

fessor of botany and director of Botanic Garden at Montpellier. In 1816 he resigned his offices and came to Geneva whose citizens founded a chair for him in 1817.

Histoire des plantes grasses (1799-1803) was his first book. His doctorate thesis was an *Essay on the medicinal properties of plants* (1804). He revised Lamarck's *Flora of France* (1805). His *Theorie elementaire de la botanique*, which is remarkable for its profoundness and which is regarded as his masterpiece came out in 1813. His *Regni vegetabilis systema naturale* (1818-21) had to be discontinued after the second volume as its plan was too vast for one man to execute. In 1824 began a more modest version under the title *Prodromus*. But even this had to be completed only after his death, by his son and other botanists. His *Organographie vegetale* (1827) dealt with the anatomy of plants and developed the doctrine of metamorphosis. This was followed in 1832 by a book on the physiology of plants.

While every botanist had yielded to the influence of the artificial system of Linnaeus, De Candolle was the first to estimate its merits correctly. In the principles of classification expounded by him in his introduction to Lamarck, he said "The natural method endeavours to place each individual object in the midst of those with which it possesses the greatest number of points of resemblance; the artificial has no other end than that of enabling us to recognise each individual plant. ... The former being truly a science, will serve as an immutable foundation for anatomy and physiology, to build upon; whilst the second ... does nothing towards enlarging the boundaries of science."

After a visit to a meeting of naturalists at Turin, De Candolle died 9 September 1841.

S. R. RANGANATHAN

University Library,
Madras.

SCIENCE NOTES AND NEWS

Contact Angles.—An interesting method for measuring contact angles has been described by Bikerman (*Ind. Eng. Chem., Anal. Edn.*, 1941, 13, 443) making use of the equation

$$\frac{\Delta_0^3}{v} = \frac{24 \sin^3 \theta}{\pi (2 - 3 \cos \theta + \cos^3 \theta)}, \text{ where}$$

Δ_0 = the diameter of a minute droplet of the liquid,

v = the volume of the drop, and θ = the contact angle between air, liquid and solid.

A microsyringe is used to produce very small drops while their volume is determined by a micrometer syringe. The diameter of the contact circle is determined by measuring the diameter of the mark produced after evaporation of the liquid drops using a suitable travelling microscope. The method described, is used to measure the contact angle for water drops on built-up multilayers of soaps, on lacquered tin plate and on glass plates. The method seems to be simple as it involves the measurement of length and volume and not of the angle and the results obtained represent a more accurate average value for the contact angle.

M. R. A.

Particle Size Determination by Sedimentation.—Sedimentation methods offer a means of obtaining the size distribution curves of soils. Wiegner, Kelly and others developed a simple method which consists in measuring the change in hydrostatic pressure exerted by the suspension as the suspended material separates. It was observed that the liquid from the manometer capillary entered the settling tube thereby causing a disturbance in the suspension. Kammermeyer and Binder (*Ind. Eng. Chem., Anal. Edn.*, 1941, 13, 335) have improved it by using an all-glass manometer. A spoon gauge

made by elongating a thin-walled bulb and then flattened on one side has been used to measure the pressure differences. The pointer movement is amplified by optical arrangements. Calibration curve is got by converting the increases in height of the liquid to increases in pressure and plotting against pointer displacements. The advantages of this method are: (1) that the final position of the pointer can be easily calculated which corresponds to complete settling, (2) disturbances caused by the flow of the liquid from the side arm are avoided and (3) a closer differentiation of particle sizes is possible owing to the high sensitiveness of the all-glass manometer.

G. S.

Passivated Tinplate.—When sulphur-containing food-stuffs are packed in tin-plated cans, the insides of the cans generally become stained during the hot sterilising process. In addition, the artificial colouring matter added to certain food-stuffs get bleached by reduction by the tin. A special sulphur-resisting lacquer is often applied to the tinplate to avoid these difficulties. An alternative and simpler method of protection is described by R. Kerr in *The Tin Research Institute Publication* No. 104. This consists in passivating the tinplate with an invisible oxide film produced by treatment with a solution which is both alkaline and oxidising and contains, essentially, trisodium phosphate and sodium dichromate. Full details are given in the publication.

