

Broughton, who have been conspicuous, so far as India is concerned, in the rapid development of the enterprise.

The efforts of our own Government have not been confined to India, but localities have been sought in other parts of the world where natural conditions seemed to favour the chance of success in the introduction of quinine-yielding trees, and at the time I speak of (1863) there were under the care of Mr. Thwaites in Ceylon upwards of 20,000 young Cinchona plants. Jamaica also had made a successful beginning, and the authorities of several European countries were considering how far their respective colonies might be utilised to the same end, though but little decided action beyond what I have stated had been taken.

The ten years that have intervened need not detain us, but having noticed the origin, we will turn at once to the practical aspect of the subject at the present time.

The latest official return places the number of Cinchona trees in cultivation in the Island of Java at two millions.

I can find no published account of the exact extent of the British plantations at the present time. My latest information I owe to the kindness of C. R. Markham, F.R.S., of the India Office. It is contained in the Parliamentary Blue-book of August 1870, and refers only to the Madras and Bengal Presidencies. This gives the total number of Cinchona plants growing on the Neilgherries in January of that year at 2,595,176, of which nearly one-half (1,143,844) were permanently planted out.\* The number at Darjeeling in the Bengal Presidency in March 1870 is stated at 2,262,210, of which a million and a half were in permanent plantations.

Of the extent of the plantations in Ceylon and Jamaica I know nothing, but reports from time to time state that they are prospering. It is needless to refer to the experiments in cultivation in the south of Europe, the Caucasus, Brazil, the Philippines, or Australia, as these are not yet sufficient in extent to have any practical significance.

The relative value of the bark produced by the various species and varieties of Cinchona is a question that has received close attention, and perhaps cannot be considered settled until something more like uniformity in the subdivision and nomenclature of the genus prevails. Plants regarded as merely varieties of the same species yield widely differing proportions of alkaloids, and the subject is further complicated by considerations as to the possible effects of cultivation and of different climatal conditions. . . .

The barks now being produced in the Dutch and British colonies are referable to five species, viz. :—

*C. Calisaya*, of which, as I have said, only a small proportion realises expectation in its yield of quinine ;

*C. Hasskarliana* (called a hybrid), which appears to be of little value in respect of alkaloids ;

*C. Pahudiana*, deficient in the same particulars, but producing a bark which finds a ready market for pharmaceutical purposes ;

\* Since this was written I have received a copy of a return which is believed to represent the actual number of Cinchona trees in the Government plantations in the Neilgherries at the present time. It shows an increase of 12,330 "planted out," and is as follows :—

Crown barks ( <i>C. officinalis</i> )	...	...	...	508,878
Red barks	...	...	...	579,938
Yellow barks	...	...	...	33,850
Grey barks	...	...	...	23,759
Other species	...	...	...	4,749
				1,156,174

In addition to these it must be recollected that the Government had up to 1870 distributed upwards of 173,000 trees from the Neilgherry nurseries, as well as nearly three hundred ounces of the seeds of various species, to private individuals disposed to plant on their estates. After all, when the experimental stage of such an undertaking is over, private enterprise would seem to be its safest basis. A Parliamentary paper on the progress of India in 1872, just issued, gives the total number of plants in the Neilgherry plantations as 2,639,235, but this probably includes the very young trees still in nurseries. I have no particulars beyond what appear in a paragraph in the *Times*.

*C. officinalis*, which, in British India,\* appears to be the most generally satisfactory ; and

*C. succirubra*, which, notwithstanding certain exceptional samples, has not turned out altogether well. . . .

I can say little about the West Indian plantations as to extent, but the quality of the bark they produce is encouraging. Mr. Howard reports that the chemical examination of barks from Jamaica is "highly satisfactory as regards the prospects of Cinchona culture in that island."

Various questions are still pending :—the influence of manures on the chemical constituents of the trees, the various methods of removing the bark from the tree, and the encouragement of renewal by the processes of stripping and mossing, and many others of like importance, the solution of which must be left to time, and need not occupy our consideration here.

### DONATI

SCIENCE, and more particularly astronomy, has recently sustained a serious loss in the death of Prof. G. B. Donati, Director of the Royal Observatory of Arcetri, near Florence, and Professor of Astronomy in the Royal Institution of that city.

