Science Notes.

The Central College Mathematical Society.—This Society whose primary object is "to stimulate and encourage the study of. and research in, the field of contemporary mathematics", was recently inangurated at Bangalore. The programme of the Society includes monthly meetings for the reading of original papers and weekly discussions on selected topics, the discussion being initiated by a member who has made an intensive study of the subject. It is also proposed to hold special discussions from time to time on problems of mathematical interest. The organisers welcome co-operation from all those interested in mathematics.

The inaugural address of the Central College Mathematical Society was delivered by Prof. K. S. K. Iyengar on the 3rd September 1934, Prof. B. Venkatesachar presiding. "Mathematical Philosophy" formed the subject of the address.

In the course of the address Prof. K. S. K. Iyengar pointed out that all arguments based on our experience show that they depend upon two important elements for their validity, sense data and certain general principles forming a group of intuitive truths, that is, they belong to the *a priori* aspect of our knowledge and cannot be proved or disproved although we come to realise their truth by experience. The elements of the *a priori* knowledge are called universals which in ordinary language mean qualities and relations. Whether universals and a knowledge of their relations being not empirical, are purely mental is a very important question. To assert that they are purely mental would lead one to great difficulties (Kantean doctrine) in the theory of knowledge. This difficulty is solved in Indian Philosophy by the assumption of an unchanging Universal Mind (*Mahat*) of which our minds are in some way parts.

The Professor then passed on to a detailed examination of the elements and methods of procedure in mathematics, stressing on the importance on the serial order. The fruitfulness of a critical examination of postulate systems with special reference to geometry, was pointed out.

"I may say that the essence of mathematical procedure is the postulation method and hence rigour is of the utmost importance in mathematics. Whenever anyone asks us whether mathematics deals with truth, we can only reply to him that we are all concerned here in drawing implications of a set of assumptions and there our business ends. No doubt we construct, out of our Universals, all possible worlds, but we do not know whether such worlds exist in the ordinary sense of the word in which I may say that we exist. True research of a high order in mathematics is in building up of such synthetic structures of relational Universals. Some of these structures may be of use some time later, in building up the theories of experimental sciences as, for example, the theory of groups and matrices has proved to be, in modern quantum mechanics." He concluded with a very appropriate quotation from Lord Russell that pure mathematics (or logic which is the same thing) aims at being true in the true Leibnitzian phraseology in all possible worlds and not merely in this higgedly-piggedly job lot of a world in which Chance has imprisoned us.

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Twenty-ninth Half-Yearly Meeting of the Indian Central Cotton Committee.—The meeting was held on the 28th and 29th August with Diwan Bahadur Sir T. Vijayaraghavacharya, Vice-Chairman of the Imperial Council of Agricultural Research, in the Chair. Among the important subjects that came up for discussion, were (1) the immediate need for legislative measures to rid the cotton industry of the prevailing malpractices of watering and mixing of cotton which were widely condemned by leading cotton merchants and firms in Bombay; (2) the cultivation of improved varieties of cotton in the Barrage areas of Sind; (3) the campaign for extension, seed distribution and marketing of pure Sind-American Cotton; (4) and the future policy to be adopted in the case of the Institute of Plant Industry.

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Asiatic Society of Bengal.—An ordinary meeting was held on Monday, 3rd September. Several valuable exhibits were shown and commented upon. Among them may be mentioned:—(1) Exhibition of four specimens of Deccan trap Basalts and Dolerites from the Chhindwara District, Central Provinces, by Dr. L. L. Fermor, (2) The Bahjoi Meteoric Iron, by Dr. M. S. Krishnan, (3) The Khanpore Meteorite by Dr. M. S. Krishnan, (4) Photographs of sun-shades for fishes, by Dr. S. L. Hora, (5) Three small Bronzes from West Africa, by Dr. S. K. Chatterjee, and (6) Three China Plates representing the three famous Buddhist Pilgrims, by Mr. Johan van Manen.

A course of four lectures by eminent scientists of the country were arranged under the auspices of the Society, at Calcutta during August and September. They were designed to convey instructive and interesting information in attractive form to a general cultured audience not necessarily composed of specialists.

