

SCIENCE NOTES AND NEWS

A Pyralid Caterpillar Pest—*Nephoteryx eugraphella* Rag.—on Sapota.—Messrs. M. C. Cherian and K. P. Anantanarayanan, Entomological Laboratory, Agricultural Research Institute, Coimbatore, write:—

The occurrence of this Pyralid caterpillar in pest form was first noted in Coimbatore in 1938. The same insect recurred again in a more virulent form in the summer of 1941. Very little is known regarding the life-history and control of this insect, though Fletcher (1920) has noted this pest elsewhere as early as 1920 on sapota and also on *Mimisops elengi*. During recent studies some useful information has been gathered on this insect.

The affected tree is readily recognised from a distance by the presence of numerous webbed shoots, dry leaf clusters and dark brown patches on leaves containing tunnels and frass of the caterpillar. The insect does a lot of damage to the leaves, and in addition, destroys a number of successive flower buds which eventually dry up and droop. The whole life-cycle is passed on the leaves and shoots. Eggs are laid on leaves and buds of tender shoots. After an egg period of 3 to 5 days the active larvæ bore into the buds or scrape the green leaves. Pupation is effected in folds of leaves and further sheltered by the tunnels of silken webs and frass after a varying larval period of 17 to 32 days. In about 7 to 12 days the moth emerges. The moth is greyish in colour, sluggish and rests on twigs during day. The moth is not easily detected, its colour pattern being well in harmony with that of the bark. A stomach poison, such as calcium arsenate is very effective in controlling this insect. Other cheaper insecticides are also being tried.

January 6, 1942.

Ancient Town Site at Arikamedu.—A few years ago Prof. Jouveau-Dubreuil and Frere Fauchaux of Pondicherry found ancient-looking beads and potsherds from a mound on the right bank of the Gingee or Ariyankuppam river near Kakkayantope village, south of Pondicherry. The site has been described by Prof. Jouveau-Dubreuil in *Bull. de l'Ecole Francaise de l'Extreme Orient*, 1940, 40, 2. Among the remarkable surface finds was an oval carnelian plaque with the figure of Emperor Augustus. Prof. Jouveau-Dubreuil generously presented a collection of beads and potsherds to the Madras Government Museum. The beads, according to M. Cortenau, could be dated circa 500 B.C. The beads and pottery bore close resemblance to those from Buddhist sites of the Andhra country. Among the surface finds were terracotta figures of great excellence, coins of Andhra kings, various fragments of articles made of glass of diverse shades of colour, and sherds of ornamental grey ware and of cream coloured amphoræ.

Recent trial diggings brought from near the foundations of ancient walls, fragments of

inscribed pottery, the characters of the inscription being Brahmi of the second century B.C. Some other characters on the pottery appear to be unreadable.

Arikamedu goes back thus to the early centuries of the Christian era, and is definitely the most ancient archæological site yet discovered in the Tamil country. The Government of French India are taking steps to protect the site and a Committee has been appointed to consider details.

A. A.

Tuberculina which belong to the group of Fungi imperfecti are hyperparasitic on many rusts. They possess hyaline conidia and smooth sporodochia. In Europe experiments have been carried out to use them as a means of controlling the devastating effects of the pine rust *Cronartium ribicola*. Hubert, Tubeuf and others report partial success in utilising *Tuberculina maxima* as a means of biological control of the pine rust. *Tuberculina costaricana* was collected by the writer on the Jasmine rust (*Uromyces Hobsoni*) round about Bangalore. The fungus parasitises pycnia and æcia of the Jasmine rust, and in most of the cases effectually prevents the development of teliospores. The suppression of the resting spore-form might prevent the perpetuation of the disease from season to season.

