

## SCIENCE NOTES.

**Need for Research in India on Intergeneric Crosses between *Brassica* and *Raphanus*.**—Dr. R. H. Richharia, Agricultural Research Institute, Nagpur, writes :—

Some of our oil seed crops such as mustard and rape belong to the genus *Brassica*. The intergeneric crosses between this genus and *Raphanus* to which radish belongs have been of great interest in recent years especially in demonstrating the experimental production of new species and genera by hybridisation. They are important not only from purely scientific point of view but from economic view-point as well. The interesting Radish-cabbage hybrids, (Karpechenko, 1921-27; Richharia, 1936) Raphano-brassica, are well known (see photograph).<sup>1,2,3</sup> In  $F_2$  from this cross, *Raphanus sativus* (Radish)  $\times$  *Brassica oleracea* (Cabbage Brussels sprout, etc.) several types of polyploids originate, of which only tetraploids are very fertile and constant. These hybrids are quite huge and vigorous. Their leaves can be used as fodder and fruits as vegetables. During the year 1931-35 a few hybrids could withstand the extreme winter of England (Cambridge), thus were biennial. It is quite possible that under favourable climatic conditions they may be made perennial. In India the question is whether they will be able to survive through the hot season. Experiments from this point of view have been started on this experimental station.

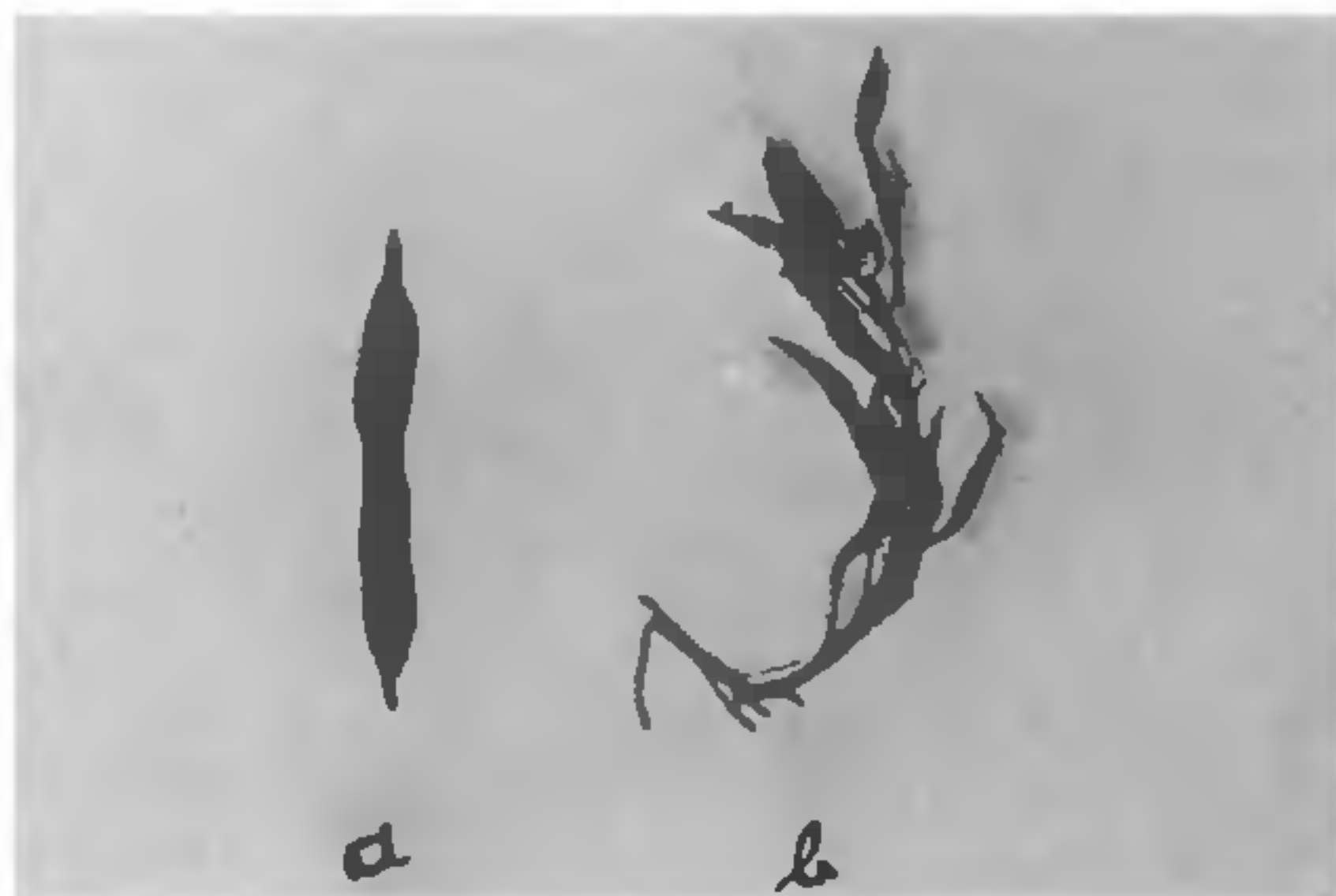


Fig. 1.—Fruits from Tetraploid Raphanobrassica (*Raphanus sativus*  $\times$  *Brassica oleracea*).

(a) A single fruit. The upper half (nearly) is radish part and the lower, cabbage.

(b) A branch with feebly developed fruits.

