ahmedabad we have had occasion to raise seedlings of this plant for inoculation experiments and we have found that the seeds have a normal embryo and the germination is also perfectly normal.

The non-formation of an embryo noted by Joshi and Rao is probably only due to the absence of pollination. This point can be easily settled by them by artificial pollination. The question of the germination of the exembryonate seeds can also be answered by them by actual trial.

The development of "barren" fruit without the stimulus even of pollination is a familiar phenomenon in cultivated plants, *e.g.*, in Fig, Cucumber, Grape.

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A note on seed variations in Carrica papaya, *Linn.*—Mr. S. A. Parandekar, M.Sc., Rajaram College, Kolhapur, writes under date 9-2-1935: "The usual experience of many of us is that the mature fruit of Papaw (*Carrica papaya*) contains numerous black seeds filling up as it were the cavity of the fruit. All these seeds are very nearly alike. Very interesting types of variations in the sizes and the number of these mature ovules have been observed.

"In one of the ripe fruits only two seeds of the usual form and size were found. In another fruit belonging to the same plant only one ovule of an abnormal size (about ½") and of a yellowish colour was found. This could not in any way be differentiated into the parts of a seed. The micropyle was wide open and the integuments prominently seen. A naked eye examination of the longitudinal section, however, failed to show any differentiation in the nucellar tissue which simply represented a large mass of cells; in a third fruit of the same plant an ovule of the type mentioned above was present in addition to a few (about 10) normal seeds."

* * *

Rare Observation of a Plant drawing Nourishment from Eggs.—Mr. A. Ramakrishna Reddy, B.Sc. (Hons.), of the Annamalai University, reports a rare observation concerning a well-developed grass plant of the genus *Cyperus* in the University grounds whose roots had pierced three developing *calotes* eggs lying at different levels. Apparently the plant was drawing its nutrition from them. The plant had also developed adventitious roots in the lower and middle eggs, both of which had shrivelled down owing to their being depleted of the contents. The observer considers this to be a case of semi-parasitism or a rare and unusual instance of a plant developing a carnivorous habit through the root system.

* * *

Map-making in India.—From the first attempts at Map making made by the Merchant Adventurers of old to the rigorous methods of surveying introduced first by Col. Lambton (1800-1823) and extended and improved by Col. Sir George Everest (1830-1843), the history of Indian surveys is one of evolutionary progress. The first map of India appears to have been prepared by the French Geographer D'Anville from a knowledge derived by the routes of travellers in India and rough charts of the coasts; the English Edition of this was published in 1764.

The credit for laying the real foundation of Indian Geography goes to Major James Rennell (1763-1782) who as Surveyor-General of Bengal carried out systematic route surveys, the specified stations being located by means of astronomical observations of longitude and latitude. The Bengal Atlas published in 1781 was the result of his labours. About the year 1800, Major Lambton, who realised the inaccuracy of the older methods, put up proposals for carrying out a scientific trigonometrical survey. The work of covering the whole of India with a grid of accurately measured triangles has been continued ever since, and the credit of planning and mapping of India on a really scientific basis goes to Lambton. His able successor Sir George Everest started

on the completion of the Great Meridional Arc series of triangles which had been brought up from Cape Comorin to Sironj in the centre of India, and was to terminate in the Himalayas near Mussoorie. Up till 1843 he was employed in extending his system of a gridiron of triangulation in the series about 60 miles apart which was opposed to Lambton's scheme of a network. The whole conception of the basis of land surveying in India, as it now exists, is due to the creative genius of Sir George Everest (1830-1843).

* * *

Third International Congress of Soil Science.—The Third International Congress of Soil Science will be held in Oxford, England, from July 30th to August 7th this year under the presidency of Sir John Russell, D.Sc., F.R.S. The two previous congresses of the series were held in Washington in 1927 and in Leningrad and Moscow in 1930, and were notable for the exceptionally international character of the personnel and the discussions. The Congress will meet as a whole in six plenary sessions, at which a general survey of recent advances in every branch of soil science will be made, and it will also work in sections or "Commissions" dealing specifically with soil physics (I), chemistry (II), biology (III), fertility (IV), classification (IV) and technology (VI). Three sub-Commissions will discuss problems relating to alkali, forest, and peat soils respectively. A 16-days excursion round Great Britain leaving Oxford immediately after the Congress, and terminating in Cambridge on August 23rd is being arranged for the benefit of members wishing to obtain first hand knowledge of British agriculture and soils.

