cular genus, is the place where there are the maximum number of its species. Regarding the endemics, based on the floristic studies of Ceylon and New Zealand, Dr. Willis concludes that the endemic species which occupy the smallest areas in those islands are young, and that the area of the species is proportional to age. As Dr. Wulff has pointed out, this does not explain the cases of endemics which have acquired their monotypic character as a result of the dying out of most of their species. Endemism might be the result of taxonomic isolation, in which case it might be young, as compared with the endemics which manifest phylogenetic antiquity. Various terminologies to differentiate the two types, including the use of the terms, neoendemics and palæo-endemics, are given.

A discussive account of various species and their possible origin due to edaphic factors is given. The importance of plant rusts and plant lice in gleaning out the facts about past distribution of plants is finely illustrated. This indirect method of study is useful where evidences from fossil records are lacking.

In the chapter on artificial factors in the geographical distribution of plants, the role of man in distributing and changing vegetation is pointed out. Considering the vastness of the flora, man's part is insignificant in changing the character of an area.

Referring to natural factors concerning geographical distribution of plants, such as wind, importance of competition among plants to inhabit new areas, or between the new comers and those already present is stressed. The necessity of understanding the past history of the globe to explain discontinuous distribution is explicitly stated. In this connection a comprehensive account of Wegener's theory of Continental drift as supported by phyto-geographical studies is given. Diel's criticism of Wegener's hypothesis is shown to be not in keeping with facts. In the last chapter concepts of floral elements such as geographical, ecological and historical elements are elegantly described. The book is a very valuable addition to the Chronica Botanica series and must have a wide circulation it deserves.

M. J. THIRUMALACHAR.

SCIENCE NOTES AND NEWS

On the Production of Carbarsone.—Mr. A. K. Bose, of the Indian Research Institute, Ltd., Calcutta, writes:—Carbarsone, the carbamido derivative of arsenilic acid, is one of the most innocuous of the organic arsenicals. Its amœbicidal action is directly connected with its arsenic content. Theoretically it contains 28·8 per cent. arsenic; but as the drug is being marketed in tablets and gelatin capsules containing 0·25 gm., it is of special importance to see that its content of arsenic as demanded by the above amount of the drug, is strictly maintained. The arsenic content of "Carbarsone" usually available in the market is sometimes found to be lower than the standard (28·1 to 28·8 per cent.).

The compound has now been prepared in this laboratory and has been found to be upto standards and specifications as mentioned in the *New and Non-official Remedies*, 1939. The product melts at 172° with decomposition and the arsenic content as determined by the U.S.P. XI method has been found to be 28·7 per cent. in average, indicating thereby, that a technique of producing carbarsone with arsenic content just within the limit as specified in the N.N.R. has been developed in the country.

Post-War Agricultural Policy in India: Planning for Self-Sufficiency in Manurial Requirements.—Dr. C. N. Acharya writes:—One of the bitterest lessons taught this country by the present war is the great weakness in the national economy in having to depend on imports from foreign countries in order to meet the normal food requirements of the country. A searching analysis of the failure of the country in recent decades to meet the food requirements of its increasing population, shows this failure to be due ultimately to the low fertility level and crop-yielding power of Indian soils. In any post-war agricultural policy, a systematic planning for improving the fertility status of Indian soils should occupy the most prominent attention. Such planning would envisage primarily the production and application of greater quantities of fertilizers and manures to the land than are done at present.

In considering various methods of tackling the manurial problem, weightage should be given to a policy which would stand the stress of prolonged war conditions. Dependence on imports of fertilizers for maintaining food production in the country is no sounder policy in war time than dependence on imports of food materials themselves. So far as India is concerned, her local resources of mineral phosphates are limited and in the matter of nitrogenous fertilizers, her internal production is also low at present. Even supposing that the production of nitrogenous fertilizers by fixation from the air could be increased greatly after the war, it is well known that most of this production would be diverted for the manufacture of explosives in war-time.

In the light of the above considerations, it would be seen that the soundest policy to be adopted in our post-war agricultural reconstruction in India would be to concentrate on increasing the quantity and quality of organic manures that could be produced within the country itself.

