

Meteor-Showers.

	R.A.	Decl.	
Near 55 Aurigæ	98	46 N.	March 14-25.
„ θ Ursæ Majoris ...	143	49 N.	March 20.
„ β Ursæ Majoris ...	162	58 N.	Rather slow.

**THE PUBLIC GARDENS OF BRITISH INDIA,
ESPECIALLY THE BOTANIC GARDENS.¹**

THE appearance of the hundredth Annual Report of the Royal Botanic Garden, Calcutta, is an event of no little interest in the botanical world, not alone for what it contains, but also for the evidence it affords of the vitality and vigour of the institution, the primary object of which was to disseminate useful information respecting the vegetable products of the possessions of the "Company," and to introduce exotic plants of economic value.

Dr. George King, F.R.S., the present able Superintendent, gives a concise history of the foundation and progress of the Garden down to the present time; and the appendices show that the establishment was never conducted with greater activity. We might make some interesting extracts from the present Report; but our object now is to give a foreigner's view of the principal horticultural establishments in India.

Mr. Warburg roughly classes the gardens under three heads, according to their degree of scientific and practical utility, as distinguished from purely pleasure-gardens, though no hard and fast line can be drawn, because some of the gardens are maintained partly for pleasure and partly for profit. There are only three real botanic gardens in India—we let Mr. Warburg speak for himself—namely, Calcutta, Madras,² and Saharunpore, unless we count the garden at Ganesh Khind, near Poona, which is often erroneously called a botanic garden. Besides these, there is the botanic garden at Peradeniya in Ceylon, which, however, comes under the Colonial Office. Of the officially so-called botanical gardens, two were originally founded as such by far-seeing officials: Calcutta by General Kyd in 1786, and the Ceylon Garden by Sir Joseph Banks in 1810; the latter having been established at Peradeniya ever since 1821. The origin of the Saharunpore garden in the North-West Provinces I did not ascertain [it was originally a pleasure garden of the native princes, and when Lord Moira conquered the Mahrattas he caused it to be transformed into a botanic garden; and the first Superintendent was Dr. Govan (1816-23), who was succeeded by the better-known Dr. Royle, Dr. Falconer, and Dr. Jameson]; and the gardens of Ootacamund and Singapore have passed through various stages before attaining their present condition. Of agricultural experimental gardens I am acquainted with those of Kandesh (Bombay Presidency), Saidapet (near Madras), Nagpore (Central Provinces), and Hyderabad (in the Deccan).

There is also a horticultural garden in Lucknow, an agri-horticultural garden in Lahore (Punjab), and the beautiful garden at Madras belonging to an Agri-horticultural Society. Similar Societies exist in Calcutta, Rangoon, and probably in other places; the first publishing a special Journal.³

In almost every town where there is a considerable European population or garrison there are ornamental gardens or parks, called into existence by the demand, and almost necessity, for some such place for social recreation—riding, driving, and walking—in a tropical country, where many of the pleasures and amusements of our European towns cannot be enjoyed. Then there are numerous extensive and costly gardens belonging to the native princes and nobles.⁴

Respecting the gardens having a practical aim, we may be very concise, as their objects are much the same, subject only to the climatal differences of the various provinces, and consequently the kinds of plants that may be profitably cultivated within their

¹ Chiefly from an article by O. Warburg in vol. xlv. of the *Botanische Zeitung*.

² Mr. Warburg refers here doubtless to the Madras Presidency, as the botanic garden is at Ootacamund in the Nilghirries, and not at Madras. It should be understood that we are only extracting passages from a rather long article.

³ And we may add that there is an experimental garden in the mountains at Mussoorie in connection with Saharunpore; another at Darjeeling, partly pleasure and partly practical; and an important experimental garden at Mongpo (Sikkim), under Mr. J. Gammie: the two last offshoots of Calcutta.

