

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	845	Press ~~Mis.~~
¹⁰⁵⁻¹⁰⁶ Dated	8 - 6 -	1870.

Not to be folded or roughly handled

No. 105. Read the following despatch from the Right Honourable the Secretary of State for India, (Revenue,) to His Excellency the Right Honourable the Governor in Council, Fort Saint George, dated India Office, London, 20th April 1870, No. 11:—

I TRANSMIT to your Excellency in Council herewith a copy of a despatch, No. 27, which I have this day addressed to His Excellency the Governor-General of India in Council, together with its enclosures, on the subject of the introduction of Ipecacuanha plants into India.

2. I transmit also four copies of a Memorandum prepared by Mr. Clements R. Markham, which Dr. Anderson and Dr. Cleghorn consider to contain much useful information.

3. With reference to the postscript to Dr. Anderson's letter, I desire to be furnished with an account of all the Ipecacuanha plants received at your Presidency, and the mode in which they have been dealt with; and the number which you now possess.

—
ENCLOSURE No. 1.

Despatch from the Right Honourable the Secretary of State for India, (Revenue,) to His Excellency the Right Honourable the Governor-General of India in Council, dated India Office, London, 20th April 1870, No. 27.

I HAVE considered in Council the despatch from your Excellency in Council, numbered 12, Public, and dated the 25th of January, urging upon me the importance of introducing the Ipecacuanha plant into India, and suggesting that Dr. Anderson, the Superintendent of the Botanical Gardens at Calcutta, now in this country, should be asked to submit proposals as to the best means of obtaining the object in view.

2. On the application of the Government of Bombay last year I had already recognized the importance of introducing this valuable medicine; and the two plants received at Bombay having died, I had already taken steps for providing others for transmission in July next.

3. I transmit to you the correspondence which has been held with Dr. Anderson on this subject, and I trust that, even should the other attempts fail, Dr. Anderson will still have a sufficient number of strong plants to send or to take back with him to India to secure the introduction and establishment of the plant.

4. It seemed to me that an application, through the diplomatic agents of Her Majesty, was not likely to be so successful as an application through commercial or scientific gentlemen. You will see from the accompanying Memorandum by Mr. C. R. Markham, of which I transmit fifteen copies, that he has written to Messrs. Miers & Co., of Rio, to Mr. Bramah, and to Dr. Otto Wercherer, to obtain roots of the plant.

5. The accompanying correspondence with Dr. Cleghorn and Dr. Balfour will show you that I have also enlisted the kind assistance of the Royal Botanical Gardens at Edinburgh, the aid promised at Kew. I forward also herewith seventy copies of the Memorandum on the propagation of the Ipecacuanha plant, prepared by Mr. M. Nab of the Royal Botanical Gardens at Edinburgh. Dr. Christison, and Dr. Balfour, have likewise applied to Dr. Gunning, a medical practitioner at Rio, to assist them in obtaining plants and seeds.

To Dr. Anderson, March 3rd.
From Dr. Anderson, March 29th.
To Dr. Anderson.

From Dr. Cleghorn.
To Dr. Cleghorn.
From Dr. Balfour.
To Dr. Balfour.
To Dr. Balfour.

*Proceedings of the Madras Government, Revenue Department,
8th June 1870.*

To Dr. Hooker.
From Dr. Hooker.
To Dr. Hooker.

6. I add to these documents the letters which have passed between Dr. Hooker and this office on the subject of the supply of plants for Bombay.

7. You will learn from my despatch* to that Government of this day's date that the plants destined for them will be retained at Kew, and two healthy plants will be sent to them from the Botanical Gardens at Calcutta.

* Revenue (Forests) No. 4.

No. 106.

ORDER THEREON, 8th June 1870, No. 845.

Miscellaneous.

THE foregoing despatch, together with copies of its enclosures, will be communicated, through the Commis-

sioner of the Neilgherry Hills, to Mr. McIvor; also to the Board of Revenue, Officiating Conservator of Forests, and Government Quinologist.

2. Mr. Breeks will be good enough to obtain from Mr. McIvor and forward the information required by the Secretary of State in paragraph 3 of his present despatch.

3. Mr. Broughton will also be requested, with reference to G. O., 21st December 1869, No. 3,225, to report the result of his attempt to establish the Ipecacuanha plant at Nellumboor.

(True Extract.)

(Signed) R. A. DALYELL,
Acting Secretary to Government.

To the Commissioner of the Neilgherry Hills.
,, the Board of Revenue.
,, the Officiating Conservator of Forests.
,, the Government Quinologist.

Exd. F. R. Bantleman.

*Proceedings of the Madras Government, Revenue Department,
8th June 1870.*

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To Dr. Anderson, March 3rd.
From Dr. Anderson, March 28th.
To Dr. Anderson.

From Dr. Cleghorn.
To Dr. Cleghorn.
From Dr. Balfour.
To Dr. Balfour.
To Dr. Balfour.

Cost. of 1870: 24/6.

REVENUE.

To

THE COMMISSIONER OF THE

NEUCHERRY HILLS.

Ac., Es., &c.

Dated June, 8th.

Recd.

Encl.

G. O., 8th June 1870, No. 846.

JUNE.

Nos. 105-106.

Ipecacuanha plant.—Despatch from Hon. Government on the subject of its introduction into India forwarded to authorities concerned, with orders thereon.

*Proceedings of the Madras Government, Revenue Department,
8th June 1870.*

To Dr. Hooker.
From Dr. Hooker.
To Dr. Hooker.

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* Revenue (Forests) No. 4.

No. 106.

ORDER THEREON, 8th June 1870, No. 845.

Miscellaneous.

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(True Extract.)

(Signed) R. A. DALYELL,
Acting Secretary to Government.

To the Commissioner of the Neilgherry Hills.
,, the Board of Revenue.
,, the Officiating Conservator of Forests.
,, the Government Quinologist.

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60th. of 1870 *ENDING*.

REVENUE.

THE COMMISSIONER OF THE

JERRY HILLS.

Ac., Ec., &c.

Dated June, 8th.

Recd.

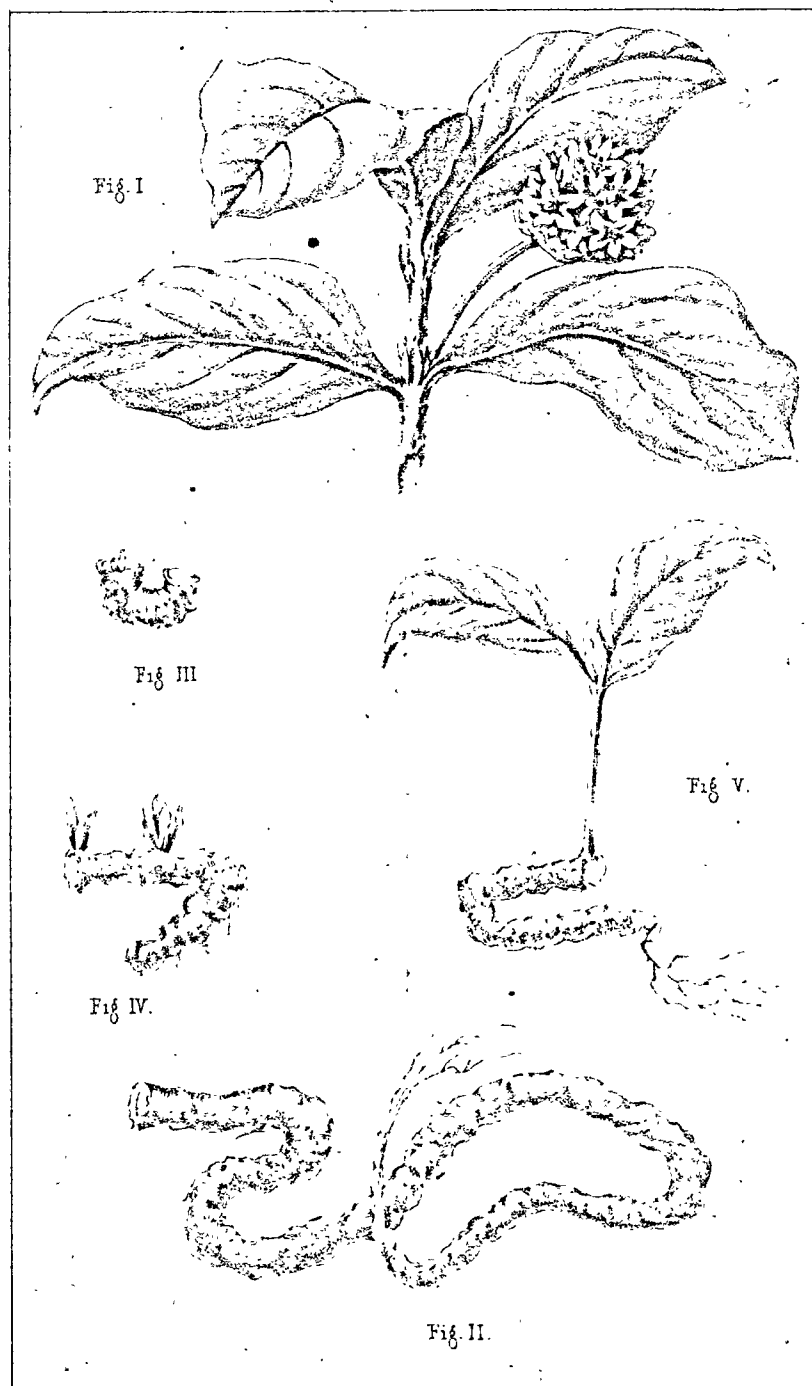
Exl.

