# SCIENCE NOTES.

**Coronation Honours.**—The names of the following men of science are to be found in the list of the recipients of the Coronation Honours :—

*C.I.E.*—Lieut.-Col. C. Newcomb, Chemical Examiner to the Government of Madras; Mr. J. F. Blackiston, Director-General of Archæology in India; Mr. F. Ware, Officiating Expert Advisor in Animal Husbandry to the Imperial Council of Agricultural Research, New Delhi.

*Knighthood.*— Brigadier H. J. Couchman, Surveyor-General of India; Col. Arthur Alver, Expert Advisor in Animal Husbandry to the Imperial Council of Agricultural Research.

*Dewan Bahadur.*—Dr. B. Sundar Raj, Director of Fisheries, Madras.

*Rao Bahadur.*—Prof. K. Ananda Rao, Presidency College, Madras.

*Rai Bahadur.*—Mr. Ramalal Sethi, Economic Botanist to Government, Government Research Station, Shahjanpur, U.P.; Dr. Sundarlal Hora, Zoological Survey of India, Calcutta; Dr. Karamchand Mehta, Professor of Botany, Agra College, Agra.

*Rao Saheb.*—G. K. Kelkar, Deputy Director of Agriculture, Southern Circle, Nagpur.

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**Spinning Tests on Mixtures of Staple Fibres and Indian Cottons.**—Dr. Nazir Ahmed, Director of the Technological Laboratory, Indian Central Cotton Committee, has written an interesting report (*Technological Bulletin Series*—A, No. 36) on spinning tests carried out on mixtures of staple fibres and Indian cottons. In the Introduction it is pointed out that the past few decades have witnessed a large increase in the use of artificial fibres as a supplement to, or substitute for, natural fibres, in which rayon silk has held the first position. Rayon produced in short definite lengths, called staple fibre, went up from 8 million pounds in 1931 to 21 million pounds in 1932 and then to 156 million pounds in 1935 which represented 15 per cent. of the total rayon output. This large increase is attributed to the fact that staple fibre possesses uniform length and cross-section, it is clean and therefore there is very little waste and it does not adhere to the machine. But the more important reason is that it can be mixed and blended with cotton, wool, flex and silk and spun on the existing machines with some minor adjustments. The spinners, weavers, dyers and finishers can therefore produce a wide range of effects with it.

The Bulletin gives full details of the machinery employed in these tests and the results obtained are described and discussed in detail. It is hoped that it will be found useful by the industry. It can be had from the Secretary, Indian Central Cotton Committee, 'Vulcan House', Nicol Road, Ballard Estate, Fort, Bombay, at 8 as. per copy.

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**The Sugar Committee of the Imperial Council of Agricultural Research**, held a two-day session (May 3rd and 4th) to discuss the various problems affecting the sugar industry. Sir Bryce Burt presided. The Committee considered the serious situation arising from the alarming expansion of the acreage under cane, resulting in the production of cane far in excess of that for which there is effective demand. In this connection it is hardly realised that the cane crushed in factories for manufacturing white sugar is 11½ million tons, which is only about 16 per cent. of the cane produced in the country. Some 12 million tons are consumed mostly by chewing and no less than 43¾ million tons go into the manufacture of *gur*. An enormous quantity of cane is still left over. In a contribution appearing in the '*Hindu*' (May 1) Mr. D. P. Khaitan has given some interesting details regarding the Indian Sugar Industry. The production of sugar in India in 1932, when protection was granted was 158,581 tons, and 516,200 tons valued at about 6 crores of rupees were imported from abroad. It is roughly estimated that the annual consumption at present is nearly 12 lakhs tons, and in 1935–36, no less than 1,166.000 tons of sugar were produced in the country, the production being almost equal to the annual consumption. The acreage under cane was 3,076,000 in 1931–32, and in 1936–37 the acreage rose up to 4,431,000. It is estimated that no less than 2 crores of the whole population of India is dependent on the cultivation of sugarcane and the total amount paid to the cultivation of sugarcane used in the factories during the last year, 1935–36, alone came to Rs. 8 crores.

The distribution of the area under sugarcane in India is ill-ordered. The prevailing system of land tenure and the existence of small holdings constitute a handicap. The cultivation of canesugar should be spread over specially marked zones so situated that particular factories can draw the raw material they require from those zones; in other words the factories should enjoy a situational advantage. How best this could be secured, was one of the problems which was carefully considered by the Committee.