M. A. G.

Chinese Amphibians and Reptiles.—South-eastern China has been very little explored from a herpetological point of view and for this reason the collection of Amphibians and reptiles made and described by J. L. Gressitt (*Philippine Journal of Science*, May 1941, 75, No. 1) is interesting. The collection has

been made in three provinces of south-eastern China, i.e., Kiangsi, Kwangtung and Fukien and extend over varying altitudes. The specimens fall under 63 species, including one urodele, 24 species of Anura, 6 lizards, 25 snakes and 7 turtles. In this collection has been reported one species of snake, *Natrix boulengeri* which is new to science but it includes a number of species of both amphibians and reptiles which have been taken in these provinces for the first time. No Apoda are reported from the area but one species of newt, *Pachytriton brevipes* occurs in Kwangtung province at an altitude of 640 metres in fresh-water pools and streams. It is of interest to note that a number of Indian forms occur in this part of China, notably species of *Bufo* (*B. melanostictus*), *Rana* (*R. limncharis*), *Kaloula* (*K. pulchra*), *Microhyla* (*M. ornata*) and a number of turtles and snakes.

Chromite in Mysore.—Mysore State is one of the chief centres of chromite ore production in India. It contributes nearly one-half, and Baluchistan one-third, of the total Indian output. Mysore's total is roughly two and a half per cent. of the entire world production. In a bulletin issued for the benefit of the general public (*Mysore Geological Dept. Popular Studies No. 2*) Mr. Venugopal explains in detail the nature of occurrence, origin and distribution of chromite deposits in the State.

Workable deposits of chromite occur only in Hassan and Mysore Districts. In the former the chief productive mines are situated near Chokenhalli, Bhaktarhalli, Jambur and Byrapur on the Nuggihalli Schist belt which extends roughly from Nuggihalli to Arsikere. The Byrapur mine alone has yielded upto 1937, 60,000 tons of ore valued at Rs. 11 lakhs. In the Mysore District the only mine of importance is Shinduvalli which produces annually 2,000 tons of chromite. N. JAYARAMAN.

Substitutes for Mineral Oils.—The Board of Scientific and Industrial Research have suggested certain vegetable oils or vegetable-mineral oil mixtures as substitutes for mineral oils.

It is understood that the Inspectorate General of Stores, Cawnpore, is prepared to undertake testing of these oils. The Inspectorate is being expanded to include a Lubricant Section which, when properly equipped, will be able to undertake testing of all lubricants, including aero-engines lubricating oils required by the Defence Services. It will also test oils on behalf of the Civil Services.

The Kalabagh Barrage which is now under construction is situated on the river Indus. Its purpose is to divert water for the irrigation of the Thal area.

The catchment area of the Indus above Kalabagh is 111,900 square miles and the barrage is designed to pass a discharge of 950,000 cusecs. Sufficient freeboard is, however, provided to permit 1,100,000 cusecs to pass with safety.

There is a possibility of this discharge being experienced in the event of the Shyok glacier

dam forming again and bursting simultaneously with a high flood. As a result of the bursting of the Shyok Dam in 1929 exceptionally serious floods were caused in the Punjab and the North-West Frontier Province. About 225 lives were lost and thousands of houses and head of cattle destroyed in nine districts of the Punjab. There was also loss of life and enormous destruction in some districts of the Frontier Province.

The Barrage, which is founded on a mixture of sand, shingle and boulders is designed for a maximum head of 22 feet which allows for 2 feet of retrogression downstream. It is 3,781 feet long between abutments and comprises a central weir section consisting of 42 bays of 60 feet each with an undersluice section at each end consisting of 7 bays of 60 feet each. All bays are provided with gates. The gates and gearing are being manufactured by the Central Canal Workshops at Amritsar.

The estimated cost of the Barrage is Rs. 1,75,00,000.