⁴ We must pass on to what Mr. Warburg has to say concerning the conditions and functions of the botanical gardens and their adjuncts.

several radiuses of activity. The manner in which these practical ends are attained consists on the one hand of experiments and trials in the acclimatization of useful and ornamental exotic plants; and on the other hand of raising new and improved varieties of native plants; and when successful results follow, propagation on a large scale is practised for free distribution or sale. Thus, for instance, during the year 1884-85 the Calcutta Garden sent out 23,500 living plants to various places in India, and forty-two Wardian cases of plants to foreign countries. Further, some 3000 packets of seeds were distributed; yet the proceeds amounted to only 1075 rupees, because one of the principal functions of the Calcutta Garden is to provide the public gardens and pleasure-grounds with plants.

In the same year the Saharunpore Garden distributed as many as 42,000 plants and 21,300 packets of seeds; whereof 31,400 plants and 14,000 packets to private persons; the amount received being 8500 rupees. But ornamental plants, both as living plants and seeds, occupy the first position, while fruit-trees, timber-trees, and seeds of vegetables take a secondary place.

The Singapore Garden sent out the large number of 163,000 living plants in 1884. These figures, however, are merely extracted as examples of what is done by the different establishments, and afford no idea of their relative importance, inasmuch as the number of plants distributed by each one is subject to the greatest fluctuations; in illustration of which it may be mentioned that the Saharunpore Garden distributed 146,000 plants in 1882-83, against 42,000 in 1883-84; the difference being almost made up by 100,000 plants of agave. Similarly in 1884 the Horticultural Gardens in Madras sold 100,000 plants of the "Mauritius hemp," *Fourcroya gigantea*.

As already observed, the nature of the work of the different gardens varies according to the requirements of each district. In many parts, especially in Ceylon, the Nilghirries, British Sikkim, the interests of European planters have to be considered first; in the rice-growing districts of the Ganges, Malabar, and Ceylon, the things cultivated in the gardens and plantations engage special attention. In Bengal, jute, indigo, and to some extent opium, and in Central and Northern India improvements in the cultivation of cereals, are of primary consideration; while in the Bombay Presidency and some parts of Ceylon cotton is added thereto; often associated with the latter the sugar-yielding palm, *Borassus flabelliformis*. For the dry regions of the Punjab it is a question of finding suitable woolly plants for afforestation, as well as for the saline soil of the North-West Provinces, in order to provide fuel for the agricultural districts, and thereby gain the dung of cattle for purposes of manuring. And among other things of vast importance is the conservation and renewal of the rapidly disappearing caoutchouc forests of Malacca.

The Singapore Garden has only been a scientific establishment since 1882, when it was placed under the direction of Mr. Cantley; but much has been done in these few years without destroying the natural beauties of the old garden. A small herbarium has been formed, and the most necessary buildings erected. The new plantations are, as far as possible, systematically grouped. A special charm of this Garden is a remnant of the original forest, traversed only by a few paths, where one can enjoy, in a small way, the delights of tropical vegetation without the fatigue attending excursions in pathless forests. The fern garden and the palmetum promise to be very rich and attractive; but a larger income is necessary to carry out the functions of a botanic garden fully and expeditiously. It is perhaps superfluous to add that the Director has to superintend the gardens and promenades of the town; but in order to understand the whole of the circumstances, it is important to bear in mind that he has also been placed at the head of the newly created Forest Department for the whole of the Straits Settlements—an arrangement which of course causes him no inconsiderable amount of additional labour.

Seeds and plants are continuously being distributed from Kew, where all new things are reported and presented, and where competent authorities are consulted on the merits of the samples sent in. At this centre advice is sought, and there is a constant interchange of ideas and experiences between it and the Indian establishments, the advantages of which are so evident that it is unnecessary to enumerate them.

With the exception of rice, tropical cultivation generally is so uncertain and subject to fluctuation, owing to the conditions of labour, communication, and credit, that improvements are very slow; and the experimental work is not so systematically con-

ducted as with us. There are too few officers, and everybody has too much to do; nevertheless many of the reports exhibit an amount of zeal and industry deserving of all the more recognition on account of the difficulties under which much of the work is done.