Species such as *B. Carinata* (Abyssinian mustard), *B. chinensis*, etc., also easily cross with Radish (e.g., Karpechenko, 1929; Tarasawa and Shimotomai, 1928; Tarasawa, 1933, etc.).<sup>4,5,6</sup> But  $F_1$  generation in all these crosses is extremely sterile. Occasionally a few seeds may be obtained which in  $F_2$  produce different types of polyploids. It is quite possible that if the different  $F_1$ 's are grown under various controlled and natural environmental conditions important results may be obtained.

<sup>1</sup> Karpechenko, *J. Genet.*, 1924, 14, 375.

<sup>2</sup> Karpechenko, *Bull. App. Bot. and Plant Breeding*, 1927, 17(3), 305.

<sup>3</sup> Richharia, R. H., *Cytological Investigation of Raphanus sativus, Brassica oleracea and their  $F_1$  and  $F_2$  hybrids*. (In press.)

<sup>4</sup> Karpechenko, *Proc. U.S.S.R. Congr. Genet.*, 1929, 2, 277.

<sup>5</sup> Tarasawa and Shimotomai *Abstr. Int. I. Bot.* 1928

These crosses also open a very promising line of research from the bio-chemical point of view.

The purpose of the above note is to invite the attention, of scientific workers to the possibility of utilising intergeneric crosses between *Brassica* and *Raphanus* as experimental material.

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DR. T. S. WHEELER has returned from leave and resumed charge of office as Principal, Royal Institute (of) Bombay.

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**A Note on a Few Rusts from Kolagaon (Nagar District).**—Prof. S. A. Parandekar, Rajaram College, Kolhapur, writes :—

Rusts are so common in our fungus flora; by their coloured spots specially on the leaves that they are conspicuous enough to the "rust-collectors".

During a casual visit to Kolagaon (about 15 miles from Kopergaon Railway Station on Poona-Dhond-Manmad Line) in October last, the following three rusts were collected and identified; the identification was later confirmed by Dr. Sydow of Berlin. As these forms are not reported so far from the same locality, it was thought worth while to do so.

