

Revenue (1897) Department.

PRESS SERIES.

G.O., No. 689

Dated 11th August 1897.

[Despatch Abstract.]

Hydrochlorate of Cocaine.

Considering it inadvisable for the Govt. itself to actively engage in the manufacture of —, but stating that it is anxious to do all in its power to initiate and foster the cultivation of the coca plant in the country, and accordingly requesting the Curator of the Govt. Gardens, Nilgiris, to obtain a small supply of seeds every year and to offer for sale the plants reared there from.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

No. 335 T.R., dated Darjeeling, the 14th October 1890.
 From—C. E. BUCKLAND, Esq., *Officiating Secretary to the Government of Bengal,*
Revenue Department,
 To—The Secretary to the Government of India.

WITH reference to Mr. Muir-Mackenzie's letter No. 877—74-2 A., dated the 12th July 1890, I am directed to submit, for the information of the Government of India, the accompanying copies of the letters noted on the margin, from the Board of Revenue and the Superintendent of the Royal Botanical Garden, Calcutta, reporting on the subject of the possible manufacture of hydrochlorate of cocaine at one of the Government Opium Agencies and the Cinchona Factory respectively. It will be observed that no difficulty is anticipated in the preparation of the drug, provided the coca plant can be successfully cultivated. On this point no positive opinion can yet be formed. I am to ask that the cultivation of the plant (*Erythroxylon Coca*) at the Cinchona Plantation, and the manufacture of the drug hydrochlorate of cocaine at the Cinchona Factory, if a sufficient quantity of the raw material can be obtained, may be sanctioned as experiments.

No. 708 B., dated Calcutta, the 20th September 1890.
 From—K. G. GUPTA, Esq., *Secretary to the Board of Revenue, Lower Provinces,*
 To—The Secretary to the Government of Bengal, *Revenue Department.*

I AM directed to acknowledge the receipt of Mr. Maude's endorsement No. 2584—406 O., dated 23rd July 1890, forwarding, for report, a copy of letter No. 877—74-2 A., dated 12th idem, from the Under-Secretary to the Government of India, and of its enclosure, regarding a suggestion made by the Examiner of Medical Stores to manufacture hydrochlorate of cocaine at the Government Opium Agencies.

2. In reply, I am to submit, for the information of Government, the accompanying copy of a note on the subject prepared by Dr. Weir, Principal Assistant to the Opium Agent, Benares, and to say that if a sufficient supply of raw material could be ensured, the Ghazipur Factory could easily undertake to carry on the manufacture, though, as Dr. Weir points out, it would be preferable to make the alkaloid near the place where coca may be grown.

No. 953.

Manufacture of Cocaine Hydrochlorate.

The subject divides itself into two heads:—

- (1) The cultivation of *Erythroxylon Coca*; and
- (2) the separation of its alkaloid, cocaine, and the preparation of its hydrochlorate.

(1) The coca plant would seem likely to be most successfully cultivated in India in the situations which have already been found to be best suited for rearing the cinchonas: as both cinchona and *Erythroxylon Coca* have their native habitat in the same quarter of the globe, where they occur under very similar conditions in respect of climate and elevation. At the same time an elevated situation is not an absolute essential to the healthy growth of the coca plant. I have a plant growing in my garden which as a verandah pot plant drooped and pined, but when planted out about three years ago rapidly revived and is now in vigorous growth and flowers and fruits abundantly. But I doubt whether the plant could be cultivated successfully in the plains of India, on the scale that would be needed to turn out the quantity of hydrochlorate of cocaine annually used in India. I should certainly advise its cultivation being first tried on the large scale on the existing Cinchona Plantations.

(2) The separation of the alkaloid, cocaine, from the dried leaf and the preparation of the hydrochlorate could of course, if it were considered advisable, be carried out at one or other of the Government Opium Factories, probably preferably at this Factory where we are already engaged during the greater part of the year in dealing with the opium alkaloids and their salts. But it would be necessary to arrange for special plant and for some small additional accommodation.

7302/90

It is not by any means certain, however, that the outturn of the alkaloid would not be greater if its extraction were carried out on the plantations where, I assume, it would be grown, and where probably apparatus exists already for the extraction of the cinchona alkaloids, which might be utilised in part in the separation of crude cocaine. It is, I believe, found to be more economical in every way to detain the crude cocaine on the spot in South America, and to send it to Europe to be refined, than to import into Europe the dried leaf from which to extract the alkaloid prior to making the hydrochlorate.

The climate of the cinchona plantation in Northern India is probably much cooler than the climate at either of the Opium Factories,—an additional reason why the manufacture of the hydrochlorate of cocaine should be carried out at the Cinchona Alkaloid Factories.

P. A. WEIR,
Principal Assistant.

No. M. 1-1/2, dated Darjeeling, the 2nd October 1890.

Endorsed by the Government of Bengal, Financial Department.

COPY forwarded to the Revenue Department for information, with reference to their endorsement No. 2585-407 O., dated the 23rd July 1890, and for transmission to the Government of India.

No. 27 E.C.—P., dated Seepore, the 19th September 1890.

From—Dr. GEORGE KING, M.B., LL.D., F.R.C.S., C.I.E., Superintendent, Royal Botanical Garden, Calcutta,

To—The Secretary to the Government of Bengal, Financial Department.

I HAVE the honour to acknowledge the receipt of your office endorsement No. M. 1-1/2

(Financial Department), dated 9th ultimo, forwarding for report the marginally noted correspondence on the subject of the manufacture at the Cinchona Factory of the drug hydrochlorate of cocaine, and the cultivation of the plant (*Erythroxylon Coca*) from the leaves of which the drug is prepared.

2. In reply, I have the honour to state that the plant has been cultivated for a good many years in this Garden, and although it does not grow

very luxuriantly in the climate of Calcutta, I have been able to obtain a good deal of seed, and to raise a good many seedlings, which have been freely distributed amongst tea planters in the Province of Assam and in the districts of Cachar and Darjeeling. The cultivation of the plant has also been tried, to a small extent, on the Government Cinchona Plantation in Sikkim, but hitherto without any conspicuous success. I have now, however, arranged to have it tried in fresh localities within the Plantation.

3. As regards the extraction of the alkaloid, cocaine, from the leaves, no experiments have hitherto been made at the Cinchona Plantation; but as soon as I can grow a sufficiency of leaves on the Plantation, I shall make experiments. It would be an excellent thing if the manufacture of cocaine could be made an adjunct to that of quinine, and I shall spare no effort to bring about such a result.

No. 1854 A.
74-5

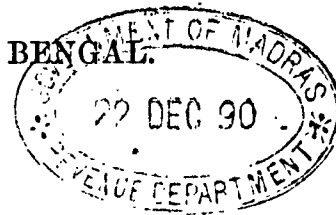
FROM

SIR E. C. BUCK,

Secretary to the Government of India,

TO

THE SECRETARY TO THE GOVERNMENT OF BENGAL.



Revenue & Agricultural Dept.
Agriculture.

CALCUTTA, the 3rd December 1890.

SIR,

In reply to your letter No. 335 T. R. of the 14th October 1890, I am directed to say that the Government of India approve of the proposal of the Superintendent, Royal Botanical Garden, Calcutta, to endeavour to make the manufacture of cocaine an adjunct to that of quinine, on the Government Cinchona Plantations. I am also to request that a special report may be submitted on the progress made by Dr. King in any experiments he may be able to conduct in the course of the ensuing year.

I have the honour to be,

SIR,

Your most obedient Servant,

E. C. BUCK,

Secretary to the Government of India.

No. 1877 A.
74-5

COPY, with copy of letter from the Government of Bengal, forwarded to the Government of Madras for information, with reference to Mr. Galton's letter No. 858, dated the 31st October 1890.

By order,

James Macdonald

Under-Secretary to the Government of India.

Wat

25 copies of audit & enclos. sent separately.

CP 9302/90

70
File No. 102.

No. 2339-O., dated Calcutta, the 20th June 1892.

From—T. W. RICHARDSON, Esq., Officiating Under-Secretary to the Government of Bengal, Revenue Department, SERIAL No. 1.

To—The Secretary to the Government of India, Revenue and Agricultural Department.

WITH reference to the Government of India's letter No. ¹⁸⁵⁴₇₄₅ A., dated the 3rd December 1890, I am directed to submit for the information of that Government, the accompanying copy of a letter No. 2^{E.C.}_{P.}, dated the 20th May 1892, from the Acting Superintendent, Cinchona Cultivation in Bengal, regarding the manufacture of cocaine at the Government Cinchona Plantations, Sikkim.

No. 2^{E.C.}_{P.}, dated Mungpoo-Kurseong, the 20th May 1892.

From—J. GAMMIE, Esq., Acting Superintendent, Cinchona Cultivation in Bengal,

To—The Secretary to the Government of Bengal, Financial Department.

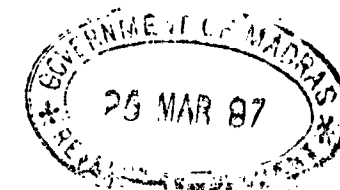
82/1
WITH reference to your office endorsement No. 92, dated the 6th January last, and your reminder dated the 14th instant, concerning the manufacture of cocaine at the Government Cinchona Plantations, Sikkim, I have the honour to state that no experiments during the past year were made, as there are, as yet, no leaves to work upon.