From this point Mr. Warburg explains and describes in some detail what has been effected by the combined action of Kew and the Indian botanic gardens in the introduction, resulting in the extensive cultivation, of economic plants of the first importance, such as the cinchona, tea, and coffee, the cultivation and manufacture of which have developed into industries of incalculable value. He further alludes to the cultivation of rubber-trees, ipecacuanha, fibre-yielding plants, &c., which is, in many instances, still in a more or less experimental stage. He also enters into particulars and comparisons of the climate of different districts in its relations to cultivation, and altogether his Report is an interesting and instructive one, containing much information new to the English public. He specially mentions the great interest taken in the Madras gardens by Sir Mount Stuart Grant-Duff, and the material assistance he extended to Prof. Lawson. And he concludes with a brief review of the literature directly or indirectly connected with the botanic gardens of India, culminating in Sir Joseph Hooker's gigantic undertaking, "The Flora of British India." With regard to the intimate connection between Kew and the Colonial and Indian gardens, Mr. Warburg thinks it is at present most beneficial, though he looks forward to the time when they shall have developed so far as to be less dependent on a central institution.

SCIENTIFIC SERIALS.

Revue d'Anthropologie, troisième série, tome iii. fasc. 1 (Paris, 1888).—On the colour of the eyes and hair among the non-nomadic Tunisian tribes, by Dr. R. Collignon, based on the observations of Capt. Rebillat and Lieut. Fannezo. These observations, which were conducted in accordance with the methods employed in France for similar investigations, refer to more than 2000 individuals belonging to the "sedentary" or settled populations of the towns and rural districts. The men observed being all regular soldiers, the tables do not refer to any nomads of Arab race, since all the dwellers in tents are exempt from conscription in Tunis. Expressed in general terms, among these 2030 individuals, dark eyes occurred in 1543 cases, or 7·6 per cent., and light eyes in 69 cases, or 3·5 per cent.; while dark hair occurred in 1887 cases, or 92 per cent., and light hair only in 7 cases, or 0·4 per cent. On considering the data obtained from a comparison of the tables referring to different districts, it is found that the blond type occurs only sporadically, and almost exclusively in the littoral settlements, on which account Dr. Collignon thinks it may be assumed that its presence in the Tunisian population is due to the incidental amalgamation of foreign elements through invasion or immigration by more northern races.—On the colour of the eyes and hair in Denmark, by Herr Søren Hansen (communicated to the Society by Dr. Topinard). From this paper we learn that observations made on 2000 males of the age of twenty, belonging to the southern and eastern districts of Jutland, yielded the following results: light, *i.e.* blue, eyes, 1527; dark eyes, 65; leaving 408 of medium colour. In regard to the colour of the hair it was found necessary to establish four groups, which gave the following figures: dark brown, 306; medium, 1267; light (blond), 333; and red, 94. From this it would appear that the majority of the population have blue eyes, and medium brown, or chestnut, hair. A further analysis of Herr Hansen's tables shows that while the perfect brown type—*i.e.* where both hair and eyes are dark—occurs only in 2·7 per cent.; blond hair and light eyes are met with in 16·2 per cent. Finally the curious circumstance has been deduced that while light eyes are twenty-four times more frequent than dark ones, light hair is only seven times more frequent than dark hair; hence Dr. Topinard is led to ask whether the explanation of this peculiarity may not have to be sought in some general law by which in a mixed race, descended from blond and dark races, the eyes may be more generally transmitted from the former, and the hair from the latter.—On recruiting in the cantons of St. Omer, by Dr. H. Favier. The enormous difference in the cantons north and south of St. Omer in the number of persons available for military service has been attracting much notice among French officers of late years. According to M. Costa, who wrote on the subject in 1866, these

