

ASTRONOMICAL NOTES

Planets during June 1939.—Mercury will be in superior conjunction with the Sun on June 7 and will be visible as an evening star about the end of the month. Venus can still be seen as a fairly bright object near the eastern horizon for about an hour and a half before sunrise. It continues to get closer to the Sun and is becoming fainter. On June 17 there will be a close conjunction of the planet with the Moon. Mars reaches the meridian at about 3 a.m. and is well placed for observation during the latter part of the night. On June 24, it will be at one of the stationary points of its apparent orbit. The planet is increasing considerably in brightness, the stellar magnitude being -2.0 at the end of the month.

The major planets Jupiter and Saturn continue to be visible as morning stars; the former rises about an hour after midnight and can be seen as a bright object (mag. -2.0) in the early hours of the morning. The ring ellipse of Saturn is gradually getting wider, the angular dimensions of the major and minor axes being $38''.0$ and $10''.0$ respectively, about the middle of the month. Uranus is also a morning star

and will be situated about 2° to the south of the star δ Arietis (mag. 4.5). A close conjunction with the moon will occur on June 15 and will be helpful to observers in locating the planet.

Comets.—Pons-Winnecke's Comet is visible as a faint object (of magnitude 13 on May 10) and is moving slowly in the constellation Bootes. Information has been received of the discovery of a bright Comet (1939 d) on April 18 by Hassel at the Oslo Observatory. At the time of discovery the Comet was of the third magnitude and is reported to have had a nucleus and a short tail.

It has become fainter since then and has been moving rapidly in a south-easterly direction in the constellations Perseus and Taurus. An orbit computed by Möller gives 1939 April 10 as the date of perihelion passage.

Kopff's periodic comet was re-discovered on April 22 by Prof. Van Biesbroeck at the Yerkes Observatory. It appears to have been a faint and diffuse object without central condensation or nucleus.

T. P. B.

SCIENCE NOTES AND NEWS

The Drainage of India.—Dr. S. L. Hora has made an important contribution (*Proc. Nat. Inst. Sci. India*, 1938, 4, No. 4) on "Changes in the Drainage of India as evidenced by the Distribution of the Freshwater Fishes". Dr. Hora has, by this and other publications, pointed out the zoogeographical importance of the Indian fish fauna and thus made the study of Ichthyology more interesting. It has been clearly shown that the distribution of both past and present-day freshwater fishes constitute an important criterion for the elucidation of the palæohydrographical features of land masses. A brief geological history of India is given. A main drainage of the Upper Gondwana period has been indicated by the presence of the Dipnoan and the Ganoid fishes in the Kota-Maleri beds in the Godavari valley. Based on the occurrence of the estuarine fishes in infra- and inter-trappean beds of the Central Provinces, it is concluded that during pre-trappean period a main river flowed towards Rajputana. Further it is pointed out that during the post-trappean period the drainage of the Peninsular India was reversed. That the modern bony fishes particularly the Siluroids had become dominant as early as the Siwalik period is evidenced by their remains among the Siwalik rocks. Based on the distribution of fishes Dr. Hora supports the view of the existence of 'Indobram' or 'Siwalik' river.

Further Dr. Hora contends that freshwater fishes originated in Southern China and from thence spread to all directions. A close similarity between the fish fauna of the Peninsular India, Eastern Himalayas, Burma, S. China and

Malay regions is shown. The occurrence of forms like *Bhavana* and *Silurus* in the hill streams of the Western Ghats indicates that they must have migrated from the Assam hills via the Satpuras by a series of river captures. The publication of Dr. Hora's article on the fish remains of the Central Provinces, to which reference has been made in this paper, is keenly awaited.

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The Indo-Brahm or the Siwalik River.—At the ordinary monthly meeting of the Royal Asiatic Society of Bengal, held on Monday, 1st May 1939, Dr. Bains Prashad presented a paper on the Siwalik River, the occurrence of which during the Tertiaries was postulated in 1920 by Sir Edwin Pascoe of the Geological Survey of India, as a result of his study of the Punjab Oil Belt. The headwaters of the river corresponded with those of the Brahmaputra. "Through Assam the river flowed westwards and north-westwards along the foot of the Himalayas as far as North-West Punjab, and then turning southwards along a course, not very different from that of the modern Indus, it emptied itself into the Arabian Sea. Almost simultaneously Dr. G. E. Pilgrim of the Geological Survey, from a study of the Siwalik Conglomerates, communicated a paper to the *Asiatic Society*, in which he suggested that there was a single westwardly flowing river, the Siwalik River, in place of the Indus, the Ganges and the Brahmaputra River systems, which served for the drainage both of the eastern and western Himalayas. Both the authors did not refer to the earlier communications by

Oldham (1894) and Kobelt (1899) in which similar views had been put forward." Dr. Bains Prashad discussed the zoological evidence in support of the existence of such a river system.