During the year the stock of plants and cuttings has been raised to 3,600, of which 1,270 have been planted out at an elevation of 2,000 feet above the sea, and ground is now being got ready 600 feet lower down for another experimental plot. So far the plants look healthy, but their growth is slow, and they suffer somewhat from the cold in winter. There is but one old plant of *Erythroxylon Coca* on these plantations, all the others being 18 months old or less and few of them over a foot in height, so that some time must elapse before leaves are available for manufacturing purposes on even an experimental scale. A few seeds of the plant have been got from Ceylon, Madras and Calcutta, and the plants raised from them show at least two distinct types. These types will be carefully watched and compared with each other as regards hardiness, rapidity of growth and yield of alkaloid.

A few coca plants have been put out in different places by tea-planters in the Darjeeling Terai, and I am given to understand that, although the growth has been good, the leaves are so thin in texture that the yield in weight is not encouraging and the prices offered have been so disappointing that no extensions are being made, which is, perhaps, an extra reason for the Government persevering with the experiment on these plantations.

Revenue (189) Department.

CURRENT No.



From

Order

*The Collector of
Nilgiris*

No. *N bis ou cur 355*
77

Dated *22nd March 1897*

Received

Registered

Enclosures

Spare copies

SUBJECT.

*Furnishing information
on the cultivation of Cocco
plants in the Nilgiris.*

*For (info. person)
22/3/97
M. S. S. S.*

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

No. 798

GOVERNMENT BOTANIC GARDENS,

OOTACAMUND, 17th March 1897.

From

R. L. PROUDLOCK, Esq.,

CURATOR, GOVERNMENT BOTANIC GARDENS AND PARKS,

Nilgiris,

Varis.
Forwarded
H. P. 22.3.97
To

The Secretary to Government,
Revenue Department,
Madras.

Through
The Collector of the Nilgiris.

SIR,

With reference to G. O. No. 5079 Mis. dated 10th December 1896, I have the honor to state that in October 1896 there were 48 very small plants of *Erythroxylon Coca* in one of the glass houses in Ootacamund Garden, 24 small plants in the Gudalur Garden, and only one large plant growing at Barliyar making a total of 73 plants. On the 26th November 1896 I took 25 plants from Ootacamund and planted them at Barliyar. During January all the 24 Coca plants at Gudalur were lifted and brought to Ootacamund; and these, with 18 more plants from the Ootacamund Glass House, were planted at Barliyar on the 3rd Instant. The total number of Coca plants at Barliyar at the present time is, therefore, 68; while the total left in the glass house at Ootacamund is only 5 very small weak plants, which are not yet fit

to be planted out permanently.

2. The large plant at Bartiyar is in full flower at present, and I hope to be able to collect a few seeds from it (should they ripen) later on in the season.

3. The cost of obtaining fresh seeds to grow a large supply would depend (1) upon the number of plants required to be raised, and (2) on the prices that would have to be paid for them. William Bros., Heneratgoda, Ceylon, quote the price of Coca seeds at £3/- per 1000 seeds; and this may be taken as the maximum price that would have to be paid for them. I am, however, making enquiries elsewhere, and shall not write to William Brothers until after I learn what the results of my enquiries are.

4. I, therefore, prefer not to make any definite statement at present as to what the cost of obtaining fresh seeds would be, but will report again as soon as I obtain definite information on the point.

5. The expenditure could be met from one or other of the heads provided

provided in the Budget for 1897-98 for the upkeep of this Department.

I have the honor to be,

Sir,

Your most obedient servant,

R. L. Groundlock
Curator.

Curio 355

1897.

From

THE CURATOR

OF THE GOVERNMENT BOTANIC

GARDENS AND PARKS,

NILGIRIS,

To

THE

Collector
of the Nilgiris

Dated

Despatched

17th } March 1897
17th }

ENCLOSURES

nil

Subject.

Furnishing information
on the Cultivation of Coca
plants on the Nilgiris.

$\frac{D}{4}$ 1,000-11-6-96.

Coca cultivation &

Cocaine manufacture

REVENUE DEPARTMENT.

G.O. No. 1266 of 6th March 1897

C N: 2657 of 97

From the Collector of the Nilgiris

Dated 25th March 1897.

The Hon. Mr. Grose C.E.

The Hon. Mr. Bliss C.E.

A.E. the Governor

FOR ORDERS.

I have detained these papers in order that I might make inquiries in England & elsewhere about Cocaine Hydrochlor. Cryst. Soluble. The result is that though, if I were a private planter, I should feel convinced that it would be very profitable to enter on the growth of *Erythroxylon Coca* & the manufacture of Cocaine, I cannot recommend Govt. to do so.

The reports we called for give very little information as to the expense of growing the plant & manufacturing the drug, but it is certain that the plant could be grown on the Nilgiris 'to perfection', & that the drug could be manufactured in our Linnæa factory (the best account of the manufacture I have got hold of is contained in A) at much less than its present price. Would this ensure Commercial success?

The following passages occur in Dr. Warden's note on *Erythroxylon Coca* grown in India, published in Vol 2 of the Journal

Please see the notes stitched with G.O. No. 5079 of 10th Decr 1896 (flagged E - the previous papers referred to in it being again flagged A, B, C and D). In accordance with the opinion therein expressed by the Hon. Mr. Grose (and concurred in by the Hon. Mr. Bliss and A.E. the Governor) the Curator of the Govt. Gardens was in the G.O. above quoted, asked to report the number of coca plants standing on the several gardens under his control, the cost of obtaining fresh seeds and the expenses likely to be incurred in their cultivation on a large scale. The Chemical Examiner was also requested

at

to be blank

at the same time to report
furnish information as to
the approximate quantity of
hydrochlorate of cocaine which
could be manufactured extracted
from a pound of coca leaves
and the cost of extraction.

2. The replies re-
ceived from the two officers to
the above references (vide G.O.
no 1266 of 6th March 1897 and
no 2657 of 97) are now sub-
mitted for information and
orders.

3. Surgeon Major
Van Geyzel reports (1) that
the quantity of cocaine which
could be extracted from a pound
of leaves varies according to
the quality of the latter from
0.2 to 1.56 per cent. (2) that
he was able to get 0.258 p.c.
from Madras leaves while Mr
Hooper once extracted 0.5 p.c.
from leaves presumably grown
at Ootacamund, (3) that no
inference as to the cost of the
alkaloid can be drawn from the
available data
obtained

FOR ORDERS.

of the Agri-Hort. Society of India
Dec 31, 1886. "The present sources
of coca are very large. The Peruvian
Govt is said to record & tax a
production of 15,000,000 to (of
dry leaf) per annum, & the
Bolivian Govt about 7,500,000
to & & & Equivocal preliminary
remarks that 1,000,000 to of
coca leaf and yield at least
2,500 to of cocaine, while 1/4
of that quantity and probably over-
stock the world. There is nothing
to show that the production of
the leaf in Peru & Bolivia could
not be indefinitely increased. It
follows that, even if the price fell
& the demand rose, the present
sources might be able to supply
the market. They have done so up
to the present time. It appears from
Dr Ward's note that in 87 the
price was 32/ an oz. Dr Bourne
tells me that last May it was
12/6 an oz. Mr Ferns & Co charged
me for the last consignment I got
12/6 an oz, so the wholesale price
must have been much less
when they sent it in June.
There is, moreover, the possibility
Dr Van Geyzel that the drug may be
taken 0.5 p.c. made artificially on a
large scale. This possibility
as the extract from leaves from
the Virginis. is noticed by Dr Ward,
this appears to be a possibility
manufactured on a large scale
hide person has on
report on the Virginis
cause in 1884. From C, it is a
subject from whom the
druggists in England, it appears that
there are two 'artificial' substitutes
already in the market, but it is in-

+ For working on a
pound of leaves
Dr Van Geyzel says
"about 2 or 3 lbs of
alcohol" costing for
"a smaller amount"
of either costing about
2 shillings a lb in England
& "a very small amount" of
acid sulphate, are
necessary.
11/11/97

How large, it is not
stated. The report is
most in definite. The
11/11/97

from the to say how far there will
displace cocaine".
In the letter recorded in
3.0. 3445 the 9 of 1. expressed the
4.9.94
opinion that the demand for the drug
in this country is too small to
justify our undertaking the manu-
facture of it. This was based on the
reports of Medical Officers as to
the quantity consumed in hospitals.
I am sure the demand is not so
restricted as the 9 of 1. believe.
I, myself, consume many of the
drugs, ^{already} ^{has} ^{been} ^{used} ⁱⁿ ^{the} ^{hospitals} ^{and} ⁱⁿ ^{the} ^{wholesale} ^{trade} ⁱⁿ ^{the} ^{Presidency} [&] ^I ^{know} ^{of} ^{others} ^{who} ^{use} ^{it},
as I do. Moreover, if the price
were smaller it would be more
used in hospitals. But, as I have
said, I do not think Government
should embark on the manufacture.

J. G. G.

27.7.97

The info available might
appear in the J.O. which should
be placed at the disposal of the
Rep
29/7/97

obtained by working upon a
small quantity of the leaves, (4)
that he has neither the appa-
ratus nor the time to make
trials on a larger scale (5) that
the required experiments can
easily be made at the Medico-
factory or the Madras Medical
Stores Laboratory and (7) that
the present market value of
the drug (11s per oz) is not
considered by the Trade as
paying.
4. The Curator
of the Govt. Gardens states
that there are only 73 plants
of coca now standing on
the gardens under his control,
that a Ceylon firm quotes
the price of the seeds at
32 per 1000; that he is making
enquiries with a view to as-
certaining whether the seeds
could be obtained at a
cheaper rate elsewhere and that
he would submit a further
report later on. Mr Brown-
lock does not furnish any
estimate as to the cost of
growing

to
growing the plants but merely
states that it can be met
from the same-sized colonies
for the current year.