The Sugar Committee approved of the proposals for carrying out a proper marketing survey of sugar on the same lines as those adopted for the wheat survey. The Committee also considered the research programmes and work now in progress in the various experimental stations for evolving improved varieties of cane. The subject of utilisation of molasses was also considered; further trials relating to (1) the preparation of silage by mixing molasses with fibrous fodder and (2) the utilisation of molasses as a road-surfacing material will be carried out in order to relieve the sugar industry from the dead-weight of its by-product.

It is understood that representatives of the sugar industry have urged on the Government, the need for constituting a Central Sugar Committee on the lines of the Indian Central Cotton Committee to co-ordinate and guard the interests of the industry, by research, propaganda and other methods.

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**Red Palm Oil.**—"The nutritive value and cost of the Red Palm Oil" is the subject of a communique recently issued by the Director of Public Information.

The oil derived from the fruit of the West African Palm, *elais guineensis*, is very rich in

carotene, the precursor of Vitamin A. Chemical tests conducted by Lt.-Col. R. E. Wright, I.M.S., Professor of Ophthalmology, Government Ophthalmic Hospital, Madras, have shown that red palm oil is as effective as cod liver oil in the treatment of several cases of human keratomalacia. In a number of cases rapid improvement took place in cases which remained living under the identical domestic conditions in which they had developed the syndrome, the only change in their daily routine being the addition of red palm oil emulsion to their diet. In addition, the progress of cases in hospital on red palm oil and cod liver oil was carefully compared. While Colonel Wright points out that clinical investigations of this nature are necessarily less clearly defined than laboratory investigations under carefully controlled conditions, he has nevertheless fully convinced himself of the effectiveness of red palm oil. The decision of so experienced a worker can be accepted as conclusive.

If red palm oil cures keratomalacia, then its carotene must be capable of satisfying the daily Vitamin A requirements of human beings.

Considering the costs, it has been calculated that the amount of Vitamin A purchasable for a given sum in the form of red palm oil will be about 3 times greater than that purchasable in the form of cod liver oil. The fact that red palm oil contains little or no Vitamin D, unlike cod liver oil, is not necessarily a drawback to its use in countries where Vitamin D is supplied by abundant strong sunlight and rickets is rare. In India, it could be used in the South and other parts where Vitamin A deficiency is common and Vitamin D deficiency not a serious problem.

The question of introducing the palm *elæis guineensis* into South India should receive attention on the part of agricultural authorities. The climate of South India would probably be suitable for its cultivation.

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**The Statistical Institute.**—The Annual General Meeting was held at Calcutta on the 27th April with Mr. S. P. Mookerji in the chair. The report of the research work done during the year comprises a variety of subjects such as, Agricultural Statistics, Biometry and Anthropometry, Economic Statistics, etc. Over 100 statistical enquries from all over India were attended to during the year. An important decision was reached to start an All-India Statistical Conference to be held in January 1938, and a Working Committee was formed to work out the details. With the help of the Calcutta University, arrangements have been made to invite Prof. R. A. Fisher of London, to visit India next winter.

Sir E. C. Benthall was re-elected President and Dr. P. N. Banerji, Sir George R. Campbell, Mr. D. P. Khaitan, Dr. John Matthai, Mr. S. P. Mookerji, Dr. C. W. B. Normand, Sir. C. V. Raman, Lala Shri Ram, Prof. M. N. Saha, The Hon'ble Mr. Nalini Ranjan Sarkar, and Mr. B. M. Sen were elected Vice-Presidents. Dr. Satya Charan Law was re-elected Treasurer.

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**Indian Chemical Society.**—At the ordinary meetings of the Society held on 4th March and on 23rd April at the University College of Science, Calcutta, the following were admitted as Fellows :—

(1) D. G. Walwalkar, M.Sc., *Cawnpore*; (2) M. A. Saboor, M.Sc., *Calcutta*; (3) Dr. U. Basu, D.Sc., *Calcutta*; (4) Dr. P. B. Sarkar, D.Sc., *Calcutta*; (5) A. Kamal, M.Sc., *Calcutta*; (6) Sisir Kumar Guha, M.Sc., *Patna*; (7) N. N. Chopra, M.Sc., *Lahore*; (8) Aree Supol, B.Sc., *Bangkok* (Siam); (9) Dr. R. K. Dutt-Roy, Dr. Ing., *Calcutta*; (10) S. A. Qureshi, B.Sc., *Peshawar*; (11) R. G. Chatterjee, M.Sc., *Darjeeling*; (12) D. P. Chatterjee, M.Sc., *Howrah*; (13) Dr. J. C. Bardhan, D.Sc., *Calcutta*; (14) G. N. Banerjee, B.Sc., *Bombay*; (15) M. Abdul Hamid, M.Sc., *Bombay*; (16) Narendra Chandra Deb, M.Sc., *Sylhet*; (17) Dr. R. C. Hoon, M.Sc., Ph.D., *Lahore*.