M. J. T.

Voltametric Determinations and Amperometric Titrations with a Rotating Microelectrode of Platinum Wire.—Current voltage curves obtained with various types of microelectrodes are discussed by Laitinen and Kolthoff (*J. Phy. Chem.* 1941, 45, 1079). The advantages of the rotating platinum microelectrode, which gives a diffusion current proportional to the concentration in a medium of constant salt concentration, over stationary platinum microelectrode have been pointed out. Two types of rotating platinum microelectrodes are described in detail. The reduction of oxygen on the electrode has been studied using rotating platinum and silver plated electrodes. It has been found that oxygen is reduced at a less negative potential at the silver surface than at the platinum surface and further the diffusion current is not well defined with the silver electrode. Amperometric titrations of very dilute solutions of arsenite with bromate and silver with chloride using the platinum electrode are described. Use of gelatin is suggested to prevent the depolarising action of silver chloride. It is likely the method may be found useful in other specific cases. An explanation for the abnormal slopes of current voltage curves is given.

M. R. B.

Plate Factors in the Fractional Distillation of the Ethyl-alcohol-Water System.—The results of a very valuable study on plate efficiency,

carried out at the Engineering Experiment Station, Urbana, in a bubble cap column of four plates, operated without entrainment at vapour velocities 0.2 to 3 ft. per second and at reflux ratio $L/V = 1, 2/3$ and $1/2$, have been published (*Bull. of the Univ. of Ill.*, 1941, No. 328). The plate efficiency was found to vary with the liquid composition but not significantly with reflux ratio or rate of distillation. The Overall Murphree efficiency rises from 80 to 100 per cent. from 10 to 60 mole per cent. alcohol, in the liquid and decreases to 60 per cent. at 80 mole per cent. alcohol. The local plate efficiency varies from 80 to 50 per cent. with 50 to 80 mole per cent. alcohol in liquid. It is interesting to note that the 'median' efficiency reaches a maximum in the range of maximum viscosity in the liquid, between 20 and 40 mole per cent. alcohol. As vapour bubble size varies inversely with liquid viscosity, at maximum viscosity, bubble size is minimum. The observation lends support to the condition of a formation of heavy froth, below the point of appreciable entrainment, considered by designers as necessary to maintain high plate efficiencies. The low efficiencies at the extremes of the composition range, where the diffusional driving force is small, cannot be definitely attributed to the influence of liquid composition. As these calculations are inherently unsatisfactory and sensitive to errors in sampling, etc., the actual performance of a distilling column cannot be predicted. Hence in practice a larger number of plates are provided to safeguard against variations in design and operation.

The above study presents a marked advance in the definite knowledge of several factors influencing distillation and the *Bulletin* is a useful guide to designers of plant as well as to research workers. The *Bulletin* includes a review of previous work, a discussion of efficiency calculations, experimental data, an appendix of physical data for ethyl-alcohol-water mixtures and a bibliography.

Y. K. R.

Mysore Geological Department.—The latest number of the *Records of the Mysore Geological Department* (Vol. XXXIX) begins with the Director's Annual Report on the administrative and technical work of the Department during the year 1939-40. Then there are six papers contributed by the officers of the Department dealing with various problems of scientific and economic importance investigated by them in the course of the year. Mr. B. Rama Rao, the Director, leads with an important paper on "The Charnockite Rocks of the Biligirirangan Hills". From his study of the rocks described by previous workers as Charnockites near Sivasamudram, Malvalli, Halagur and other parts of the State, Mr. Rama Rao has been expressing the view that "the zones mapped as Charnockites form a complex composed of a composite series of rocks of different ages and diverse modes of origin, all intensely metamorphosed, and that they cannot all be regarded as the differentiated phases of crystallisation of any single, plutonic, intrusive mass." The present paper deals with the Biligirirangan