1. *Uromyces Aloes* (Cke.) P. Magn. on leaves of *Aloe vera* plants growing on the banks of the river "Umbri" and near by. In this case it was confirmed by observations that the fungus remains dormant during the hot weather and produces the spores in spring and winter on the leaves which apparently look healthy and the infection occurs immediately after the spores mature—a view already expressed with some doubt by Ajrekar and Tonapy,<sup>1</sup> who have reported the fungus previously from Talegaon (Poona District). The same rust is also reported previously from Coimbatore.<sup>2</sup>

2. *Puccinia heterospora* Berk and Curt. on *Sida spinosa* growing in large numbers in the vicinity of the P. W. D. bungalow; this is previously reported from Poona, Dharwar, Mysore and Berars.<sup>2</sup>

3. *Uromyces commelinae* (Cke.) on *Commelina Forskalii*, Vahl., Enum. growing on the bank of the irrigation canals (Godavari—Right Bank); this is previously reported on *Commelina benghalensis*, *C. obliqua* and *Cynotis* species elsewhere.<sup>2</sup>

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**Expedition to Mount Nanda Devi.**—On August 29, the members of the Joint British-American Expedition led by Prof. Graham Brown climbed for the first time Nanda Devi, the highest peak (25,660 ft.) in the British Empire. The members of the Expedition consisting of seven experienced mountaineers, left Ranikhet on the first stage of the journey on July 14th. It was calculated that the party would take about three weeks to reach the base camp at the foot of the Naini Tal gorge.

According to an account published in *Statesman* (Sept. 13th) Messrs. Tillman and Eric Shipton first achieved in 1934 the feat of penetrating into the basin of Nanda Devi. According to Mr. Rutledge "Nanda Devi is guarded by a 70-mile barrier-ring on which stand 12 measured peaks, over 21,000 feet high and which have no depression lower than 17,000 feet except in the west where the Rishi Ganga rising at the foot of Nanda Devi and draining an area of some 250

<sup>1</sup> Airekar and Tonapy. *Journ. Ind. Bot. Soc.* Sept.



sq. miles of ice and snow has carved for itself what must be one of the most terrific gorges in the world; two internal ridges converging from the north and south upon the river form the curtains of the inner sanctuary with which the great mountain soars up to 25,660 feet." This defence had previously defeated Dr. Longstaff, Dr. Sommergele, General Wilson and Mr. Hugh Rutledge. Messrs. Tillman and Shipton entered and left the basin in 1934 by the Rishi Ganga and in the same year reached it again by the same route to emerge by the Sunderdhangra col and valley on the southern rim, after climbing a considerable distance up the south face of Nanda Devi herself.

The triumph of the Expedition is not a little due to the quick movement made possible by the light luggage with which they had provided themselves.

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**Siniolahu Conquered by German Climbers.**—Yet another triumph of Himalayan Expedition was achieved by the German climbers on September 23rd, when the party led by Herr Paul Bauer reached the summit of Siniolahu (22,620 ft.). The summit was reached at 2 P.M. The last part of the climb from a height of 21,300 ft. up to the summit provided very difficult climbing. The expeditionists hope to climb some of the neighbouring hills.

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**North America's Highest Peak.**—In a series of four flights from the Pan American Airways base at Fairbanks, Alaska, Mr. Bradford Washburn, leader of the National Geographic Society's Mt. McKinley Expedition, succeeded in photographing a vast expanse of the rugged terrain between Mt. McKinley and Mt. Hayes.

The pictures reveal the highest territory under the American flag. They also mark the first use, in the region, of infra-red ray photography, which makes it possible for the same photograph to show the town of Fairbanks and the white summits of Mt. McKinley and its related peaks projecting above the horizon more than a hundred miles away across a haze-obscured plain.

The infra-red photographs show why Mt. McKinley can claim one of the greatest heights, from top to bottom, among the world's mountains, since it rises 20,000 feet from a level plain almost without foothills. Mt. Everest although 29,000 feet above sea-level, actually rises only about 10,000 feet above a lofty plateau region. Because of its near Arctic latitude, Mt. McKinley has a very low timber line and is forbiddingly barren. Its expanses of snow and glacier do not completely cover all its jagged rocky ridges.