Dr. S. P. Roy Chaudhuri, delivered a lecture on the 23rd April on "The Nature of laterite and lateritic soils"; Prof. J. N. Mukherjee presided.

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**Hyderabad Geological Survey.**—*Bulletin* No. 2 recently published by the Geological Survey, Hyderabad (Deccan), under the authorship of Mr. Khurshid Mirza, Director, gives a brief outline of the geological history of Hyderabad State, with special reference to its mineral resources. In the course of the first 30 pages, the author gives a connected account of the main geological features of the State incorporating all the information hitherto collected; and in the latter half of the *Bulletin* which covers another 30 pages, attention is drawn to the deposits of economic value, of which a large number and variety have been located. The *Bulletin* will doubtless be found very useful by those who wish to have a general idea of the geology of this State, and the geological map given at the end greatly adds to the value of the publication.

Volume III, Part I of the *Journal of the Hyderabad Geological Survey*, which has also been recently published, contains three sections of which Section A is by far the biggest and deals with the geology of the eastern portion of the Raichur Doab, with special reference to the granodioritic phases of the Dharwar series of rocks. The paper embodies the work done in this area by the several officers of the Survey and gives an elaborate account of the various rocks met with in this part of the country representing the Dharwars, the Peninsular Crystalline Complex, and the Kurnool Series of Sedimentaries. The petrology of some of the more interesting rock groups such as the granodiorites and the pseudo- and quasi-charnockites has been studied in some detail and certain interesting conclusions drawn. Section B deals with the salinity in relation to soil and geology in Raichur District, and in Section C, we have an account of the Bore Well logs in Aurangabad and Parbhani Districts, discussed in relation to the distribution of underground water in the Deccan traps.

The *Journal* is well got up, and is profusely illustrated with maps, sections and photographs.

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**Asphalt Mastic for Roofing.**—The modern demand for waterproof flat roofs has given prominence to a number of problems connected

with the use of asphalt mastic as a roofing material. A recent report published by H. M. Stationery Office (*Building Research Special Report* No. 25, Price 9*d.*) brings together in convenient form the available information on the properties of the material and methods of testing it. The construction of the sub-roof and the laying of the mastic are described in full and a feature of the report is a set of drawings illustrating accepted practice as regards associated details. In the absence of a standard specification for the formulation of which present-day knowledge does not suffice, recommendations are made as to the selection of materials and the precautions to be taken in their use.

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**Cytological Technique for Plant Breeders.**—As Sir Daniel Hall says in a brief foreword to this Bulletin, a knowledge of cytology and some acquaintance with its technique has become essential to the plant breeder. The aim of the publication is to give an account of the standard methods used in plant cytology and it is based on practical experience with these methods rather than on a survey of the literature.

After an introduction dealing with the value of cytology in plant breeding and some general remarks on technique, the Bulletin describes in turn the paraffin method, including staining with iron-alum hæmatoxylin and with gentian violet, the aceto-carmine technique (a method particularly useful for plant breeders) and smears with standard fixatives and stains. Hints are given on the use of the microscope and the Bulletin concludes with a list of fixatives with formulæ and a short bibliography.

While the Bulletin has been prepared for the benefit of plant breeders, it is of course equally suitable for anybody wishing to learn these standard methods; the modest price is worth mention in this connection.

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**Tooth Decay Studied by X-Ray Absorption of Tooth Slabs.**—New data with regard to normal and pathological tooth conditions have recently been obtained by Drs. H. C. Hodge, S. L. Warren, G. Van Huysen and associates, of the Dental Research Group at the University of Rochester School of Medicine and Dentistry, by the use of thin tooth slabs which are surface-ground plano-parallel by the BAUSCH & LOMB OPTICAL Co. with a variation of not more than $\pm 0{\cdot}01$ mm.

Attempts by other investigators to study changes in dentine by X-ray absorption have been limited because tooth slabs were not sufficiently thin or plano-parallel, thus reducing the precision of film density measurements.

