M.R.O. 1—77,006—8-6-37.

(1) Number of pages 14

(2) Date of repair 6.9.38

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	268-69	Press / Mis.–
Dated	10-4-	1889.

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—again the following G.O., dated 26th February 1889, No. 1221, Revenue :—

Read—the following Despatch from Her Majesty's Secretary of State for India, to His Excellency the Most Honorable the Governor-General of India in Council, dated India Office, London, the 20th December 1888, No. 105 (Revenue) :—

I herewith forward, for communication to the Government of Madras, a copy of a letter, with its enclosure, received from the Director, Royal Gardens, Kew, raising the question as to the identity of the variety of "Carthagena bark" cultivated in the Nilgiri Cinchona Plantations of the Madras Presidency.

2. I shall be glad to be informed of the result of the inquiries on the subject, which I hope will be at once instituted by the Government of Madras.

ENCLOSURES.

From W. T. THISELTON DYER, Esq., Director, Royal Gardens, Kew, to Her Majesty's Under Secretary of State for India, dated Royal Gardens, Kew, the 29th October 1888.

I have the honor to enclose, for your information, a copy of the Pharmaceutical Journal and Transactions for 13th October 1888, which contains pages 295-296 a paper by Mr. David Hooper giving "the results of the experiments connected with the introduction of the Carthagena bark trees into the Nilgiri Cinchona Plantations of the Madras Presidency."

2. It may perhaps be convenient if I briefly recall to your notice the history of this transaction. Some time before 1878 Mr. Robert Cross was employed by the India Office to visit South America for the purpose of obtaining the quinine-producing plants known as the Calisaya of Santa Fe, and Carthagena bark. Mr. Cross was so far successful in his mission that he arrived in England in March 1878 with five cases of these plants. He brought them to Kew where the whole consignment remained in his charge till he himself went out to Ootacamund with the last of the plants in 1880. The whole history of the progress of the plants while at Kew is given in the Kew Reports for 1878-79 and 1880.

3. Beyond placing at Mr. Cross's disposal the cultural appliances of this establishment, Kew was not in any way responsible for the conduct of the experiment. I believe its inception was due to the advice of the late Mr. Howard, F.R.S., and from first to last it was entirely in Mr. Cross's hands.

4. On 23rd April 1878 Mr. Howard communicated to the Secretary of State the analyses of six different kinds of Carthagena bark which Mr. Cross had brought from South America. The whole of these he condemned as worthless except one, No. 5, the so-called Magdalena variety. With the approval of the Secretary of State Mr. Cross therefore abandoned the attempt to propagate any of the five kinds condemned by Mr. Howard. Only one kind of Carthagena bark was, therefore, ever grown by Mr. Cross at Kew, or transmitted thence to India, and this has always been believed to be the Magdalena variety.

5. Mr. Hooper states in his paper that, after the arrival of the plants at Kew "much difficulty was experienced in preserving the Magdalena plant, owing to the frost of the following winter and the cockroaches feeding upon it." I am quite sure that there is no real foundation for this statement, inasmuch as the propagating department at Kew, which is filled with plants of the most valuable description from every part of the world, is absolutely free from such insect pests. Nor, as Mr. Cross had any temperature he pleased at his disposal could the frost of winter have presented any difficulty to him. It is quite true that, in reporting to the India Office, 16th October 1878, on the progress of the Magdalena bark, Mr. Cross stated that "the cockroaches very nearly gobbled the whole up." But Mr. Cross was in the habit of indulging in somewhat picturesque statements, and Sir Joseph Hooker did not think

it worth while to correct a detail of this kind. For, in point of fact, the propagation of the Carthagena bark never presented any particular difficulty and was merely a question of time, whole the Calisaya of Santa Fe was always a cause of the greatest anxiety.