Every member of the Congress will receive a copy of the Official Transactions, including the full text of papers read at the plenary sessions, and detailed reports of the discussions at the Commission sessions. The cost of the Transactions will be included in the Congress fee (£ 2), payment of which will also entitle members to attend all meetings, receptions, etc., held in connection with the Congress. Accommodation during the Congress in an Oxford College may be reserved through the Organising Committee, or privately in hotels or boarding houses.

Intimation of attendance at the Congress should be sent as soon as possible to the Secretary of the Organising Committee, Mr. G. V. Jacks, Imperial Bureau of Soil Science, Harpenden, England, from whom all further information may be obtained.

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Fourth International Fertilisers' Conference.—We are happy to announce that Prof. N. R. Dhar, D.Sc. (London and Paris), F.I.C., I.E.S., Professor of Chemistry, University of Allahabad, has been appointed National Correspondent for India of the Fourth International Conference which will be held at Rome in 1936. Prof. Dhar has accepted the office and will be proceeding to Rome next year. This International Organisation has branches all over the world and the National Correspondents are expected to report to the Conference the Agricultural Progress of the Country which they represent. Dr. Franco Angelini, Member of the Italian Parliament, is the Secretary of the Conference.

* * *

New Oil Seeds Research Station in Madras.—About fifteen acres of land were leased in 1925 for research on groundnuts. In 1930, Government sanctioned the mobilisation of a separate section for research on important oil seeds, *viz.*, Groundnuts, Gingelly, Castors and Cocoanuts. The increased work demanded a larger station but there were no possibilities for extending the existing station, and it was therefore decided to open a new station about a mile and six furlongs away from Tindivanam (South Arcot District) in the heart of the groundnut area. The new station is about fifty acres in extent with possibilities for expansion, if necessary. A sum of about Rs. 25,000 is sanctioned for the purchase of land, necessary equipment and construction of residential buildings. The Imperial Council of Agricultural Research has sanctioned a scheme costing about Rs. 50,000 for research on oil seeds in Madras. The research work proposed under this scheme will be conducted on this station. Genetical, physiological and agronomic problems connected with groundnuts, gingelly and castors will mainly be dealt with at this station.

* * *

The Academic Council of the Aligarh Muslim University has decided to award the degree of Doctor of Philosophy—the first Doctorate given in Physics by the University—to Mr. Muhammad Zaki Uddin, M.Sc. Hons. (Alig.), Research Scholar of the Aligarh Muslim University.

* * *

Indian Central Cotton Committee.—The 30th meeting of the Indian Central Cotton Committee was held on the 4th and 5th February 1935, at the headquarters of the Committee at Vulcan House, Nicol Road, Ballard Estate, under the presidency of Diwan Bahadur Sir T. Vijayaraghavacharya, K.B.E., Vice-Chairman, Imperial Council of Agricultural Research.

Among the more important subjects that came up for consideration may be mentioned a reference from the International Federation of Master Cotton Spinners' and Manufacturers' Associations suggesting a reversion to the original system of marking bales on hoops; complaint from the Lancashire Indian Cotton Committee regarding the mixing of different types of cotton; report of the Publicity and Propaganda Officer; findings of the Special Meeting of the Agricultural Research Sub-Committee on the schemes of the Committee; spread of Garrow Hill or Deorwada cotton in Berar; the establishment of cotton markets in the Bombay Presidency and the Punjab and the reports of Sub-Committees.

The Committee adopted the report of the Agricultural Research Sub-Committee. The Madras Pempheres and Physiological Scheme was examined in detail and its continuance agreed to.