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Indian Museum Fish Gallery.—One of the interesting additions to the newly arranged fish gallery is the Air-breathing fish of India. Of these one is the well-known Koi fish of Bengal (*Anabas*) which possesses two special chambers developed above the gills for the storage of air, each chamber acting as the 'lung' of the fish. Other types exhibited are the snake-headed fish, *Sol*, *Sauli*, *Lata*, etc. (*Ophicophalus*), *Magur* (*Clarias*), *Singi* (*Heteropneustes*), and *Cuchia* (*Amphipnous*). The various structures responsible for aerial respiration are shown by dissected models.

The need for using atmospheric air directly seems to have been necessitated by occasional droughts of varying duration which impelled the fish to live in stagnant waters deficient in oxygen. It was in response to such circumstances that a number of fish came to the surface to make use of the vastly greater quantities of oxygen in the air. The kinds of devices employed by the fish for using atmospheric air are so varied that it seems probable that this habit was independently acquired by a number of them.

To create interest in the food fish of India the *Zoological Survey of India* has put up a special exhibit of the principal food fish of the Calcutta markets in the Fish Gallery of the Indian Museum. Actual stuffed specimens or models of as many as 28 varieties of fishes are shown.

Attention is directed to the fact that the available supply in the Calcutta markets is far from sufficient and only a small percentage of the total quantity offered for sale in the Calcutta markets is from local fisheries. Most of the freshwater fish are imported from Southern and Eastern Bengal and the Chilka Lake, the estuarine fishes come from various parts of the Gangetic Delta, while the marine forms are imported from Puri and other sea-ports.

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Prince of Wales Museum of Western India, Bombay.—The Report for the year 1937-38 recently issued, gives a brief outline of the activities of the Museum. A new wing (opened by H. E. Sir Roger Lumley, G.C.I.E., D.L., Governor of Bombay, on March 17th) was added during the year, at a cost of Rs. 2½ lakhs. On the ground floor of this wing, are displayed the collections of the Natural History Section in attractive settings in a manner which reflects a striking improvement in museum exhibition in India. At the same time, the attractiveness and educational value of the exhibits have been greatly enhanced.

The Report draws attention to several interesting investigations conducted by the staff. Mention may be made of the Man-eating *Hyænas* from the United Provinces. The Curator's investigations show that the common *Hyæna* may resort to man-eating when pressed by hunger due to shortage of natural food. Once established in an individual, man-eating

may become a tradition passed on from mother to offspring, and attacks on human beings may recur until the particular stock that has acquired this trait is exterminated.

Among the Acquisitions to the Natural History Section, mention may be made of a fine specimen of Bewick's Swan (*Cygnus bewickii*) presented by E. S. Lewis, Rajpore, Delhi. A breeding colony of the little Tern (*Sterna albifrons albifrons*) was discovered by Mr. Humayun Abdul Ali in a small island near Bombay. Messrs. Ali and McCann have obtained fine specimens of the birds and eggs.

It would be impossible to mention the several activities of the three sections of the Museum, the Arts section, the Archæological section and the Natural History section, in this note. The number of visitors to the Museum has averaged over 21,000 a day, when open to the public free of charge. After the new wing was opened, the number has appreciably increased. The Report points out that the new wing provides only for public galleries; there is, however, pressing need for providing accommodation for research collections, library, office, work rooms and lecture hall, and it is hoped that generous-minded wealthy citizens of the Presidency and the Government will come forward to provide necessary funds to enable these additions, so essential for the Museum, to be made.

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Madras Fisheries Department.—To an impoverished country like India, whose large tracts suffer from frequent visitations of famine and whose populations are afflicted from malnutrition, it is a matter of paramount importance that the food resources of the sea should be explored and harvested. The importance of developing fisheries in India has been frequently emphasised in the columns of *Current Science*.

The administration report of the Madras Fisheries Department for the year 1937-38, which has been recently published, reveals the various lines of useful work carried out by the department. Of particular interest are the technological researches relating to deep sea fishing methods, fish manures, prawn pickling, and the vitamin survey of fish oils. Some of the oils particularly from certain kinds of shark, have been found to be exceptionally rich in their vitamin content. It is to be hoped that these encouraging results will be soon commercially exploited.

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Haffkine Institute.—In addition to the routine production of large quantities of prophylactic vaccines, the Haffkine Institute is establishing itself as a producer of new knowledge under the direction of Col. S. S. Sokhey. The Annual Report for the year 1937, which has been recently issued, records several lines of investigation which are being pursued at the Institute. Researches relating to the several aspects of plague and its vaccine by Col. Sokhey and his collaborators, Pharmacological studies of anti-malarials by Dikshit and his collaborators, researches relating to certain diagnostic constants of blood, investigations on snake venoms, and a study of the cultural requirements of the plague bacillus, constitute some of the useful

lines of investigation which have yielded promising results. It should be a matter for satisfaction to the Director that the Institute has not only attracted a number of voluntary workers but also secured generous support from the Indian Research Fund Association for most of the above researches.