After flying 500 feet above the top of Mt. McKinley, despite dangerous air currents, and circling the peak several times Mr. Washburn flew straight along the axis of the mountains, taking close range photographs in pairs, stereoscopic fashion, at intervals of a minute. He thus obtained a progressive series showing the various peaks in their true relations to one another.

Photographs of Mt. McKinley reveal a giant of almost unrealizable magnitude massive to the very top. Its steeply sloping western face has been called the world's highest cliff—an almost sheer drop of over three miles. The southern side, however, is perhaps more impressive, although only about two miles deep, its wall is perpendicular. Only three expeditions have been known to scale Mt. McKinley.

**South Indian Epigraphy.**—The annual report for the South Indian Epigraphy for the year 1932-33 just issued, chronicles the activities of the special branch of the Archaeological Department, interested in the decipherment of inscriptions discovered in South India. During the years an intense survey in selected parts of the Madras Presidency and Bombay—Karnatak was carried out; 600 inscriptions were copied in 133 villages, the actual number of villages inspected being over 350.

Several inscriptions refer to the Pallava Kings of Conjeevaram and these throw interesting sidelight on the ancient social customs and beliefs. The existence of several unknown kings of the Chanukya dynasty in the Northern Circars can be inferred from the inscriptions found in the Ganjam and Godavari Districts, and a revised genealogy of the Kona-Haihaya chiefs of the Andhra country has been given.

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**State Aid to Industries.**—A review of the efforts that have been made by the Government of India to stimulate industries, has been published as a *Bulletin* of the Industries and Labour Department of the Government of India. The review covering the period 1928-1935 has been prepared by Mr. N. Mahadeva Ayyar, I.C.S., and forms a sequel to a similar review "The State and Industries" by Mr. A. G. Clow for the years 1920-1928.

**Technical and Industrial Education.**—The stress of unemployment among the middle classes has brought home to parents and sons alike the increasingly small value from the pecuniary point of view of the purely literary type of education imparted in schools and colleges and the imperative necessity of seeking new fields of employment in the industrial world. The gradual development of industry has steadily widened the effective demand for the services of those who have received industrial training and has thus stimulated the expansion of schools and colleges to meet the need. A large number of technical and industrial schools have come into being throughout India and numerous scholarships have been instituted to encourage students.

**Cottage Industries.**—The Handloom industry is not confined to the class of hereditary weavers. It provides a subsidiary occupation to the agriculturist at the season when work on the field is slack. In order to develop this industry, the Government of India decided to spend to the extent of 5 lakhs of rupees every year for a period of 5 years, and schemes were formulated and discussed. These schemes provide for improvements in marketing, appointment of technical experts and supply of materials at cheap rates. Similar action was taken by the Government with a view to assist the silk industry, and an annual grant of Rupees one lakh for five years—1935-40—was made. An Imperial Sericultural Committee was set up, which met in 1935 to scrutinise schemes submitted by local governments. More recently, the Government has taken an important step to aid the cottage and small scale woollen industries by making a special grant of Rupees five lakhs spread over five years and a Special Woollen Industry Committee has been set up to advise the Government of India on the question of allotments. The crux of the problem of developing cottage industries is to find a suitable market for the products. Accordingly, the question of efficient marketing organisation for



handloom products was thoroughly studied and promising schemes based on co-operative effort have been adopted. An important feature of the development of cottage industries is the exhibitions organised by Government departments. Besides these, numerous publications have been ushered in, to disseminate commercial intelligence and useful surveys of different industries are being undertaken.

The Governments of Madras, the Punjab and the United Provinces have made several successful efforts to develop the hydro-electric resources of the country, thus making provision for cheap power for industrial consumers.

One of the most outstanding events of the period under review has been the establishment of the Industrial Research Bureau, by the Government of India, which has already undertaken a heavy programme of work and is contributing valuable observations on industrial methods.

The record also deals with the fiscal measures adopted by the Government for assisting industries. Among articles receiving protection are paper, salt, matches, wheat, silver thread and wire, silver plates and like manufactures, magnesium chloride, etc. The policy regarding iron and steel, cotton and other textiles, and sugar is also dealt with. The Government is further affording all possible encouragement to the development of industries in India by giving a definite preference in making purchases for articles of indigenous manufacture.