5. The main
reason which actuated the
Govt. to reconsider the pre-
vious orders issued on the
subject of the cultivation of
the plant and the manu-
facture of the alkaloid was
that the drug being valuable
there would probably be a great
demand for it if it was were
cheap. In view however of the
fact that the Govt of India
has definitely declared "that
the demand for the drug in
this country is too small to
justify anything being under-
taken beyond experimental
cultivation on a small scale
in the Nilgiris", it is submitted
that it seems to be a question
for consideration whether ^{before action} ~~pro-~~ is taken
fessional opinion should not
be taken as to whether the
demand for the drug would ^{actually} in-
crease if its price were cheap:

The only suggestion I would venture to offer, and I do
so with diffidence, because the whole question has
been dealt with in a complete and exhaustive
manner, is - that Mr. Parnell might be
induced to put a small supply of seeds away grow,
plant them, and offer the plants for sale. This
would cost little, and might help to initiate and
push the cultivation.

A.S.H. 31.7.97

flashed D.

B.M.
18.12.97

The volume of the Dictionary
of Economic products which
contains the article on
Coca referred to by the Govt.
is circulated herewith for
perusal. No separate pamph-
let like that stitched with
G.O. 4618 dt. 16.11.1896 ap-
pears to have been published.

The Chemical Examiner
might ask for a report
defining the quantity
of leaves on which he
considers a satisfactory
Experiment at minimum
cost might be made. And
the curator might then
be asked to supply the cost
of supplying the required
quantity of leaves. The
Experiment seems well
worth making if not too
costly. Then would then
be a basis on which to
calculate the cost of
continuing manufacture.

11/11/97
11/11/97

Let me have a few copies
of the EO

JG

10/8/97

Will get 10 copies for the
member
11/7/97

11-8-97

The Hon Mr G. W. C. R.
Draft G.O. for approval
is submitted.

Note.
(1) contains the first refusal
of this Govt. to undertake the
cultivation of the coca plant
owing to the small consumption
of the Hydrochlorate.

(2) (3) (4) contain the history
of the experimental cultivation
in Bengal ending in failure.

(5) Dr. F. S. S. suggests that
it be tried on the Nilgiris.

(6) Dr. F. S. S. report Govt.
records and ^{of cocaine} shows how much
hydrochlorate is consumed.

(7) The Govt. of India is in-
formed of the quantity con-
sumed in this Presidency.

(8) India agrees that the plant
can only be cultivated on a small
scale experimentally on the
Nilgiris.

(9) The Curator was asked to
report how many plants he had &
the Chemical Examiner was asked
to report the cost of experi-
mental manufacture.

(10) The report of the Chemical
Examiner.

(11) The report of the Curator.

May have Dr. S. H. S.
can be a
minutes and also
be read. It gives
information as to
how contained in the
EO

JG
I did read a part
"B"

The price in 1887 was
32 shillings an ounce

L.C. 7/1/97
11/7/97

Cur
a

Ernst Herington Co.
Manufacture of Cocaine Hydrochlorate
Type first shown
Print & let me
See the proof
11/5/97

Read again

- (1) G.O. 857 d/ 21st Oct. 1890. A. all for
- (2) G.O. 7277 d/ 20th Dec. 1890. A. all for
- (3) G.O. 3408 d/ 27th July 1892. A. all for
- (4) F.O. 3822 d/ 20th Oct. 1893. A. all for
- (5) F.O. 1232 d/ 21st March '24. A. all for
- (6) G.O. 1736 d/ 2nd May '24. A. all for
- (7) G.O. 2817-1 d/ 12th July '24. A. all for
- (8) G.O. 3445 d/ 4th Sept. '24. A. all for
- (9) G.O. 5022 d/ 19th Dec. '24. A. all for
- (10) G.O. 1222 d/ 6th March '07. in file
- (11) Read G.O. 2657. in file
- (12) Minute to the Hon Mr G. W. C. R.
with enclosure. A.C. in file

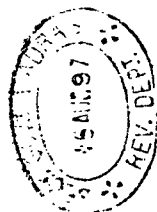
G.O. No 689 d/ 11th Aug: 1897.

The above papers contain the
history of the proposal to cultivate
the coca plant (Ernst Herington Co.) in
India with a view to the manufacture
of cocaine.

The two papers last read above
do not give very definite information
as to the expense of growing the plant
and manufacturing the product but it
appears certain that the plant could be
grown on the Nilgiris to a large extent
and the drug manufactured at much less
than its present price, which appears
to be about 11 shillings per oz.

The opinion of the Govt. of In-
dia expressed in its letter No. 10.

A
 7. Cocaine Hydrochloride Preparation Pharmacology It may be obtained by
 of it with other an aqueous solⁿ of an alkaloid.
 alcoholic extract with alkaline water carbonate of
 Sodium; separating evaporating the alkaline liquid,
 purifying the product by reprecipitating the treatment with
 acidulated water carbonate of sodium + other;
 decolorizing, neutralizing with hydrochloric acid
 + re-crystallizing.



Enyphorugum Cor.
 Pure Cocaine Hydrochloride

P.C. 7/8/97
 12/19/97

is expressed in its letter to.

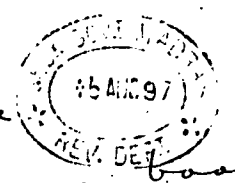
No.

B

GOVERNMENT MUSEUM,

PANTHEON ROAD, EGMORE,

Madras, 13 May 1897.



My dear Mr. Prose

I send you a book
containing Bardeen's paper
on Erythroxylon coca which
contains much information
about the growth of the
plant - I am informed
by W. E. Smith & Co. that
the best account of the
preparation of the hydrochlorate
to be found in Remington's
Dispensary of Pharmacy - This
is a new book and I do

Have sent this
to you
in a
box

M.C. 7/18/97
207977

is expressed in its letter to...

not find a copy in Madras
but the son (Smith & Co.) says
that his father has a
copy in boty.

We have about 200 young
plants in the gardens, they
thrive perfectly and are
constantly in flower and seed
freely - we keep them in
pots and purposely starve
them so that we may have
small plants always ready
to send up country in case

There is a demand - we
have sent a good deal of seed
from time to time to Calcutta.
Properly treated we could
set a great deal of leaf
I should think 1-2 lbs of
leaf per annum perhaps
more - yielding about $\frac{1}{4}$
that weight of dried leaf.
The plants are productive
for at least twenty years
in S. America

With regard to the Commercial
aspect of the question please
see p. 156 of Warden's paper

I quote that the price of
the hydrochlorate in 1887 was 32/-
per oz.

I hear that it has fallen to
12/6 the present price and
an ounce goes a very very
long way in medicine
Young Smith also thinks
that the price would fall
very greatly if there were
an increased demand so
that the manufacture took
place on a larger scale

There seems to be no
difficulty about the
manufacture - the proper
drying of the leaves seems
very important and that
could probably be done in
the drying chamber at

A.C. 718/91
2-17977

612 EXPRESSES

In reply to yours re Cocaine Hydrochlor, and the growing of Coca leaves on the Nilgiris, we regret it is not possible for us to give you much information to guide your correspondent, but we would say this much, that since the introduction of this article the West Coast of S. America have kept the market supplied with all that has been required & that when the supplies have been more than the demand the price drops and when the price falls below what producers of the raw material consider do not leave them a profit & they withhold further supplies until they can get a fair price; then prices improve, but beyond this there is also more or less speculation by persons clearing the market of all available parcels and trying to "corner" the manufacturers &c.&c.

As to substitutes there are two now in the market, the first was Eucaine Hydrochlor & now Holocaine Hydrochlor another synthetic body is coming in, but it is impossible to say how far these will displace Cocaine, which despite of opposition will undoubtedly stay for some time yet".

1.C. 7/14/91
209977

die expressen

Cur
Synthesis in
Manufacture of Cocaine Hydrochloras
N

GOVERNMENT MUSEUM,
PANTHEON ROAD, EGMORE,
Madras, 189.

Madras

the same has at last
connected to the opening
of the Museum and during
the 3 years so a history
and then he was off on
a historical journey of the
cavaliers on part of them

from
from
A. J. B. B. B.

Manufacture of Cocaine

1.C. 7/18/91
2. 7/9/91

via express

11-8-97.

The Hon Mr G. W. C. M.
Draft G.O. for approval
is submitted.

- Note.
- (1) contains the first refusal of this Govt. to undertake the cultivation of the coca plant owing to the small consumption of the Hydrochlorate.
 - (2) (3) (4) contain the history of the experimental cultivation in Bengal ending in failure.
 - (5) Dr. Buchanan suggests that it be tried on the Nilgiris.
 - (6) on Mr. Benson's report Govt. agrees and enquires how much Hydrochlorate is consumed.
 - (7) The Govt. of India is informed of the quantity consumed in this Presidency.
 - (8) India agrees that the plant can only be cultivated on a small scale experimentally on the Nilgiris.
 - (9) The Curator was asked to report how many plants he had & the Chemical Examiner was asked to report the cost of experimental manufacture.
 - (10) The report of the Chemical Examiner.
 - (11) The report of the Curator.