G. O., 8th June 1870, No. 815.

JULY.

Nos. 105-108.

Ipecacuanha plant.—Despatch from Home
 Government on the subject of its introduction into
 India forwarded to authorities concerned, with
 orders thereon.



Cephaelis Ipecacuanha, Rich.

NOTES
ON THE
PROPAGATION
OF THE
IPECACUAN PLANT
(*CEPHAELIS IPECACUANHA*).

BY
JAMES M'NAB, F.B.S.E.,
SUPERINTENDENT OF THE ROYAL BOTANIC GARDEN, EDINBURGH.

EDINBURGH:
PRINTED BY NEILL AND COMPANY.

MDCCCLXX.

NOTES

ON THE

PROPAGATION OF THE IPECACUAN PLANT.

IN August 1869 I had a conversation with Dr Anderson, Director of the Botanic Garden, Calcutta, relative to the growth, habit, and propagation of the Ipecacuan plant. He was anxious to procure as many specimens as possible from the British and foreign nurseries and gardens, to send to India, for the purpose of establishing them in that country. The Ipecacuan plant has always been exceedingly scarce in British collections, and, owing to its peculiar habit of growth, is likely to remain so. The conversation referred to induced me to turn my attention to the mode of propagating this plant, which for years had remained much in the same condition, making little or no progress.

Martius, in his "Plantas Usuelles de Brazil," gives the following information regarding the wild state:—"It is found inhabiting the moist and shady forests of various parts of Brazil, especially in the provinces of Pernambuco, Minas Geraes, and Bahia, its growth extending as far south as Lat. 22°; on the islands of Parahyba and the banks of two rivers called Pomba and Xipota it is particularly abundant."

It was first introduced into the British gardens in 1830, but through what source does not seem to be recorded. It is a plant of remarkably slow growth; the largest specimen now in the Botanic Garden at Edinburgh is scarcely one foot in height, although more than thirty years of age, and has three leading shoots, each four inches in length.

The method hitherto adopted of propagating the *Cephaelis* (as far as I am aware) is by cuttings, but of these not more than one or two can be got at a time, and at long intervals. Cuttings root freely when inserted in white sand. If placed in bottom heat, and kept somewhat moist, five or six weeks will be amply sufficient to produce roots. After the cuttings are sufficiently strong, they should be potted in a mixture of fine loam and sand. On account of this comparatively slow method of propagating, the *Cephaelis* will probably remain scarce.

The roots, or rather rhizomes, of the *Cephaelis* are peculiarly annulated (fig. 2). A few of them were taken from one of the plants in the Botanic Garden during the month of August 1869, and after being cut into transverse sections of different lengths, were inserted in a horizontal position over the surface of a pot prepared with drainage and white sand. This pot was placed under a hand-glass in a warm propagating bed, and kept moist. A few weeks afterwards the root-cuttings began to swell, and showed signs of budding, chiefly on the edge of the upper cut surface, as in fig. 3. In most cases only one bud was developed, but in some instances two or more were produced. When several growing points are observed, the root can be cut through, so as to form independent plants. In every case the leaf buds are first developed and nourished by the sap in the fleshy portion of the root. As the buds begin to elongate, some fine filmy roots are protruded from the under surface. Young plants so produced are now growing freely in the garden, the largest being $3\frac{1}{2}$ inches high, with five small leaves, and young fibrous roots about $1\frac{1}{2}$ inch long. In order to meet the demand which in all likelihood will be made on nurserymen for plants of the *Cephaelis*, it is well to know how it can be propagated independently of cuttings, and at the same time without injury to the parent plant.

Understanding that the Government intend to introduce the cultivation of this plant into India, I would suggest that no time should be lost in securing a quantity of the Ipecacuan plants for the purpose of making a fair start. I have explained from experiments how this plant can be increased by means of root division; but as this will be a slow

process, on account of the few established plants in the country to work upon, it is desirable that immediate steps should be taken to procure a quantity of plants or roots (rhizomes) from the native habitats in Brazil, and thus enable cultivators to get a stock to propagate from. For this purpose I beg to offer a few observations on the introduction and extension of the Ipecacuan plant. Various ways may be suggested for this end. The first, and perhaps the most expensive method, would be to have the plants brought home in Wardian cases, and on their arrival in this country, or in India, they could be subjected to root propagation. If the tops come home alive, they also could be placed in positions to secure a new growth of leaves and roots. But a cheaper, and perhaps the safest, method of procuring plants, would be to collect a quantity of the fresh roots or rhizomes from their native soil, and after sealing the cut extremities, to place them longitudinally in a close-fitted packing-box made of wood (not less than one inch thick), having a layer of fresh sphagnum moss placed between each layer of roots. If the moss is firmly packed, it ought to keep the roots in a plump and perfect state for many months, or until such time as they reach their destination. If white sphagnum moss cannot readily be obtained, moss of any kind moistened, and the excess of moisture thoroughly squeezed out, will perhaps answer the purpose as well. If moss cannot be procured, heavy soil, taken six or eight inches under the surface, with the natural moisture in it, may be used, although not so suitable as sphagnum.

Rose bushes have been sent from this country to Australia, packed entirely in layers of sphagnum moss, and have reached their destination in safety. Some years ago I packed a quantity of roots of herbaceous plants in sphagnum, in the backwoods of Canada, during the month of August, and unpacked them in Edinburgh in January, all perfectly fresh; and I have also brought home many species of American tree seeds in sphagnum moss, in a state fit for growing, while samples of the same seeds, brought home in canvas and paper bags, were incapable of germination. From my knowledge of the preservative powers of fresh sphagnum moss, and the nature

of the woody roots of the Ipecacuan plant, I have no hesitation in saying, that roots, or rooted stems (the plants being previously divested of their foliage), might be sent home alive in the manner described. It is a curious fact, that some variety of sphagnum moss is found in almost every quarter of the globe. A few weeks ago some plants of *Anæctochilus*, packed in sphagnum at Singapore, reached this country in good condition, thus showing the wonderful preservative powers of the moss.

- When the young Ipecacuan plants intended for India are of sufficient size, they ought to be hardened in a moderately cool plant-house for some weeks, to enable them better to stand the transit. After being sufficiently matured, they may be planted in a Wardian case, where they should remain a few weeks to settle before being sent out. However, this method of packing for transmission abroad is not always desirable, except in the case of very strong specimens. With the exception of a few old ones, the age of the majority to be sent out will not average over eight or ten months. Such young plants could hardly survive in a case constructed on the Wardian principle, and the young roots could not hold the soil together; besides, Wardian cases are liable to be upset, and the roots injured and lost.

Judging from the size and nature of the plants likely to be available, it will be preferable to send them all in pots. The case for such plants to be divided into wooden compartments like a bottle basket (fig. A), each compartment being made to contain only one pot (fig B). The pots to be enve-

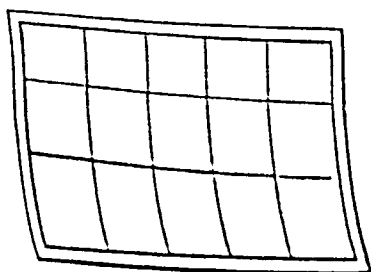


Fig. A.

loped in sphagnum moss, having some light clean pieces carefully placed on the surface of each, and afterwards tied round

and kept down with very fine galvanised iron wire, as bast matting or hemp cord, generally employed for such purposes is apt to mould with the damp and injure the young plants. The bottom of the case should be perforated with six or eight holes half an inch in diameter, to carry off any superfluous moisture. The plants, before being tied up, ought to be watered and well drained before the sphagnum covering is put round them, and so arranged in the case that the tallest shall be in the centre row. The bottom of the case should be covered with sphagnum, so that each pot will rest securely on it, and if necessary, some fine wire can be taken over the surface of the rack to keep the pots from moving. By the method of packing here suggested, the cases will be lighter than the ordinary earth ones, and more easily moved. A little fresh water now and then poured over the moss will be sufficient to keep the earth in the pots in proper condition. Such sphagnum prepared cases, could be glazed, wired, and covered with tarpaulin in the way adopted for Wardian cases. Instead of glass, I would recommend strong white cotton cloth tightly stretched, and tacked over properly constructed frames, hinged at the bottom, and made to lock or open at pleasure (fig. B). A sprinkling of fresh water over the cotton covering several times during the transit, ought to keep the plants in good condition till they reach their destination, without pouring it over the moss, as is necessary in glazed cases.