The Madras Herbaceum Scheme was extended for a further period of three years for the further testing of promising strains. The Punjab Root Rot Scheme, the Punjab Botanical Scheme and the Punjab Spraying Trials Scheme were extended for various periods. A new scheme known as the Mysore 'Red Leaf Blight' Scheme was sanctioned for three years with a grant of Rs. 2,814 per annum. The Sub-Committee also recommended that the existing arrangement for subsidising the Hubli and Gadag Co-operative Societies be

continued for one more year at an estimated cost of Rs. 19,000. This was adopted.

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Chronica Botanica—International Year-Book of Botany.—This work which is expected to be published in the Spring of 1935 embodies several important sections: (1) Calendar—important dates connected with the History of Botany and the activities of the well-known Botanists. (2) The International Botanical Congress--Announcements, Reports of Proceedings, etc. (3) International Societies, Committees, Congresses, etc. (4) Survey of Pure and Applied Botany during the preceding year. This section will contain personal information about botanists in every part of the world and also annual reports of all botanical institutions including laboratories, museums, herbaria, experimental and other stations for applied botany. The nature of the more important investigations being carried on in these institutions will also be indicated. (6) Correspondence. This "Forum Botanicum" will provide opportunities for ventilating the views on all subjects of interest to botanists. (7) Advertisements. This Year-Book is edited by Fr. Verdroon in collaboration with an Advisory Board and numerous assistant and corresponding Editors. Further information can be obtained from Fr. Verdroon, Botanica, P.O. Box 8, Leiden, Holland.

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Association of Economic Biologists.—5th January 1935:—Dr. R. D. Rege, Crop Physiologist, Padegon, gave a lecture on the "Problems of the Deccan Canal Tract".

At the annual meeting of the Association on the 23rd January 1935, the following office-bearers were elected: Mr. K. Ramiah, M.Sc., Paddy Specialist to the Government of Madras, *President:* Mr. V. Ramanathan, L.Ag., Cotton Specialist to the Government of Madras, *Vice-President;* and Dr. J. S. Patel, M.Sc. Ph.D., Oil Seeds Specialist to the Government of Madras, *Secretary.* The resolutions were passed, opposing the removal of valuable Botanical specimens from this country. The Retiring President, Mr. N. L. Dutt, Second Sugarcane Breeder, Imperial Cane Breeding Station, Coimbatore, delivered a very able address on "Recent advances in Sugarcane Breeding in India" illustrated with lantern slides.

28th January 1935:—Dr. J. A. Daji, Officer in charge of Soil Research, Sholapur, delivered a lecture on the "Decomposition of the green manure in soils".

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Indian Botanical Society.—At the annual meeting of the Indian Botanical Society held at Calcutta on January 4th, 1935, the following office-bearers were elected.

President (1 year): Dr. J. H. Mitter, M.A., Ph.D., F.L.S.: *Vice-Presidents* (1 year): Prof. P. Parija, M.A., I.E.S; Dr. S. R. Bose, M.A., D.Sc., F.L.S., F.R.S.E.; *Honorary Secretary* (3 years): Dr. E. K. Janaki Ammal, M.A., M.Sc., D.Sc., F.L.S.; *Members of the Executive Council* (1 year): (1) Dr. B. Sahni, M.A., D.Sc., Sc.D., F.G.S., F.A.S.B.; (2) Dr. P. C. Sarbadhikari, M.A., Ph.D., D.Sc., D.I.C.; (3) Dr. P. Maheshwari, M.Sc., D.Sc.; (4) Dr. T. Ekambaram, M.A., Ph.D. (5) Dr. M. A. Sampathkumaran, Ph.D.; (6) Prof. R. H. Dastur, M.Sc., F.L.S.; (7) Dr. S. P. Agharkar, M.A., Ph.D., F.L.S.; (8) Dr. K. C. Mehta, M.Sc., Ph.D.; (9) Dr. K. Bagchee, M.Sc., D.Sc., D.I.C.; (10) Mr. K. Biswas, M.A. Particulars regarding membership may be obtained from the Secretary. Dr. E. K. Janaki Ammal, M.A., D.Sc., Imperial Sugarcane Station, Lawley Road P. O., Coimbatore. Subscriptions for membership should be sent to the Treasurer and Business Manager, Prof. M. O. Parthasarathi Iyengar, M.A., Ph.D., F.L.S., Director, University Botany Laboratories, Teynampet, Madras.