6. Mr. Hooper, you will observe, has analysed the Carthagena bark produced on the Nilgiris and finds a striking discrepancy between the result and Mr. Howard's analysis, and he regards it in fact as having the composition of No. 2 in Mr. Howard's list which was one of the discarded varieties. He proceeds:—"It is very evident that this variety of Carthagena bark, now being cultivated on the Nilgiris, is a very useless one commercially, and that the better kind brought from the Magdalena valley, never reached India at all, or was unsuited to the climate and died." With regard to this I must point out, as I have already shown, that only *one* kind of Carthagena bark was ever sent out to India, and this was believed to be the Magdalena variety. That there has been a mistake somewhere seems possible, but it seems hardly likely that Mr. Cross can have thrown away the best kind, especially as he states in the Report to the India Office that to obtain this particular variety he was delayed in South America no less than three months, during the whole of which time the plants of the Calisaya of Santa Fe had to remain at Popayan.

7. I am inclined to think that the poor quality of the Carthagena bark grown on the Nilgiris may be the result of the local conditions on which the composition of Cinchona bark is known largely to depend, and I think it would be very desirable that Mr. Hooper should, if possible, obtain Carthagena bark grown in other parts of India, with a view of ascertaining if there is any variation in the results of analysis in other cases. The same variety was sent from Kew to both Ceylon and Darjeeling. It would be further interesting to ascertain what is the character of the renewed bark. I observe too in Mr. Lawson's report, dated 6th July 1887, that plants raised from the seed of Carthagena bark showed great divergence from the type, a circumstance which he attributes to their having hybridized. It would be very desirable to ascertain the chemical character of the bark of these divergent forms.

8. Finally, I observe that the Calisaya of Santa Fe appears to be established on the Nilgiris. It would be very interesting to know the result of Mr. Hooper's analysis of its bark whenever a sample can be submitted to the process.

BRITISH PHARMACEUTICAL CONFERENCE.

TWENTY-FIFTH ANNUAL MEETING.

SECOND DAY'S PROCEEDINGS.

Wednesday, September 5.

(Continued from page 264.)

The following two papers were then read and discussed together:—

CARTHAGENA BARK.

BY DAVID HOOPER.

Some of the cinchona barks are known by the names of the localities in which they are collected, others are named from the ports whence they are distributed, and perhaps none of these barks has been less noticed than that bearing the name of Carthagena in the United States of Columbia. As the botanical source of this bark will very probably be cleared up at an early date, it would be interesting in the meantime to link together historical facts on the subject, and to give the results of the experiments connected with the introduction of the Carthagena bark trees into the Nilgiri Cinchona Plantations of the Madras Presidency.

José Celestino Mutis, at the request of the Spanish Viceroy, was the first botanist sent out to explore the bark region of New Granada,* and discovered the first cinchona tree at Teena, in the year 1772. A few years later, Ruiz and Pavon were sent round to Peru to investigate the bark regions of that country, and a hot discussion sprang up between the botanists as to the respective merits of the species they had discovered in the two countries. It would indeed seem that Mutis was not acquainted with the more valuable species of cinchona, as the large quantities of bark that were subsequently exported from Carthagena and Santa Martha were found to be so worthless that the barks of New Granada were brought into disrepute.

The distinguished traveller, Alexander von Humbolt, with Aimé Bonpland, visited the ports of the Caribbean Sea in 1801, and expresses an interest in the bark trade of South America. He says: "The proximity of the port of Carthagena would render the neglected

* In 1819, after the war with Spain, Columbia was proclaimed a republic. In 1831 the Confederation resolved itself into three independent states, New Granada, Venezuela, and Ecuador. In 1861 the former was re-christened Columbia, with Bogota as chief town.

cultivation of cinchona an object of great importance to European trade. The real febrifuge cinchona with the hardy corolla is nowhere else found so near the coast, if we except the Sierra Nevada of Santa Martha." Whatever might have been the value of the barks exported at this time, the trade was considerably brisk; it is shown in the Report of the Administrator that between 1802 and 1807 the shipment of New Granada bark from Carthagena was 3,340,000 lb., and the first arrivals in Spain sold at 5 to 6 dollars a pound.