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Quality of Digitalis Preparation sold in India.—A representative survey of the digitalis preparations sold in India carried out by the *Biochemical Standardization Laboratory*, Calcutta, has led to the finding that a large proportion of the preparations is below par. Digitalis preparations are extensively employed by Physicians in the treatment of heart diseases. The Laboratory collected some 110 samples (102 tinctures and 8 powders) from all provinces of British India and analysed them by the 'Intravenous Cat Method' recommended by the British Pharmacopœia. As many as 87 preparations were below 80 per cent. in strength and 57 were below 50 per cent. potency. 102 samples in the group were of Indian origin and 8 of foreign make. It is suggested that all digitalis preparations issued for sale should be tested and their potency controlled before they are released into the market. Strict precaution should be enjoined regarding their storage in cool and dark places, preferably in cold storage and all digitalis tinctures more than a year old should be retested for their potency and if below par, withdrawn from clinical use.

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Survey of India.—Full details of the Survey Operations of the ordinary field units, as well as, of map publications and instrument manufacture for the year 1938, are now compiled from the General Report of the Survey of India recently issued. The report also gives an abstract of the other volume "The Geodetic Report" containing full details of all scientific work.

The earliest maps of India prepared by Major James Rennel, the first Surveyor-General of Bengal in 1767, were originally military reconnaissances and latterly chained surveys based on astronomically fixed points and from these beginnings, this department has gradually become primarily responsible for all topographical surveys, explorations and the maintenance of geographical maps of the greater part of Southern Asia and also for geodetic work.

During the year under report, the area surveyed was 38,559 square miles. The report gives an abstract of the geodetic operations including the measurement of geodetic bases, principal triangulation, geodetic levelling, precise latitudes, longitudes, azimuths, seismological and meteorological, gravity determinations in all parts of India and predictions of tides at 41 eastern ports between Suez and Singapore. The longitude of Dehra Dūn has been determined by the bi-weekly transit observations; latitude observations at Agra show surprisingly large variation as was also found at Dehra Dūn.

The re-adjustment of the primary and secondary triangulation has been completed so far as it is at present contemplated to take it, until circumstances make it possible to adopt the International Spheroid instead of Everest's

which is unlikely to happen for many years to come.

The probable errors of the primary and secondary triangulation have been investigated and it is found that the length and breadth of India have been measured with probable errors of about 1 part in 500,000 or of 20 feet in 2,000 miles.

Investigations have been made regarding the anomalies of magnetic force associated with underground bodies of magnetic rock. At 48 stations in Bengal, S.W. Baluchistan, the Punjab and Rajputana, observations to determine the force of the gravity were made. In co-operation with the Geological Survey and the Burmah Oil Company the effect of known geological abnormalities on intensity of gravity is being studied.

Observations for latitude and longitude were made at 49 stations along a line running southwards from near Mandalay to near Victoria Point and these observations confirm the existence of a very large southerly rise of the geoid in this area.

The old triangles of the Assam Longitudinal Series between Gauhati and Goālpāra were re-observed.

An abstract of topographical work is given in Part 3 of the Report. The tables A, B and C indicate the progress in the topographical survey programme and contain details of the work done during the year. Table A indicates the area of survey completed since 1905 as well as what remains over to complete the contoured Topographical Survey of India, Table B shows the area revised during the year and Table C enumerates in detail the survey operations carried out during the year under report.

The Survey of India, from the year 1905, concentrated on the preparation of a new series of modern topographical maps in several colours on the 1 inch to 1 mile scale; this new series is meant to meet the demand for more detailed information to be shown on maps, especially as regards the portrayal of hill features by contours, proper classifications of communications and more recently of air traffic requirements. This series intended to be completed in twenty-five years, is only two-thirds completed by 1938, full progress having been deterred by the outbreak of the War and other circumstances. Though every year, thirty to sixty thousand square miles of area are surveyed, the maps of a large part of the country are still over fifty years old.

Air survey work for civil purposes is also receiving a good measure of attention and continuous research is being carried on, in the latest methods of mapping from photographs taken from the ground and in the air. Photographic methods have been employed for the survey of about 1,600 square miles of area. An air survey of Bettiah Town has also been undertaken.

The last part of the report details the progress of map publication to date. Progress of publication to date, of a standard series of modern maps, excluding transfrontier work is indicated in Index maps C to G at the end of the report. All publications and map issues for the year, the fair drawing carried out by the

various drawing offices and field parties and the working of the printing and miscellaneous offices are indicated in this part of the volume.

The Mathematical Instrument Office has continued to do increasingly useful work, the manufactures and repairs covering a wide range of scientific instruments. During the year there has been a considerable increase in the value of stores issued and in the output of the work.

C. G.

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Mustard and Rape Seed Industry in India.—A recent publication issued by the Indian Industrial Research Bureau (A Study of Indian Mustard and Rape Seed and their Oils, *Bulletin* No. 13, Manager of Publications, Delhi, 1938. Price 14 annas) draws attention to the present mustard and rape seed industry in India. Technical data on which an All-India Standard Specification for mustard oil may be based, are presented and it has been shown that mustard oil of equal pungency and of superior yield to that given by the indigenous *ghannis*, can be obtained from modern plant when suitably operated.