~~May have been
carried into a
minutes and also
be read. It gives
information which is
not contained in the
G.O.~~

I did read a part
of it.

The price in 1887 was
32 mls. an ounce

A.C. 7/8/97
19/9/97

Cur
a.m. manufacture of Cocaine Hydrochlorates
Type first issue
with the proof
See the proof
11/5/97

Read again

- (1) G.O. 857 d/ 31st Oct. 1890. A. all p.
- (2) G.O. 7977 d/ 30th Dec. 1890. A. all p.
- (3) G.O. 3408 d/ 27th July 1892. A. all p.
- (4) G.O. 2889 d/ 20th Oct. 1897. A. all p.
- (5) G.O. 1232 d/ 21st March '94. A. all p.
- (6) G.O. 1776 d/ 2nd May '94. A. all p.
- (7) G.O. 2817-1 d/ 12th July '94. A. all p.
- (8) G.O. 3445 d/ 4th Sept. '94. A. all p.
- (9) G.O. 5072 d/ 19th Dec. '94. A. all p.
- (10) G.O. 1288 d/ 6th March '97. in full
- (11) Read G.O. 2857. in full
- (12) Minute by the Hon Mr J. G. W. C. M. with enclosure. A.C. in full

G.O. No 689 d/ 11th Aug. 1897.

The above papers contain the history of the proposal to cultivate the coca plant (Hydrochlorate Cocaine) in India with a view to the manufacture of cocaine.

The two papers last read above do not give very definite information as to the expense of growing the plant and manufacturing the drug but it appears certain that the plant could be grown on the Nilgiris to perfection and the drug manufactured at much less than its present price which appears to be about 10 mls. per oz.

The opinion of the Govt. of India expressed in its letter No. 1288

22/7/34 dated 1st August 1934 read in
C. 3145 dated 4-9-34 above was that
a demand for the drug in this country
is too small to justify Govt. under-
taking the production of it. This opi-
nion was based on the reports of medical
officers as to the quantity consumed
in hospitals etc. The Govt. is assured
however that the use of the drug is
not so restricted as it was then. report-
ed to be, but ~~it is not known~~
double use it. Moreover, if the price
were less, it would be still more cate-
gorical.

4. The existing sources of supply,
Peru and Bolivia, produce annually at
present about 2 1/2 million lbs. of
dry leaf ~~which would yield about 2,500 lbs.~~
~~the of cocaine which would yield about 2,500 lbs.~~
~~and the total is available for export~~
~~and it is estimated that the sup-
ply for existing demand might be in-
creased.~~

There is also the possibility
that the drug may be artificially pro-
duced ~~on a large scale~~. It ap-
pears that there are already two arti-
ficial substitutes in the market. ~~but~~
~~however~~ the Govt. be-
lieves that ^{in this country} it might be profitable for
someone to come for private individuals
to take up the production of the drug.

5. It does not ^{however} consider it advisable
for the Govt. itself to actively engage
in the manufacture of the drug, Govt. is
entitled to do all in its power

to knows of cases in which
private individuals consume
large quantities of the drug

and it is estimate that one million
lbs of leaf would yield 2,500 lbs of
cocaine, and the supply from existing
sources might in all probability
be increased

but it
is not known how far
they will surpass the natural
drug and

to initiate and foster the cultivation
in this country and accordingly the
Curator of the Govt. Gardens, the Kil-
ris, will be requested to obtain a small
supply of seeds of the Erythron
100 Coca every year and to offer for
sale the plants reared therefrom.

7/8/37
7/5/37

To
The Com. of N. I. G. J. J.
... is of the (as of 1934)
... Surgeon General who the
Public Health.

7/5

17-10-37

2. The two papers last read above do not give very definite information as to the expense of growing the plant and manufacturing the drug, but it appears certain that the plant would flourish on the Nilgiris and that the drug could be manufactured there at much less than its present price which appears to be about 11 shillings per ounce.

3. The opinion of the Government of India expressed in its letter, No. 2232-74, dated 1st August 1894, read in G.O., No. 3445, dated 4th September 1894, above, was that the demand for the drug in this country was too small to justify Government undertaking the production of it. This opinion was based on the reports of Medical officers as to the quantity consumed in hospitals, &c. The Government is assured, however, that the use of the drug is not so restricted as it was then reported to be, but that many private individuals use it. Moreover, if the price were less, it would be still more extensively used.

4. The existing sources of supply, Peru and Bolivia, produce annually at present about 22½ million lbs. of dry leaf which would yield about 56,250 lbs. of cocaine, while 600 lbs. would probably overstock the world and it is not unlikely that the supply from existing sources might be increased. There is also the possibility that the drug may be artificially produced on a large scale. In fact it appears that there are already two artificial substitutes in the market. Nevertheless the Government believes that in this country it might be profitable for some time to come for private individuals to take up the production of the drug.

5. The Government does not, however, consider it advisable for itself to actively engage in the manufacture of the drug, but is anxious to do all in its power to initiate and foster the cultivation of the plant in this country. The Curator of the Government Gardens, the Nilgiris, accordingly will be requested to obtain a small supply of seeds of the *Erythroxylon coca* every year and to offer for sale the plants reared therefrom.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Collector of Nilgiris.
„ the Board of Revenue (Revenue Settlement,
Land Records and Agriculture).
„ the Surgeon-General, through the Public Department.

Exd. A. F. L. J. Leston.

70 Copies.

has flourished
and

The price
in 1894 was
32 shillings
an ounce

and it is estimated
that one million
lbs of leaf
yield 250,000
lb of cocaine

in all proba-
bility

now

It knows of
cases in which
the individuals
consume large
quantities of
the drug

but it is not known how
far they will surpass the
natural drug

From

Dated

189

The Hon: Mr. George C. L.

FOR ORDERS.



My dear Stokes,

My dear Stokes,
My only intention in
ordering my notes to be printed as
a Minute was to give you the
information in addition to that
given in the L.O.
I am sure that it will
be of use to you.

As it appears that it wd
not be in accordance with the
usual procedure to lay it
before the Public, I have altered
the G.O. (original & finished
draft) so as to give all the
necessary information, & the Note
(or Minutes) wd be omitted.
Yours sincerely

09/9/97

Sincerely
J. Groce

A proof copy
of the G.O. re: the culti-
vation of Erythroxylon loca
with the H.M.'s minute
printed therein is submitted
for approval.

It has not been usual to publish minutes and ^{from} the copies of the B. to be sent out of the Office, this time's minutes will be omitted the original of this minute will be found flagged A

Scars
 To Mr. H. H. H.
 minutes and afternoon
 coming to his
 Supreme wishes
 All
 H. H. H.

FOR ORDERS.

Government {1897} of Madras.
REVENUE.

Recd.

Regd.

} 1897.

Enclosures

Spare copies

G.O., No. 689, 11th August 1897.

AUGUST.

Hydrochlorate of Cocaine.

Considering it inadvisable for the Government itself to actively engage in the manufacture of —, but stating that it is anxious to do all in its power to initiate and foster the cultivation of the coca plant in this country; and accordingly requesting the Curator of the Government Gardens, Nilgiris, to obtain a small supply of seeds every year and to offer for sale the plants reared therefrom.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—again the following G.O., dated 31st October 1890, No. 857, Revenue :—
 Read—again the following G.O., dated 29th August 1890, Mis. No. 5366, Revenue :—
 Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 23rd August 1890, No. 248 :—

Mr. CLOGSTOUN.

Read—again the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 8th August 1890, Mis. No. 3215 :—

Read—the following G.O., dated 1st August 1890, Mis. No. 4744, Revenue :—

Read—the following endorsement of the Government of India, Revenue and Agricultural Department, dated 12th July 1890, No. 878—74-2A, on letter to the Government of Bengal, dated 12th July 1890, No. 877—74-2A :—

I am directed to forward the accompanying copy of a despatch * received from Her Majesty's Secretary of State for India, and to request that the Board of Revenue and the Director of Cinchona Plantations may be asked to furnish a report on the suggestion to manufacture hydrochlorate of cocaine at the Government Opium Agencies or Cinchona Alkaloid Factories.

2. I am to say that, from such information as is available to the Government of India, it appears that up to the present the cultivation of the coca plant in India has not been carried beyond the experimental stage. It is known, however, to have been cultivated in the Madras Presidency and to occur in Assam.

ENCLOSURES.

From the Right Honourable Lord CROSS, Her Majesty's Secretary of State for India, to His Excellency the Most Honourable the Governor-General of India in Council, dated India Office, London, 10th April 1890, No. 19, Military (Stores).

I forward, for the consideration of your Excellency's Government, a copy of a report, dated 7th March 1890, by Dr. Macnamara, the Examiner of Medical Stores, suggesting that inquiry might be made with the object of ascertaining whether hydrochlorate of cocaine cannot be economically manufactured at one of the Government Opium Agencies or Cinchona Alkaloid Factories.

2. The price of the drug in this country being high (at present about £12 per lb.), it appears desirable that the above suggestion be considered.

Report by the Examiner of Medical Stores, dated 7th March 1890.