The cotton-covered cases could be made of different sizes, to hold twelve, fifteen, or eighteen pots. The pots placed in each case should be of a uniform size, say 3 or 4 inches outside diameter. We shall suppose a plant case constructed to hold fifteen plants, and each pot 4 inches in diameter. This ought to be 26 inches long, and 16 inches wide (inside measure), made of wood one-inch thick, the sides to be eight inches deep, and the height need not be more than 18 or 20 inches. The ends to be wholly of wood, so constructed as to receive the framed cotton covering, and to be provided with iron handles. The rack to contain the pots should be made of wood $\frac{3}{4}$ of an inch thick, and 3 inches deep, so secured as to be 4 inches above the bottom of the case, thus allowing the moss to be uniform over all the under surface; by being

8 *Notes on the Propagation of the Ipecacuan Plant.*

so, it will be less liable to become dry, than if each compartment were filled separate. If properly done at first with clean moist sphagnum, it will be found that the occasional moistening of the cotton cloth, either by rain or artificial watering, will be found sufficient to keep the plants in good condition till they reach their destination.

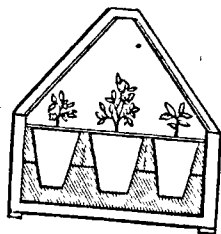


Fig. B.

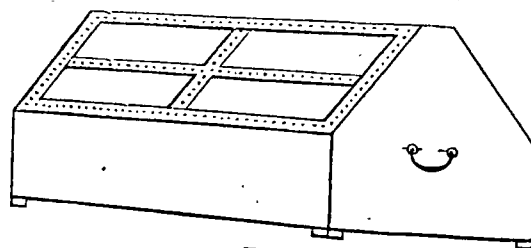


Fig. C.

It will be necessary when the cases arrive at their journey's end, to admit light and air very cautiously. In the event of a glass covering, air ought to be introduced gradually, but with a cotton covering, less care is required, as no matter how strong, it always admits a certain amount of ventilation.

If the plants arrive in good condition, they should be planted at first in an open, free, and fibrous soil, with a slight mixture of sand, and properly shaded and protected. In such a mixture, the fleshy roots will develop themselves better than in soil of a heavy compact or clay nature; which, however, may suit them after they are sufficiently matured.

If the tops of any of the plants should decay during the transit, the pots and soil should be preserved, as it is likely that fresh tops will be produced, from the fleshy portion of root under the surface.

EXPLANATION OF PLATE.

- Fig. 1. Ipecacuan Plant in flower.
- „ 2. Annulated Root or Rhizome, cut from a pot-grown plant.
- „ 3. Cut portion of a Rhizome, showing the growth at one month old.
- „ 4. Cut portion of a Rhizome, showing the growth at two months old.
- „ 5. Cut portion of a Rhizome, showing the growth at four months old.

8 *Notes on the Propagation of the Ipecacuan Plant.*

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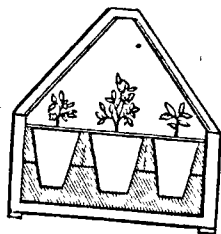


Fig. B.

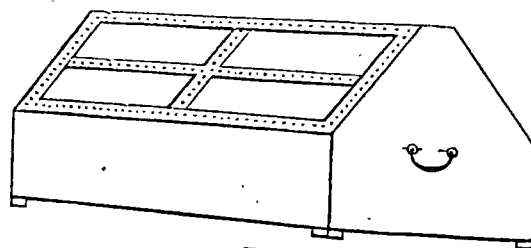


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IPECACUANHA.

HERBARIUM, ROYAL GARDENS,
Kew, 28th March 1870.

Sir,

In reply to your letter, dated the 3rd of March, 1870, enclosing a copy of a despatch from His Excellency the Governor-General of India on the introduction of the true Ipecacuanha plant (*Cephaelis ipecacuanha*) into India, I have the honour to submit the following report. The steps I have taken to secure a supply of plants from Europe, which I may take to India on my return, or may be able to send out in charge of persons who may offer to attend to the plants during the voyage, will show what appears to me to be the best method of obtaining a good stock of plants of Ipecacuanha, and will, at the same time, inform the Government of India of the progress that has been made to forward their views.

In the end of last June I received a letter from the Government of Bengal, with copies of the correspondence that had taken place on this subject after my departure from India, and with a request that I would endeavour to further the wishes of Government as expressed in that correspondence.

Acting on that letter I determined to obtain as many plants of *Cephaelis ipecacuanha* as possible from botanical and private gardens in Britain and Europe. I communicated first with Dr. Balfour, Professor of Botany in the University of Edinburgh, and both he and Mr. Macnab, the Curator of the Botanical Gardens there, promised to propagate as many cuttings of Ipecacuanha, for transmission to India, as could safely be taken from the two old plants in the Edinburgh Garden. It was when examining these old plants, in order that the best method of propagating might be determined on, that it occurred to Mr. Macnab that the numerous root-like tubers might be taken advantage of as a means of rapidly increasing the plants. I saw the first crop of these rhizomes taken off without causing the slightest injury to the plant, and before I left Edinburgh I had the satisfaction of seeing that many of these rhizomes had struck root, and sent up a strong shoot. I heard lately that a considerable number of young plants had been obtained in the Edinburgh Botanical Gardens by means of this root-division, and that many more would be procured as the roots are re-produced, all of which are intended for India. I may mention that the two old plants of *Cephaelis ipecacuanha* have been many years in Edinburgh, and they are by far the largest and finest I have seen. In addition to these young plants promised by Dr. Balfour from the Edinburgh Botanical Gardens, I procured from Messrs. Lawson and Sons of Edinburgh four large plants of *Cephaelis ipecacuanha*, and which I have left in their charge for propagation. Messrs. Lawson and Sons possess extensive propagating pits for tropical plants, which are managed by a very successful and intelligent gardener who takes a great interest in the increase of the Ipecacuanha.

There are seven young plants of *Cephaelis ipecacuanha* in the Royal Gardens, Kew, and the greater proportion of these and all the cuttings that can be obtained from them will be available for transmission to India along with the stock I may obtain from other sources. I have also procured another large plant of Ipecacuanha in London, from which cuttings will be made, both of the roots and stem, during the remainder of my leave in England. I have heard of a few more large plants in nurseries and private gardens, some of which I shall be able to purchase or obtain in exchange for seeds or plants from the Calcutta Botanic Gardens. Cuttings will be got from those in private gardens, and will be rooted and grown in Kew.

I estimate that I shall be able to take out to India, in January 1871, not less than fifty plants of the true Ipecacuanha, all of which will have been obtained in Europe, principally, in exchange for rare plants and seeds from the Botanical Gardens, Calcutta. In the correspondence sent to me along with the copy of the despatch of the Government of India, I observe that it is assumed that only one form of the flower (they are dimorphic as regards the relative length of stamens and pistils) exists in Europe, and therefore all the plants procured from Europe will prove to be sterile. I hope this is an error, and I believe it is, because it is supposed in India that only one plant was introduced from Brazil, from which all those in Europe have been artificially propagated; whereas the Ipecacuanha plants were brought into Europe on two distinct occasions, first, I think, in 1832 or

1833, and again some years afterwards; and there is every reason to believe that each importation consisted of several plants.

The plants flower regularly in stoves in England, but no one has recorded the condition of their flowers. I shall endeavour to obtain information regarding the nature of flowers as the plants I have procured come into blossom, so as to distinguish and mark plants having different forms of flowers. I had also acted on the suggestion first made by Mr. Macnab, that living roots packed in sphagnum might survive the voyage from Brazil. I discussed this proposal with Mr. Macnab in Edinburgh in October, when we examined the fresh roots cut from his large plants. I had, at the end of June, mentioned the introduction of the *Ipecacuanha* into India to Dr. Christison, Professor of *Materia Medica* in the University of Edinburgh, and he then wrote to a friend* in Rio de Janeiro, who had long resided there as a medical practitioner, and requested him to obtain information of the habitat of the plant, and, if possible, procure living plants and seeds for me. Drs. Balfour and Christison have since then addressed this gentleman a second time, and have described to him the method of packing the roots recommended by Mr. Macnab. In December I requested Messrs. Veitch and Sons of the Exotic Nursery, Chelsea, to procure living plants in Wardian cases, roots in moss, and seeds of the true *Ipecacuanha*, from Rio de Janeiro. Messrs. Veitch and Sons at once wrote to their agent in Brazil, and he has replied that he will have no difficulty in sending plants and seeds to England. In consequence, last week, I entered into an agreement with Messrs. Veitch and Sons to supply me with a good stock of the *Cephaelis ipecacuanha* from Brazil. The importation is to consist of live roots packed in moss, and some planted in soil in Wardian cases; and live plants and seeds are also to be sent if they can be obtained. The cost of this importation is not to exceed 25*l.* sterling, including charges for collecting in Brazil and transit to England.