In the present method several slabs of teeth, about 1 mm. thick, are obtained by slicing a tooth longitudinally through its centre by means of two parallel, corundum-vulcanite disks on a watchmaker's lathe, after which they are ground plano-parallel.

Dr. Hodge and his associates are seeking the answer to tooth decay by a study of the physical, chemical, and structural make-up of the tooth and the effect of diet and heredity. Some of the properties measured have been hardness, X-ray absorption and diffraction, chemical composition, density, refractive index, and the sizes of the tiny calcified rods that make up tooth enamel, and the smaller tubules that run out from the tooth pulp through the dentine.

According to their report, when menaced by decay or wear the tooth protects its health by building a dike of calcified material between the danger zone and the living pulp. These changes can be measured by X-ray study of the plano-parallel tooth slabs whose thickness does not vary more than 1/2500 of an inch.

When teeth wear down, exposing the dentine, the tooth closes the inner end of the tubules affected by building a plug of dentine which is as transparent as glass. To measure the hardness of these areas the surface of the tooth is illuminated with vertical polarized light which shows the transparent area as a dark area on a white background.

These studies have disclosed, among other things, that some teeth are as hard as mild steel and that dentine is as hard as brass.

By the use of the thin tooth slab, which may be X-rayed at will, the limits of accuracy and reproducibility of the method may be measured quantitatively, an achievement which has not been possible in living material.

The substitution of monkey teeth, which are nearest the human type and which suffer the same diseases, are to be included in future studies. The question as to whether soft teeth decay more rapidly than hard ones, and why, will not be answered until some 2,000 additional teeth are studied.

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**Attempt on Nanga Parbhat.**—The members of the second German Expedition to conquer Mt. Nanga Parbhat consisting of Dr. K. Wein (leader) and eight others are now in India and will start the climb after reaching Gilgit, by about the end of May. It is anticipated that the climb will lost about 4 weeks.

It will be recalled that an attempt was made by a German party three years ago but the attempts were foiled by the early onset of monsoon. The expedition also lost four of its members in a snow-storm. The present party consists of Prof. C. Troll and Dr. H. Hartmann, eminent geologists, who propose to collect scientific data during the climb.

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**Statistical Abstract for British India.**—The Government of India have recently issued the *Statistical Abstract for British India* with statistics, where available, relating to certain Indian States for 1924–25 to 1933–34. This is the 13th issue of the *Abstract*. The statistics presented relate to a variety of subjects such as Area and Population, Police and Prisons, Registration, Finance, Coinage and Currency, Banks, Municipalities, District and Local Boards, Education, Press, Co-operative Societies, Agriculture and Law, Forests, Port Trusts, Emigration, Vital Statistics, Road, Railway and Steamer communications, Trade, Posts and Telegraphs, Meteorology, Irrigations, Industries, Patents, Mineral production, etc., etc. The statistics relating to Agriculture and Co-operative Societies generally relate to the year running from July to June. All the other tables relate either to the fiscal year ending 31st March, or to the calendar year and where the latter is the case the fact is clearly indicated in the tables.

**Maynard Ganga Ram Prize.**—Prof. R. S. Jai Chand Luthra, I.A.S., Professor of Botany, has been awarded the prize for 1935, in consideration of his researches on the Control of Loose Smut of Wheat. This disease is prevalent in most parts of Punjab and causes considerable loss to cultivators. The old method of control involved treatment of the wheat before sowing with hot water and unless carried out by skilled workers, it was prone to affect the germinating power of the seed. Prof. Luthra's method which is far simpler, consists in treating the seed merely in water at ordinary temperatures for four hours during the morning of a day in summer, after which the soaked seed is spread out to dry in the sun. Experience has shown that this treatment is effective in controlling the disease.

The award for 1932 has also now been announced. The recipient of the prize is Mr. T. A. Miller Brownlie, lately Agricultural Engineer to Government, of Punjab, for his invention of a slip strainer suitable for water augmentation of supplies derived from bores sunk in open wells. This strainer has the particular merit that it is not affected by alkaline sub-soil water.

The award which is of the value of Rs. 3,000 is due to the munificence of the Late Sir Ganga Ram, Kt., C.I.E., M.V.O., R.B., who in 1925, handed over to the Punjab Government a sum of Rs. 25,000 for the endowment of a prize, to be awarded every 3 years for a discovery or an invention or a new practical method which will tend to increase agricultural production in the Punjab on a paying basis. The competition is open to all, throughout the world.