An exhibition of Indian manufactured articles has been organised in the Imperial Secretariat Buildings, New Delhi, for bringing prominently to the notice of indenting authorities and the general public the standard of quality attained in certain industries.

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*Nature* reports that Dr. John Henry Hutton well known in India as the author of the monumental *Census Report* of 1931, has been appointed a Lecturer in the Faculty of Archaeology and Anthropology in the University of Cambridge for a period of three years as from October 1st. Dr. Hutton entered the Indian Civil Service in 1909 and during the 27 years of his service he had ample opportunities to come into contact with the peoples of India. He made a special study of the ethnography of the Nagas of Assam, the results of which study have been incorporated in two monographs published under the auspices of the Government of Assam. His *Census Report* published in 1933, is a remarkable document which has ensured for him a prominent place among the scientists as an expounder of the racial history of India. He was General President of the Indian Science Congress, 1935, and President of the recently formed Indian Anthropological Institute.

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**Malaria and Nutrition.**—*Nature* announces that at a meeting of the Council of the Royal Society held in July, it was decided that the whole income together with the invested income of its Medical Research Funds should be employed for a period of 5 years on a scheme of laboratory research on Malaria to be conducted in England, and a field enquiry into malnutrition in India. Lieut.-Col. J. A. Sinton, lately Director of the Malaria Survey of India, has been appointed to conduct the first part of the malaria programme. He will work in the laboratories of the Malaria Therapy Centre at Horton.

Dr. Curgel Wilson has been appointed to conduct the Malnutrition Survey of India in collaboration with Dr. Aykroyd, Director of the Nutritional Research Institute, Coonoor. The problem of malnutrition in India is one of the major problems (see *Current Science*, 1935, 4, 75) requiring immediate attention and it is hoped that the survey which will be concerned chiefly with the incidence of malnutrition among school children and the dietary habits of groups of families in the districts where the children live, will be to the lasting benefit of India.

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Dr. H. S. Rao of the Zoological Survey of India received a specimen of *Hippocampus kuda* Bleeker, 6 inches long from the vicinity of Port Bonnington, North Andamans, where it was collected by Mr. M. Balasubramanian of the Forest Department on the 2nd July 1936. The fish was caught on the southern shore of the Steward Sound not far from Mangrove Island in a fishing net along with sardines in about 3 feet of water over a sandy bed. According to the information supplied by the collector the local Andamanese know this fish casually and only from deep water, while the Burmese settlers believe that paste made with this fish is an antidote for snake and centipede venom.

This sea-horse is a littoral species widely distributed along the tropical coasts of the Indian and Pacific Oceans as far east as the Hawaiian Islands north of Japan. The observation that a paste prepared from the "Godha machi" (*Hippocampus*) is an effective cure for snake or centipede bite is new and well worth recording.

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**Nitrogen Transformations in the Soil.**—Addressing the *Society of Biological Chemists*, at Bangalore, on "Nitrogen Transformations in the Soil," Prof. N. R. Dhar of Allahabad stressed the importance of molasses as an effective means of increasing the nitrogen content of Indian soils, which as a class are poor in this essential constituent when compared to soils of temperate and cold climates. The excessive heat and moisture of the tropics which account for the rapid depletion of soil organic matter and loss of nitrogen, could be utilised to help nitrogen fixation and augment the nitrogen reserves of the soil through the application of molasses. In the rapid photochemical and bacterial oxidation of molasses, large amounts of energy are set free, which result in the production of ammonia and nitrates. Application of molasses 2 or 3 months before sowing and subsequently ploughing 3 or 4 times, has been found to give greatly increased yields from rice, sugarcane, etc. Another important observation of Dr. Dhar is the great utility of molasses in the reclamation of alkaline soils. In this respect, molasses appears to be more effective than gypsum or powdered sulphur and requires a much shorter time to show results. Alkaline lands have been successfully reclaimed in different parts of the United Provinces and of Mysore by the application of molasses and crop yields obtained where no vegetation grew before.