The department is buying large and increasing quantities of cocaine and its salts for the supply of the demands from India, and I wish to suggest that inquiry should be made in India whether the hydrochlorate of cocaine could not be economically manufactured at one of the Government Opium Agencies or Cinchona Alkaloid Factories. About a month since I received from the Surgeon-General with the Government of India a small box of coca leaves grown in

India, which I sent for valuation to Messrs. Morsons, who are one of the largest makers of the drug in question in England. Messrs. Morsons reported to me that the leaves were the finest and best preserved they had seen, and valued them at 6d. or 8d. per pound for their use; but, owing to their fine aroma, at double that price for the coca wine-makers.

The Pharmaceutical Journal of the 2nd June 1888 contains a paper by Dr. Warden, Chemical Examiner to Government at Calcutta, on "Coca grown in India," a reprint from the Journal of the Agricultural and Horticultural Society of India, which shows that the cultivation of the coca plant has been considered there. I understand that it grows freely in parts of the Himalayas, and I think that the question of the manufacture of the cocaine alkaloid in India ought also to be considered there.

(Signed) F. N. MACNAMARA,
Examiner of Medical Stores.

Endorsement.

Copy, with copy of despatch, forwarded to the Government of Madras for information and with a request that a report may also be obtained from the Director of Cinchona Plantations.

* Order—dated 1st August 1890, Mis. No. 4744, Revenue.

Referred to the Government Botanist and Director of Government Cinchona Plantations for very early report, which should be submitted through the Board of Revenue.

(True Extract.)

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

To the Government Botanist and Director of
Government Cinchona Plantations, through the Commissioner
of Revenue Settlement, Land Records and Agriculture.

Resolution—dated 8th August 1890, Mis. No. 3215.

Forwarded.

(A true Extract.)

(Signed) J. LAKSHMIKANTA RAO,
Acting Secretary.

To the Government Botanist and Director of
Government Cinchona Plantations,
with enclosures, in original (to be returned).

Read—also the following letter from M. A. LAWSON, Esq., Government Botanist and Director of Government Cinchona Plantations, Nilgiris, to the Secretary to Government, Revenue Department (through the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture), dated Ootacamund, 11th August 1890, No. 29 :—

With reference to G.O., No. 4744, dated the 1st August 1890, Revenue, I have the honour to inform you that I have discussed the question of the feasibility of manufacturing the hydrochlorate of cocaine with Mr. Hooper, and he tells me that there ought to be no difficulty in extracting the pure alkaloid from the leaves in a laboratory such as is possessed by the Medical Store Department in Madras.

2. I have the honour to refer you further to my letter to the Board of Revenue, No. 139, dated the 1st July 1890, embodied in Board's Proceedings, No. 206 of 12th July 1890.

Resolution—dated 23rd August 1890, No. 248.

Submitted to Government in continuation of Board's Proceedings, No. 206, dated 12th July 1890.

2. The experiments already made in this Presidency show that the leaf can be grown in several districts wherever suitable elevation is obtainable, and from the letter of the Government Botanist read above, it appears that there ought to be no difficulty in extracting the pure alkaloid from the leaves in a laboratory such as is possessed by the Medical Store Department in Madras.

3. Before conducting further experiments, however, in this Presidency, the Board considers that the results of the trial in Bengal to extract the pure alkaloid economically might be awaited. The experiments in that Presidency have gone much farther than in Madras, and the leaf is much more widely grown.

4. Meanwhile the Surgeons-General with the Government of Madras and of Her Majesty's Forces will be requested to favour the Board with information as to the amount of cocaine and its salts at present used in this Presidency.

(True Copies and Extract.)

(Signed) J. LAKSHMIKANTA RAO,
Acting Secretary.

To the Secretary to Government, Revenue Department.

" Surgeon-General with the Government of Madras.

" Surgeon-General, Her Majesty's Forces.

Copy to the Government Botanist.

" all Collectors.

" the Agri-Horticultural Society.

" the Principal, Agricultural College.

Order—dated 29th August 1890, Mis. No. 5366, Revenue.

Recorded pending the receipt of the information called for in paragraph 4 of the above Proceedings.

(True Extract.)

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

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.

Read—again the following G.O., dated 15th October 1890, Mis. No. 6246, Revenue:—

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 26th September 1890, Mis. No. 3986:—

MR. CLOGSTOUN.

Read—the following letter from the Surgeon-General with the Government of Madras, dated 22nd September 1890, No. 5923:—

With reference to paragraph 4 of your Board's Proceedings, No. 248, dated 23rd August 1890, I have the honour to state that the annual expenditure of cocaine hydrochloras in this Presidency is under 1 lb. at present (about 15 oz.); all demands for this expensive drug are, however, not complied with; if all demands were complied with, the expenditure would probably amount to 3 lb. per annum.

Resolution—dated 26th September 1890, Mis. No. 3986.

Submitted to Government with reference to G.O., No. 5366, dated 29th August 1890.

2. The Surgeon-General of Her Majesty's Forces will be requested to favour the Board, at an early date, with his reply to paragraph 4 of Board's Proceedings, No. 248, dated 23rd August 1890.

(A true Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

To the Secretary to Government, Revenue Department.
" Surgeon-General, Her Majesty's Forces.

Order—dated 15th October 1890, Mis. No. 6246, Revenue.

Recorded pending receipt of the report called for from the Surgeon-General of Her Majesty's Forces, which should be expedited.

(True Extract.)

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

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.

Read—also the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 18th October 1890, Mis. No. 457:—

MR. BLISS.

Read—the following letter from the Principal Medical Officer, Her Majesty's Forces, dated 15th October 1890, No. 2896:—

With reference to the Board's Proceedings, Mis. No. 4065,* dated 1st October 1890, I have the honour to forward copy

* Forwarding to the Principal Medical Officer, Her Majesty's Forces, a copy of Board's Proceedings, No. 248, dated 23rd August 1890, with request that the information called for therein may be furnished as early as possible.

2. As indents for authorized medicines from medical hospitals are not passed by my office, I have been obliged to obtain the required information from the Principal Medical Storekeeper, Madras.

ENCLOSURE.

From Brigade-Surgeon C. McVITTIE, Principal Medical Storekeeper, to the Secretary to the Principal Medical Officer, Her Majesty's Forces (through the Secretary to the Surgeon-General with the Government of Madras), dated Madras, 8th October 1890, No. 1801.

[Reference.—His memorandum, No. 2216-A., dated , herewith returned as requested.]

Has the honour in reply to inform him that the total amount of cocaine hydrochlorate indented for by all military hospitals in this Presidency amounted during the past twelve months to 1 lb. 4 oz. 5 dr. 23 grs.; the total amount supplied to these hospitals was 4 oz. 5 dr. 4½ grs. (this does not include troops in Burma).

One lb. 8 oz. of this drug would probably cover all demands from the military hospitals in this Presidency including Burma.

No. 6320.

Forwarded.

(By Order)

(Signed) F. J. CRAWFORD, M.D.,
Ag. Secy. to the Surgeon-Genl. with the Madras Govt.

10th October 1890.

Resolution—dated 18th October 1890, Mis. No. 4257.

Submitted to Government for information in continuation of Board's Proceedings, No. 3986, dated 26th September 1890.

2. The report shows that cocaine hydrochlorate indented for by all military hospitals in this Presidency during the past twelve months amounted to 1 lb. 4 oz. 5 dr. 23 grs.; the total quantity issued to them was 4 oz. 5 dr. 4½ grs. (not including troops in Burma); and it is said that 1 lb. 8 oz. of the drug would probably cover all demands from the military hospitals in this Presidency including Burma.

(True Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

To the Secretary to Government, Revenue Department,
with one enclosure.

Order—dated 31st October 1890, No. 857, Revenue.

Miscellaneous.

In G.O., dated the 1st August last, Mis. No. 4744, the Government Botanist and Director of Government Cinchona Plantations was directed to submit a report on the feasibility of manufacturing hydrochlorate of cocaine in this Presidency. It appears, from the papers read above, that in a laboratory such as is possessed by the Madras Medical Department there should be no difficulty in extracting the pure alkaloid from the leaves of the coca plant.

2. The annual demand for hydrochlorate of cocaine in this Presidency is, however, estimated at only 4 lb. 8 oz., and the value of this, at the price quoted by Dr. Macnamara, would amount to about Rs. 700. The consumption, therefore, is so small that the Government is not at present prepared to institute any experiments in the direction suggested by Dr. Macnamara. The Government approves of the suggestion made by the Board in paragraph 3 of its Proceedings, dated the 23rd August last, and will address the Government of India accordingly.

(True Extract.)

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

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.
„ Government Botanist.

READ—again the following G.O., Mis. No. 7977, Revenue, dated 30th December 1890:—

Read—also the following letter from Sir E. C. BUCK, Secretary to the Government of India, Revenue and Agricultural Department (Agriculture), to the Secretary to the Government of Bengal, dated Calcutta, 3rd December 1890, No. 1854—74-5 A.:—

In reply to your letter, No. 335 T.R. of the 14th October 1890, I am directed to say that the Government of India approve of the proposal of the Superintendent, Royal Botanical Garden, Calcutta, to endeavour to make the manufacture of cocaine an adjunct to that of quinine, on the Government Cinchona Plantations. I am also to request that a special report may be submitted on the progress made by Dr. King in any experiments he may be able to conduct in the course of the ensuing year.

ENCLOSURES.