Dr. Karsten, a German botanist, arrived in South America in 1844, and during a long residence examined the cinchona trees of New Granada, and determined the origin of several barks exported from the northern towns. He found *Cinchona lancifolia* of Mutis to be a very variable plant, and to furnish barks of very different appearance. This species, he says, affords principally two kinds of barks, the valuable variety called Soft Columbian, or Calisaya, of Santa Fe, and the less valuable variety, called Carthagena, or Cogueta bark, or Carthagène ligneux of the French. Other investigators refer the latter bark to the species named by Mutis, *C. cordifolia*, a tree largely distributed in South America, and considered to be very poor in alkaloids. The *Quina anaranjada* from *C. lancifolia* was exported very largely between 1849 and 1855, but after that time the supplies began to fail. About the year 1872 Columbian barks were again in the market, and 12 cwt. was shipped to Europe from Carthagena and neighbouring ports, but the bark trade at this time ceased to be characterised by one or two special kinds, as the Pitayo forests had been recently explored by travellers, and quantities of bark from this district formed the bulk of the exports. Within the last decade Remijias have been discovered in the forests of Columbia, and cuprea barks have taken the lead in the commerce of that country; in 1881, for instance; out of 87,000 serons exported, 60,000 serons were cuprea bark.

The United States of Columbia at the present time probably yield the greater portion of the South American cinchona bark of commerce. The cuprea bark comes from low elevations at Antioguia in the north-west, from the basin of the lower Magdalena in the north, from Bucaramanga and Llanos on the eastern slopes of the eastern Cordillera, and from near the several affluents of the Orinoco and Amazon. The mountainous territory in the south-west affords the Pitayo bark and the Calisaya of Santa Fe, and includes the habitat of the Carthagena bark trees. In nearly every part of the country, from 9,000 feet on the three branches of the Columbian trifurcation of the Andes, down to river basins a little above sea-level, are numerous rubiaceous trees more or less valuable as quinine-producers. The bark from this country is not all exported from Carthagena, but this port still holds an important position in the trade. In the Consul's report on the trade of Carthagena for the year 1887, 138,000 pounds of cinchona bark were passed out, together with some drugs of less importance, as balsam, ipecacuanha, and sarsaparilla.

Mr. Robert Cross was employed in 1877-1878 to collect plants of the Calisaya Santa Fe on the eastern Andes and of the Carthagena bark on the central Cordillera. This intrepid traveller and accomplished gardener made a successful journey through Cali and Popayan, over the western and central Cordilleras, and returned with cuttings and seeds of the plants for which he went in search. He defined the Carthagena bark region as situated on the eastern declivities of the central Cordillera on the border of the Magdalena valley in the district Paez, a little below 3° north latitude. The tree grows at elevations of from 4,000 to 8,000 feet in forests with a heavy rainfall. It is rapid and robust in habit, and stands great variations in temperature. Five specimens of bark were collected from trees in the Cauca valley, and one from Coralis Inza in the district of the Magdalena, and the latter was the only one that was found to contain quinine. The analyses of the six samples by Mr. J. E. Howard might here be conveniently reproduced:—

—	1	2	3	4	5	6
Quinine	·00	·00	..	·00	1·88	·00
Cinchonidine	·00	·46	..	·28	1·18	·00
Quinidine	·00	·00	..	·00	·18	·00
Cinchonine	1·23	1·25	..	1·30	·80	1·24
Amorphous alkaloids	1·68	1·97	..	2·18	·71	1·48
Total ..	2·91	3·68	0·44	3·76	4·75	2·72

No. 1. Paniquita variety, Popayan. 5,000 feet, valley of the Cauca.
No. 2. Paniquita variety, Usenda. 8,500 feet, district of the Cauca.
No. 3. Smooth-leaved variety, Pueblo Nuevo. 8,000 feet, district of Cauca.