(1) Trade in Live Fish (*Jiol Machh*) in Calcutta, by Dr. S. L. Hora (31-8-1934):—A great volume of trade in live fish has been built up in Calcutta which annually receives over 50,000 maunds of this article of food from the outlying deltaic stations. Fish is generally popular among the major sections of population in Bengal and if live fish can be obtained, there must naturally be a great demand for them on account of their greater flavour and nutritive qualities.

The consignment produced in the market represents a group of animals belonging to different families and their transportation to Calcutta from various mofussil centres is rendered possible by their capacity to breathe atmospheric air as well as water. They can be easily carried in large numbers in suitable cases in a live state. Dr. Hora dwelt at length on old methods of distributing the fish and described the present-day means. He drew attention to the several ways in which the imported fish and the local produce are distributed and in passing, touched on the culinary processes of preparing these articles for the table. Reference was made to the trade statistics together with remarks on the social and economic

conditions of the people engaged in this traffic. The periodic fluctuations in the trade which must necessarily affect both the consumer and the producer are accounted for by investigations into the general and seasonal habits of the fish.

Dr. Hora has offered practical suggestions for improving the quality of the fish offered for sale, which must be beneficial both to the consumer and the tradesman. Generally the live fish produced for sale in the Calcutta markets, go involuntarily on hunger strike tending to great slimming thereby impoverishing their nutritional value. One of the suggestions made by Dr. Hora for the preservation of fish in their proper condition till the time of disposal, is to investigate the natural food of the fishes and prepare nearly the same food or a good substitute on which they could be fed during the period of captivity.

(2) The North Bihar Earthquake of the 15th January 1934, by Mr. J. B. Auden (7-9-1934):—The lecture summarises the results of an investigation in the field of Mr. Wadia, Dr. Dunn, Mr. Ghosh, and the lecturer. The description of the severe damage caused by the earthquake regards two main zones: firstly, the central zone represented by the epicentral tract and the slump belt; secondly, the bordering Patna-Monghyr belt and the Valley of Nepal. A brief discussion of the more general effects of the earthquake, such as emission of sand and water, landslides, etc., is followed by an account of the possible causes, comparison being made with other recent Indian earthquakes. Finally, the lecture ends by discussing the time of the earthquake as deduced by seismographic records, and the question of future immunity in Bihar.

(3) The Fundamental Constituents of Matter by Dr. Meghnad Saha (15-9-1934):—The lecture will describe discoveries of the Electrons and the recent discoveries of the Positrons and the Neutrons. It will also deal with the probable existence of other probable fundamental particles as Dirac's Free Magnetic Poles and the probable effect of their existence on our views regarding the electro-magnetic origin of mass. The lecture will also deal with the nature of cosmic rays, the probable existence of a world of anti-atoms, and also certain other cosmological problems of fundamental importance.

(4) The Shan Hinterland: the country and its people, by Dr. M. R. Sahni (21-9-1934):—The speaker will give a talk on the prolific and amazing variety of tribes inhabiting the Shan States of Burma and deal briefly with their geographical distribution, their more interesting customs and traditions.

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Mr. D. Narayanamurti, M.Sc., A.I.C., A.I.I.Sc., A.Inst.P., of the Forest Research Institute, Dehra Dun, has been awarded a scholarship by the Deutsche Akademie. Mr. Narayanamurti will be sailing for Germany from Bombay on the 8th October. During his stay he proposes to devote most of his time to research on the seasoning of timber and to the study of X-ray technique as applied to the study of the properties of fibrous materials.

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Mr. V. Ramanjalu Naidu, Temporary Demonstrator in Physiology of the Medical College, Mysore, and a Medical Graduate of the Mysore University, has been awarded the Fellowship in Pathology by the Mayo Foundation, Rochester, U. S. A. He sailed for America *via* England on the 18th August 1934.

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We understand that Mr. G. B. Patel, a cotton breeder of Gujerat, has been granted a scholarship by the Central Cotton Committee for training in cotton breeding in U. S. A., for 2 years.