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**Manufacture of Liquid Chlorine in India.**—Under the auspices of the Technological Association, University of Bombay, Mr. G. S. Gulrajany read a paper on 'The Possibility of Liquid Chlorine Manufacture in India,' on the 28th September. The present demand for liquid chlorine



is estimated at 360 tons per annum, valued at 2½ lakhs of rupees. The principle use of liquid chlorine is for bleaching bamboo pulp. About half the quantity is used up in Bombay and there is ample scope for installing a plant, with a daily output of 1,000 to 1,500 lb. of liquid chlorine. The capital requirements for such a concern is estimated at 20 lakhs of rupees and it is expected that it will be able to pay a dividend of about 10 per cent. The product can be marketed at 3½ as. per lb., as against 5 as. per lb. at which the imported article is sold.

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**The Problem of Trisection of Any Angle.**—(By Sri Niwas Asthana).—By using an elaborate set of constructions, the author believes that he has successfully solved a classical problem. His proof, published about two years ago, in the form of a pamphlet was not accepted, and he has now made an attempt to correct the mistake in his proof. Unfortunately, a mistake occurs in the very same place, only under different wordings.

The problem is closely allied to the problem of solving a cubic equation by means of quadratic Surds only, and it is known that the problem is insoluble "if in our constructions we restrict ourselves to the use of circles and straight lines, that is, to Euclidean Geometry" (W. W. R. Ball, *Short History of Mathematics*, p. 37; also refer to J. W. A. Young, *Monographs on Modern Mathematics*, p. 364).

Mr. Sri Niwas Asthana is a schoolmaster gifted with remarkable enthusiasm and "geometrical patience," and would surely be able to do interesting work if he attempts other problems instead of worrying himself about an insoluble problem.

C. N. S.

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An important event connected with the recent meeting of the British Association at Blackpool is the amalgamation of the British Science Guild with the Association.

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The foundation of the British Science Guild in 1905 was primarily due to the efforts of Sir Norman Lockyer, the celebrated founder of *Nature*. Lord Haldane was its First President. The Guild's aim is to influence public opinion and to promote closer contact between science on the one hand and social problems and public affairs on the other. Since the Association has also pursued the same aim in recent years it was considered desirable to incorporate the Guild with the British Association.

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**The Geological, Mining and Metallurgical Society of India.**—The Twelfth Annual Meeting of this all-India body was held at Calcutta, the Society's headquarters, on 24th August. Prof. N. P. Gandhi, the President, delivered an address on India's drift without a mineral policy.

During the year 1935-36, the Society held 8 ordinary meetings for reading and discussing scientific communications, and 9 Council meetings for transacting ordinary business. Among the important steps taken by the Council, mention may be made of the addition of a Review Section to the *Quarterly Journal* of the Society. The Society has kept up its usual level of activity, and its Journal has maintained a high standard. As many as 16 papers were published in the Journal mostly pertaining to Geology. It is hoped that papers dealing with Mining and

Metallurgy will find place in the *Quarterly Journal*, the official expositor of the activities of the Society.

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**The National Academy of Sciences, India.**—At the Ordinary Monthly Meeting of the Academy held on 15th September 1936 the President announced that the Imperial Council of Agricultural Research has made an annual grant of Rs. 500 for a period of three years to the National Academy of Sciences, India, to meet the publication expenses of the Academy.

At the same meeting, Mr. B. K. Bhatnagar, B.Sc. (Allahabad) and Mr. Hrishikesha Trivedi, M.Sc. (Lucknow) were elected Members.

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**Calcutta Mathematical Society.**—At the meeting of the Society held on the 5th, Mr. H. N. Ganguly, M.A. (Patna) and Mr. N. Chatterjee, M.A. (Bankipur) were proposed for election as ordinary members.