Mr. Howard remarks this is the *Quina blanca* of Carthagena, and does not belong to the cinchona, but to an allied family.

No. 4. Paniquita variety, Silvia. 7,500 feet, district of the Cauca.
No. 5. Magdalena variety, Coralis inza. 7,000 feet, district of the Magdalena.
No. 6. Paniquita variety. 6,000 feet, district of the Cauca.

The plants were taken to Kew, arriving there in March 1878, and forty cuttings were obtained from the root pieces of the plants; much difficulty was experienced in preserving the Magdalena plant, owing to the frost of the following winter and to the cockroaches feeding upon it. Next year the young plants were brought to India, and six Carthagenas were planted out on the Nílgiris, in October 1880. The high elevation of Dodabetta was unsuited to their habit and growth, but two plants at Naduvatam found a more genial climate, and even now thrive most luxuriantly. Colonel Beddome, reporting on the plantations in June 1881, remarks: "The two plants brought lately by Mr. Cross from the central Cordillera near Bogota (elevation 4,000 to 6,000 feet) are healthy and strong growing, and are being propagated. The prospect of establishing it on the Nílgiris is promising. It is supposed to be a strong growing and large tree, which its present appearance does not belie; its yield in quinine is much the same as that of succirubra, and it will probably succeed in the same localities as that species." Mr. Cross tells me that he believes the "China Cuprea" from Bogota is the same species. In 1884 they flowered and seeded, and in the same year 400 young plants were put out and grew rapidly.

One of the trees planted by Mr. Rowson in Ossington estate, Naduvatam, was cut down and uprooted last year; it had been growing in a poor soil with a southern aspect, and was five-and-a-half years old.

This year some bark was taken from an original tree six years old, on the Government Plantation, and examined with the other specimens, with the following results:—

—	Government stem-bark.	Ossington stem-bark.	Ossington root-bark.
Quinine	..	..	1·10
Cinchonidine	·40	·22	·55
Quinidine	..	..	·36
Cinchonine	1·64	1·60	1·77
Amorphous alkaloid	1·51	1·33	·62
Total ..	3·55	3·15	4·40

The appearance of the bark was not very different to that of other species; the outer surface was marked by transverse rings at rather regular intervals and warty exuberances. The powder of the stem, and specially of the root-bark, was decidedly more yellow than other kinds of cinchona. Although this bark is known in some quarters as "hard Carthagena," no particular hardness was noticed in the small sample from the locally-cultivated trees; if the hardness depends upon the heaviness the name would not apply to this bark, as the specific gravity of some of the powder showed it to be like the cuprea, lighter than the red and brown barks. The analyses, however, are of the most importance, and these show the bark to have the same composition as those brought by Mr. Cross from Usenda and Sylvia in the district of the Cauca, and analysed by Mr. J. E. Howard in 1878.

It is very evident that this variety of Carthagena bark, now being cultivated on the Nílgiris, is a very useless one commercially, and that the better kind, brought from the Magdalena valley, never reached India at all, or was one of the plants that was unsuited to the climate and died. Now we know of the little value of this species, its propagation will not be continued, a few trees only will be reserved for botanical identification and future chemical investigation. In the first analysis of the root-bark the small quantity of alkaloid named quinine appeared to have some of the properties of homoquinine, an alkaloid found in cuprea bark, but further tests on a larger scale showed it to be chemically and physically identical with quinine. Cinchonidine was also readily detected in each sample, and as the absence of this alkaloid constitutes a perfectly distinct character of the Remijias, it is very clear that the barks above examined are from a separate species of cinchona from any of those hitherto introduced into India.

In concluding this paper I must acknowledge the use I have made of the works of Markham, Howard, Kaisten, Triana, Humbolt, Cross, Flückiger, Van Gorkum, the reports of the Madras Government, and the statistical notices of the cinchona trade in the *Pharmaceutical Journal* and *Chemist and Druggist*.