In accordance with the permission given me to communicate with Mr. John Bramley Moore, who has expressed his willingness to assist in procuring roots and plants of *Ipecacuanha* from Brazil, I have called upon that gentleman, but have not had yet an interview with him.

There can be no doubt, I think, that the attempts to introduce the true *Ipecacuanha* from Brazil into India will succeed only by establishing a nursery in England, where roots and plants should remain until they become large and healthy enough to be sent to India. I do not think so small rhizomes as those of the *Ipecacuanha* could survive the long and trying voyage from Brazil to India, even by the shortest overland route, however well they may be packed. Plants received at Calcutta from England, and packed in sphagnum, generally reach in bad order from fermentation having taken place from the great heat the plants have been exposed to, probably in the Red Sea.

It is most likely that a considerable per-centage of *Ipecacuanha* roots in sphagnum and plants in Wardian cases will arrive alive in England from Brazil, but not possessing sufficient vitality to enable them to withstand the risks they would be exposed to during the very trying voyage to Calcutta. Seeds, too, may retain their vitality until they reach England, but not much longer; for, like the seeds of most species of the *Coffea*, to which tribe *Cephaelis* belongs, they soon lose their germinating power. I therefore recommend that Dr. Hooker should be requested to all the transmissions of *Ipecacuanha* plants, roots, and seeds, to be received at the Royal Gardens, Kew, and to be kept there until they have properly recovered from the effects of the voyage, or until the seeds have germinated. As I am occupied at Kew, assisting in the publication of the "*Flora of British India*," I shall be able to observe the state of the plants, and to arrange with Dr. Hooker for despatch of the plants to India as opportunities may occur. If any of the roots packed in moss are found to be in very good order, a few of the best may be selected, re-packed, and forwarded to India by the overland route. If a large quantity of seed is obtained, part of it also might be sent to India, the remainder being sown at Kew.

I may mention that this plan is approved by Dr. Hooker, who also agrees with me in thinking that roots or plants of *Ipecacuanha* sent direct to India from Brazil could not survive so long a voyage.

With reference to the plants of *Ipecacuanha* now in England, which I have secured for transmission to India, I think they should not be exposed to the risks

* Dr. Gunning.

of so long a voyage, unless some one conversant with the management of plants can be found to take care of them. Should no one be found willing to do so, no time will be lost by keeping them in England till my return to India in January next, as their multiplication by cuttings and root-divisions can be carried on most successfully in this country, and it has been arranged that this should be done. If, however, any officer returning to India, who understands the treatment of plants, can be found to undertake the care of a small Wardian case of *Ipecacuanha* plants, one or two despatches might be made to Calcutta or Madras before next January. I strongly recommend that the experiment of cultivating the *Ipecacuanha* plant should be entrusted, in the first case, to the Superintendent of the Calcutta Botanical Gardens, and to Mr. McIvor at Ootacamund, instead of sending them to other places where there are no horticultural appliances, and where the plants cannot recover from the damage they inevitably receive on the voyage in spite of all the care that may be taken of them.

The plants have thriven at Calcutta and at the lowest levels of the *Cinchona* plantations in Sikkim, and also at Ootacamund. There were twenty plants at Calcutta and Darjeeling last November, all the produce of one plant I received in 1866, and thirteen at Ootacamund on the 9th of November last, the produce of three plants obtained by Mr. McIvor from Kew in 1866-67. These four original plants are the only ones from which cuttings have been made in India; all others having perished on the voyage, or soon after reaching the country.

Localities in India adapted to the growth of the *Ipecacuanha* plant will be found in districts possessing no well marked or very long, dry, cold season, as the plant cannot withstand cold or drought. Sikkim is the most western province of the Himalaya in which the plant will grow. The plains of North-West India are also too hot and dry, and I do not think the plant will withstand the cold, or the dry season of Lower Bengal without shelter. Assam, Cachar, Chittagong, the moist parts of Burmah, and the Tenasserim Provinces are districts in the east in which the cultivation would succeed. The western ghauts, from latitude 20° N. southwards, and the tropical valleys of the Neilgherries, Anamallay, and Pulney Hills, and the Wynaad, in the Bombay and Madras Presidencies, will also be found suitable.

I have just read the memorandum on the *Ipecacuanha* by Mr. Markham, which contains almost all that is known on the subject, and I can add very little to the information therein given.

The account of the plant by Sir William Hooker in the "*Botanical Magazine*," and quoted by Mr. Markham, is drawn from St. Hilaire's "*Plantes usuelles des Brésiliens*," published in 1824, and there is no description of it in that author's "*Histoire des Plantes les plus Remarquables de Brésil et du Paraguay*." In that work he also describes another spurious sort of *Ipecacuanha*, besides those referred to by Mr. Markham. It is yielded by the *Ionidium poaya* of the natural order *Violaceae*—an order distinguished by the emetic properties of its plants.

I am,

Sir,

Your obedient servant,

THOS. ANDERSON,

Superintendent of the Botanical Gardens, Calcutta,

P.S.—I have just been informed by Dr. Hooker that he thinks he sent two more plants to Madras, in addition to the one taken out by Mr. Broughton, the Quinologist at Ootacamund, and the two given to Mr. McIvor, thus making five sent from Kew to Madras.

I think I have observed a notice of these plants in the Proceedings of the Agricultural Society of Madras, and that the plants were kept in Madras. It might be as well to inquire about those plants, as no notice of them occurs in the correspondence that has taken place on this subject.

I think it would be very useful to have a translation made of extracts from St. Hilaire's "*Plantes usuelles*," and also from Weddell's Memoir in the "*Annales des Sciences Naturelles*," and if the Secretary of State approves of this suggestion, I can have the translation made and transmitted to the India Office to be printed.

29th March.

T. A.

The Under Secretary of State for India.

India Office.
13 April 1870.

Sir,

I am directed by His Grace the Secretary of State for India in Council to acknowledge the receipt of your letter of the 28th ultimo stating in reply to the letter from this office of the 3rd ultimo the measures which you have already taken, and those which you recommend should be taken for procuring a supply of plants in order to introduce the *Specuaria* into India.

2. In reply I am desired to thank you for your interesting letter on this subject, which His Grace will have printed and sent to the Government of India with the other papers on this subject.

D. Anderson

The

3. The Duke of Argyll approves of the measures which you have taken, and of those which you suggest in your letter. It seems clear from your opinion and that of Dr. Hooker that it is desirable as Dr. Hooker is able and kindly willing to arrange for receiving and propagating the plants at Kew that they should be sent thither and be under your superintendence to be rafted off when any are fit to be transplanted, and if a favorable opportunity should occur sent to Calcutta or the Nilgherries where some few plants have been successfully propagated. His Grace consents also that the two plants now reserved at Kew for Bombay should be made over to you on the understanding that you will supply two good plants from Calcutta, and transmit them to that

Presidency

Presidency in July next, and His Excellency the Governor in Council at Bombay will be informed to this effect.

4. You are also at liberty to correspond officially with Dr. Balfour of the Royal Botanical Gardens at Edinburgh on this matter, and he will be requested to communicate with you in regard to the plants which he has reserved for transmission to India.

5. Your arrangement with Messrs. Keith is sanctioned, and the Secretary of State will be obliged to you if you will as you propose procure translations of the extracts from the works suggested by you, and forward them to this Office to be printed.

I am &c
Edw. H. Mearns.

22^d December 1869.

Sir, I understand from Professor Balfour of Edinburgh that Mr. Macnab of the Botanic Garden has discovered a successful mode of propagating the *Specacuanha* plant, and I venture to suggest that he be requested to prepare a supply of this valuable officinal plant for transmission to India at the proper season to supplement the number which Dr. Hooker can spare from Kew.

I would also recommend that application should be made for a number of copies of the memoranda describing this mode of propagation which is about to be printed, - this would

The Under Secretary
of State

22^d December 1869.

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I would also recommend that application should be made for a number of copies of the memoranda describing this mode of propagation which is about to be printed, - this would

The Under Secretary
of State

would be useful in India.

There would be little expense incurred by following these suggestions, merely the cost of the Waidian case and the carriage with probably a triffe for two spare copies of the paper and a gratuity to the person deputed to see the blanks safely delivered.

I have to

Yr. Hbley
M.D.

India Office

3^d January 1870.

Sir, I am directed by His Grace the Secretary of State for India in Council to acknowledge and express his thanks for your obliging letter of the 22^d ulto. acquainting him with the probability of his being able to obtain a supply of the Speciosa plant from the Royal Botanical Gardens at Edinburgh, and suggesting that a supply should be obtained and sent out to India, together with copies of a Memorandum on the mode of propagation adopted, which is now about to be printed.