Hills area and embodies a detailed account of the typical character and the field relations of the several rock types found in this area which have been distinguished and mapped previously as Charnockites. A discussion of the wider aspects of the age relationship and the mode of origin of the Charnockites in general has been reserved for a separate paper to be published some time later. Mr. M. B. Ramachandra Rao's "Report on the Geophysical Survey near Gudadarangavanahalli in Chitaldrug District," is of particular interest as recording the results of a new line of investigation recently initiated by the Department, with the object of studying the practical application of some of the electrical methods for the location of ore bodies. After giving a brief outline of the general principles of the methods adopted, together with descriptions of the apparatus employed, Mr. Rao proceeds to describe in detail the actual field surveys carried out and discusses the interpretation of the results obtained. He concludes: "The investigations embodied in this report were largely of an experimental nature, and it has not yet been possible to fully verify the few important indications by actual prospecting work." The other four papers contained in the *Records* are: (i) Earth-salt Deposits in the Shimoga and Chitaldrug Districts, by Mr. N. M. Mallikarjunappa, (ii) Petrology of the Felsite and Porphyry dykes in Mysore, by Mr. B. N. Raghunatha Rao, (iii) Notes on Prospecting for Alluvial Gold round Kudurekonda and Palavanahalli, Honnali Taluk, Shimoga District, by Mr. B. P. Radhakrishna, and (iv) The Conglomerates of Kalavaranganbetta, Honnali Taluk, Shimoga District, by Mr. B. P. Radhakrishna, and all of these furnish valuable information on the topics dealt with.

Department of Chemical Technology, University of Bombay (*Annual Report, 1940-41*).—The Department has continued to maintain contact with the textile and chemical industries of the province, as evidenced by the employment of its graduates, the subsidies received for industrial research, and the increasing amount of analytical work and technical investigations submitted to the Department. Among others a wool research scheme has been started under the auspices of the Imperial Council of Agricultural Research for investigating the possibility of effecting improvements in the quality of Indian wool, and for setting up standards for Indian wool.

The foundation stone of the new buildings for the Department was laid in March 1941. It is planned that the Department will finally shape itself into a University College of Technology, with additional degree courses in 'Plastics, Paints and Varnishes', 'Oils and Fats', 'Paper and Cellulose Industries', 'Pharmaceuticals and Fine Chemicals', and 'Foods and Drugs'.

Irrigation Research.—Reports on the research work carried out at the various centres were reviewed and the programme for 1942 was drawn up at the 12th annual meeting of the *Central Board of Irrigation* held in Delhi recently.

The Board considered the work done relating to the staunching of canals to prevent leakage. Considerable work on the subject has already been done in view of its importance.

Some instances of the success of the measures adopted for carrying out model experiments were reported to the Board. One was the Beas river model, on which the construction of armoured "T" head spurs in the river Beas was decided. It was emphasised by the engineers concerned that if they had not had the model, the results of erosion might have been serious. The Board decided to collect further data comparing the behaviour of a prototype to that of its model, for various types of models.

Work done in connection with the meandering of rivers, design of channels in alluvium, the accuracy of different methods of taking discharges, and silt selective heads was discussed. Some channels taking off from larger ones draw excessive silt which causes considerable trouble in the off-taking channel. This, it was considered, could be remedied by a suitable design of head of off-take, viz., a silt selective head, arranged to draw the correct proportion of silt. The design depended on many factors which differed at different sites. Model experiments were of great value in this connection. The Board asked the Research Committee to indicate the types of silt selective heads best suited to different conditions.

The design of silt excluders and ejectors was also considered as well as methods of calculating the head required to operate such devices. The silt excluder withdraws the heavy bed sand at the head-works and so prevents it from entering a canal, whereas a silt extractor is constructed on the canal to extract heavy silt or sand which is being carried down the canal.

One of the problems on which much research has been done in America is the deposit of silt in reservoirs year by year reducing their capacity. A large amount of data on the subject has also been collected in India and Burma. The subject is one of general interest to the Board, but particularly to those provinces which have in hand schemes for the construction of storage reservoirs, such as the Bakhara Dam in the Punjab.