From C. E. BUCKLAND, Esq., Officiating Secretary to the Government of Bengal, Revenue Department, to the Secretary to the Government of India, dated Darjeeling, 14th October 1890, No. 335 T.R.

With reference to Mr. Muir-Mackenzie's letter, No. 877—74-2 A., dated the 12th July 1890, I am directed to submit, for the information of the Government of India, the accompanying copies of the letters noted on the margin, from the Board of Revenue and the Superintendent of the Royal Botanical Garden, Calcutta, reporting on the subject of the possible manufacture of hydrochlorate of cocaine at one of the Government Opium Agencies and the Cinchona Factory, respectively. It will be observed that no difficulty is anticipated in the preparation of the drug, provided the coca plant can be successfully cultivated. On this point no positive opinion can yet be formed. I am to ask that the cultivation of the plant (*Erythroxylon Coca*) at the Cinchona Plantation, and the manufacture of the drug (hydrochlorate of cocaine) at the Cinchona Factory, if a sufficient quantity of the raw material can be obtained, may be sanctioned as experiments.

From K. G. GUPTA, Esq., Secretary to the Board of Revenue, Lower Provinces, to the Secretary to the Government of Bengal, Revenue Department, dated Calcutta, 20th September 1890, No. 708 B.

I am directed to acknowledge the receipt of Mr. Maude's endorsement, No. 2584—406 O., dated 23rd July 1890, forwarding, for report, a copy of letter, No. 877—74-2 A., dated 12th idem, from the Under Secretary to the Government of India, and of its enclosure, regarding a suggestion made by the Examiner of Medical Stores to manufacture hydrochlorate of cocaine at the Government Opium Agencies.

2. In reply, I am to submit, for the information of Government, the accompanying copy of a note on the subject prepared by Dr. Weir, Principal Assistant to the Opium Agent, Benares, and to say that if a sufficient supply of raw material could be ensured, the Gazipur Factory could easily undertake to carry on the manufacture, though, as Dr. Weir points out, it would be preferable to make the alkaloid near the place where coca may be grown.

No. 953.

Manufacture of Cocaine Hydrochlorate.

The subject divides itself into two heads:

- (1) The cultivation of *Erythroxylon Coca*; and
- (2) the separation of its alkaloid, cocaine, and the preparation of its hydrochlorate.

(1) The coca plant would seem likely to be most successfully cultivated in India in the situations which have already been found to be best suited for rearing the cinchonas, as both cinchona and *Erythroxylon Coca* have their native habitat in the same quarter of the globe,

where they occur under very similar conditions in respect of climate and elevation. At the same time an elevated situation is not an absolute essential to the healthy growth of the coca plant. I have a plant growing in my garden which as a verandah pot plant drooped and pined, but when planted out about three years ago rapidly revived and is now in vigorous growth and flowers and fruits abundantly. But I doubt whether the plant could be cultivated successfully in the plains of India, on the scale that would be needed to turn out the quantity of hydrochlorate of cocaine annually used in India. I should certainly advise its cultivation being first tried on the large scale on the existing Cinchona Plantations.

(2) The separation of the alkaloid, cocaine, from the dried leaf and the preparation of the hydrochlorate could, of course, if it were considered advisable, be carried out at one or other of the Government Opium Factories, probably preferably at this factory where we are already engaged during the greater part of the year in dealing with the opium alkaloids and their salts. But it would be necessary to arrange for special plant and for some small additional accommodation.

It is not by any means certain, however, that the outturn of the alkaloid would not be greater if its extraction were carried out on the plantations where, I assume, it would be grown, and where probably apparatus exists already for the extraction of the cinchona alkaloids, which might be utilized in part in the separation of crude cocaine. It is, I believe, found to be more economical in every way to detain the crude cocaine on the spot in South America, and to send it to Europe to be refined, than to import into Europe the dried leaf from which to extract the alkaloid prior to making the hydrochlorate.

The climate of the cinchona plantation in Northern India is probably much cooler than the climate at either of the Opium Factories—an additional reason why the manufacture of the hydrochlorate of cocaine should be carried out at the Cinchona Alkaloid Factories.

(Signed) P. A. WEIR,
Principal Assistant.

Endorsement of the Government of Bengal, Financial Department, No. M.-1-E-3-4, dated Darjeeling, 2nd October 1890.

Copy forwarded to the Revenue Department for information, with reference to their endorsement, No. 2585-407 O., dated 23rd July 1890, and for transmission to the Government of India.

From Dr. GEORGE KING, M.B., LL.D., F.R.C.S., C.I.E., Superintendent, Royal Botanical Garden, Calcutta, to the Secretary to the Government of Bengal, Financial Department, dated Seebpore, 19th September 1890, No. 27 E.C.-P.

I have the honour to acknowledge the receipt of your office endorsement, No. M.-1-C-3-2 (Financial Department), dated 9th ultimo,

1. Copy of letter, No. 877-74-2, Revenue and Agricultural Department (Agriculture), dated 12th July 1890, from the Under Secretary to the Government of India, to the Secretary to the Government of Bengal.
2. Copy of Secretary of State's Despatch, Military (Stores), No. 19, dated 10th April 1890.
3. Copy of Report by the Examiner of Medical Stores, dated 7th March 1890, forwarded with Government of Bengal endorsement, No. 2585-407 O., dated Revenue Department, Miscellaneous Revenue, Calcutta, the 23rd July 1890.

does not grow very luxuriantly in the climate of Calcutta, I have been able to obtain a good deal of seed, and to raise a good many seedlings, which have been freely distributed amongst tea planters in the Province of Assam and in the districts of Cachar and Darjeeling. The cultivation of the plant has also been tried, to a small extent, on the Government Cinchona Plantation in Sikkim, but hitherto without any conspicuous success. I have now, however, arranged to have it tried in fresh localities within the Plantation.

3. As regards the extraction of the alkaloid, cocaine, from the leaves, no experiments have hitherto been made at the Cinchona Plantation; but as soon as I can grow a sufficiency of leaves on the Plantation, I shall make experiments. It would be an excellent thing if the manufacture of cocaine could be made an adjunct to that of quinine, and I shall spare no effort to bring about such a result.

No. 1877-74-5 A.

Copy, with copy of letter from the Government of Bengal, forwarded to the Government of Madras for information, with reference to Mr. Galton's letter, No. 858, dated the 31st October 1890.

(By order.)

(Signed) J. MUIR-MACKENZIE,
Under Secretary to the Govt. of India.

Order—Mis. No. 7977, Revenue, dated 30th December 1890.

Communicated to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture and to the Government Botanist and Director of Government Cinchona Plantations.

(True Extract.)

(Signed) R. C. C. CARR,
Under Secy. to Government.

To the Commissioner of Revenue Settlement (Land Records and Agriculture).
„ Government Botanist and Director of Government Cinchona Plantations.

READ—again the following G.O., Mis. No. 3403, Revenue, dated 27th July 1892:—

Read—Endorsement of the Government of India, Revenue and Agricultural Department (agriculture), No. 1630-102, dated 18th July 1892, forwarding to the Government of Madras, for information in continuation of endorsement No. 1877-A-74-S, dated 3rd December 1890, the following letter from the Officiating Under Secretary to the Government of Bengal, Revenue Department, to the Secretary to the Government of India, Revenue and Agricultural Department, dated Calcutta, 20th June 1892, No. 2339 O.:—

With reference to the Government of India's letter, No. 1854-74-5 A., dated the 3rd December 1890, I am directed to submit for the information of that Government, the accompanying copy of a letter, No. 2 E.C.-P., dated the 20th May 1892, from the Acting Superintendent, Cinchona Cultivation in Bengal, regarding the manufacture of cocaine at the Government Cinchona Plantations, Sikkim.

ENCLOSURE.

From J. GAMMIE, Esq., Acting Superintendent, Cinchona Cultivation in Bengal, to the Secretary to the Government of Bengal, Financial Department, dated Mungpoo-Kurseong, 20th May 1892, No. 2-E.C.-P.

With reference to your office endorsement, No. 92, dated the 6th January last, and your reminder, dated the 14th instant, concerning the manufacture of cocaine at the Government Cinchona Plantations, Sikkim, I have the honour to state that no experiments during the past year were made, as there are, as yet, no leaves to work upon.

During the year the stock of plants and cuttings has been raised to 3,600, of which 1,270 have been planted out at an elevation of 2,000 feet above the sea, and ground is now being got ready 600 feet lower down for another experimental plot. So far the plants look healthy, but their growth is slow, and they suffer somewhat from the cold in winter. There is but one old plant of *Erythroxylon Coca* on these Plantations, all the others being 18 months old or less and few of them over a foot in height, so that some time must elapse before leaves are available for manufacturing purposes on even an experimental scale. A few seeds of the plant have been got from Ceylon, Madras and Calcutta, and the plants raised from them show at least two distinct types. These types will be carefully watched and compared with each other as regards hardness, rapidity of growth and yield of alkaloid.

A few coca plants have been put out in different places by tea-planters in the Darjeeling Terai, and I am given to understand that, although the growth has been good, the leaves are so thin in texture that the yield in weight is not encouraging and the prices offered have been so disappointing that no extensions are being made, which is, perhaps, an extra reason for the Government persevering with the experiment on these plantations.

Order—Mis. No. 3403, Revenue, dated 27th July 1892.

Communicated to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture and to the Government Botanist and Director of the Government Cinchona Plantations, in continuation of G.O., No. 7977, dated 30th December 1890.