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Dr. D. R. Sethi has been confirmed as Director of Agriculture, Bihar and Orissa, in succession to Mr. G. S. Henderson.

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Dr. MacLagan Gorrie, D.Sc., I.F.S., of the Forest Research Institute, Dehra Dun, has been awarded the Leverhulme Fellowship, 1934, for carrying out researches on "The Correlation of Erosion Damage and Grazing in Forests".

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The Academic Council of the Muslim University has conferred its first Ph.D. Degree on Mr. Omar Farooq for a thesis entitled "The Directive Effect of Substituents on the Thiazole Cyclisation of S-Diarylthio carbamides by Bromine".

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The Cauvery-Mettur Project was inaugurated by His Excellency Sir George Stanley on 21st August. The scheme consists of a dam which is the largest in the world and which forms a reservoir to store the flood waters of the Cauvery and supply water to the delta as and when necessary. The reservoir, besides benefitting the ryots of the Tanjore District by ensuring a steady supply of water, provides for the irrigation of a new area of 301,000 acres in the Tanjore District.

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University of Mysore.—The Seventeenth Convocation of the University of Mysore, for conferring degrees, will be held in the Pavilion, Jaganmohan Palace, Mysore, on Wednesday, the 31st October 1934, at 9 a.m.

Admission to the Convocation Hall will be by tickets and intending visitors should apply previously in writing to the Registrar, University of Mysore, Mysore, for the tickets, giving name and occupation. No ticket will be issued for school children. In view of the very limited accommodation available, applications made by any one for more than one Visitor's Ticket cannot be complied with.

Candidates for degrees desirous of bringing a guest, should apply for tickets previously, giving name and occupation of guest. Applications will be complied with to the extent of accommodation available and not more than one guest ticket will be given to any one candidate. Applications should be made before the 15th October 1934.

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Cotton Breeding in Madras.—The Madras Herbaceum Scheme financed by the Central Cotton Committee, has for its objective the evolving of a strain possessing the yield, ginning and spinning qualities of Karunganni, *Gossypium indicum* and the colour and root system of Uppam *Gossypium herbaceum*. Whereas the former yields and gins higher its lint is not so white as that of Uppam and thrives well only in years of good rainfall, the latter type grows even in years of moderate drought. The farmer generally grows the two cottons together as an insurance against a bad season but the inevitable indiscriminate mixing lowers the value of a fine cotton.

The research was started in 1923 and during the first few years attention was concentrated on the isolation of pure lines. Hybridization work is now in progress and although several interesting results have been obtained, it is too early to give a definite verdict on the success or otherwise of the investigation.

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A copy of *Marriage Hygiene*, a new journal devoted to a scientific exposition of sex problems, has been sent to us. Edited by a board of eminent medical men of Bombay the magazine contains contributions from Havelock Ellis, Marie Stopes, Julian Huxley and other eminent scientists who have devoted their energies to educating public opinion concerning sex and sex problems. The Journal is printed by the Times of India Press, Bombay, and the get-up is neat and attractive. It is a welcome addition to Indian Scientific journalism and we wish it a career of usefulness.

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Mechanical Properties of Bricks and Brickwork Masonry. (Building Research Special Report No. 22. H. M. Stationery Office, Price, 1*s.* 5*d.* Post free.)

This special Report describes an investigation which was carried out with the object of collecting information on the mechanical properties of typical bricks and brickwork in use in Great Britain. It was deemed particularly necessary as no authoritative work on the subject has been published since 1905. The test results covering a wide range are collected together in a series of valuable tables. Data on other physical properties are given in an appendix to the report.

* * *

Abnormal Development of the Radicle in Mango.—Mr. Tarachand Nandi, Bangabasi College, Calcutta, *writes*; "The germination of the mango ordinarily takes place by the bursting of the hard endocarp and the radicle comes out through it on having sufficient moisture and other necessary conditions of germination but in the specimen under consideration, while the mango was still a perfect fruit with epicarp, mesocarp and endocarp, the development of the radicle has considerably progressed. The fruit was perfectly ripe and on the removal of the epicarp and fleshy mesocarp, the radicle was seen to have developed to 3·6 inches and the endocarp showed slight bifurcation.