Agricultural meteorology.—A number of new problems of practical importance to agriculture, which were suggested recently by the Agricultural Commissioner with the Government of India, are being dealt with by the Agricultural Meteorology Section of the India Meteorological Department. This Section was taken over by the Department in April 1940, as its work is of permanent value to Agriculture in India. The physics of sub-soil irrigation involving measurements of the rates of upward and downward movement of moisture through the soil from the sub-soil level, the wind-break effect of different crops as measured by the variation of wind velocity in the different environments with the help of a hot-wire anemometer, the effect of shade plants on the climate of tea-gardens, weather factors influencing the incidence of insect pests and the investigation

of the influence of weather on cane and sugar tonnage per acre, are a few of the problems which are receiving the attention of the research staff.

Considerable attention is devoted to the development of new instruments for the use of agricultural workers in India. To facilitate the experimental work of the Section, the construction of a field laboratory at the Central Agricultural Meteorological Observatory was completed recently and an additional plot of land has been placed at the disposal of the Section by the authorities of the Agricultural College, Poona.

Fish Canning.—A "mobile cannery" with the canning plant installed on board a large sailing or power-propelled boat, as is often done in Japan, is suggested by the Agricultural Marketing Adviser to the Government of India as a more suitable method for developing the fish canning industry in India.

The Indian migratory fishes are rather erratic in their movement. They do not touch the shores of India each year with any degree of regularity. Further, the difficulties of transporting the catches (including 40 per cent. or more of non-cannable waste) from distant waters to the cannery on the shore form a serious problem in tropical climates. A mobile cannery is both convenient and economical.

Previous to the present war, on an average, 44,000 cwt. of canned fish valued at over 10 lakhs of rupees used to be imported into India from the United Kingdom, Canada, Norway and Japan. Fish canning industry in India has now assumed increased importance owing to supplies having been cut off from these sources.

Experiments in canning Indian fish were first conducted at an experimental canning factory opened by the Madras Government at Chalyam (Malabar) as early as 1911. These experiments showed that, besides oil sardines, a number of other fishes, such as mackerel, pomfret, Indian salmon and prawns, could be advantageously canned. The Government cannery, however, was not a commercial success and in 1933 was sold to a private party, who has re-equipped it not only for canning of fish but also of fruits and vegetables. Small lots of sardine and mackerel in olive oil have been prepared already. Efforts at canning Indian fish are being also made at two fruit canning establishments, operating at Bezwada and Bombay.

The average annual catch on the British Malabar and South Kanara sea fronts of the Madras Presidency is about 2,607,000 maunds, of which approximately 60 per cent. consists of varieties which are suitable for canning. They are: mackerel—985,000 maunds, oil sardines—371,000 maunds, prawns—108,000 maunds, seer fishes—40,000 maunds, pomfrets—10,000 maunds and bekti—5,000 maunds.

Canning and Food Preservation.—Canned and dried foods, particularly fruits and vegetables which on account of their vitamin content are of special value to troops, have assumed a special importance in view of the enormous

armies moving rapidly and operating at long distances from the base.

In order to secure easily transportable supplies of food in a form which will keep them intact in any climate, the Supply Department created a Food Directorate in 1940 with which the Imperial Council of Agricultural Research has been working in collaboration.

Manufacture of Surgical and Orthopaedic Instruments.—India is now a predominant instrument producer among the Eastern Group countries and practically 100 per cent. of hospital and operation theatre equipment and 98 per cent. of orthopaedic instruments and appliances are now produced by the Indian industries.

Planning is in progress for the production during the next twelve months of five million instruments and appliances by the Indian surgical instruments industry.

The Medical Store Department has been the main instrument in developing the manufacture of surgical instruments in India. Some 25 years ago, a surgical instruments factory was established in Bombay. As Departmental demands increased it was found necessary to stimulate the production in other parts of India and now the surgical instruments industry is well established in Lahore and Sialkot in the Punjab.