differences are due to hygienic causes; the district north of St. Omer, where the rejections are only 227 in 1000, being well adapted to agricultural and other rural pursuits, while in the southern canton, where the rejections amount to 342 in 1000 the lands are almost all marshy, exposing the inhabitants to fevers and other malarial influences by which the race is deteriorated. Dr. Favier does not believe that these causes affect the question in any way, but, even if they did so when M. Costa wrote, statistics prove that of late years, more especially since the stricter law of conscription of 1872 has been put into force, the south canton has shown a gradual diminution in the numbers of rejections; and while he denies the action of malarial causes or the influence of differences of ethnic origin between the people of the two cantons, he believes that to industrial centres, such as d'Arques in the southern canton, may very possibly be ascribed certain conditions antagonistic to the success of recruiting.—On the "castellots" of Mont Sainte-Baume in Provence, by Dr. Beranger-Féraud. The presence of numerous little heaps of stones on the higher peaks of Mont Sainte-Baume has repeatedly arrested the attention of strangers, and the fact of their having been deposited by the hand of man is now confirmed by Dr. B. Féraud, who last year made the ascent of the mountain for the purpose of investigating their character and purpose. These so-called "castellots" (little castles) are either composed of several stones forming a rude sort of pyramid, or of one large stone inserted in a fissure of the rocky soil. Although widely distributed, they are most frequent in the vicinity of the oratory of Saint-Pilon, where they are found at an elevation of nearly 1000 feet, close to the edge of the vertical wall of rock forming the northern boundary of the range. On inquiry he learnt that these structures were also locally designated *moulouins de joye* (heaps of joy), and that they were not alone intended to testify to the successful ascent of the pilgrims to the summit of St. Pilon, but were frequently designed to propitiate St. Magdalen, to whom prayers are made on the spot for approval of the special maiden whom the worshipper may desire to marry. In the latter case the mound is visited by the builder at the end of a year, and if he finds the stones undisturbed he considers that the saint approves of his choice; if, however, the heap is broken up, this is generally regarded as a decisive barrier against the intended marriage. In this superstition, Dr. B. Féraud sees a survival of the ancient usage of erecting stone monuments as altars, pillars, menhirs, &c., to commemorate some important personal event.—On inequality amongst men, by M. de Lapouge. In this address the view is boldly advocated that a man is what his birth made him, and that education can do no more for him than develop the pre-existing germs derived from his progenitors in accordance with the laws of heredity. This reasoning is extended to classes, nations, and races, who are assumed to be unequal, and incapable of attaining to an equal degree of perfection. The writer divides men into four classes, in the first of which he places those possessed of creative and initiative faculties above their fellows, while it is to the relative numerical preponderance of this class over the others that he refers the undoubted superiority of one race over another. He thus sees in the dolichocephalic blonds the most favoured of all the races of humanity, since, from the dawn of history, all heroes and leaders among men have belonged to this type. In modern times the Anglo-Saxon race has owed its superiority to the preponderance of this dolichocephalic element. He believes that France is suffering from the diminution of this type in its population, together with the rising predominance of the brachycephalic type to which the lower classes of the community belong, while he anticipates as inevitable a great deterioration of the general national character through the amalgamation of the two. Similarly he sees in the present movement for raising the negro races a deep source of danger in the future to the more highly gifted Aryan races, who may in time find themselves beaten down by the brute force of teeming masses of inferior brachycephalic peoples. Such are some of the leading points in M. de Lapouge's treatise, which, notwithstanding its redundancy of diction, and the dogmatism with which certain views are maintained, is a highly interesting, suggestive, and learned contribution to ethical inquiry.

Bulletin de l'Académie Royale de Belgique, December 1887.—On some new derivatives of normal heptylic alcohol compared with their homologues, by C. Winssinger. After describing the mode of formation and special properties of normal heptylic alcohol, of the chlorides of heptyl, heptylic mercaptan, oxy-