On his return from Vienna, where he had represented Italy at the International Meteorological Congress, he was seized by a severe attack of Asiatic cholera, to which in a very short time he fell a victim, dying at his villa near the Observatory, on the morning of the 20th of September last, being only forty-seven years of age. He was born at Pisa in 1826. In 1852 he began his astronomical career at the Observatory of Florence, and by his talents, his attainments, and his indefatigable industry, rapidly gained the esteem and admiration of the learned, attaining a well-merited fame, not so much by the discovery of new comets—among which the most remarkable was that of 1858, to which he bequeathed his name—as by the important observations which he made and published. Of these we need only mention his observations on the study of the spectra of the stars, by which work he successfully inaugurated in 1860 one of the most important branches of physical astronomy, namely, the spectroscopy of celestial bodies.

In 1864 he succeeded Prof. G. B. Arnia as Director of the Observatory, after which much of his time and energy were devoted to the establishment of an observatory for Florence and for Italy, which should be completely adapted to the present exigencies of Science, both as regards astronomy and terrestrial physics.

He was in no way discouraged by the serious difficulties of this undertaking, but, inspired by a true love of Science, he overcame them all, insomuch that in a short time, under his active and keen-sighted superintendence, the new observatory was erected on the hill of Arcetri ; an observatory which, by the excellence of its position, as well as by the convenience and solidity of its construction, has guaranteed for astronomy and terrestrial physics the most important advantages in every branch of observation.

The observatory was already in working condition, and an important series of observations had been commenced when Science was robbed, by a premature death, of one of her most valued worshippers, who was thus cruelly cut off just as he had entered upon a brilliant career, in which, had he lived, he would certainly have greatly augmented his fame, and shed glory on the Observatory of Arcetri.

Prof. Donati had already commenced a series of notes from the new observatory by the recent publication of

\* This limitation is at present necessary. Dr. De Vrij's late paper on Jamaica barks (*"Pharm. Journal,"* August 16, 1873) shows the produce of *C. officinalis* in that island to be very deficient in quinine, inferior indeed to *C. Pahudiana*, whilst a still later communication confirms Mr. Howard's opinion as to the richness of Indian-grown specimens.

some most careful observations of his own on the luminous phenomena of the great Polar aurora of the 4th to the 5th of February, 1872; and we had hoped that other important observations by the illustrious Italian astronomer would, to the great advantage of Science, have been published in the future Notes issued from that scientific establishment.

### NOTES

WE regret to have to record the death of two notable men this week. The one is Sir Henry Holland, Bart., M.D., F.R.S., &c., who died on Tuesday, the 28th inst., at the age of 85 years. Sir Henry had caught cold on returning from Paris, which, in spite of his wonderfully robust constitution, proved too much for the veteran traveller. The other is Mr. Albany Harcock, the distinguished anatomist, who died on the 24th inst. He was a medallist of the Royal Society, though not a Fellow. We hope shortly to give memoirs of both men.

SIR ROBERT MACLURE, C.B., so well known in connection with Arctic discovery, died on the 17th inst., at the age of 66.

SIR SAMUEL BAKER was announced to appear before the Geographical Society on Monday first, and give an account of the geography of the country he has lately visited; but we regret very much to hear that illness will prevent him from fulfilling this and other engagements. He has been suffering from inflammation of the lungs.

PROF. FLOWER, we regret to hear, has been compelled to spend the winter in Egypt on account of the state of his health.

DR. J. EMERSON REYNOLDS has been elected Professor of Chemistry to the Royal College of Surgeons in Ireland. The College of Surgeons is to be congratulated on this appointment. Dr. Reynolds will, we believe, still hold his appointment of Keeper of the Minerals and Professor of Analytical Chemistry to the Royal Dublin Society.

MR. JOHN STUART MILL has left his herbarium of European plants to Kew.

WE are informed that the authorities of the Jardin des Plantes, of Paris, have acquired the valuable collection of books on Natural History belonging to the late M. J. Verreaux, and also his private collection of Sugar birds (*Nectarinidae*), which includes many unique specimens.