I am directed to state that His Grace will feel himself greatly obliged if you will be so kind as to procure a supply of these valuable plants
packed

D. Cleghorn

19 01
packed in a Wardian Case for transmission
to Bombay in June or July next - Should
it be possible to obtain a sufficient supply
for the purpose, the Duke of Argyll
would be glad to send a similar case
to Madras. He will be glad also to receive
250 copies of the Memorandum referred
to in your letter.

I am further to request
that you will let His Grace receive a
statement of the expenses which you
may incur in executing this commission
in order that he may give orders to
reimburse the amount to you.

I am &c

W. A. Merivale

Royal Botanic Garden
Edinburgh. 5 Feb. 1870.

My Lord Duke,

I heard from my friend
Dr. Cleghorn that your Grace is anxious
to send out cuttings of the *Specacuantha*
plant to India, and that you will
be glad if the Edinburgh Botanic
Garden will aid in the object.

I have given directions to
the Curator to do all he can in the
way of propagation so as to have plants
ready for being sent out this year.
Mr. MacRae (our Curator) has been very
successful in procuring plants by
cuttings of the rhizomes or root like
underground stems. I trust that a
sufficient number will be ready to be
sent in a Wardian case in the course

of the summer or autumn.

Dr. MacRae has drawn up suggestions as to the mode of cultivation as well as regarding the mode of introducing plants into India. He thinks that the most efficient method of getting a large supply at once or by procuring roots from Brazil packing them in the common Sphagnum moss, and thus transmitting them to India. By this method the roots will keep well.

In complying with your Grace's request I shall get Dr. MacRae's communication printed with a wood cut showing the mode of propagation, and I shall transmit to your Grace the number of copies which you may require for Indian cultivation.

I trust that Her Grace the Duchess continues to improve in health

health.

I am, My Lord Duke
Yours respectfully
J. H. Balfour
Prof. of Botany

India Office

17 February 1870

Sir, I am directed by His Grace the Secretary of State for India in Council to acknowledge the receipt of the letter which you addressed to him on the 5th Instant, and to convey his thanks to you for the kind manner in which you express your willingness to assist him in complying with the request which has been made to him from India to send out a supply of *Speeacantha* plants to that country. As you have I believe been informed by Dr. Cleghorn the Bombay Government have urged that a Wardian case containing these plants should be sent from this country in June or July next, and His Grace will be

Professor Balfour

glad

glad to be able to send another case
to the Governor in Council at Madras.

In reply to your question
as to the number of copies of Dr. Macleod's
Memorandum which will be required,
I am to state that this Department
will be glad of 250 copies.

With reference to the suggestion
of Dr. Macleod of obtaining a supply of
the roots of the *Specacuanha* plant to
be transmitted packed in sphagnum
moss to India, I am to observe that
the Duke of Argyll would gladly act
upon it, if he knew of any sure
agency to which it might be
entrusted. There is not only the
difficulty of procuring the real plants
but also that of getting them out of
the country when obtained.

It occurs to the Duke of
Argyll

Argyll that you may have a
Botanical Agent in those regions to
whom the task could be safely
confided, and I am to state that if
this be so, the Secretary of State would
gladly defray the expenditure necessary
to procure the Roots, provided he
could be assured of their genuineness
and of their being received securely
packed in this country.

I am to repeat this in
thanks for your kind assistance
and

I am to
(ff) W. Merivale

India Office.

13 April, 1870.

Sir,

I am directed by His Grace the Secretary of State for India in Council with reference to my Letter of 17th of February to inform you that he has instructed Dr. Anderson, Superintendent of the Botanical Gardens at Calcutta, now employed at Kew, with the duty of collecting Ipecacuanha Plants with the object of transmitting a sufficient number of them to India to secure the establishment of this valuable medical plant in this Country. His Grace has informed Dr. Anderson that he is at liberty to correspond with you on this subject, and I am to request that you will be good enough to communicate to that Officer such information as to the plants which you are kind enough to place at the disposal of the Indian Government as you may deem necessary.

Dr. Palfour

Transmit a Copy of a
Memorandum which has been
prepared by Mr. Clements Markham
on the subject.

I am &c

J. A. Newman Mervale

India Office
14 February 1870.

Sir,

Referring to the Correspondence
which took place with this Department
in December last, on the question
of sending a supply of Specacuanha
Roots to India, I am directed by His
Grace the Secretary of State for India
to inform you that it has been
suggested to him that the most
efficacious way of introducing the
plant into India would be to
obtain Roots of it in the Brazil
and send them to India packed in
Sphagnum moss.

His Grace would be willing
to incur the expense necessary for this
purpose if he could be assured that
he should obtain in a good state a
supply of the roots of the genuine plant,
and having obtained them could secure
their being allowed to pass out of the
Country

J. A. Hooker, C.B.

Transmit a Copy of a
Memorandum which has been
prepared by Mr. Clements Markham
on the subject.

I am &c

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14 February 1870.

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their being allowed to pass out of the
Country

J. A. Newman, C. B.

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Memorandum which has been
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J. A. Newman Mervale

India Office
14 February 1870.

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which took place with this Department
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to inform you that it has been
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efficacious way of introducing the
plant into India would be to
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and send them to India packed in
Sphagnum moss.

His Grace would be willing
to incur the expense necessary for this
purpose if he could be assured that
he should obtain in a good state a
supply of the roots of the genuine plant,
and having obtained them could secure
their being allowed to pass out of the
Country

J. A. Newman, C. B.

Country. In order to secure these
two things it would be necessary
to have a scientific Agent on the
spot. I am therefore to ask you whether
you have any person collecting
plants for you in those regions
on whom you could rely, to execute
and dispatch to this Country such a
commission and whether you could
give the Secretary of State for India
any notion as to the expense of
execution of it.

Sunt.

Cd. Thomas Mervale

India Office,

13 April 1840.

Sir,

With reference to the
Correspondence which has passed
between you and this Department
on the subject of the introduction
of the *Ipsemaurha* Plant into India,
I am directed by the Secretary of State
for India in Council to acquaint
you that he willingly accepts the
offer, which he understands from
Dr. Anderson, that you have kindly
made, of allowing specimens of the
plant to be collected at Benar, and
measures taken for propagating
them, so that they may be sent from
thence to India, should a favourable
opportunity occur, or kept until
Dr. Anderson returns from his
Tour.

I am also to inform
you that the Duke of Angoulême thinks
that it will be best to make over

Dr. Anderson

The

the two plants, which you have
obligingly reserved at His Grace's
request for the Government of
Bombay, to Dr. Anderson, and
for Dr. Anderson to transmit to
Bombay, two other plants in
their stead from the Botanical
Gardens at Calcutta.

Dr. Anderson will
acquaint you with the other
measures of which His Grace has
approved to secure the object
in view.

I am to repeat the
thanks of His Grace in Council
for your assistance.

I am &c

Edw. Hervey

Received
8 June 1870 No 105/6

Royal Gardens,
New Jersey 23/70.

Sir,
Before answering your letter of the 14 February, relating to the proposal made to His Grace the Secretary of State for India, that living *Specachantha* Roots should be procured from Brazil, through the employment of a scientific agent, and transmitted thence to India, packed in boxes. - I have made enquiries as to the necessity for such a step, and the probability of its success. These enquiries confirm my own view, that success would be problematical, costly, and superfluous, for, firstly, from what we know of the nature of *Specachantha*, and from experience in the transmission of similar roots to and from the Tropics, it is extremely improbable that the root would survive the voyage and secondly there are already

enough

Herbert M. Merivale Esq. C. B.

enough plants in India and
England to propagate from. ~~one~~
Besides the plants sent hitherto
from Kani, I have 2 strong ones
ready to go in May, and we
are still increasing our stock.
Dr. Anderson informs me that
he left some 15 or 20 plants in
Judice, and that he has procured
as many more in Europe within
the last 12 months, which are
being prepared for transmission.
Kindly, with such a stock as this,
of a plant capable of being increased
by root-division, by cuttings and
layered, there should be neither
difficulty nor delay in establishing
its culture in India, under
suitable conditions of climate and
skilful propagators.

We have no persons
collecting plants in the regions
where the *Specacanthus* grows,
which is far from the Coast, and

the

3
The Correspondent to whom we
are indebted for our original plant,
some ten years ago, has failed
in his attempt to get living plants
a second time to the Coast.

I am &c.

J. D. Hooker.

India Office.

3rd March, 1872.

Sir,

I am directed by His Grace the Secretary of State for India in Council to transmit to you a Copy of a Despatch which has been received from His Excellency the Governor General of India in Council, dated the 25th of January, 1872, Public, with its inclosures, on the question of the introduction of the genuine *Specuana* Plant into India.