No. 84.

Copy forwarded to the Government of Madras and attention invited to the request made in paragraph 2 of the despatch.

(By Order.)

HOME DEPARTMENT, MEDICAL,
CALCUTTA, *the* 15*th February* 1889.

(Signed) R. W. CARLYLE,
Offg. Under Secy. to the Govt. of India.

Order—dated 26th February 1889, No. 1221, Revenue.

Forwarded to the Government Botanist and Director of Government Cinchona Plantations, Parks and Gardens for early report.

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

To the Government Botanist and Director of Government Cinchona Plantations.

READ—also the following letter from M. A. LAWSON, Esq., Government Botanist and Director of Government Cinchona Plantations, &c., Nílgiris, to the Secretary to Government, Revenue Department, dated Ootacamund, 14th March 1889, No. 84:—

With reference to G.O., No. 1221, dated the 26th February 1889, Revenue, I have the honor to state, in reply to Mr. Thiselton Dyer's remarks on a passage in Mr. Hooper's report relating to some analyses, which the latter gentleman had made on the Carthagena bark grown in this country, that I have paid considerable attention to this plant ever since I came out to India, and I am therefore able to say, with considerable confidence, that all the plants sent out to South India are of one kind, or, at any rate, that all those growing here now are of the same sort.

2. I will, however, write to Doctor Trimen of Ceylon, and Mr. Gammie, in Darjeeling, and ask them to send me samples of the bark of their trees, if they have any, for analysis; and will hereafter report to you on the subject.

3. The hybrid mentioned by me in my report is too young, as yet, to admit of any bark being taken from it for the purpose of analysis.

4. The *Santa Fès* have been increased considerably in numbers in the propagating houses of the Government Gardens at Ootacamund, and about forty have been planted out in those gardens, and on the several Government Cinchona estates. They grow, but not vigorously, and I have yet to find out the particular conditions which will best suit them.

5. With reference to Mr. Hooper's remark that the young plants raised at Kew, from seed received from America, were destroyed by cockroaches, I would say that he took his statement from Mr. Cross's report, as is supposed by Mr. Thiselton Dyer, and that he intended to cast no slur on the cultural arrangements of the Kew establishment. Indeed, no one acquainted with the excellence of all the cultural appointments and management of the Kew houses would fail to perceive the absurdity of bringing such a charge against that department.

ORDER—dated 10th April 1889, No. 268, Revenue.

Miscellaneous.

Ordered to be forwarded to the Government of India for transmission to the Secretary of State.

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

To the Government Botanist.

Exd. P. L. Pereira.

60 Copies.

Original

Govt. of {1889} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 10th April 1889, No. 268.- 69

APRIL.

Carthagena Bark.

Forwarding to the Government of India, for transmission to the Secretary of State, a report on the question of the identity of the variety of — cultivated in the Nilgiri Plantations.

(1)

10TH APRIL 1889, No. 269, REVENUE.

REVENUE DEPARTMENT.

From

THE SECRETARY TO THE GOVERNMENT OF FORT ST. GEORGE,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA, HOME DEPARTMENT.

SIR,

Adverting to your office endorsement No. 84, dated 15th February last, I am directed to forward, for transmission to the Right Honorable the Secretary of State, copy of the Proceedings * of this Government embodying a report from Mr. Lawson, the Government Botanist, on the question of the identity of the variety of "Carthagena bark" cultivated in the Nilgiri Plantations.

Miscellaneous.

* Dated 10th April 1889, No. 268.

2. The further report promised by Mr. Lawson will be forwarded on receipt.

I have the honor to be,
Sir,
Your most obedient servant,

(Signed) C. A. GALTON,
Secretary to Government.

OOTACAMUND,
10th April 1889.

Exd. P. L. Pereira.

60 Copies.

1889.

HOME DEPARTMENT.