Forest Research Institute.—All the member mills of the Indian Paper Makers' Association have agreed to a voluntary cess of four per ton of output, based on the audited statements of the production of the mills in order to finance the researches carried out in the Paper Pulp Section of the Forest Research Institute, in the general interest of the industry. According to a report appearing in the *Indian Forester* (1941, 67, 498) a committee has been appointed to function in an advisory capacity in matters relating to research work, undertaken at the Forest Research Institute, either on its own initiative or at the instance of the member mills. At the first meeting of the Committee held at Calcutta on March 8, it was agreed that the Paper Pulp Section staff should undertake an investigation relating to the possibility of eliminating silicious scale occurring on the surface of bamboos, which appears to be unaffected by digestion or bleaching and which appears to be one of the primary causes of dirty bamboo pulp. A small technical sub-committee was formed to consider and adopt a scheme to standardise tests and testing apparatus for paper and pulp and also to consider standards for testing the various raw materials found in India. Among other important decisions reached, mention may be made of the following: (1) a scheme in paper technology for workers in paper mills, and (2) building up a reference library at Dehra Dun for the use of those interested in the paper and pulp industry.

With a view to having closer co-operation and co-ordination between the manufacturers and research institutions, the Indian Chemical Manufacturers' Association has approached important Universities in India carrying on research with a request to include representatives of manufacturers of chemicals and drugs on the Advisory Boards of the Universities. It is pointed out that association of manufacturers with Advisory Boards would enable them to give their suggestions about researches that would be useful to the Industry, as it often happens that researches

are being carried out on products which are already being manufactured in the country or which could not be economically manufactured. Moreover, the manufacturers would be able to keep themselves in touch with the researches that are being carried out in the laboratories under the Universities.

Indian Central Jute Committee.—At the meeting of the Committee held on Friday, July 25, the following schemes of research were sanctioned: (1) Preparation of synthetic resins and plastics in soluble or emulsion form, suitable for impregnating bleached jute fibre with a view to improving its qualities, (2) investigations on the chemical utilisation of jute and jute waste, and (3) researches into jute fibre when treated with plastics. Experiments contemplated in this connection include the use of jute twine in the manufacture of camouflage nets, the possibility of manufacturing all-jute fabrics for canvas and other military needs.

A sub-committee was appointed in this connection, to draw up a detailed programme of work on plastics in which the respective parts that the Board of Scientific and Industrial Research, the Indian Lac Research Institute and the universities could play in this matter was to be clearly indicated. The sub-committee will consist of Sir S. S. Bhatnagar, Dr. H. K. Sen, Mr. I. G. Kennedy, Dr. W. G. Macmillan, Prof. B. C. Guha, Mr. C. R. Nodder, Mr. Padam-pat Singhania, Mr. Priya Nath Sen and Dr. M. N. Saha. To the same Committee was also entrusted the task of formulation of a programme of work for the Technological Research Extension Scheme.

A scheme (by Prof. B. C. Kundu) on the study of the growth and development of the jute fibre, and a scheme (by Dr. B. C. Guha) for biochemical investigations of the processes involved in the retting of jute were approved.

An important step in the progress of agricultural research on jute in Bengal was signaled by the opening of a Research Station at Konda, a village in the Brahmanbaria Sub-Division of the District of Tipperah, on the 19th August. The opening ceremony was performed by Mr. O. M. Martin, C.I.E., I.C.S., Commissioner, Chittagong Division. In the varying conditions of soil, water and climate in which the jute crop is grown in Bengal, it is necessary that agricultural research work on jute, particularly in its more practical aspects, should be decentralised and replicated at selected centres, spread over representative jute-growing areas. The research centres are intended to serve as a link between the Committee's research activities and the practical needs of the cultivators.

A Charter for Science.—The London correspondent of the *Hindu* reports: "At the Royal Institute on September 26, under the auspices of the Ministry of Information and with the support of the British Association, a world conference on science and world order will be opened.

"Explaining the object, Sir Richard Gregory, President of the British Association, said that

science could be used for good or evil and the time has arrived when scientists, who themselves constituted a democracy that knew no distinctions of race, colour or creed should determine how their work should benefit, not injure humanity. The main theme of the Conference would be the use of science for constructive not destructive purposes. They hope to devise a charter to which all scientists could subscribe and reach decisions that would keep science from the hands of gangsters who used it to wreck society.

"Prof. Einstein will address the Conference by radio on 'The Common Language of Science'.

University of Mysore.—A meeting of the Academic Council was held on the 30th August in Bangalore.