Manufacture of Optical Instruments.—The *Mathematical Instrument Office*, Calcutta, has been performing an increasing amount of work for the Defence Services, particularly in respect of optical instruments. It is now manufacturing, in large quantities, binoculars (not hitherto produced in India), prismatic compasses and other optical instruments for the army, as well as mathematical and surveying instruments. Experiments have also been in progress for some time in the manufacture in India of optical glass.

Forest Research Institute.—A large volume of research of immediate interest to war industries, has been recently carried out at the Institute. To mention a few of its activities, investigations have shown that 75 per cent. of the timber used in modern aircraft (aircraft in its widest sense), is made up of short 10-foot lengths, and a careful selection of Indian spruce and fir can supply such timber. Certain other species, almost unknown and untested in time of the last War, have since been found which appear to answer the requirements. The Institute has also been making aircraft propellers in sissoo, walnut and Andamans *Padauk*. As the result of experiments, a sleeper creosoting plant at Naharkhatya in Assam has been reopened and will soon be treating green sleepers straight from the forest for the use of armies overseas. A special type of synthetic resin glue for plywood and laminated wood, which is an essential material for army supplies, has been evolved at the Institute.

A hot air seasoning chamber has been recently devised which is much cheaper to instal than an ordinary seasoning kiln.

A simple key to identify six-species of bamboos in their finished states as tent poles has been devised by the Botanical Branch of the Institute, helped by the Silvicultural Branch.

Manufacture of Newsprint.—Suitable mechanical pulp for use in the manufacture of newsprint quality papers has been produced at the Forest Research Institute, Dehra Dūn.

For the production of the required mechanical pulp, the Paper Pulp Section of the Institute experimented with nine species of woods and one species of bamboo (*salia*). Five of the woods (*genwa*, *paper mulberry*, *chir*, *fir* and *spruce*) yielded fairly light-coloured pulps, suitable for use in the manufacture of newsprint quality papers.

Papers were produced on the Forest Research Institute's small experimental paper machine from a mixture of 70 per cent. mechanical pulp and 30 per cent. bleached bamboo chemical pulp, and their strength characteristics were determined. With fir and spruce, the proportion of mechanical pulp and bamboo pulp was 75 per cent. and 25 per cent. respectively, and the papers produced from these woods were comparable in strength to the average imported "newsprint" papers.

Fir and spruce are available in Kashmir and Tehri Garhwal States in sufficiently large quantities to support a small newsprint mill. The proposals for the establishment of a mill in each of these two States has, however, had to be held up till after the war, for various economic and technical reasons, the chief of which is the abnormally high capital investment required for putting up a mill at the present time.

The remaining four species of wood and the *salia* bamboo, yielded brown or brownish coloured pulps. These pulps on account of their brown colour were not considered suitable for the production of newsprint quality paper, but they can be utilised for the manufacture of certain cheap lines of paper, such as cheap printing and wrapping papers, triplex boards and cheap cardboards.

Experiments are now in progress to find out a cheap and economical method of bleaching or lightening the brown colour of mechanical pulp, especially from bamboo, as this material (bamboo) is available in India in large quantities.

New Uses for Jute.—The December issue of the Indian Central Jute Committee's *Bulletin* contains some interesting information on several new uses of jute. Production of a cork substitute on a patented jute waste base has commenced in Calcutta. A new method for making felts on jute fibre base has recently been patented. Felts produced according to this method are claimed to be rot-proof, termite-proof, waterproof and resistant to heat of the sun.

Another announcement of considerable interest is the reported use of jute by the Ford Motor Company as a base for a plastic composition for the manufacture of car and truck bodies.

ASTRONOMICAL NOTES

Planets during February 1942.—Mercury after inferior conjunction with the Sun on February 10, passes into the morning sky. Venus also will be in inferior conjunction on February 2 and during the latter part of the month will be visible in the morning sky for about a couple of hours before sunrise. On February 22, the planet will be at one of the stationary points of its geocentric orbit. Mars is in the evening sky and although gradually decreasing in brightness, its ruddy colour makes it a prominent object among the stars in the constellation Taurus.