The first award which was due in 1929 was made in 1931, to Dr. Barber, late Imperial Sugar Expert, for his fundamental discoveries which resulted in the production of Coimbatore Sugarcane.

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**Rao Bahadur M. Vaidyanathan,** Statistician, Imperial Council of Agricultural Research, has been granted study leave for 8 months. He will be visiting the United Kingdom, where he will study problems connected with Agricultural Experimental technique in collaboration with the foremost Statisticians of England, Prof. Fisher, Wishart and Yates.

Rao Bahadur M. Vaidyanathan will be sailing from Bombay on the 17th June.

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**Agra University.**—The Executive Council of the Agra University, it is understood, have accepted the recommendations of the Committee appointed to consider the desirabiity of publishing a Journal, and have accordingly decided to issue annually a Journal, confined to the work done in the University. The Journal will comprise of two parts; Part I will comprise reports of original research work and the other part will contain summaries of extension lectures delivered under the auspices of the University.

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**University of Calcutta.**—The Sub-Committee appointed by the University of Calcutta to go into the question of instituting a Degree course in architecture has submitted its report recommending a 4-year course followed by a one year's training in the office of a practising architect recognised for the purpose by the University.

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**University of Mysore.**—The results of the Medical Examinations and the B.T. degree examination held in March 1937 were announced. They were as under:

| | Examination | No. examined | No. passed |
|---|---|---|---|
| 1. | First L.M.P. .. | 49 | 36 |
| 2. | Second L.M.P. .. | 52 | 31 |
| 3. | Third L.M.P. .. | 40 | 25 |
| 4. | Final L.M.P. .. | 58 | 24 |
| 5. | Final M.B.B.S. (Part I) .. | 27 | 18 |
| 6. | Final M.B.B.S. (Part II) | 25 | 17 |
| 7. | B.T. .. .. | 60 | 39 |

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**New Zeiss Apparatus.**—After many years of experimenting Messrs. Carl Zeiss are now putting on the market their camera-microscope *Ultraphot* an instrument which has been eagerly looked forward to by many Zeiss friends.

The Ultraphot may truly be said to fulfil the wishes entertained by the supporters of "Camera Microscopes". Every branch of microscopy and photo-micrography has been duly considered in the construction of the instrument, combining monocular and binocular observation in bright and darkfield illumination by ordinary and polarised light for transparent and opaque objects with photomicrography at lowest, medium and highest magnifications. It is possible to attach Kinematographic apparatus of both standard and sub-standard size of films, and even such a specific kind of investigation as the observation and photography in luminescent light or as the photography in the ultra-violet and infra-red regions of the spectrum have been rendered practicable. For metallography, provision is made for using the Ultraphot as an inverted microscope with camera.

Particular attention has been paid to the illuminating device so often neglected in similar instruments. Exacting requirements, for which the Ultraphot has essentially been constructed, demand the fundamental principle of illumination—*i.e.*, that the image of the source of light should be projected into the aperture of the image-forming system—which is conveniently complied with by simple manipulations for all sizes of field and apertures.

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## Announcements.

**Indian Science Congress.**—For the occasion of the Silver Jubilee session of the Indian Science Congress, to be held in Calcutta from January 3rd–9th, 1938, certain Sections have been split up, and three new Sections thereby created. The complete list of Sections with their Presidents is as follows:—

(1) *Mathematics and Physics*: Dr. C. W. B. Normand, Director-General of Observatories, Meteorological Office, Poona, 5; (2) *Chemistry*: Prof. S. S. Bhatnagar, Director, University Chemical Laboratories, Lahore; (3) *Geology*: Mr. D. N. Wadia, Offg. Supdt. Geologist, Geological Survey of India, 27, Chowringhee, Calcutta; (4) *Geography and Geodesy*: Dr. A. M. Heron,

Director, Geological Survey of India, 27, Chowringhee, Calcutta; (5) *Botany*: Prof. B. Sahni, Professor of Botany, Lucknow University, Lucknow; (6) *Zoology*: Prof. G. Matthai, Professor of Zoology, Government College, Lahore; (7) *Entomology*: Mohamad Afzal Husain, Principal, Punjab Agricultural College, Lyallpur, Punjab; (8) *Anthropology*: Dr. B. S. Guha, Zoological Survey of India, Indian Museum, Calcutta; (9) *Agriculture*: Rao Bahadur T. S. Venkatraman, Imperial Sugarcane Specialist, Lawley Road, Coimbatore; (10) *Medical Research*: Sir U. N. Brahmachari, Kt., 82/3, Cornwallis Street, Calcutta; (11) *Veterinary Research*: Col. A. Olver, Animal Husbandry Expert, Imperial Council of Agricultural Research, New Delhi; (12) *Physiology*: Brev. Col. R. N. Chopra, Director, School of Tropical Medicine, Chittaranjan Avenue, Calcutta; (13) *Psychology*: Dr. G. S. Bose, University College of Science, 92, Upper Circular Road, Calcutta.