(True Extract.)

(Signed) R. H. CAMPBELL,
Ag. Under Secretary to Government.

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.
„ Government Botanist and Director of Government
Cinchona Plantations.

READ—again the following G.O., Mis. No. 3868, Revenue, dated 20th October 1893:—

Read—endorsement of the Government of India, Revenue and Agricultural Department (Agriculture), No. 2783-156, dated 7th October 1893, forwarding to the Government of Madras for information in continuation of endorsement No. 1630, dated 18th July 1892, the following letter from the Government of Bengal, dated 26th September 1893, No. 1174-T.R.:—

With reference to the correspondence ending with your memorandum No. 3072—102, dated the 30th December 1892, I am directed to forward, herewith, a copy of letter No. 5-E—C.P., dated the 2nd May 1893, from the Superintendent, Royal Botanic Garden, to the address of the Director of Land Records and Agriculture, Bengal, reporting the failure of the experiments made at the cinchona plantation of cultivating the coca plant and to state, for the information of the Government of India, that, having regard to the opinion expressed by the Superintendent, the Lieutenant-Governor has sanctioned the abandonment of the experiments.

2. I am to add that the opinion of the Director of Land Records and the Conservator of Forests has been invited as to measures to be adopted for giving effect to the suggestion of the Secretary of State for India that the experiment should be tried of growing the coca plant at a lower elevation than the Sikkim Cinchona Plantation.

ENCLOSURE.

From the Superintendent of the Royal Botanic Garden, Calcutta, to the Director of Land Records and Agriculture, Bengal, No. 5-E—C.P., dated 2nd May 1893.

With reference to your letter No. 352, Agriculture, dated 6th February and of subsequent reminder, I have the honour to state that the winter which has recently ended has proved most disastrous to coca cultivation at the cinchona plantation. The Deputy Superintendent reports that a number of plants both of the small and large-leaved varieties of coca were planted out in two plots which were considered to be in every respect the most suitable which could be found on the plantation. The results on one of these plots situated in the Ryang valley, at an elevation of 1,400 feet, were that of the small-leaved variety 90 per cent. were killed outright by the cold and that the remaining 10 per cent. are in a dying state. The large-leaved variety planted in this spot have suffered rather less; but they emerged from the winter in very poor condition. On the other plot (at Rishat) the results are slightly better. A good many plants were retained in the nurseries and they have suffered almost equally. The general results have been so unfavourable that the Deputy Superintendent (Mr. Cammie), who is an officer of much experience, is of opinion that there is not the slightest hope of coca ever yielding a paying crop of leaves in any of the spots mentioned. The warmest, and in other respects most suitable spots in the

Cinchona reserve having thus been unsuccessfully tried for coca cultivation, it seems useless to go on with the experiment, and I have therefore the honour to recommend that I should be authorized to discontinue it.

Order—Mis. No. 3868, Revenue, dated 20th October 1893.

Communicated to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture and to the Government Botanist and Director of the Government Cinchona Plantations in continuation of G.O., Mis. No. 3403, dated 27th July 1892.

(True Extract.)

(Signed) R. C. C. CARR,
Under Secy. to Government.

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.
„ Government Botanist and Director of Government
Cinchona Plantations.

READ—again the following G.O., Mis. No. 1232, Revenue, dated 21st March 1894:—

Read—the following letter from the Under Secretary to the Government of India, Revenue and Agricultural Department (Agriculture), No. 669—74, dated the 16th March 1894:—

With reference to my endorsement No. 2783 of the 7th October 1893, and previous correspondence on the subject of the experimental cultivation of the coca plant in India, I am directed to forward a copy of the Military Department's endorsement, No. 1143-D, dated 28th February 1894, and enclosure.

that the Government of India may be informed whether effect can be given to the suggestion that a further experiment should be made in the cultivation of the plant on the slopes of the Nilgiri Hills.

ENCLOSURES.

EXTRACT paragraph 1 from a despatch from Her Majesty's Secretary of State for India, No. 4, dated 1st February 1894.

With reference to paragraph 5 of your Lordship's Military letter, No. 230, dated 1st November 1893, I regret to learn the failure of the experiments made at the cinchona plantation in the cultivation of the coca plant, and I forward, for consideration, copy of two reports by Dr. Macnamara, dated 22nd and 29th November 1893, suggesting that a further experiment should be made on the slopes of the Nilgiri Hills.

Report by Dr. Macnamara, dated 22nd November 1893.

I regret the failure of the experiment, but as the climate of Darjeeling garden proves too severe for the cultivation of the coca plant, I would suggest that a trial be given to the cultivation at any Government establishment, suitable for the purpose in the Nilgiri Hills. It is really of importance that India should, if possible, produce its own supply of cocaine, and we know that the coca plant can be grown to perfection there.

Report by Dr. Macnamara, dated 29th November 1893.

I think the slopes of the Nilgiris afford a more likely climate for the growth of the plant than do those of the Himalayas. Experiment so far appears to have been limited to Bengal.

Endorsement by Military Department, dated 28th February 1894, No. 1143-D.

Copy of the above and of its enclosures forwarded to the Revenue and Agricultural Department, with reference to that department endorsement No. 2782—156, dated 7th October 1893, for favour of necessary action.

Order—Mis. No. 1232, Revenue, dated 21st March 1894.

Referred to the Government Botanist and Director of the Government Cinchona Plantations for early report which should be submitted through the Board of Revenue (Revenue Settlement, Land Records and Agriculture).

(True Extract.)

(Signed) L. E. BUCKLEY,
Ag. Under Secy. to Government.

READ—again the following G.O., Mis. No. 1736, Revenue, dated 2nd May 1894:—

Read—the following Proceedings of the Board of Revenue, Revenue Settlement, Land Records and Agriculture, Mis. No. 2208, dated 10th April 1894:—

Read—the following letter from M. A. LAWSON, Esq., Government Botanist and Director of Government Cinchona Plantations, Nilgiris, dated 30th March 1894, No. 26:—

With reference to the Government of India letter No. 669—74, dated the 16th March 1894, forwarded to me for early report under your endorsement, No. 1232, Revenue, dated the 21st March 1894, I have the honour to inform you that the coca plant grows well on all the slopes of the Nilgiris, at elevations varying from one to four thousand feet.

2. There are in stock in the Green houses in the Government Gardens, Ootacamund, about fifty basketted plants, which shall be put out in the experimental gardens at Gudalur during the present season; and next year, a sufficient number of plants can be raised to plant up an acre, placing the shrubs four feet by four, and growing them on the same plan that tea is grown.

Resolution—Mis. No. 2208, dated 10th April 1894.

Submitted for the information of Government with reference to G.O., No. 1232, dated 21st March 1894.

2. The Government Botanist reports that the coca plant grows well on all the slopes of the Nilgiris. In some experiments made about five years ago, the plant was also found to do well at Punganur, and several other places in the Presidency, where a suitable elevation could be obtained. The advisability of undertaking the local manufacture of hydrochlorate of cocaine was also considered at the suggestion of Dr. Macnamara, but the consumption of the drug was so small that the Government was not prepared to undertake experiments in its manufacture, pending the result of the experiments then proceeding in Bengal. These experiments appear to have failed, and the question may now be reconsidered, provided the demand for the drug in India is sufficient to justify such further experiments.

Board's Proceedings, No. 155, dated 27th May 1890.
Mis. No. 2635, dated 27th June "
" No. 206, dated 12th July "
" No. 248, dated 23rd Aug. "
" Mis. No. 4257, dated 18th Oct. "
G.O., No. 857, dated 31st October 1890.

the local manufacture of hydrochlorate of cocaine was also considered at the suggestion of Dr. Macnamara, but the consumption of the drug was so small that the Government was not prepared to undertake experiments in its manufacture, pending the result of the experiments then proceeding in Bengal. These experiments appear to have failed, and the question may now be reconsidered, provided the demand for the drug in India is sufficient to justify such further experiments.

Order—Mis. No. 1736, Revenue, dated 2nd May 1894.

Mr. Lawson's proposals in paragraph 2 of his letter, dated 30th March 1894, No. 26, regarding the cultivation of the coca plant are approved. The experiments conducted five years ago were * discontinued as the demand for the manufactured drug in this Presidency was incommensurate with the cost of production. It is understood, however, from Mr. MacLagan's letter, dated 16th March 1894, No. 669—74 that is under contemplation to supply the whole of India from the Government gardens of this Presidency, and His Excellency the Governor in Council is of opinion that the manufacture of hydrochlorate of cocaine may be conducted without difficulty on the Nilgiris, if the Government of

* G.O., No. 857, dated 31st October.

With reference to the correspondence ending with your letter No. 2814, dated the 19th ultimo, I am directed to say that the Government of India, after carefully

India considers that there is sufficient demand for the drug in India. The Surgeon-General with the Government of Madras and the Principal Medical Officer of the Madras Army will accordingly be directed to report the present consumption of the drug in this Presidency and Burma.

2. The following letter will be despatched to the Government of India.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.
" Surgeon General (through Public Department).
" Principal Medical Officer, Madras Army
(through the Military Department).
" Government Botanist and Director of the Government
Cinchona Plantations.

READ—again the following G.O., No. 2813, Revenue, dated 19th July 1894:—

Order—No. 2813, Revenue, dated 19th July 1894.

Ordered that the Government of India be addressed.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.
" Government Botanist.