The possibility of identifying seeds of different Brassica species by the microscope examinations of their seed-coat structures, has been indicated and the factors controlling pungency and the improved milling methods for the extraction of oil are discussed.

Since there is a strong tendency to adulterate this oil, definite specifications have been fixed by the different Provinces. These values have been compared with those of the oil extracted from the pure seeds, and it is concluded that certain mustard oil specifications in force in India need modifications to admit genuine oils. Certain specifications are also recommended.

In the last chapter the authors deal with pungency and the oil mill technique, "pungency in edible mustard oil", they conclude, "depends on hydrolysis of the glucoside present in the seed, and the optimum temperature for the reaction is between 40°-45° C.". They have also shown "that if mustard seed is pressed in a *ghanni* or in any other type of machinery without being moistened, or if the seed is heated about 70° C., the oil obtained lacks the essential mustard smell". It was found that the modern oil milling plant can be used to produce pungent oil, if operated according to the improved methods described in the *Bulletin*.

The publication will prove useful to the Oil Mill owners who wish to utilize their modern plant in extracting pungent mustard oil of commerce. To the plant breeder and botanist the knowledge of the seed-coat structure of different Brassica species and *Eruca sativa* illustrated by photographs will be of immense value.

R. H. R.

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The Imperial Bureau of Plant Breeding and Genetics, Cambridge, has recently issued a bulletin on "The Action and Use of Colchicine in the Production of Polyploid Plants" (by J. L. Fyfe, Price 1sh.). The discovery of the action of the drug colchicine on nuclear division, making it the most reliable agent yet used in the production of polyploid plants, has excited

great interest even in laymen and is of importance to those working on the cytology or genetics of plants. The bulletin begins by explaining the chromosome doubling; next a detailed account of the action of colchicine on mitosis and meiosis is given, followed by summaries of the results obtained from the use of colchicine for producing polyploid plants. The action and use of acenaphthene, which the Russian workers have shown to be a similar agent to colchicine, are also described. Particular attention has been paid throughout to treatments and dosages and some recommendations are given which should be helpful to those contemplating the production of polyploids. All the literature appearing up to the end of January 1939, is included and listed in a bibliography of 38 references.

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Guiding Principles for Studies on the Nutrition of Populations.—The Health Organisation of the League of Nations has just published a handbook entitled *Guiding Principles for Studies on the Nutrition of Populations* by Professor E. J. Bigwood, of Brussels University. (Ser. L.O.N.P., 1939, III, I, 281 pages. Price 6/-, \$1.50.)

The author has endeavoured to work out methods of enquiry which can be generally applied as to the actual food consumption and the state of nutrition of given population groups. The handbook is divided into two parts: (A) *Dietary Surveys*: There are four types of dietary survey: investigations may extend over a whole country, or be limited to population groups, to families, or to individuals.

The author describes the technique of these surveys—weighing methods; method of records in household books—questionnaire method, etc.; he then deals with the analysis of the collected data from the standpoint of the physiology of nutrition and with the scales of family consumption coefficients which have to be used in comparing the results of enquiries concerned with groups of different age and sex composition. The last two chapters of Part I deal with diets from the economic standpoint and the statistical significance to be assigned to the results of surveys. (B) *Enquiries into the State of Nutrition of Populations*: In this part of his handbook, the author discusses the somatometric (biometric, clinical and physiological) methods that may be suitably employed in these investigations. Special attention is given to the physiological methods, especially those for detecting latent hypovitaminoses and iron deficiency.

The handbook is completed by examples of surveys of various types in a number of different countries; it also comprises a terminological index and bibliographical references.

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The Child Welfare Information Centre of the League of Nations has just issued *The Summary of the Legislative and Administrative Series of Documents of the Child Welfare Information Centre* unpublished in 1938 (Ser. L.O.N.P., 1939, Vol. 1, pp. 58. Price 1sh.)

"A glance at this publication shows what questions have been engaging the particular

attention of Governments in the last few years. It will be seen, for example, that the protection of neglected and delinquent children has made fresh progress in nine countries, and that the small number of countries which inflict corporal punishment on minors has been further diminished, since New Zealand has amended her legislation so as to abolish whipping inflicted by order of the Children's Courts.

"In another direction it will be observed that the United Kingdom has made a bold innovation in the legislative sphere by investing the local authorities of the large towns with the power to close certain streets for traffic at certain hours in order that they may be utilised as playgrounds. The effects of this measure will be felt both as regards the prevention of juvenile delinquency and that of the protection of children against the physical dangers of the streets.

"A number of countries make no distinction between the protection of children and the protection of families. In this connection the Uruguayan law of April 19, 1938, authorising the constitution of "homesteads" and laying down the conditions attaching thereto is a document of great interest."