The two chief sources of organic manure that are available in this country are farmyard manure and town refuse compost—the quantities of oil-cake, fish meal, etc., available being quite small in comparison. Farmyard manure has been the staple manure of this country for centuries past, but unfortunately it is unable to satisfy in full the present manurial requirements of our agriculture, since (a) the quantity of farmyard manure produced is much smaller than what could be made available from a bovine population of over 200 millions maintained in this country, on account of the widespread custom of our farmers, of converting cattle dung into fuel cakes; (b) the quality of the manure produced is very poor on account of defective methods of preparation; (c) the most important constituent of animal excreta, *viz.*, urine, is almost wholly wasted under existing conditions; and (d) the miscellaneous odds and ends of vegetable and habitation refuse that are available on the farms and in farmers' houses are not systematically collected and utilized for manure preparation.

The experiments and trials carried out by the writer at Bangalore, Poona, Surat and other centres, have shown that the quantity of farmyard manure that could be prepared can be increased by 50 per cent. and the contents of nitrogen and phosphoric acid could be increased from 0·5 per cent. and 0·3 per cent. respectively (on dry basis) on average samples by the farmer's method to about 1·5 per cent. and 0·8 per cent. respectively by the improved method.

The practical possibility of utilizing town wastes on the large scale for conversion into agricultural manure has attracted the attention of the Government of India, who have recently sanctioned a special grant for organizing the preparation of compost manure from municipal wastes in all the major Provinces and States in India. Under this scheme, which is operated by the Imperial Council of Agricultural Research, Special Biochemist Officers have been appointed in the major Provinces and States in India, with necessary staff for organizing compost production work at urban centres in their respective areas. The above Biochemist Officers have undergone intensive training in the theoretical and practical aspects of compost making for a period of six months under the guidance of the Chief Biochemist to the Imperial Council of Agricultural Research.

It is suggested that the staff of Compost Biochemists and Assistant Chemists already appointed in each Province, primarily for dealing with town wastes, may be more fully utilized by empowering them to take into their purview the problem of introducing improved methods, of farmyard manure and farm compost preparation into the rural areas in their respective Provinces and States; and that for this purpose the present staff may be strengthened by the appointment of a number of Compost-Khamghers or Maistries attached to each Assistant Chemist, who would specifically deal with the widespread introduction of the improved process for the treatment of farm wastes in rural areas.

India's Mineral Industries.—In the course of his Presidential Address to the Nineteenth Annual Session of the Geological, Mining and Metallurgical Society of India, held on the 29th November 1943 at Calcutta, Mr. B. Rama Rao stated that the estimated value of India's annual production of ores, minerals and metals has been ranging now from 30 to 35 crores of rupees, which, when compared with the value of minerals, metals and mineral fuels produced annually in the United Kingdom, South Africa, Canada and Australia, stands lowest. The progress of mineral industries in India during the last fifty years, though not altogether negligible, cannot be considered to be commensurate with the country's extent and of its total population. Lack of enterprise and initiative on the part of the Indian capitalists have been responsible for this slow progress. State-guidance and Government help have not been forthcoming in as generous a measure as would be effective; the country's general ignorance of its available mineral resources and their uses is also a contributory cause.

India's present imports of various mineral products, mineral fertilisers and chemicals, etc., amount to several crores of rupees every year. Most of these,—like refined kaolin, dressed emery, graded asbestos, and industrial chemicals like the dichromates, can be easily prepared in India out of the raw minerals available in the country.

Mr. Rama Rao said that India has deposits of more than a hundred varieties of useful minerals which could serve as raw materials for several industries, but these are, however, irregularly distributed in the country. For the development of mineral industries in any part easy accessibility to the requisite mineral deposits is necessary. While some parts like Bihar and Orissa, and Southern India have a multitude of useful minerals, others like Bombay, Baluchistan and Rajputana have but a few worthy of note. After giving a succinct account of the provincial distribution of minerals and the mineral industries now existing therein, he examined in detail the scope for expansion of the metallurgical industries like iron and steel smelting, production of ferro-alloys, extraction of gold, lead, and copper, etc., and also the scope for developing various non-metal industries—like the manufacture of abrasive products; ceramic, refractory, and glass industries; mineral paints and pigments; and production of mineral fertilisers and chemicals.