Jupiter will be on the meridian at about sunset and continues to be bright enough to attract attention. Saturn is in quadrature with the Sun on February 11 and can be seen as a star of the first magnitude in the western sky during the early part of the night. The planet will be in conjunction with Mars on February 24 when the angular distance between the two will be a little over three degrees. Uranus will be stationary on February 3 when it resumes its slow eastward motion among the stars in the constellation Taurus. On February 15, the planet is in quadrature with the Sun. An occultation of considerable interest that can be observed with the naked eye is that of the first magnitude star Aldebaran (α Tauri) which will occur in the early part of the night on February 23. The disappearance of the star as well as the reappearance will be visible in India.

T. P. B.

MAGNETIC NOTES

December 1941, was slightly less active than the previous month. There were 13 quiet days,

16 days of slight disturbance, one of moderate disturbance and one of great disturbance during December 1941, as compared with 6 quiet days, 22 days of slight disturbance and 3 of moderate disturbance during December 1940.

The day of the largest disturbance during December 1941, was the 1st when a magnetic storm of great intensity was recorded. The quietest day was the 20th.

Characterisation of individual days was as follows:—

Quiet days	Disturbed days		
	Slight	Moderate	Great
5, 11, 12, 15, 16, 19-22, 26, 28, 30, 31	2-4, 6-10, 14, 17, 18, 23-25, 27, 29	13	1

During December 1941, one storm of great intensity was recorded as against one of moderate intensity recorded during December 1940. The mean character figure for the month was 0.65 as against 0.90 for December 1940.

M. R. RANGASWAMI.

SEISMOLOGICAL NOTES

During the month of December, 1941, one great, three moderate and three slight earthquake shocks were recorded by the Colaba seismographs as against one moderate and seven slight ones recorded during the same month in 1940. Details for December are given in the following table:—

Date	Intensity of the shock	Time of origin I. S. T.		Epicentral distance from Bombay (Miles)	Co-ordinates of the epicentre (tentative)	Depth of focus (Miles)	Remarks
		H.	M.				
December 1941 6	Great	2	17	10580	Lat. 0°, Long. 90° W. Off Equador (S. America)		
7	Moderate	2	55	10510			
9	Slight	8	13	3520			
13	Slight	11	46	3110			
17	Moderate	0	50	3130	In the neighbour- hood of Formosa Island		
23	Slight	16	59	1380	Apparently in Tibet		
26	Moderate	20	18	1850	Lat. 20° N., Long. 101° E. To the east of Burra on the border of Thailand and Indo-China	Probably about 60-80	

ANNOUNCEMENTS

Indian Science Congress, 1943.—The next session of the Congress will be held at Lucknow from January 2-8, 1943. PANDIT JAWAHARLAL NEHRU, Chairman, National Planning Committee, will preside over the session.

The following have been elected Presidents of the different Sections:—*Physics*: Dr. H. J. Bhabha (Bangalore); *Chemistry*: Dr. S. S. Joshi (Benares); *Geology and Geography*: Lt.-Col. E. A. Glennie (Dehra Dun); *Botany*: Dr. K. Biswas (Calcutta); *Zoology*: Dr. B. N. Chopra (Calcutta); *Anthropology and Archaeology*: Dr. N. Chakrabarti (New Delhi); *Medical and Veterinary Sciences*: Dr. F. C. Minett, (Mukteswar); *Agricultural Sciences*: Rao Bahadur Y. Ramachandra Rao (Bangalore); *Physiology*: Dr. B. Narayana (Patna); *Psychology and Educational Sciences*: Dr. B. L. Atreya (Benares); *Engineering and Metallurgy*: Prof. K. Aston (Bangalore).