Letter from the Secretary to Government, Revenue Department, Madras, to the Government of India, Revenue and Agricultural Department, No. 2814, dated 19th July 1894:—

In continuation of my letter, No. 1737, dated 2nd May 1894, I am directed to state for the information of the Government of India that from reports received from the Surgeon-General with the Government of Madras and the Principal Medical Officer of the Madras Army, it is found that the total quantity of hydrochlorate of cocaine consumed during the year 1893—94 in the Civil hospitals of this Presidency was 5 lbs. 7½ oz., while that consumed in the Military hospitals under the Principal Medical Officer during 1893 was only 1 lb. 4 oz. 5 drms. and 23½ grs.

2. The total consumption of cocaine in the Civil hospitals of this Presidency and Burma during the five years ending 31st March 1894 is given in the appended statement:—

Year.	Madras.		Burma.		Total.	
	LB.	OZ.	LB.	OZ.	LB.	OZ.
1889-90	1	..	..	5½	1	5½
1890-91	1	5	..	..	1	5
1891-92	1	12	..	3½	1	15½
1892-93	1	9	1	..	2	9
1893-94	5	7½	..	..	5	7½

READ—again the following G.O., No. 3445, Revenue, dated 4th September 1894:—

Read—the following letter from the Government of India, Department of Revenue and Agriculture, No. 2232—74, dated 15th August 1894:—

With reference to the correspondence ending with your letter No. 2814, dated the 19th ultimo, I am directed to say that the Government of India, after carefully

considering Dr. Macnamara's further proposal for the cultivation of the coca plant for the manufacture of cocaine in India, are of opinion that the demand for the drug in this country is too small to justify anything being undertaken beyond experimental cultivation on a small scale in the Nilgiris.

Order—No. 3445, Revenue, dated 4th September 1894.

Communicated to the Board of Revenue and to the Government Botanist and Director of the Government Cinchona Plantations.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

To the Board of Revenue (Revenue Settlement,
Land Records and Agriculture),

„ Government Botanist.

Copy to the Surgeon-General with the Government of Madras
(through the Public Department).

„ „ Principal Medical Officer, Madras Army
(through the Military Department).

READ—again the following G.O., Mis. No. 5079, Revenue, dated 10th December 1896:—

Order—Mis. No. 5079, Revenue, dated 10th December 1896.

The Curator of the Government Gardens, Ootacamund, will be requested to state through the Collector of the Nilgiris, whether any, and if so, how many, coca plants (*Erythroxylon Coca*) are now standing on the gardens under his control and to report the approximate cost of obtaining fresh seeds and growing a large supply.

2. The Chemical Examiner to Government will be requested to furnish information as to the approximate quantity of hydrochlorate of cocaine which can be extracted from a pound of coca leaves and the cost of extraction.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

READ—again the following G.O., No. 1266, Revenue, dated 6th March 1897:—

Read—the following letter from the Chemical Examiner, Madras, dated 25th February 1897, No. 179:—

With reference to paragraph 2 of G.O., Mis. No. 5079, dated 10th December 1896, I have the honour to report that the quantity of alkaloid which can be extracted from a pound of the coca leaves will depend much upon the quality of the leaves themselves. This is a variable factor, for Dr. Warden of Calcutta has examined samples which yielded from 0.322 per cent. to 1.56 per cent., Mr. Hooper has obtained 0.5 per cent. from samples presumably grown on the Nilgiris, and I have obtained 0.258 per cent. from plants grown in Madras. The amount obtained from leaf of commerce is stated to vary from 0.2 to 0.5 per cent. Presuming that Mr. Hooper's figures represents an average yield from Nilgiri grown leaves, a pound of the leaves would yield 35 grains of the alkaloid or about 40 grains of cocaine hydrochlorate.

2. As to the cost of extraction, the data obtained from working upon such small quantities as can be manipulated in this laboratory would not form a reliable basis for estimating the cost of working upon a large scale. In operating upon a small quantity like a pound of leaves about two to three pounds of alcohol and a smaller amount of ether with a very small amount of acid and alkali are required. The

alcohol costs about 8 annas here, and ether costs about 2 shillings a pound in England. Larger quantities of the re-agents would be required for operating on larger quantities of leaves, but by suitable condensing managements the same re-agents can be successively employed for extracting fresh portions of leaves, and in this way the cost would be considerably reduced. Unless therefore the extraction is tried upon a larger scale for which I have neither the apparatus, nor with current duties have I the spare time, it would not be possible to forecast an estimate of the probable cost with any degree of accuracy. The process involves nothing which cannot be carried out on a larger scale at the Madras Medical Stores laboratory or the Quinine Factory at Nedivattam.

3. I may add that cocaine hydrochlorate has for some time recently been quoted in the drug marked at 11s. per oz. which is stated to be regarded by the wholesale trade as a non-paying basis. In 1890, the price appears to have been 15s. or 16s. per oz.

4. The delay in sending this, I regret to say, was caused through interruption (by current duties) of the experimental work undertaken for the purpose of this reply.

Order—No. 1266, Revenue, dated 6th March 1897.

Recorded, pending the receipt from the Curator of the Government Gardens of the reply to paragraph 1 of G.O., No. 5079, dated 10th December 1896, the submission of which should be expedited.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Curator of the Government Gardens and Parks,
Nilgiris, through the Collector of the Nilgiris.

READ—also Endorsement of the Collector of Nilgiris, dated 22nd March 1897, N.-Dis. on Cur. No. 355, forwarding the following letter from the Curator, Government Gardens and Parks, Nilgiris, dated 17th March 1897, No. 798:—

With reference to G.O., Mis. No. 5079, dated 10th December 1896, I have the honour to state that in October 1896 there were 48 very small plants of *Erythroxylon Coca* in one of the glass houses in Ootacamund garden, 24 small plants in the Gúdálúr garden and only one large plant growing at Barliyar, making a total of 73 plants. On the 26th November 1896, I took 25 plants from Ootacamund and planted them at Barliyar. During January all the 24 coca plants at Gúdálúr were lifted and brought to Ootacamund and these with 13 more plants from the Ootacamund glass house were planted at Barliyar on the 3rd instant. The total number of coca plants at Barliyar at the present time is therefore 68; while the total left in the glass house at Ootacamund is only five very small weak plants, which are not yet fit to be planted out permanently.

2. The large plant at Barliyar is in full flower at present, and I hope to be able to collect a few seeds from it (should they ripen) later on in the season.

3. The cost of obtaining fresh seeds to grow a large supply would depend (1) upon the number of plants required to be raised, and (2) on the prices that would have to be paid for them. William Brothers, Heneratgoda, Ceylon, quote the price of coca seeds and this may be taken as the maximum price that would have to be paid for them. I am, however, making enquiries elsewhere and shall not write to William Brothers until after I learn what the results of my enquiries are.

4. I therefore prefer not to make any definite statement at present as to what the cost of obtaining fresh seeds would be, but will report again as soon as I obtain definite information on the point.

5. The expenditure could be met from one or other of the heads provided in the budget for 1897-98 for the upkeep of this department.

ORDER—No. 689, Revenue, dated 11th August 1897.

Miscellaneous.

The above papers contain the history of the proposal to cultivate the coca plant (*Erythroxylon Coca*) in India with a view to the manufacture of cocaine.

2. The two papers last read above do not give very definite information as to the expense of growing the plant and manufacturing the drug, but it appears certain that the plant has flourished and would flourish on the Nilgiris and that the drug could be manufactured there without difficulty and at much less than its present price which appears to be about 11 shillings per ounce. The price in 1887 was 32 shillings an ounce.

3. The opinion of the Government of India expressed in its letter, No. 2232—74, dated 1st August 1894, read in G.O., No. 3445, dated 4th September 1894, above, was that the demand for the drug in this country was too small to justify Government undertaking the production of it. This opinion was based on the reports of Medical officers as to the quantity consumed in hospitals, &c. The Government is assured, however, that the use of the drug is not so restricted as it was then reported to be. It knows of cases in which private individuals consume large quantities of the drug.

4. The existing sources of supply, Peru and Bolivia, produce annually at present about 22½ million lbs. of dry leaf and it is estimated that one million lbs. of leaf would yield 2,500 lbs. of cocaine, and the supply from existing sources might, in all probability, be increased. There is also the possibility that the drug may be artificially produced. It appears that there are already two artificial substitutes in the market, but it is not known how far they will supersede the natural drug. The Government believes that in this country it might be profitable for some time to come for private individuals to take up the production of the drug.

5. The Government does not, however, consider it advisable for itself to actively engage in the manufacture of the drug, but is anxious to do all in its power to initiate and foster the cultivation of the plant in this country. The Curator of the Government Gardens, the Nilgiris, will accordingly, be requested to obtain a small supply of seeds of the *Erythroxylon coca* every year and to offer for sale the plants reared therefrom.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Collector of Nilgiris.
„ the Board of Revenue (Revenue Settlement,
Land Records and Agriculture).
„ the Surgeon-General, through the Public Department.

Encl. A. F. Eccleston.

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READ AGAIN G.O., No. 149

SUBJECT NO.

ENCLOSURE TO G. No.

ORDER OF GOVERNMENT

LETTER OF GOVERNMENT

STATEMENT WITH DITTO

PAPERS NOT FILED UP, BEING MEANT FOR DISPATCH IN ORIGINAL.

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