Reliable information on the extent and quality of most of the deposits, in several areas, was lacking and this could be obtained only by an intensive mineral survey of each of the provinces by modern methods of prospecting. But the geological service now available for such a task was absolutely inadequate. It should be the primary function of the State to foster the rapid growth of the country's mineral industries. Mr. Rama Rao strongly urged (1) the organisation by Government of well-equipped mineral survey departments in each of the provinces, and (2) the constitution at the Centre, of a "National Mineral Utilisation Board" with several

advisory committees in respect of different groups of industrial minerals.

Indian Patents.—Mr. S. G. Sastry, B.A., M.Sc. (Lond.), Director of Industries and Commerce (Retired), writes to us as follows:—

Recently I had occasion to have some correspondence with the Controller of Patents in Calcutta on a matter of some importance to Indian scientific workers. My correspondence with the Controller of Patents and Designs referred to a particular type of sulphur burner which had been described in the *Chemical and Metallurgical Engineering of New York*. Whether the process or the apparatus already described in current technical literature which had already been patented in foreign countries could be given patent rights in India was the main issue raised by me. The Controller of Patents has given a ruling on this subject, and further he has permitted me to quote the relative portions from his letter on the subject. It is this official ruling given by the Controller of Patents that is of some importance to scientific workers in India. "... The second question is 'can any one apply for a patent if a particular invention or if a particular process which is known in other countries happens to be either unknown or little known in British India?' The answer to this question is that prior knowledge or prior use of an invention outside British India is not a bar to the grant of a patent in British India if the invention has not been publicly used or publicly known in any part of British India, prior to the date on which the application for a patent was made in this counery. An invention is deemed to be publicly known if a document containing an adequate description of it, whether issued as a general publication or not, has in the course of ordinary business and without imposing any secrecy, reached an appreciable section of the public interested in the art to which the invention relates."

Administration Report of the Government Mineralogist for 1942, Ceylon, Part II—Revenue (1).—This Report which covers some six pages of close printing, deals with the usual activities of the Department during the year.

A new mining ordinance has been introduced to improve mining conditions. Though a lot of difficulty was felt, the production of graphite has considerably increased. To encourage exploitation, the Royalty on mica has been reduced from 5 to ¼ per cent. A new welcome feature of the Department is the starting of publication of professional papers on various topics concerned with the Geology and Mineralogy of Ceylon. The Government have also started to record scientifically the fall of meteorites and to preserve them in the State museum.

On the economic side investigations on Peat tracts are progressing and more information is available on the vanadium-content of the ilmenite sands. Kaolin can be worked if a market is found for it outside Ceylon, and the occurrence of Copalite resin offers an incentive for the development of a new industry. The iron ore deposits of Ceylon have been estimated as sufficient to last the country for about a century.

Geological survey of small areas is proceeding, and the relationship between the major formations of Ceylon is becoming more and more clear.

B. V. I.

The Geological, Mining and Metallurgical Society of India: Elected Council for 1943-44.—*President*: Sir Cyril S. Fox; *Vice-Presidents*: (1) Prof. L. Rama Rao, (2) Prof. N. N. Sen; *Joint-Secretaries*: (1) Prof. N. N. Chatterjee, (2) Prof. S. K. Bose; *Treasurer*: Prof. B. N. Maitra; *Librarian*: Prof. S. Ray; *Other Members of the Council*: (1) Prof. M. Chatterjee, (2) Dr. A. K. Dey, (3) Prof. T. N. Muthuswamy, (4) Mr. P. S. Narayana, (5) Mr. N. H. Ojha, (6) Mr. N. L. Sharma, (7) Prof. Daya Swarup, (8) Prof. K. P. Rode.

SEISMOLOGICAL NOTES

Among the earthquake shocks recorded by the seismographs in the Colaba Observatory, Bombay, during the month of September 1943, there were four of moderate and four of slight intensities. The details for those shocks are given in the following table:—

Date	Intensity of shock	Time of origin I.S.T.		Epicentral distance from Bombay	Co-ordinates of epicentre (tentative)	Depth of focus	Remarks
		H.	M.	(Miles)		(Miles)	
5	Moderate	15	05	3540	Lat. 5° N., Long. 125° E., near Mindanao.	..	Probably slightly deep.
6	Moderate	10	12	7070	..	90	
9	Slight	10	36	1310	..	170	Epc.: Hindu-Kush. Felt at Rawalpindi, Muzaffarabad, Dera Ismail Khan, Gauhati. Kabul, Drosh, Gulmarg and Srinagar.
10	Moderate	15	07	3950	..	..	..
14	Slight	03	31	7180	..	..	..
14	Slight	10	13	7110	..	..	..
14	Slight	13	56	5290	..	..	..
24	Moderate	18	01	1190	Lat. 37° N., Long. 74°·5E., near the Hindu-Kush mountains	..	..