You will perceive that His Excellency has requested the Duke of Argyll to call upon you for a definite plan for procuring plants and seeds in sufficient quantities for experimental cultivation in different localities of India;—His Grace will be glad therefore to receive from you any suggestions as to the best method of executing the wishes of the Government of India.

I am at the same time to acquaint you that, in consequence of a

J. F. Anderson

a similar application from the Govt.
of Bombay, this Department has been
in communication with Dr. Hooker
of Kew and Dr. Balfour of Edinburgh,
as to the best means of obtaining
Ipecacuanha Plants for transcription
to India.

In a Letter received from Dr.
Balfour, it has been suggested by Mr.
McLach, who has successfully propagated
some Plants in the Royal Gardens at
Edinburgh, that the readiest and surest
method of obtaining plants would be
by the transcription of Rhizomes packed
in sphagnum moss.

There would be no objection
to try this Plan as well as the transcription
of Plants in Wardian Cases, and also of
Seeds securely packed, some might also
be sown in the Cases before they are
closed up, provided that an agency which
could be relied on to obtain the genuine
Plant might be secured in the Brazil.
With regard to this point I am desired to
inform you that Mr. John Brauley Moore
whose

whose name is connected with the
trade of that Country has expressed to a
member of the Council his willingness
to assist the Secretary of State in
procuring Plants and Roots, and does
not apprehend that there will be any
difficulty in so doing. You are at
liberty therefore to place yourself in
communication with Mr. John Brauley
Moore, 10. King Street St. James'.

I am &c.
Wm. A. C. Hervey

Memorandum on Ipecacuanha.

10th March 1870.

The native tribes of Brazil have always known the efficacy of the little root of the best sort of Ipecacuanha in various diseases. Their ancestors, in very remote times, learned its use from the *irara*, a kind of martin, which, when it had made a beast of itself on brackish water, always ran to chew the roots, to excite vomiting. The common native name is *Poaya de mato* and *Cipo*. In the province of Minas Geraes it is called *Ipecacuanha*. The meaning of this name is uncertain, but it is composed of Guarani words. According to one derivation, it is formed of *ipe* (bark), *caa* (plant), *cua* (scented), *nha* (striped), i.e., "the bark of a scented and striped plant."* Burton gives *ipê cá goêne*, "the little plant by the road side."† The "Medical Botany" has *ipi* (Peruvian for a root), and *Cacuanha*, a district; but *ipi* is not the Peruvian for a root, and there is no such district as *Cacuanha*.

Ipecacuanha.
Discovery of its use.

Meaning of the word.

The first mention of ipecacuanha, as of most things, is to be found in "Purchas his Pilgrimes." Purchas begged, borrowed, or stole every journal of travels he could get hold of. A certain Captain Frank Cook, of Dartmouth, appears to have taken a journal from a "Portugal," in 1601, much against the owner's will, and to have lent it to Purchas. It was signed "Manoel Tristan, Enfermero do Colegio de Baya," and contained the first known account of the root. In this journal it is called *Ippecaya*, or *Pigaya*, and is thus described:—"It is said to be profitable for the bloody flux. The stalk is a quarter long, and the roots of another or more. It hath only four or five leaves, and smelleth much wheresoever it is, and the smell is strong and terrible." In 1689, the plant was described by Piso, in his "Natural History of Brazil," p. 101.

First mention.

Helvetius received a great reward from Louis XIV. for his successful treatment of dysentery with ipecacuanha, and he wrote a treatise on its use.

Use in dysentery.

Professor Brotero, of Coimbra, first described the plant (which he called *Callicocca Ipecacuanha*), from specimens brought from Brazil by Bernardo Gomez. His description is published in Vol. vi., p. 137, of the "Transactions of the Linnæan Society for 1801," and the paper is illustrated by a drawing of two stems, with the leaves, from one root.

First described.

The great French chemist Pelletier discovered the active principle in the root in 1817, which he called emetine; and in 1818 M. Richard again described the plant, calling it *Cephaelis Ipecacuanha*, a name which has been generally adopted.

Emetic discovered.

Present name given.

The ipecacuanha plant is described in Stephenson and Churchill's "Medical Botany" (1834), with a coloured plate, copied from the one in the Linnæan Transactions, but only giving one stem. It is also figured in Curtis's "Botanical Magazine," 1844, vol. 70, p. 4063; and there is a full account of it, with good drawings of the roots, in Pereira's "Materia Medica," 4th ed., 1854, vol. ii., part ii. A plant, presented by M. Makoy, of Liege, flowered at Kew in June 1843.

Various descriptions.

The *Cephaelis Ipecacuanha* is met with in Brazil from about latitude 8° to 22° S., in the forests of the Serra do Espinhaço,† or mountains extending from the capitanía of Bahia, through the province of Minas Geraes, to the northern part of Sao Paulo. The forests in Minas Geraes are divided into four classes:—The *Matos Virgens*, or virgin tropical forests; the *Catingas*, or woods composed of smaller deciduous trees; the *Carrascos*, at still greater heights, consisting of shrubs; and the *Capoeiras*, or scrub growth on land once cultivated. The *Matos Virgens* clothe the eastern slopes of the Serro do Espinhaço and the Organ Mountains. To the westward of the Serra do Espinhaço, in Minas Geraes, the country is flatter, consisting of pasture land and much *Catinga* forest; and still further west is the *Sertão*, or desert country in the basin of the San Francisco and its affluents. The ipecacuanha is found, I believe, both in the *Matos Virgens* and the *Catinga*, in moist shady situations.

Habitat.

* Probably the correct derivation. *Ipe* is bark, and *caa*, a tree or plant.

† Wrong.

‡ Back bone mountains.

Growth.

Root.

Stem.

Leaves.

Flower.

Berry.

Trade.

Cultivation.

Yield of emetine.

Silence of travellers.

Second kind.

Third kind.

Measures for obtaining roots, &c.

Cephaelis Ipecacuanha is a little shrub, consisting of a perennial root, three to six inches long, and a short stem with a few leaves at the end.

The root is bent and contorted, having a knotty appearance like a number of rings of unequal size strung on a thread, of a pale brown colour when fresh.

The stem is creeping at the base, then erect and rising five to nine inches. After the first year or two the stem throws out crooked knotty runners, which take root irregularly at the knots and produce new stems.

There are four to eight leaves at the end of the stem. They are almost sessile, oblong-ovate, opposite and entire, three or four inches long by one or two broad, rough and deep green above, pale and finely pubescent beneath. The petioles, at the base of the pairs of leaves are short and hairy, and there are a pair of interpetiolar stipules deeply cleft into segments.

The flowers are aggregated into a solitary head, a little drooping, set on a round, downy stalk, terminating the stem. The green bracts are pubescent, entire, and sessile. The florets sessile and 15 to 24 in number. Calyx five-toothed and very short. Corolla synpetalous, white, and five-lobed. Anthers enclosed; stigma bifid and usually exserted; stamens, 5ve.

The berry is obovate oblong, and crowned with the remains of the calyx. Soft and fleshy, being reddish purple at first, and becoming black and wrinkled. It has two smooth oval seeds.

The ipecacuanha roots are gathered at all seasons, but more frequently from January to March, by the negroes in the neighbouring estates, and also by the Coroado Indians in Minas Geraes. They cut the roots from the stems, dry them in the sun and pack them in bundles. The berries are ripe in May. The bundles of roots are disposed of to traders, who bring them down to the coast, and they are shipped from Rio and Bahia in bales, bags, barrels, and serons.* It is called *annulata ipecacuanha* in commerce.

Koster, who wrote in 1817, tells us that the ipecacuanha plant is easily cultivated. He had himself made the experiment, but he adds, that it requires shade, or at least that it must not be completely exposed to the sun.

Pelletier found that the *Cephaelis Ipecacuanha* contained 16 per cent. of emetine in its roots; but Professor Attfeld recently obtained only 10.5 per cent. of pure emetine.

It is remarkable how very little is said of ipecacuanha by travellers who have written on Brazil. Nieuhoff, St. Hilaire (in his eight volumes of travels), Castelnau, Henderson, Gardner, Scully, Kidder, Fletcher, and Burton, scarcely mention it. Spix and Martius give a few particulars, as also does Koster; and I understand, that there is an account of it in St. Hilaire's "Histoire des Plantes les plus remarquables de Brésil et du Paraguay." But this work (distinct from his travels) is neither in the Linnaean, Geographical, nor Athenæum libraries.

The second best kind of so called ipecacuanha is obtained from the root of *Psychotria emetica*, a chinchonaceous shrub growing in Peru, and also in New Granada along the banks of the Magdalena. It is known in commerce as striated ipecacuanha, the root being longitudinally striated, with deep circular intersections at intervals. It is of a blackish brown colour. Pelletier found nine per cent. of emetine in this root; but the results of a recent analysis by Professor Attfeld have not been so satisfactory. Last autumn Messrs. Meier imported about 700 lbs. of the striated ipecacuanha from Bogota by way of Carthagena, and sent a specimen to Professor Attfeld for assay. He only found 2.75 per cent. of pure emetine, and expressed a strong opinion that the importation of this root should be discouraged, as being of no direct value. I hear, however, that the cultivation of the *Psychotria emetica* has been successfully introduced into Algeria by M. Hardy.