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**Sir Edward Poulton**, Emeritus Professor of Zoology at Oxford, the well-known entomologist and Darwinian, has been elected President by the British Association for the Advancement of Science for 1937. The meeting will be held at Nottingham from September 1 to 8.

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News has been received that DR. B. S. GUHA of the Indian Museum, Calcutta, has been elected a member of the Comité International de Préparation Scientifique of the Institut International D'Anthropologie. He has also been recently elected a member of the Comité Permanent de Recherches pour la Standardisation des méthodes anthropologiques of the Congress International Des Sciences anthropologiques and is on the Executive Body of the section dealing with anthropometry.

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Dr. Habib Abdur Hafiz is confirmed as Assistant Superintendent of the Zoological Survey of India.

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Dr. S. S. Bhatnagar has returned to India after his European tour, in which he represented the University of the Punjab at the Empire Universities Conference.

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In the death of **Monsieur Paul Kestner** (b. 1864) the scientific world is deprived of an eminent chemical engineer and industrial chemist, gifted with great inventive ability. He was the Founder of the firm of Paul Kestner at Lille, the name of which was subsequently changed to Société Anonyme Appareils et Evaporateurs Kestner. His inventions cover a very wide field; mention may be made of the improvement of lead chambers in sulphuric acid manufacture, fans to deal with corrosive acid fumes, and the well-known Kestner Evaporators. After the Great War, Paul Kestner occupied himself with researches in agriculture and vegetable physiology.

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#### Announcements:

**The King George Thanksgiving (Anti-Tuberculosis) Fund Committee** has decided to hold the next post-graduate course for training in tuberculosis at the All-India Institute of Hygiene and Public Health, Calcutta, from the 4th to the 30th January, 1937. The number of students will be limited to 25 as a greater number cannot be dealt with effectively for demonstration and clinical purposes. Selected candidates will be



paid by the Thanksgiving Fund second class return railway fares from their stations to Calcutta and back subject to a maximum of Rs. 100, the balance being met by the candidates themselves or their employers.

Medical men, whether private practitioners or in the service of a government, railway, municipality, etc., are eligible to apply. Applications should be submitted by the 1st November 1936, in the prescribed form, which can be obtained from the Organising Secretary, King George Thanksgiving (Anti-Tuberculosis) Fund, from 20, Talkatora Road, New Delhi.

Applications should reach Dr. A. R. Mehta, the Organising Secretary of the Thanksgiving Fund, by the 1st November 1936. Those received after this date will not be entertained.

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**Imperial Council of Agricultural Research.**—Applications are invited for the award of prizes, during 1937, for improvements in *Machinery for Preparing Crops for Market, for Food or for Storage*.

On the 7th June 1933, it was announced that the Imperial Council of Agricultural Research would award annually one Gold and two or three Silver Medals for improvements of distinct merit in the science and art of agriculture and animal husbandry of an all-India importance and that awards would be made each year in one of the five groups, viz., (1) Veterinary Scientific Instruments and Appliances (1934). (2) Dairying and care of animals (1935). (3) Field Implements and Appliances (1936). (4) Machinery for Preparing Crops for Market, for Food or for Storage (1937). (5) Water Lifts (1938).

Entries will be submitted in the first instance to the Provincial Agricultural Research Committees which will forward to the Council those which they consider suitable with a description of entries that have been rejected.

All entries for the award should reach the Secretary, Imperial Council of Agricultural Research, through the proper channel not later than 1st December 1936. Entry forms and the conditions to be fulfilled can be obtained from the Secretary, Imperial Council of Agricultural Research, Simla.

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We acknowledge with thanks receipt of the following:—

"The Agricultural Gazette of New South Wales," Vol. XLVII, No. 9, Sept. 1936.

"Journal of Agricultural Research," Vol. 53, No. 1, July 1936.

"Indian Journal of Agricultural Science," Vol. VI, No. 4, Aug. 1936.