From the Government of
Fort St. George.

Issued

Recd.

Encl.

Letter, dated 10th April 1889,
No. 269.

APRIL.

FORWARDING, for transmission to the Right Honorable the Secretary of State, copy of the Proceedings of this Government, on a report of the Government Botanist on the question of the identity of the variety of "Carthagena bark" cultivated in the Nilgiri Plantations.

No. 45

Director's Office,
Ootacamund, 4th March 1889.

From

M. A. LAWSON, Esq.,
Government Botanist and Director of
Government Cinchona Plantations, &c.,
Nilgiris.

To

The Secretary to Government
Revenue Department
Fort St. George.

Sir,

With reference to G. O. No. 1221 dated the 26th ult. February 1889. Revenue. I have the honor to state in reply to Mr Thistleton Dyer's remarks on a passage in Mr. Hooper's report relating to some analyses which the latter gentleman had made on the Carthagena bark grown in this country, that I have paid considerable attention to this plant ever since I came out to India, and I am therefore able to say, with considerable confidence, that all the plants sent out to South India are of one kind, or at

at any rate, that all those growing here now are of the same sort.

2 I will, however, write to Doctor Trimen of Ceylon, and Mr Gammie in Darjeeling, and ask them to send me samples of the bark of their trees, if they have any, for analysis; and will hereafter report to you on the subject.

3. The Hybrid mentioned by me in my report is too young, as yet, to admit of any bark being taken from it for the purpose of analysis.

4. The Santa Fés have been increased considerably in numbers in the propagating houses of the Government Gardens at Ootacamund, and about forty have been planted out in those Gardens, and on the several Government Cinchona Estates. They grow, but not vigorously, and I have yet to find out the particular conditions which will best suit them.

With

With reference to Mr Hooper's remark that the young plants raised at Kew, from seed received from America, were destroyed by cockroaches, I would say that he took his statement from Mr Crozier's report, as is supposed by Mr Thiselton Dyer, and that he intended to cast no slur on the cultural arrangements of the Kew Establishment. Indeed no one acquainted with the excellence of all the cultural appointments and management of the Kew houses would fail to perceive the absurdity of bringing such a charge against that Department.

I have the honor to be

Sir

your most obt servant

M. A. Lawson

Supt

Govt Botanist and Director

Read again for 26. 2. 89 no 1224

C - No. 2062.

Revenue Dept.

Under Order

Ordered to be forwarded to the Govt. of India for transmission to the Secretary of State.

JHS 10/4/89 HAS 9 Apr.

To The Govt. Botanist

To The Secretary to the Govt of India Home Department.

JHS 10/4/89

Sir

Adverting to your office Endorsement No 87 dated 15th Feby last, I am directed to forward for transmission to the Secretary of State, Copy of the Proceedings of this Govt embodying a report from Mr Lawson, the Govt Botanist, on the question of the identity of the variety of "Carthagena Bark" cultivated in the Nilgiri Plantations.

2. The further report promised by Mr Lawson will be forwarded on receipt.

I have &c

9/4

Cor 9/4 R 10/4

60/V

REVENUE {1889.} CINCHONA.

No. 2062.

From

M. A. LAWSON, Esq.,

GOVERNMENT BOTANIST AND DIRECTOR OF GOVERNMENT CINCHONA PLANTATIONS,

Nilgiris.

To The Secretary to Government Revenue Department Fort St George

No.

Dated 11th
Despd. 11th } March 1889.
Reed. 16th

Print 10/4.

RECEIVED IN MADRAS 23 MAR 89 GENERAL DEPARTMENT

ENCLOSURES

SUBJECT.

Carthagena bark

Submits a report on Mr Thistleton Dyer's remarks on certain analyses made by the Government Chemist of — grown in the Country

Nil

Mem The forwarder of Secy: State in reply to para 2 of Dispatch

HAS 9/4 Dec 88.

Mews 29/3/89