Naturalistic Measures in the Control of Malaria.—The latest issue of the *Bulletin of the Health Organization* of the League of Nations (No. 6) is mainly devoted to rural life problems. Drs. Heckett, P. F. Russell, J. W. Schraff and Senor White have discussed in an interesting article, the present use of naturalistic measures in the control of malaria. "In including this problem, the Malaria Commission of the League of Nations had in mind the questions raised by rural malaria in poor countries. The article deals with the first step towards the solution of the problem by critically surveying all action taken so far on naturalistic lines. This is defined as "the deliberate extension or intensification of natural processes which tend to limit the production of mosquitoes or their contact with man". The authors stress the desirability of creating experimental centres and of ascertaining the cost of methods before applying them".

A study of the Jute apion has been undertaken at Dacca in the Agricultural Research Laboratory of the Indian Central Jute Committee. A survey of the low land areas in the Rangpur District revealed that young seedlings were attacked by a number of pests and diseases. The jute apion does not appear to have been previously recorded at such an early stage. To study their life-history, the jute apion and the indigo-caterpillar are being reared in the Laboratory. From the diseased material, species of *Rhizoctonia*, *Fusarium* and *Alternaria* have been obtained.

The creation of a separate government department in order to undertake research on earthquakes is urged in the Memoir on the Bihar-Nepal Earthquake of 1934, just issued by the Geological Survey of India. The subject is too specialised to be regarded as requiring the occasional attention of the meteorological

department and the Geological Survey. The work could be more thoroughly and authoritatively studied by whole-time specialists. There are two lines of investigation awaiting such a department: (a) the prediction of future earthquakes as to time and place, and (b) the means of minimising their effects. "From a scientific and engineering view-point, the whole of North India within, say, 200 miles of the foothills of the Himalaya, must be regarded as a region particularly susceptible to severe earthquakes". Evidence exists for postulating the constant movement of the Himalaya throughout tertiary times down to the present day, a movement directed laterally towards the peninsula and giving rise to great horizontal thrust planes. On the Peninsula in Chota Nagpur, there has been a succession of upward movements during Tertiary times, giving rise to a general tilting towards the north. In the Gangetic Plains between, there has been constant subsidence. It is believed that all these movements are related. In the downward folded zone of the Gangetic Plains between the two uplifted regions of the Himalaya and the Peninsula, a state of strain or potential fracture is presumed to exist.

We understand that the Locust Research Scheme of the Imperial Council of Agricultural Research, which has till now been located at Karachi under the Locust Research Entomologist, has now been definitely closed. In view, however, of the importance of continuing the work of watching the deserts in the Indian area for locust developments and of warning the Indian cultivator about locust invasions in advance, the Government of India have sanctioned, with effect from 1st April 1939, the establishment of a "Locust Warning Organisation" under the supervision of the Imperial Agricultural Research Institute, New Delhi, for which the services of a good part of the staff of the late Locust Research Scheme have been retained. The desert staff is to be controlled by a Superintendent stationed at Karachi.

The Twenty-first Anniversary of the Bose Institute was also the first Memorial Meeting for its illustrious Founder, Sir Jagdis Chandra Bose, who dedicated this Institute to the Nation on his fifty-ninth birthday, November 30, 1917. Sir Nilaratan Sirkar, in his Presidential Address, gives a very interesting summary of Bose's life and work, and points out that the Bose Institute is the "first and foremost among his gifts for the advancement and diffusion of knowledge. This unique Institution, with its potentialities, should form an invaluable asset to the Nation, provided we knew how to utilise it." Sir Nilratan concludes with a quotation from Bose's inaugural address delivered on the Foundation Day of the Institute, a masterpiece of Bose's poetic imagination, literary skill and dynamic philosophy.

Dr. D. M. Bose, the present Director of the Institute, gives an outline of the work now being carried on at the Institute in plant physiology, plant genetics, agriculture, biochemistry, zoology, anthropology, and the chemical analysis of soil, food-stuffs, and the active constituents of Indian medicinal plants. The Physics

Laboratory of the Bose Institute has been enlarged for investigations in spectroscopy, ultrasonics, natural and artificial radioactivity and cosmic radiation. In co-operation with the Departments of Physics and Applied Mathematics of the University College of Science, Calcutta, the Institute conducts a lively Colloquium on Nuclear Physics.

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Mr. P. M. Kharegat, C.I.E., I.C.S., lately Secretary, Industries and Education Department, United Provinces, has succeeded Sir Bryce Burt, C.I.E., M.B.E., I.A.S., as Vice-Chairman, Imperial Council of Agricultural Research.

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The Maynard-Gangaram Prize for the year 1939 has been awarded to Rao Sahib Ch. Ram Dhan Singh, M.A. (Cantab.), Cerealist, Punjab Agricultural College, Lyallpur, in consideration of his meritorious work on the breeding of new wheat varieties.