Under the new rules of the Association, the abstracts of papers will be printed in final bound form before the meeting. *The Executive Committee have, therefore, fixed August 15th as the last date for the submission of papers and abstracts.*

Since it is desirable that a very high standard should be maintained on the occasion of this session, the Executive Committee have decided that *no abstracts will be printed unless accompanied by the full paper at the time of submission*, thereby enabling the papers to be refereed by the Sectional Committees.

Regarding the Botany Section, Prof. B. Sahni, the President, has divided his section into six Sub-sections, with separate Chairmen. He asks us to request intending contributors to send their papers direct to the Chairmen of the appropriate sub-section, who will act as referees and advise the President. The following are the six Sub-sections :—

*Cryptogams*: M. O. P. Iyengar, Professor of Botany and Director, University Botanical Laboratory, Madras; *Phanerogams & Taxonomy*: S. P. Agharkar, Ghose Professor of Botany and Head of the Department of Botany, University of Calcutta; *Genetics & Cytology*: Dr. (Miss) E. K. Janaki Ammal, Geneticist, Imperial Sugarcane Station, Lawley Road, Coimbatore; *Mycology & Plant Pathology*: K. C. Mehta, Professor of Botany, Agra College, Agra; *Physiology & Ecology*: P. Parija, Professor of Botany, Revenshaw College, Cuttack; *Palæobotony*: B. Sahni, Professor of Botany, University of Lucknow.

As far as possible the meetings of the subsections will be held consecutively, in a continuous programme, so as to avoid their overlapping with each other.

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**The Inter-University Board.**—The next annual session will be held at Allahabad in the month of November during the Golden Jubilee Celebrations of the Allahabad University.

We acknowledge with thanks the receipt of the following :—

" Agricultural Gazette of New South Wales," Vol. 48, No. 4.

" Indian Journal of Agricultural Science," Vol. 7, No. 1.

" Monthly Bulletin of Agricultural Science and Practice," No. 4, April 1937.

" Journal of Agriculture and Livestock in India," Vol. 7, No. 2.

" The Philippine Agriculturist," Vol. 25, No. 9.

" Journal of the Royal Society of Arts," Vol. 85, Nos. 4401–4404.

" Chemical Age," Vol. 36, Nos. 926–929.

" Journal of Chemical Physics," Vol. 5, No. 4.

" Journal of the Indian Chemical Society," Vol. 14, No. 2.

" Russian Journal of General Chemistry," Vol. 7, No. 2.

" Experiment Station Record," Vol. 76, No. 3.

" Transactions of the Faraday Society," Vol. 33, Part 4.

" Indian Forester," Vol. 63, Nos. 4 and 5.

" Indian Forest Records," Vol. 2, No. 12.

" Forschungen und Fortschritte," Vol. 13, Nos. 10–12.

" Transactions of the Mining and Geological Institute of India," Vol. 31, Part 3.

" The Calcutta Medical Journal," Vol. 32, Nos. 4 and 5.

" Review of Applied Mycology," Vol. 16, No. 3.

" Journal of the Bombay Natural History Society," Vol. 39, Nos. 4 and 5.

" Nature," Vol. 139, Nos. 3518–20.

" Canadian Journal of Research," Vol. 15, No. 3.

" Journal of Research, National Bureau of Standards," Vol. 17, No. 6.

" Ceylon Journal of Science," Section B, Vol. 20, Part 2 and Section D, Vol. 4, Part 3.

" Science and Culture," Vol. 2, No. 10.

" The Sky," Vol. 1, No. 6.

" Science Progress," Vol. 31, No. 124.

" Indian Journal of Venereal Diseases," Vol. 3, No. 1.

Government of India Publications :—

" Indian Trade Journal," Vol. 134, Nos. 1608–11.

" Bulletin of Industrial Research," No. 7.

CATALOGUES :

Messrs. Bausch and Lomb : " Research Microscopes and Accessories."

Messrs. Verlag von Gustov Fischer in Jena.