"Monthly Bulletin of Agricultural Science and Practice," Vol. 27, No. 8, August 1936.

Dominion of Canada, Department of Agriculture: National Research Council—

"The Comparative Feeding Values for Poultry of Barley, Oats, Wheat, Rye and Corn."

"The Philippine Agriculturist," Vol. XXV, No. 4, September 1936 and Index for first 20 volumes.

"The Allahabad Farmer," Vol. X, No. 5, August 1936.

"Journal of the Royal Society of Arts," Vol. LXXXIV, Nos. 4370-4374.

"Biochemical Journal," Vol. 30, No. 8, Aug. 1936.

"Chemical Age," Vol. 35, Nos. 895-899.

"Journal of Chemical Physics," Vol. 4, No. 9, September 1936.

"Journal of the Indian Chemical Society," Vol. 13, No. 8, August 1936.

"Berichte der Deutschen Chemischen Gesellschaft," Vol. 69, No. 9.

"Journal de Chimie Physique," Vol. 33, Nos. 8-9, August-September 1936.

"Experiment Station Record," Vol. 75, No. 2, August 1936, and Index to Vol. 73.

"Transactions of the Faraday Society," Vol. XXXII, Pt. 9, September 1936.

"Indian Forester," Vol. LXII, No. 10, Oct. 1936.

"Forschungen und Fortschritte," Vol. 12, Nos. 26-27.

Government of India Publications:—

"Monthly Statistics of Production of Certain Selected Industries of India" (Department of Commercial Intelligence and Statistics), No. 3, June 1936.

"Annual Report of the Imperial Council of Agricultural Research for 1935-36."

Indian Meteorological Department, Scientific Notes, Vol. XXIV, Part VI: "Typhoons and Indian Weather."

"Indian Trade Journal," Vol. CXXII, Nos. 1577-1580.

Report of the Haffkine Institute, Bombay, for 1932-35.

Annual Report of the All-India Institute of Hygiene and Public Health, Calcutta, 1935.

University of Illinois Publications, Vol. 33, No. 42—"A Study of the Reactions of Various Inorganic and Organic Salts in Preventing Scale in Steam Boilers."

League of Nations Publications—"The Problem of Nutrition, Vol. IV—Statistics of Food Production, Consumption and Prices."

"Marriage Hygiene," Vol. III, No. 1, Aug. 1936.

"Journal of the Indian Mathematical Society," Vol. II, No. 3, 1936.

"The Calcutta Medical Journal," Vol. 31, No. 3, September 1936.

"Medico-Surgical Suggestions," Vol. 5, No. 8, August 1936.

"Electrotechnics," No. 9, April 1936.

"Review of Applied Mycology," Vol. 15, No. 8, August 1936.

International Institute of Agriculture—"Bibliography of Tropical Agriculture, 1935."

"Journal of the American Museum of Natural History," Vol. 38, No. 2, September 1936.

"Journal of the Bombay Natural History Society," Vol. 38, No. 4.

"Nature," Vol. 138, Nos. 3486-3490.

"Journal of Nutrition," Vol. 12, Nos. 2-3.

"Indian Physico-Mathematical Journal," Vol. 7, No. 2, September 1936.

"Canadian Journal of Research," Vol. 14, No. 8.

"Journal of Research, National Bureau of Standards," Vol. 16, No. 2.

"Scientific American," Vol. 155, No. 4, Oct. 1936.

#### Catalogues:

"Monthly List of Books on Natural History and Science," September 1936 (Messrs. Wheldon & Wesley, London).

"Mitteilungen über Neuerscheinungen und Fortsetzungen," 1936, No. 4, September (Messrs. Verlag von Gustav Fischer in Jena).

"Bell's Miscellany, Autumn Books," 1936 (Messrs. G. Bell & Sons, Ltd.).

"Cambridge Autumn Books, 1936" (The Cambridge University Press).

"Balopticons and Accessories" (Messrs. Bausch & Lomb, Rochester, N. Y.).