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Cawnpore Sugar Technology Institute.—The annual report of the Imperial Council of Agricultural Research for the year 1937-38 gives details of the training facilities provided by the Cawnpore Sugar Technology Institute. It will be remembered that the Institute was established by the Government of India in October 1936, on the recommendations of the Tariff Board and the Sugar Committee, for a period of five years. It undertakes research on (1) Problems of Sugar Technology in general and those of sugar factories in India in particular; (2) Utilisation of bye-products of the industry; (3) Detailed testing of new varieties of cane under factory conditions; and (4) General problems of sugar engineering and chemistry.

To meet the demand for specialised technical staff for work in sugar factories, the Institute trains students in all branches of Sugar Technology and Sugar Engineering and arranges for refresher courses for men already employed in industry. In Sugar Technology and Sugar Engineering, a three years' course for the diploma of I.I.S.T. is provided. Graduates in Physics, Chemistry and Mathematics, Mechanical or Electrical Engineering are eligible for admission. Twelve admissions are made each year.

The Sugar Boilers' Certificate course is open to candidates who have passed the Intermediate Examination in Science or any equivalent examination. It is a one-year course; after two years, experience in Pan-boiling, the student becomes entitled to the certificate. Twelve admissions are made each year.

Three admissions are made yearly for post-graduate research in the sugar technology section and three in the sugar engineering section. The course extends to two years during the non-working period of cane factories and two seasons' factory experience after qualifying for the associateship. The diploma of F.I.I.S.T. is the highest Government diploma of Sugar Technology or Sugar Engineering in India.

Arrangements have also been made for short courses on a variety of subjects relating to Sugar Industry for candidates who do not possess the necessary technical and academic qualifications for the higher courses. These include a two sessions' course on Chemical Con-

trol and Bacteriology and a one session course on Pan-boiling, Fuel and Boiler control, Statistics (for sugar students), statistical methods (for research students) and training in Dutch and German languages. The sessions are usually held during the sugar off-season, so that actual employees in sugar factories may not be at a disadvantage. The general qualifications required for short courses are a B.Sc. degree with Chemistry, and some practical experience in a sugar factory. A high school leaving certificate is the minimum qualification for a Pan-boiling course, for the course on Statistics (for sugar students), the candidate is required to have passed the I.A. or I.Sc. with Mathematics as one of the subjects.

The Institute grants two scholarships of Rs. 25 per month each, one for the Associateship Course in Sugar Technology and the other for the Associateship Course in Sugar Engineering.

An employment bureau assists the ex-students of the Institute in finding jobs in Sugar Factories.

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University of Mysore.—I. *Lectures:* Under the Scheme of Extension Lectures, Mr. V. L. D'Souza, B.A., B.Com., delivered a lecture in English on "Population and Production" at each of the places, Shimoga and Bhadravati.

II. *Meeting of the Senate:* The annual meeting of the Senate was held on the 31st March 1939. Among the propositions that were passed, mention may be made of the following:—(1) Holding the Final Examination for the M.B.B.S Degree twice a year; (2) Removal of the condition of a pass in the Intermediate examination in the case of candidates who hold the L.M.P. Diploma of Mysore and who seek admission to the Pre-Medical Course; (3) Holding the University examinations in future in February and March instead of March and April commencing from 1940, the University session commencing on 1st June instead of on the 24th; (4) Recommendation to the University Council to take necessary steps for affording the University students every opportunity for obtaining Military Training on suitable lines; (5) Recommendation to the University Council for the deputation of two members of the University staff in the cadre of Assistant Professor of English to England for higher studies in English Language and Literature; (6) Recommendation to the University Council for taking all necessary steps for establishing an Intermediate College at a mofussil centre to be selected by the Council; (7) Opening of a 'University Adult Literacy Campaign' in connection with Rural Reconstruction Centre now located by Government at Closepet.

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Enquiry into the Cultivation of Cloves in India.—The subject of this enquiry, *viz.*, cloves, is one of those important agricultural products of commerce about which little is known. It was a welcome attempt on the part of the Imperial Council therefore to have instituted the present survey which not only brings out the very gratifying fact that cloves are already growing in the country and that the conditions of soil and climate in certain parts are quite suitable for its cultivation but also brings

together a comprehensive mass of information bearing on all aspects of the cultivation methods as carried out both in this country and in the more important centres of cultivation outside such as Zanzibar, Madagascar, Ceylon, and the Dutch East Indies (Report of an Enquiry into the Cultivation of Cloves in India by A. K. Yegna Narayan Aiyer, *Misc. Bulletin*, No. 20, Manager of Publications, New Delhi, 1938). An interesting account is given of the great attempts of the old East India Company to introduce the cultivation into India from the Dutch East Indies and thereby break the monopoly which the Dutch enjoyed in respect of this costly and valuable product, in those far off days of the struggle for supremacy in the trade with India and the orient generally. A description is given of the clove groves to be found in India, and for the sake of comparison of the clove groves in Ceylon, the descriptions being illustrated by photographs. The present trade in cloves in India is reviewed, there being an import annually of some 62,000 cwts. valued at about forty lakhs of rupees, though in a peak year the imports rose to over 73,000 cwts. This gives an idea of the scope there exists for local production. The soils of the present clove areas in India and those of the Ceylon areas for comparison have been analysed and these elaborate data form an important feature of the survey. Nursery practices, varietal characteristics, manuring, pests and diseases, harvesting and curing methods are dealt with in detail. With the exception of the fact that at the young stage the plants are delicate and are difficult of establishing, the cultivation appears to present no difficulties. Experimental cultivation on an area of about one hundred acres in the different eligible centres is suggested, as well as a study of various methods of propagation for overcoming the initial difficulties and securing other advantages. It is now up to the Imperial Council to follow up this commendable beginning with definite practical steps for the starting of the cultivation in the centres spoken of as suitable in the Report.