IN connection with St. John's College, Cambridge, there will be offered for competition an Exhibition of 50*l.* per annum for proficiency in Natural Science, the Exhibition to be tenable for three years in case the exhibitor have passed within two years the previous examination as required for candidates for honours; otherwise the exhibition to cease at the end of two years. The candidates for the Natural Science Exhibition will have a special examination (commencing on Friday, December 12, at 9 A.M.) in (1) Chemistry, including practical work in the Laboratory. (2) Physics, viz., Electricity, Heat, Light. (3) Physiology. They will also have the opportunity of being examined in one or more of the following subjects, (4) Geology, (5) Anatomy, (6) Botany, provided they give notice of the subjects in which they wish to be examined four weeks prior to the examination. No candidate will be examined in more than three of these six subjects, whereof one at least must be chosen from the former group. It is the wish of the Master and Seniors that excellence in some single department should be specially regarded by the candidates. They may also, if they think fit, offer themselves for examination in any of the Classical or Mathematical subjects. Candidates must send their names to one of the tutors fourteen

days before the commencement of the Examination. The tutors are Rev. S. Parkinson, D.D.; Rev. T. G. Bonney, B.D., and J. E. Sandys, Esq., M.A.

THE Royal Horticultural Society of Tuscany has announced an International Horticultural Exhibition to be held at Florence from May 17 to 25, 1874, and has also issued the programme of an International Botanical Congress to be held on three days during the Exhibition. A very large number of prizes, including 100 gold medals, are offered for collections of plants or single plants, which are included in 248 different classes; and among other objects for which prizes may be obtained are bouquets, botanical drawings, models, garden tools and ornaments, garden structures, manures, herbaria, specimens of timbers, &c. The Congress will be opened by the president, Prof. Parlato; excursions to the neighbourhood of Florence and the principal gardens will be inaugurated, &c.; and among the subjects proposed for discussion, *inter alia*, are the following:—On the duration of dormant vitality in plants, and on the means of restoring it; on the causes of the movements in leaves; on the acclimatisation of perennial plants; on the analogy between the reproductive organs of flowering and (so-called) flowerless plants; on the general occurrence, or otherwise, of cross-fertilisation, and on the durability of the vitality of pollen; on the nature and functions of the gonidia of lichens; on the nature and origin of Bacteria; on the possibility of establishing rules for a rational distinction between the groups called species, race, variety, &c.; on the value to be set on the determination of fossil plants, &c.; on the character and origin of Alpine floras, and especially on the causes which have limited their extension. The Horticultural Society of Tuscany seem determined to do everything they can to attract visitors, who must send their names to the president or secretary at the Musée Royale de Physique et d'Histoire Naturelle at Florence; and altogether botanists and horticulturists seem likely to have a good time of it.

AN effectual remedy for the devastations committed on the vines by the *Phylloxera vastatrix* is said to have been discovered by MM. Monestier, Lautand, and D'Ortoman, of Montpellier. It consists in placing in the ground, close to the root of the infected plant, an uncorked tube containing about 2 oz. of bisulphide of carbon. The vapour from the bisulphide in a short time permeates the whole of the ground about the root; the vapour is not, like the liquid itself, injurious to the plant, but is immediately fatal to the insect. Care must be taken not to spill any of the liquid on the roots of the vine.

THE following subjects for prizes to be awarded in 1874 have been proposed by the Batavian Society of Experimental Philosophy:—1. To discover if there exists in the molecular state of bodies, modifications other than those caused by temperature, which are such as to give for the same body, different spectra. The Society wishes that this inquiry should bear chiefly on the magnetic condition of bodies. 2. To find out by new experiments if the vapour of water exercises on radiant heat an absorbent effect much more powerful than dry atmospheric air as Mr. Tyndall maintains; or if there exists no difference in this respect between dry and moist air, as M. Magnus maintains. The Society desires that the new experiments which it asks for be conclusive and enable it to decide between the two opinions. 3. To determine what influence the pressure which is put upon an electrolyte has on electrolysis, and how far in this case is the principle of conservation of energy confirmed. It is wished that this inquiry bear on three liquids at least, to be chosen by the competitor. 4. To determine the resistance of the liquid amalgams of zinc and gold to the galvanic current. Six at least of each of these amalgams, in various proportions, ought to be examined. 5. A prize is proposed for new experiments which will enable a