Among the earthquake shocks recorded by the seismographs in the Colaba Observatory, Bombay, during the month of October 1943, there were one of great, one of moderate and five of slight intensities. The details for those shocks are given in the following table:—

Date	Intensity of shock	Time of origin I.S.T.	Epicentral distance from Bombay	Remarks
		H. M.	(Miles)	
1	Slight	13 01	1370	..
5	Slight	17 41	1610	..
10	Slight	07 13	1360	..
22	Moderate	22 31	3110	..
23	Great	23 54	1290	Epicentral region in Assam. Reported to have been felt in some places in Assam and North Bengal.
24	Slight	20 11	4890	..
24	Slight	22 34	8330	..

MAGNETIC NOTES

Magnetic conditions during November 1943 were slightly less disturbed than in the previous month. There were 10 *quiet* days, 18 days of *slight* disturbance and 2 days of *moderate* disturbance as against 17 quiet days and 13 days of slight disturbance during the same month last year.

The quietest day during November 1943 was the 11th and the day of largest disturbance the 19th.

The individual days during the month were classified as shown below:—

Quiet days	Disturbed days	
	Slight	Moderate
2–4, 9, 11, 13–15, 17, 30.	1, 5–8, 10, 12, 16, 18, 21–29.	19, 20.

No magnetic storm occurred during the month of November in the years 1942 and 1943.

The mean character figure for the month of November 1943 was 0·73 as against 0·43 for November 1942. M. V. SIVIRAMAKRISHNAN.

We acknowledge with thanks the receipt of the following:—

"Journal of the Royal Society of Arts," Vol. 91, Nos. 4644, 4648, 4650.

"Journal of Agricultural Research," Vol. 67, Nos. 1, 2 & 4.

"Agricultural Gazette of New South Wales," Vol. 54, Pt. 10.

"Biochemical Journal," Vol. 37, No. 3.

"Central Board of Irrigation Bulletin," No. 41 (Sep. 1943).

"Journal of Chemical Physics," Vol. 11, No. 9.

"Experiment Station Record," Vol. 89, Nos. 2-3.

"Indian Farming," Vol. 4, No. 6.

"Indian Forester," Vol. 69, Nos. 11-12.

"Bulletin of the Indian Central Jute Committee," Vol. 6, Nos. 7-8.

"Indian Medical Gazette," Vol. 78, Nos. 10 and 11.

"American Meteorological Society Bulletin," Vol. 24, No. 4.

"Review of Applied Mycology," Vol. 22, No. 8.

"Journal of Nutrition," Vol. 26, No. 2.

"Nature," Vol. 152, No. 3859.

"Science," Vol. 98, Nos. 253-39.

"Science and Culture," Vol. 9, Nos. 5-6.

"Journal of Scientific and Industrial Research," Vol. 2, No. 1.

"Monthly Science News," No. 25.

"Sky," Vol. 2, No. 11.

"Indian Trade Journal," Vol. 151, Nos. 1947-1953, 1955.

BOOKS

An Introduction to the Modern Theory of Valency. By J. C. Speakman. (Edward Arnold & Co., London), 1943. Pp. 159. Price 5/6.

ERRATA

"Coconut Shells as an Industrial Raw Material: I. Composition of Shells".—Vol. 12, p. 292, in the table *for* "SO_2" *read* "SiO_2"; p. 292, para (*iii*), Organic Constituents: line 2, *for* "W. L. Winton" *read* "A. L. Winton"; line 5, *for* "species" *read* "spices".

"The Origin of Rohr at Didwana".—Vol. 12, p. 295, para 3, line 3, *for* "months" *read* "weeks"; p. 297, Table III, Raw Brine, NaCl : Na_2SO_4, col. 3, *for* 2·8°:1 *read* 22·82:1.