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The Composition and Agricultural Value of the Fine Ejecta of Volcanic Eruptions.—The eruption of the Mayon Volcano in the Philippine Islands in the month of June 1938 was taken advantage of to determine the chemical and physical composition of the ejecta and its agricultural value by N. L. Galvez (*The Philippine Agriculturist*, 27. Nos. 9 & 10). Seven samples were examined, six of which were similar in texture to ordinary soils, while the seventh belonged to that class of ejecta called lava. The chemical composition of the latter was found to be almost identical with the former, which analysed as follows:— SiO_2 , 56.36, TiO_2 , 0.78, Al_2O_3 , 19.37, Fe_2O_3 , 8.23, MnO , 0.4, CaO , 8.50, MgO , 1.13, K_2O , 1.16, SO_3 , 0.40, P_2O_5 , 0.56 and loss on ignition 0.72. The lava differed materially from the other ejecta only in the loss on ignition and the Fe_2O_3 contents which were 0.20 and 7.80 respectively. Analysed for their agricultural value, the six samples contained on the average (in the portion soluble in 10 per cent. HCl) among other constituents the following:— Al_2O_3 , 4.67, Fe_2O_3 , 1.53, CaO

2.17, MgO , 0.20, K_2O , 0.07, Na_2O , 0.57, P_2O_5 , 0.10. One of the samples contained a trace of nitrogen while the others, including the lava, contained nothing of this constituent. The insoluble residue was high, *viz.*, 88.76. The amount of available K_2O was low while that of available P_2O_5 higher than for ordinary soils. The fine ejecta is hygroscopic and acidic in reaction and the leaves of abaca (*Musa textilis* Nee) and papaya (*Carica papaya* Linn.) on which the ejecta settled became scorched and wilted, in consequence. Though the samples were all devoid of any nitrogen, they contained (collected two weeks after the eruption) colonies of bacterial growths of moulds and sulphur-oxidising organisms, while nitrifying and azotobacter organisms were absent. A. K. Y.

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Announcements

Seventh World's Poultry Congress and Exposition.—The Seventh World's Poultry Congress and Exposition will be held at Cleveland, Ohio (U.S.A.), from July 28 to August 7, 1939. Immediately before and after the Congress, a series of tours to various parts of the country will be arranged for visitors. It is the desire of the General Congress Committee that National Committees be formed as soon as possible by all countries expecting to participate in the Congress. Each National Committee will serve to organize the representation of its country at the Congress and to maintain contact with the United States Organization.

The following five sections will comprise the Scientific Sessions: (1) Genetics and Physiology; (2) Nutrition and Incubation; (3) Pathology and Disease Control; (4) Economics, including Processing and Marketing; and (5) General.

All communications regarding the Congress should be addressed to W. D. Thermohlen, Secretary General, Seventh World's Poultry Congress and Exposition, United States, Department of Agriculture, Washington, D.C., U.S.A.

All-India Obstetric and Gynecological Congress, 1939.—The Third All-India Obstetric and Gynecological Congress will be held in Calcutta in December 1939. The principal subjects of discussion are (1) anæmia of pregnancy, (2) functional uterine hæmorrhage, and (3) maternity and child-welfare. The Provisional Scientific Committee have formulated a scheme to facilitate investigations on these subjects. All communications are to be addressed to the Secretary, Dr. S. Mitra, M.D., F.R.C.S., F.R.C.O.G., 3, Chowringhee Terrace, Calcutta.

A New "Nomenclator Zoologicus."—Professor Julian S. Huxley, Secretary, Zoological Society of London, writes:—The preparation of this work, respecting which an announcement was made in 1935, is now approaching completion. It constitutes an attempt to bring together the names of all the genera and subgenera in Zoology that have been described from the 10th edition of *Linnaeus*, 1758, up to the end of the year 1935, with a bibliographical reference to the original description of each. It will also

include the great majority of alternative spellings that have appeared during that period. Another feature that will, it is thought, be found valuable for systematists relates to cases where a new name has been proposed for a homonym. In these instances a cross-reference is given under the homonym to the new name.

It is estimated that the work will comprise some 225,000 entries, of which about 5,000 appear to have been omitted from all previous publications of this character. It is proposed to publish the work in 4 volumes of nearly 1,000 pages each, which it is hoped it will be possible to issue at intervals of about six months.