Ramalinga Reddy Sastyabdapurti Commemoration Volume, Part I—Sciences.—The learned articles that were presented by scientists from different parts of India to Dr. C. R. Reddy, Vice-Chancellor, Andhra University, on the occasion of his *Sastyabdapurti* in December 1940, have now been published in a collected form. The sale proceeds will be utilized for the benefit of the Andhra University to which Dr. Reddy's donations amount nearly to half a lac of rupees. As only a limited number of copies are available, intending purchasers are requested to register their orders early with the Registrar, Andhra University, Waltair.

A new service of Biological Abstracts.—To meet the requirements of men engaged in the animal industries, *Biological Abstracts* announces the establishment of a new section, *Section F, Abstracts of Animal Production and Veterinary Science*, beginning January 1942.

The biological research literature on the breeding, nutrition, husbandry, diseases and pests of the domesticated animals—including poultry, fur-bearing animals and pet stock—is scattered throughout a large number of original research journals in many languages, and its assembly, in the abstract issues and indexes of a single comprehensive abstracting journal will, it is felt, be a great convenience to all who are working in the broad field of animal production.

The new section will consist of ten abstract issues per year. The annual subscription rate will be \$5. Subscribers will receive the index to the complete edition of *Biological Abstracts*.

Section F will contain all of the abstracts published in *Biological Abstracts* that have to do with the breeding, nutrition, and metabolism, husbandry, reproductive and other physiology, anatomy, pathology and parasitology, and arthropod pests of live-stock, poultry, and semi-domesticated animals and birds, including pet stock.

Biological Abstracts now covers some 1,450 periodicals—thus the new abstracting section

will, from the beginning, afford a very complete coverage of the biological literature pertaining to the animal industries.

Inquiries should be addressed to *Biological Abstracts*, University of Pennsylvania, Philadelphia.

Dr. B. V. Narayanaswami Naidu, Annamalai University, has been elected President of the Economic Conference, to be held in December 1942, at Madras.

Ceylon Journal of Science.—The Editor-in-chief, *Ceylon Journal of Science*, informs us that the publication of "Spolia Zeylanica" issued in December 1941 from the Colombo Museum as Vol. XXIII, Part I, has no connection whatever with the *Ceylon Journal of Science*, the Editorial Board of which disclaims any responsibility in connection with the said publication.

Indian Research Fund Association.—The attention of our readers is drawn to an advertisement appearing in the December 1941 issue (Vol. 10, No. 12), inviting applications for five Research Fellowships of the value of Rs. 150 each per mensem under the Indian Research Fund Association. Applications should reach the Secretary, I.R.F.A., Secretariat, New Delhi, not later than 7th February, 1942.

* * *

We acknowledge with thanks, the receipt of the following:—

"Journal of Agricultural Research," Vol. 63, Nos. 4-6.

"Agricultural Gazette of New South Wales," Vol. 52, Pt. 11.

"Journal of the Indian Chemical Society," Vol. 18, No. 9.

"Chronica Botanica," Vol. 6, Nos. 17-18.

"Experiment Station Record," Vol. 85, Nos. 4-5.

"Indian Forester," Vol. 68, No. 1.

"Indian Farming," Vol. 2, No. 12.

"Indian Journal of Genetics and Plant Breeding," No. 1, Dec. 1941.

"Bulletin of the American Meteorological Society," Vol. 22, No. 8.

"Journal of the Indian Mathematical Society," Vol. 5, No. 3.

"Journal of the American Museum of Natural History," Vol. 48, No. 3.

"Nature," Vol. 148, No. 3755.

"Canadian Journal of Research," Vol. 19, No. 8.

"Sky," Vol. 1, No. 1.

"Indian Trade Journal," Vol. 143, Nos. 1851-53; Vol. 144, Nos. 1854-55.

Books

"The Cytoplasm of the Plant Cell," by Alexandre and Guilliermond. (The Chronica Botanica Co., Waltham, Mass., Macmillan & Co., Ltd., Calcutta), 1941. Pages 247, Price \$4.75.

"Landscape as developed by the processes of normal erosion," by C. A. Cotton. (Cambridge University Press, London), 1941. Pages xviii + 301. Price 21sh.