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Biochemical Society, Calcutta.—A meeting of the Biochemical Society, Calcutta, was held on Wednesday, the 30th January, at the School of Tropical Medicine at 4-15 p.m. Dr. N. R. Chatterjee *et al* read a paper on "The effect of bacteriophage on the enzyme activity of vibrio choleræ" and Dr. B. C. Guha and Mr. A. R. Ghosh read a paper on "The biological synthesis of ascorbic acid (Vitamin C.)"

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The Executive Council of the Lucknow University has nominated Dr. Birbal Sahni of the Lucknow University as delegate to the third centenary celebrations of the Natural History Museum, Paris, which is being held about the last week of June 1935. Dr. Birbal Sahni will also represent the Lucknow University at the International Botanical Congress which is being held at Amsterdam in September 1935.

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Proceedings of the Association of Economic Biologists, Coimbatore, Vol. I, 1930-33.—This little pamphlet of about 100 pages contains an account of the transactions of the Association since the date of its inception in 1930. The activities of the Journal which were being recorded from time to time in the pages of the *Madras Agricultural Journal* have now been brought together within the covers of one volume in chronological sequence. The pamphlet represents a useful collection of abstracts of papers and lectures and since a good number of the observations communicated in abstract form does not appear to have been published as full scientific papers in any of the scientific Journals, this publication will form the only record of such observations. It is a matter for the publishers to consider whether in subsequent publications, it would not serve a more useful purpose if the contributions are grouped together under crop heads rather than arranging them in chronological sequence. Such an array will form a record of the progress of research under classified subjects. The abstracts, too, could be made fuller so as to include significant data.

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We are very happy to congratulate Dr. H. Chaudhuri, Ph.D., D.I.C., on his appointment as the Head of the Department of Botany Teaching in the University of the Punjab. The mantle of the late Rai Bahadur Shiv Ram Kashyap has fallen on worthy shoulders and we look forward for further progress in the department which has already a great reputation as research and teaching centre in India.

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We acknowledge with thanks the receipt of the following:—

"Journal of Agricultural Research," Vol. 49, No. 8.

"Journal of Agriculture and Live-stock in India," Vol. 4, Pt. VI.

"The Journal of the Royal Society of Arts," Vol. 83, No. 4287,

"Indian Journal of Agricultural Science," Vol. 4. Pt. VI.

"Contributions from Boyce Thomson Institute," Vol. 6, No. 4, Oct.-Dec. 1934.

"American Journal of Botany," Vol. 21, No. 10.

"The Journal of Institute of Brewing," Vol. 41. No. 1, Jan. 1935 and Supplementary Number containing title page, contents, Index, 1934, Vol. 40.

"Canadian Journal of Research," Vol. 2, No. 6.

"Chemical Age," Vol. 31. Nos. 808-809 ; Vol. 32, Nos. 810-812.

"Berichte der Deutschen Chemischen Gesellschaft," Vol. 67, No. 13, Vol. 68, No. 1.

"Journal of Indian Chemical Society," Vol. 11, No. 12.

"Indian Forester," Vol. 61, No. 1.

"Forschungen und Fortschritte," 11, Jahrgang, Nos. 1-3.

"Forest Bulletin, No. 87. 1934 (Silviculture Series) Von Wulfing's Yield Tables for Teak Plantations in Java," by H. G. Champian.

"Forest Bulletin, No 89, 1934. The Effect of Defoliation on the Increment of Teak Saplings," by H. G. Champian.

"Agricultural Statistics for India," Vol. 2, 1931-32. Area. Classification of area, Area under irrigation, Area under crops. Live-stock and Land Revenue assessment in certain Indian States.

"Transactions of the Mining and Geological Institute of India," Vol. 29, Pt. 3, December 1934.

"Indian Trade Review," Vol. 13, Nos. 73 to 74.

Department of Commercial Intelligence and Statistics in India—Statistical abstract for British India with Statistics where available relating to certain Indian States from 1922-23 to 1931-32.