The probable explanation is sought by the writer to be unfavourable condition of the soil. Such a form of germination is known in the case of viviparous mode of plant-life.

"The hard endocarp is 4·8 inches long and 2·5 inches broad and is popularly known by the name of Fuzli variety of mango; whether it should be explained as viviparous or not requires further investigation. The specimen has been preserved in the Biological Laboratory of the Bangabasi College, Calcutta."

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Aerial Roots in Vitis quadrangularis, Wall.—Mr. S. A. Parandekar, M.Sc., of the Biology Department, Rajaram College, Kolhapur, writes: "An interesting phenomenon of the presence of aerial hanging roots as those in Banyan (*Ficus benghalensis*, Linn.) has been observed in *Vitis quadrangularis*, Wall.

"The plant is being trained on a greenhouse, along with a few others, *e.g.*, Ipomea, Dioscorea, etc. It has gone on the top of the structure (12 ft. high) and spread up extensively; from there it gives off a number of adventitious hanging roots, reminding one of the Banyan plant so commonly met with. A few of such roots are also given off from the lower portions of the plant and they have already entered the soil.

"The plant is known for its quadrangular simpodial stem with stem-tendrils which are leaf-opposed. Now it is found that the adventitious roots mentioned above arise at the nodes from any of its sides which are not occupied by the tendril or the leaf, as shown in the accompanying diagram. A reference to the relevant literature at hand, however, fails to cite the phenomenon; it is thought proper, therefore, to record it as the same might prove of interest to many."

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A Statistical Study of the Maximum Temperatures at Poona (*R. J. Kalamkar*).—This paper deals with the analysis of Maximum Temperature at Poona from 1880 to 1931. The coefficient of variability of mean monthly maximum temperature is comparatively higher for June and October which are characterised by the setting in and withdrawal respectively of the south-west monsoon. The values of the correlation coefficients for the neighbouring months of autumn and winter are high. Regression equations for forecasting temperatures for the five seven-day periods, *viz.*, November 27—December 3rd, December 4th—December 10th, December 11th—December 17th, December 18th—December 24th and December 25th—December 31st, are obtained from the weekly temperatures of the preceding four weeks.

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We acknowledge with thanks the receipt of the following:—

"Actualites Scientifiques et Industrielles," Nos. 109, 113; 115, 116, 119, 133, 135, 136, 141, 147, 150, 155, 157, 158, 162.

"Journal of Agricultural Research," Vol. 48, Nos. 7–10.

"Memoirs of the University of Cambridge School of Agriculture," No. 6.

"Journal of Agriculture and Livestock in India," Vol. 4, Pt. 4.

"Indian Journal of Agricultural Science," Vol. 4, Pt. 3 and Index to Vol. 2, 1932.

"Biochemical Journal," Vol. 28, No. 3.

"American Journal of Botany," Vol. 21, No. 7.

"Canadian Journal of Research," Vol. 2, No. 1 and Vol. 10, Jan. to June 1934, Index.

"Chemical Age," Vol. 31, Nos. 785—790.

"Berichte der Deutschen Chemischen Gesellschaft," Vol. 67, No. 8.

"Journal of the Indian Chemical Society," Vol. 11, No. 6.

"Experimental Station Record," Vol. 70, No. 6; Vol. 71, No. 1.

"Educational India," Vol. 1, No. 2.

"Indian Forester," Vol. 60, Nos. 8 and 9.

"Forschungen und Fortschritte," Jahrgang 10, 20/21, 22, 23/24.

"Indian Forest Records," Vol. 20, Pts. 7, 8 and 9.

"The Quarterly Journal of the Geological Mining and Metallurgical Society of India," Vol. 5, No. 4; Vol. 6, Nos. 1 and 2.

"Transactions of the Mining and Geological Institute of India," Vol. 29, Pt. 2.