The following extension and special lectures were delivered during the month of August 1941: (1) Mr. A. Narayana Rao, "Some aspects of animal life". (2) Dr. R. E. Heilig, "Vitamins and preservation of health". (3) Dr. R. Balakrishna, "Industrial Development of Mysore". (4) Mr. A. V. Telang, "Separation of electric charges in the atmosphere". (5) Mr. C. V. Srinivasa Murthy, "The evolution of moral values". (6) Mr. B. Kuppaswamy Naidu, "The inheritance of mental ability". (7) Mr. R. L. Narasimha, "Inaudible sound".

MAGNETIC NOTES

The average magnetic activity in the month of July 1941 was slightly less than that in the preceding month. There were 3 quiet days, 18 days of slight disturbance and 7 of moderate and 3 of great and very great disturbance as against 3 quiet days, 20 days of slight disturbance and 1 of moderate disturbance. The day 5th July 1941, was very considerably disturbed and the 27th the least. The character figures of individual days in July 1941 are given in the following table:—

Quiet days	Disturbed days		
	Slight	Moderate	Great and very great
19, 26 & 27	1, 2, 3, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 28, 29, 30 & 31	4, 8, 9, 10, 11, 12 & 21	5, 6 & 7

A very great magnetic storm suddenly commenced at 4 h. 59 m. G.M.T., and ended at 23½ h. on the 5th July 1941. A moderate storm occurred at 4 h. 10 m. G.M.T. on the 21st ending at 0 h. on the following day. There was one moderate storm in the corresponding month of the previous year. The mean character figure for July 1941 was 1.27 as against 0.71 in the same month of the previous year.

ASTRONOMICAL NOTES

Planets during October 1941.—Both Mercury and Venus are in the evening sky; the former will be at greatest elongation from the Sun— $25^{\circ} 42' \text{ E}$ —on October 3, but it will be difficult to see the planet on account of its low altitude at sunset. On October 27, it will be in inferior conjunction with the Sun and will afterwards become a morning star. Venus continues to be a prominent object visible for over a couple of hours in the western sky in the early part of the night. Mars will be in opposition to the Sun on October 10, and can be seen all night. It is closest to Earth on October 3, when its distance is about thirty-eight million miles and the apparent diameter of its disc 23 seconds of arc. Its apparent magnitude is -2.4 , i.e., it will appear about twice as bright as Sirius, the brightest star in the heavens.

Jupiter rises about three hours after sunset and is a conspicuous object in the sky for the rest of the night. It is at one of the stationary points of the geocentric orbit on October 10, when it begins to move westwards among the

stars. Saturn is in Taurus and continues its slow westward motion. It rises nearly two hours after sunset; the brightness is increasing the stellar magnitude being zero at the end of the month. Uranus will be found close by, in Taurus, about three degrees to the northeast of Saturn.

The well-known meteoric showers—the Orionids are due to appear in the latter half of the month, the approximate date of maximum display being October 22. The position of the radiant is given by R.A. 96° , Declination 15° North and the meteors of this group are characterized by swift streaks. T. P. B.

SEISMOLOGICAL NOTES

During the month of August 1941, 2 moderate and a slight earthquake shocks were recorded by the Colaba Seismographs as against 1 great, 3 moderate and 1 slight shocks recorded during the same month in 1940. Details for August 1941 are given in the following table:—

Date	Intensity of the shock	Time of origin I. S. T.		Epicentral distance from Bombay	Co-ordinates of the epicentre (tentative)	Depth of focus	Remarks
August 1941—		H.	M.	(Miles)		(Miles)	
1	Slight	09	18	1330	Near Lat. $34^{\circ} 5' \text{ N.}$, and Long. 86° E. in Tibet		
4	Slight	16	23	5780			
10	Moderate	03	48	1510	Near Lat. 10° N. , and Long. 94° E. to the south of the Andamans in the Bay of Bengal		
15	Moderate	11	39	6350			
19	Slight	21	49	1710	Near Lat. 7° N. , and Long. 96° E. to the east of the Nicobar Islands		
30	Slight	15	06	4810			
30	Slight	18	37	4690			
30	Slight	22	15	1430	Near Lat. $14^{\circ} 5' \text{ N.}$, and Long. 94° E. in the neighbourhood of the North Andamans		