Lanolin Rust Preventers (2nd Edition). Issued by the Department of Scientific and Industrial Research, Engineering Research Special Report No. 12. (H. M. Stationery Office, 1934.)

National Research Council, Canada, 17th Annual Report containing the report of the President and Financial Statement, 1933-34.

"Medico-Surgical Suggestions," Vol. 3, No. 12 ; Vol. 4, No. 1.

India Meteorological Department, Scientific Notes. Vol. 5, No. 60. A study of the Atmospheric Horizontal Visibility at Bangalore.

"Journal of the Indian Mathematical Society," Vol. 1, No. 3.

"Nagpur Agricultural College Magazine," Vol. 9, No. 2.

"Nature," Vol. 134, Nos. 3399 to 3400 ; Vol. 135, Nos. 3401 to 3403.

"The Journal of Nutrition," Vol. 8, No. 6.

"The Journal of Chemical Physics," Vol. 2, Nos. 11 and 12 ; Vol. 3, No. 1.

"Journal de Chimie Physique," Tome 31, No. 9.

"Physica," Vol. 2, No. 1, January 1935.

"Science Progress," Vol. 29, No. 115.

"The Indian Trade Journal," Vol. 155, No. 1490 ; Vol. 116, Nos. 1491 to 1493.

Imperial Institute of Veterinary Research, Annual Report, 1934.

CATALOGUES.

Bailliere Tindall & Cox.—Publications in Medicine and Sciences, October, 1934.

Cambridge University Press, Cambridge Spring Books, January to July 1935.

Academies.

National Institute of Sciences of India.

At the first ordinary general meeting of the National Institute of Sciences of India held in the rooms of the Asiatic Society of Bengal, 1, Park Street, Calcutta, at 11 a.m. on the 8th January 1935, the papers mentioned below were read :

(i) "Synopsis of the Pre-Vindhyan Geology of Rajputana," by Dr. A. M. Heron, D.SC., F.R.S.E. (ii) "Physiology, Bionomics and Evolution of the Air-Breathing Fishes of India," by Dr. S. L. Hora, D.SC., F.R.S.E., F.A.S.B. (iii) "Problems of the Solar Corona," by Prof. M. N. Saha, D.SC., F.R.S., F.A.S.B. (iv) Ionospheric Height Measurements at Allahabad," by Mr. G. R. Toshniwal (communicated by Prof. M. N. Saha). (v) "On the Electron Theory of Metals," by Dr. R. C. Majumdar, PH.D., University of Lahore (communicated by Prof. M. N. Saha). (vi) "On Symmetrical Space with Minimum rate of expansion," by Prof. N. R. Sen. (vii) "New facts regarding infection of Citrus by *Colletotrichum glecsp roides*," by Dr. H. Chaudhuri, Lahore. (viii) "Synthetic Enzyme." by Prof. H. K. Sen and Mr. Sobhanlal Banerji. (ix) On the question of the Expansibility of Zero in the series of Legendre functions having non-integral parameters," by Prof. Ganesh Prasad. (x) "On the Cataphoretic Speed and Inorganic Colloids," by Prof. J. N. Mukherjee, Mr. S. G. Chaudhuri and Mr. B. N. Ghosh. (xi) "On Mon and Munda in India and beyond," by Dr. J. H. Hutton, C.I.E., M.A., D.SC., F.A.S.B., I.C.S.

Physiology, Bionomics and Evolution of the Air-Breathing Fishes of India. By Dr. S. L. Hora, Zoological Survey of India.—The fresh-water fishes of ponds, pools and marshes in this country, as in the tropics generally, are subjected, as a result of the marked periodicity of the dry and wet seasons, to extreme conditions of drought for prolonged periods. The shallow waters become very foul and are often liable to complete desiccation. As a result a number of fishes have adapted themselves to aerial respiration, so that the deficiency in the oxygen contents of the water does not affect their lives to any very great extent.

The fresh-water air-breathing fishes of Bengal have been extensively studied since 1830 and have been the subject of considerable experimental work. Fishes kept in aquaria and prevented from coming to the surface to breathe air were "drowned" in the earlier experiments, but if a larger vessel is employed or the water is kept