The third kind met with in commerce is the undulated ipecacuanha, the root of the *Richardsonia scabra* of DeCandolle. It is a perennial shrub, found in Peru and Brazil, with a root having a jointed appearance, with semi-circular grooves, and of a greyish white colour. Pelletier obtained 6 per cent. of emetine from this root; but an analysis at the present day would probably give a much smaller percentage.

It is quite clear that the *Psychotria* and *Richardsonia* should be entirely ignored, and that attention should be exclusively directed to the best sort, the *Cephaelis* of Minas Geraes. It appears, however, that there are already about 20 plants of this

* Hides.

kind in India, from which a good gardener, after a time, could propagate very rapidly. It is, therefore, unnecessary to go to any great expense in obtaining more from Brazil. Yet if, as is asserted, the roots packed in damp moss will bear a voyage and afterwards strike, supplies might be obtained at trifling expense. It would be merely necessary to instruct traders to see that a portion of the harvest of roots was not dried in the sun, but packed in damp moss and so brought down to the port of shipment. I should myself be inclined to doubt the roots surviving a voyage, unless they were in charge of a competent person. The seeds are very perishable, but if they were gathered when quite ripe, and properly packed and attended to, a per-centage would probably germinate. If a gardener was sent out to bring down plants in damp moss, and establish them at Rio or Bahia, in Wardian cases, to be sent to India, the most ordinary skill and care would ensure success. But this course would entail an expense which, as there are already plants of the right kind in India, would be quite unnecessary.

The acquisition of more accurate and detailed information respecting the soil, climate, and exposure best suited to the plant would of course be useful. Information required.

I have written to Messrs. Miers, of Rio, requesting them to take steps with reference to obtaining roots packed in damp moss for transmission to England, and also to Mr. Bramah, who will get them through a firm at Rio. I have also addressed Dr. Otho Wucherer, a scientific German, living at Bahia, asking him what steps he could take for procuring roots in a proper state, and ripe seeds, and also requesting him to furnish me, if possible, with more detailed information respecting the habitat of the plant, than is to be found in any accessible work. Captain Reeks, a Commander, and Mr. Wade, a Surgeon in the Royal Mail Steam Company's service on the Brazilian line, will be requested to take special care of any roots or seeds that may be entrusted to them. Steps that have been taken.

CLEMENTS R. MARKHAM.

ADDITIONAL MEMORANDUM.

March 11th, 1870,

Since I wrote the above, I have heard from Mr. Daniel Hanbury, a high authority on all questions relating to medicinal plants. He does not think it worth while to send to Brazil for roots of the *Cephaelis Ipecacuanha*, if there are plants already in India. He says,—“The places in which the ipecacuanha plant is found are “remote from the coast, and long and tedious delays would probably intervene “between the collecting and the shipment of any roots that might be obtained. “For these reasons I doubt extremely whether roots packed in wet moss would “retain their vitality until they reached England. Moreover, I should think that “the heat of a tropical climate would inevitably cause specimens so packed to “become rotten. If there are growing plants in India, could not a Mr. M'Ivor be “found to exercise his skill in multiplying them?”

I find that the region where the ipecacuanha has been found wild is not confined to the forests of Minas Geraes, but extends westward across Brazil to the confines of Bolivia, and the plant grows in especial quantities in the upper valley of the Paraguay, in the province of Matto Grosso. Indeed, Mr. Bramah tells me that, at the present day, nearly all the exported ipecacuanha comes from Matto Grosso. This locality was visited by Dr. Weddell, who published a “Note sur le *Cephaelis Ipecacuanha*, son mode de Vegetation dans le Province de Matto Grosso,” in the “Annales des Sciences Naturelles, 3rd Series, 1849, vol. xi., pages 193 to 202.”

Dr. Weddell says that the plant was first discovered in Matto Grosso in 1824, near the town of Villa Maria, on the Paraguay. It was generally found growing in large clusters. The collectors, called *Poayero*, take all the stems forming a cluster into one hand, press a hard-pointed stick, called *saracoa*, obliquely into the ground under the roots, and dexterously pull them all up with scarcely any fracture. In the wet season, the earth being loose and wet, it is easier to pull the roots up without fracture, but in the dry season it is more convenient for drying them in the sun. The plant sends down runners from the stem, and multiplies rapidly, and even a fragment accidentally left on the ground will take

root. The *Cephaelis* was growing, with many palm trees, on comparatively high land, above the reach of inundations from the river.

The land journey from Matto Grosso to the coast is over execrable roads, and more than twice as long as that to the Minas Geraes.

Besides the places I mentioned in the former memorandum, the plant will be found figured in "Historia Naturalis Brasiliæ," Gulielmus Piso. Amsterdam, 1632, lib. iv., cap. 65, p. 101, where there is a very rude woodcut. Also in M. Richard's "Historie Naturelle et Médicale des différentes Espèces d'Ipecacuanhe," 1820, p. 21, tab. i., and in Martius's "Specimen Materiae Medicæ Brasiliensis," 1824, tab. i., and p. 4, two flowers, with leaves, and root. There are figures also in,—

"Woodville's Medical Botany," ed. 3., vol. v.,

"Heyne, Arzneigewächse," viii., fol. 20; and Berg and Schmidt's "Offizinelle Gewächse," tab. xv., the two latter and that in the work of Martius being particularly good figures.

CLEMENTS R. MARKHAM.

IPECACUANHA.

Herbarium, Royal Gardens,
Kew, 28th March 1870.

Sir,

In reply to your letter, dated the 3d of March 1870, enclosing a copy of a Despatch from His Excellency the Governor General of India, on the introduction of the true Ipecacuanha plant (*Cephaelis ipecacuanha*) into India, I have the honour to submit the following report. The steps I have taken to secure a supply of plants from Europe, which I may take to India on my return, or may be able to send out in charge of persons who may offer to attend to the plants during the voyage, will show what appears to me to be the best method of obtaining a good stock of plants of Ipecacuanha, and will, at the same time, inform the Government of India of the progress that has been made to forward their views.

In the end of last June I received a letter from the Government of Bengal, with copies of the correspondence that had taken place on this subject, after my departure from India, and with a request that I would endeavour to further the wishes of Government as expressed in that correspondence.

Acting on that letter, I determined to obtain as many plants of *Cephaelis ipecacuanha* as possible from botanical and private gardens in Britain and Europe. I communicated first with Dr. Balfour, Professor of Botany in the University of Edinburgh, and both he and Mr. Macnab, the Curator of the Botanical Gardens there, promised to propagate as many cuttings of Ipecacuanha for transmission to India as could safely be taken from the two old plants in the Edinburgh Garden. It was when examining these old plants, in order that the best method of propagating might be determined on, that it occurred to Mr. Macnab that the numerous root like tubers might be taken advantage of as a means of rapidly increasing the plants. I saw the first crop of these rhizomes taken off, without causing the slightest injury to the plant, and before I left Edinburgh I had the satisfaction of seeing that many of these rhizomes had struck root, and sent up a strong shoot. I heard lately that a considerable number of young plants had been obtained in the Edinburgh Botanical Gardens by means of this root division, and that many more would be procured as the roots are reproduced, all of which are intended for India. I may mention, that the two old plants of *Cephaelis ipecacuanha* have been many years in Edinburgh, and they are by far the largest and finest I have seen. In addition to these young plants promised by Dr. Balfour from the Edinburgh Botanical Gardens, I procured from Messrs. Lawson and Sons, of Edinburgh, four large plants of *Cephaelis ipecacuanha*, and which I have left in their charge for propagation. Messrs. Lawson and Sons possess extensive propagating pits for tropical plants, which are managed by a very successful and intelligent gardener, who takes a great interest in the increase of the Ipecacuanha.

There are seven young plants of *Cephaelis ipecacuanha* in the Royal Gardens, Kew, and the greater proportion of these and all the cuttings that can be obtained from them will be available for transmission to India, along with the stock I may obtain from other sources. I have also procured another large plant of Ipecacuanha in London, from which cuttings will be made, both of the roots and stems, during the remainder of my leave in England. I have heard of a few more large plants in nurseries and private gardens, some of which I shall be able to purchase or obtain in exchange for seeds or plants from the Calcutta Botanic Gardens. Cuttings will be got from those in private gardens, and will be rooted and grown in Kew.