The Zoological Society of London has already borne the whole cost of preparation (approximately £1,800), but the Council of the Society does not feel justified in incurring further expenditure in respect of this enterprise, which would involve an additional £3,600.

However, with the aid of various grants from outside sources, the Editor, Dr. Sheffield Neave, has himself now been able to arrange for the printing and publication of the work. It is proposed to publish it at the low advance-subscription rate of six guineas post free for the four volumes, provided that a sufficient number of undertakings to subscribe can be obtained. (Intimation may be sent to Dr. S. A. Neave, O.B.E., Imperial Institute of Entomology, 41, Queen's Gate, London, S.W. 7.) If these are adequate, it is hoped to issue the first volume during the coming summer. After publication, the price will be raised to eight guineas.

Messrs. *The Veritas Press*, Inc., New York, announce that they will soon be publishing a comprehensive Thesaurus of Geology and allied scientific terms, under the authorship of Walther Huebner. The publication, which is the first of its kind in the history of geological literature, will explain and co-ordinate more than 25,000 geological terms in the English and German languages, covering exhaustively all branches of the subject. The price of the book, which will contain about 400 pages, will be \$7.50, and the English-German Part is expected to be published in October 1939.

Considering the nature and scope of the work we have no doubt that this compilation will be welcomed, and its value appreciated, by geologists all over the world, who wish to be familiar with English and German geological literature.

Messrs. *Annual Review*, Inc., Stanford University, P.O. California, announce that the *Annual Review of Biochemistry*, Vol. VIII, 1939, will be ready by July 15, 1939. The volume will contain approximately 680 pages and is priced \$5.00 per copy.

The non-profit Bibliofilm Service (*Bibliofilm Service*, U.S. Department of Agriculture Library, Washington, D.C.) copies, at cost, for serious research workers, extracts from almost all publications, except certain of those which are copyrighted) abstracted in *Chemical Abstracts*. Present rates are 1 cent per page plus a fixed service charge of 20 cents for copying in the form of microfilm (35 mm. standard

safety photographic film conveniently usable in reading machines now widely available at moderate cost), or 10 cents per page, plus service charge of 20 cents, for copying as photoprints 6" x 8", readable without optical aid). When properly copyable material is not available in the four great scientific libraries where Bibliofilm Service has installations, it is usually borrowed from other institutions for copying, or copies through other services or in other cities at their somewhat varying rates (*Chemical Abstracts*).

We acknowledge with thanks, receipt of the following:—

"Agriculture and Live-Stock in India," Vol. 9, Pt. 2.

"Journal of Agricultural Research," Vol. 58, Nos. 3-5.

"Agricultural Gazette of New South Wales," Vol. 50, Pts. III-IV.

"Monthly Bulletin of Agricultural Science and Practice," Vol. 30, No. 3.

"Biochemical Journal," Vol. 33, No. 3.

"Berichte der deutschen chemischen gesellschaft," Vol. 72, No. 4.

"Journal of the Institute of Brewing," Vol. 45, No. 4.

"Journal of the Indian Botanical Society," Vol. 18, No. 1.

"Biological Reviews," Vol. 14, No. 2.

"Communications from Boyce Thompson Institute," Vol. 10, No. 2.

"The Journal of Chemical Physics," Vol. 7, No. 4.

"Journal of the Indian Chemical Society," Vol. 16, No. 2.

"Chemical Age," Vol. 40, Nos. 1030-1033.

"The Calcutta Review," Vol. 71, No. 1.

"Chemical Products," Vol. 1, No. 6.

"Experiment Station Record," Vol. 80, No. 3.

"Indian Forester," Vol. 65, No. 5.

"Forschungen und fortschritte," Vol. 15, Nos. 10-12.

"Transactions of the Faraday Society," Vol. 35, No. 216.

"Genetics," Vol. 24, No. 2.

"Bulletin of Health Organization (League of Nations)," Vol. 6, No. 6.

"Calcutta Medical Journal," Vol. 35, No. 5.

"Bulletin of the American Meteorological Society," Vol. 20, Nos. 1-2.

"Scripta Mathematica," Vol. 5, No. 4.

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

"Indian Medical Gazette," Vol. 74, No. 4.

"Nature," Vol. 143, Nos. 3621-3624.

"American Museum of Natural History," Vol. 43, No. 4.

"Journal of Nutrition," Vol. 17, Nos. 3-4.

"Proceedings of the Royal Netherlands Academy," Amsterdam, Vol. 42, No. 1.

"Indian Journal of Physics," Vol. 12, Pt. VI.

"Canadian Journal of Research," Vol. 17, No. 2, A, B, C and D.

"Research and Progress," Vol. 5, No. 3.

"Journal of the Royal Society of Arts," Vol. 87, Nos. 4505-4508.

"Sky," Vol. III, No. 6.

"Indian Trade Journal," Vol. 132, Nos. 1712-1714.