"Monthly Statistics of the production of certain selected Industries of India", April, May and

June 1934. Government of India Publications, Nos. 1, 2 and 3 of 1934-35.

"Medico-Surgical Suggestions," Vol. 3, Nos. 7 and 8.

"Journal of the Indian Mathematical Society," Jubilee Commemoration Volume 20.

"Nature," Nos. 3376-3381 and Index to Vol. 133 Jan.—June 1934.

"Journal of Nutrition," Vol. 8, Nos. 1 and 2.

"The Journal of Chemical Physics," Vol. 2, No. 7.

"Journal de Chemie Physique," Tome 31, Nos. 6 and 7.

"Indian Journal of Physics," Vol. 8, Pts. 5 and 6.

"Review of the Scientific Instruments," Vol. 5, No. 7.

"The Indian Trade Journal," Vol. CXIV, Nos. 1466-1472.

Forthcoming Events.

Society of Biological Chemists, India.—The following papers will be presented during September and October:-(1) 28-9-1934. Mr. R. H. Ramachandra Rao, M.Sc., "The Influence of Aeration in the Diastatic Activity of Steeped Barley" at the *Indian Institute of Science, Bangalore.* (2) 5-10-1934. Mr. B. H. Krishna, M.Sc., A.I.C., "Colloidal Medicaments" at the *Central College, Bangalore.*

Reviews.

"THE SILVER JUBILEE COMMEMORATION VOLUME" of the Indian Mathematical Society.

The Indian Mathematical Society celebrated its Silver Jubilee in December 1932 at Bombay. The twentieth volume of the *Journal of the Society* is published as the Commemoration Volume. The volume contains a report on the progress of the Society during these twenty-five years. It also contains a number of interesting papers contributed by Indian scholars and well-wishers of the Society, on various subjects in Mathematics.

Prof. Watson contributes a paper on the proofs of certain identities in combinatory analysis which are connected with the famous Roger-Ramanujan identities in combinatory analysis. The author uses Ramanujan's notations in the course of the proof. S. S. Pillay has determined the true order of the sum-function of the number of prime factors of n and another allied function with and without the Riemannian hypothesis. E. H. Neville contributes a big paper on "*Iteratine interpolation*". E. T. Bell has contributed a paper on an algebra of numerical compositions. S. M. Shaw has determined upper and lower bounds of $\frac{A(n)}{n}$ in a closer manner than Behrend where $A(n)$ denotes the number of abundant numbers less than n. G. A. Miller has constructed an infinite system of groups possessing certain given properties and has shown every group possessing certain properties can be extended to a group belonging to the infinite system. K. Ananda Rao has studied some more properties of the elliptic modular function in the neighbourhood of its line of singularities. C. N. Sreenivasaiengar has contributed a paper on the singular solutions of ordinary differential equations of second order. K. Venkatachaliengar has given a simple general method of constructing series whose terms and sum-functions are continuous in an interval and which converges non-uniformly in every sub-interval. S. Chowla has obtained the orders of certain expressions which occur in connection with Waring-Hilbert theorem.

C. V. H. Rao has given a purely projective definition of the ϕ-Conic. T. Hayashi has solved an ancient Japanese mathematical problem. W. Blaschke has proved that a hexagonal 4-web of surfaces is except for topological transformations uniquely determined by three functions each of one variable. D. D. Kosambi has contributed an interesting paper on "*The Problem of* Differential Invariants". B. Ramamoorti has given a "Covariant specification of the simplex inscribed in a rational norm curve in a space of odd dimensions and circumscribed to a conic inpolar to the Curve". S. Krishnamoorty Rao has studied how quadrics and subregions in a space of degree n are transformed by a given point collineation. A. A. Krishnaswamy Iyengar has contributed some results in connection with oriented circles. Ram Behari has obtained the condition that the osculating quadric of a skew ruled surface be equilateral and has also obtained a new geometrical meaning for the Laguerre function. G. P. Rao has given a method computing Gravity Anomalies. M. Raziuddin Siddiqi has proved the existence and uniqueness of the solution