I estimate that I shall be able to take out to India in January 1871 not less than 50 plants of the true Ipecacuanha, all of which will have been obtained in Europe principally in exchange for rare plants and seeds from the Botanical Gardens, Calcutta. In the correspondence sent to me along with the copy of the Despatch of the Government of India, I observe that it is assumed that only one form of the flower (they are dimorphic as regards the relative length of stamens and pistils) exists in Europe, and therefore all the plants procured from Europe will prove to be sterile. I hope this is an error, and I believe it is, because it is supposed in India that only one plant was introduced from Brazil, from which all those in Europe have been artificially propagated, whereas the Ipecacuanha plants were brought into Europe on two distinct occasions, first, I think, in 1832 or

1833, and again some years afterwards, and there is every reason to believe that each importation consisted of several plants.

The plants flower regularly in stoves in England, but no one has recorded the condition of their flowers. I shall endeavour to obtain information regarding the nature of flowers as the plants I have procured come into blossom, so as to distinguish and mark plants having different forms of flowers. I had also acted on the suggestion first made by Mr. Macnab, that living roots packed in sphagnum might survive the voyage from Brazil. I discussed this proposal with Mr. Macnab in Edinburgh in October, when we examined the fresh roots cut from his large plants. I had at the end of June mentioned the introduction of the *Ipecacuanha* into India to Dr. Christison, Professor of Materia Medica in the University of Edinburgh, and he then wrote to a friend* in Rio de Janeiro, who had long resided there as a medical practitioner, and requested him to obtain information of the habitat of the plant, and, if possible, procure living plants and seeds for me. Drs. Balfour and Christison have since then addressed this gentleman a second time, and have described to him the method of packing the roots recommended by Mr. Macnab. In December, I requested Messrs. Veitch and Sons, of the Exotic Nursery, Chelsea, to procure living plants in Wardian cases, roots in moss, and seeds of the true *Ipecacuanha*, from Rio de Janeiro. Messrs. Veitch and Sons at once wrote to their agent in Brazil, and he has replied that he will have no difficulty in sending plants and seeds to England. In consequence, last week, I entered into an agreement with Messrs. Veitch and Sons to supply me with a good stock of the *Cephaelis ipecacuanha* from Brazil. The importation is to consist of live roots packed in moss, and some planted in soil in Wardian cases, and live plants and seeds are also to be sent if they can be obtained. The cost of this importation is not to exceed 25*l.* sterling including charges for collecting in Brazil and transit to England.

In accordance with the permission given me to communicate with Mr. John Bramley Moore, who has expressed his willingness to assist in procuring roots and plants of *Ipecacuanha* from Brazil, I have called upon that gentleman, but have not had yet an interview with him.

There can be no doubt, I think, that the attempts to introduce the true *Ipecacuanha* from Brazil into India will succeed only by establishing a nursery in England where roots and plants should remain until they become large and healthy enough to be sent to India. I do not think so small rhizomes as those of the *Ipecacuanha* could survive the long and trying voyage from Brazil to India, even by the shortest overland route, however well they may be packed. Plants received at Calcutta from England, and packed in sphagnum, generally reach in bad order, from fermentation having taken place from the great heat the plants have been exposed to, probably in the Red Sea.

It is most likely that a considerable percentage of *Ipecacuanha* roots in sphagnum, and plants in Wardian cases, will arrive alive in England from Brazil, but not possessing sufficient vitality to enable them to withstand the risks they would be exposed to during the very trying voyage to Calcutta. Seeds, too, may retain their vitality until they reach England, but not much longer, for, like the seeds of most species of the *Coffea*, to which tribe *Cephaelis* belongs, they soon lose their germinating power. I, therefore, recommend that Dr. Hooker should be requested to allow all transmissions of *Ipecacuanha* plants, roots, and seeds to be received at the Royal Gardens, Kew, and to be kept there until they have properly recovered from the effects of the voyage, or until the seeds have germinated. As I am occupied at Kew assisting in the publication of the "Flora of British India," I shall be able to observe the state of the plants, and to arrange with Dr. Hooker for despatch of the plants to India as opportunities may occur. If any of the roots packed in moss are found to be in very good order, a few of the best may be selected, repacked, and forwarded to India by the overland route. If a large quantity of seed is obtained, part of it also might be sent to India, the remainder being sown at Kew.

I may mention that this plan is approved by Dr. Hooker, who also agrees with me in thinking that roots or plants of *Ipecacuanha* sent direct to India from Brazil could not survive so long a voyage.

With reference to the plants of *Ipecacuanha* now in England which I have secured for transmission to India, I think they should not be exposed to the risks

of so long a voyage, unless some one conversant with the management of plants can be found to take care of them. Should no one be found willing to do so, no time will be lost by keeping them in England till my return to India in January next, as their multiplication by cuttings and root divisions can be carried on most successfully in this country, and it has been arranged that this should be done. If, however, any Officer returning to India who understands the treatment of plants can be found to undertake the care of a small Wardian case of *Ipecacuanha* plants, one or two despatches might be made to Calcutta or Madras before next January. I strongly recommend that the experiment of cultivating the *Ipecacuanha* plant should be entrusted, in the first case, to the Superintendent of the Calcutta Botanical Gardens, and to Mr. M'Ivor at Ootacamund, instead of sending them to other places where there are no horticultural appliances, and where the plants cannot recover from the damage they inevitably receive on the voyage in spite of all the care that may be taken of them.

The plants have thriven at Calcutta and at the lowest levels of the Chinchona plantations in Sikkim, and also at Ootacamund. There were 20 plants at Calcutta and Darjeeling last November, all the produce of one plant I received in 1866, and thirteen at Ootacamund on the 9th of November last, the produce of three plants obtained by Mr. M'Ivor from Kew in 1866-67. These four original plants are the only ones from which cuttings have been made in India, all others having perished on the voyage, or soon after reaching the country.

Localities in India adapted to the growth of the *Ipecacuanha* plant will be found in districts possessing no well marked or very long, dry, cold season, as the plant cannot withstand cold or drought. Sikkim is the most western province of the Himalaya in which the plant will grow. The plains of North-west India are also too hot and dry, and I do not think the plant will withstand the cold or the dry season of Lower Bengal without shelter. Assam, Cachar, Chittagong, the moist parts of Burmah, and the Tenasserim provinces are districts in the east in which the cultivation would succeed. The Western Ghâts, from latitude 20° N. southwards, and the tropical vallies of the Nilgherries, Anamallay and Pulney Hills, and the Wynaad, in the Bombay and Madras Presidencies, will also be found suitable.

I have just read the memorandum on the *Ipecacuanha* by Mr. Markham, which contains almost all that is known on the subject, and I can add very little to the information therein given.

The account of the plant by Sir William Hooker, in the "Botanical Magazine," and quoted by Mr. Markham, is drawn from St. Hilaire's "Plantes usuelles des Brésiliens," published in 1824, and there is no description of it in that author's "Histoire des Plantes les plus Remarquables de Brésil et du Paraguay." In that work he also describes another spurious sort of *Ipecacuanha*, besides those referred to by Mr. Markham. It is yielded by the *Ionidium poaya*, of the natural order *Violaceæ*, an order distinguished by the emetic properties of its plants.

I am, Sir,
Your obedient Servant,
THOS. ANDERSON,
Superintendent of the Botanical Gardens,
Calcutta.

P.S.—I have just been informed by Dr. Hooker, that he thinks he sent two more plants to Madras, in addition to the one taken out by Mr. Broughton, the Quinologist at Ootacamund, and the two given to Mr. M'Ivor, thus making five sent from Kew to Madras.

I think I have observed a notice of these plants in the proceedings of the Agricultural Society of Madras, and that the plants were kept in Madras. It might be as well to inquire about those plants, as no notice of them occurs in the correspondence that has taken place on this subject.

I think it would be very useful to have a translation made of extracts from St. Hilaire's "Plantes usuelles," and also from Weddell's Memoir in the "Annales des Sciences Naturelles," and if the Secretary of State approves of this suggestion, I can have the translation made and transmitted to the India Office to be printed.

29th March.

T. A.

The Under Secretary of State
for India.

70-845

Re: [illegible] [illegible] [illegible]
[illegible] 1890.

The foregoing
despatch, together
with copies of its
enclosures, will be
communicated
through the Commission
of the Highbury Hills
to Mr. [illegible], also
to the Board of [illegible],
Office [illegible] of [illegible]
and [illegible] [illegible].
Mr. [illegible] will

70-845

Re: [illegible] [illegible] [illegible]
[illegible] 1890.

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to Mr. [illegible], also
to the Board of [illegible],
Office [illegible] of [illegible]
and [illegible] [illegible].
Mr. [illegible] will

be good enough
to obtain from Mr.
McLvor and forward
the information re-
quired by the Secy
of State in para 3
of his present des-
patches.

Mr Braghton will
also be requested
with refce to S.O.
21st Decr 1869 no
3225 to report the re-
sult of his attempt
to establish the Spe-
cauauha plant
at Mellumboor.

- 3- Comm Neilgherry Hills Des^{with encs} 174
14- Off of Secy of War Des^{with encs}
13- Off of Secy of Trade Des^{with encs}
1- Genl Quinologist Des^{with encs}

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