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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

DEPARTMENT

G.O. No. 652 Press
~~B.P. No.~~ Mis.

Dated 29-5-1874-196-

[Signature]
Not to be folded or roughly handled

652
1

*Proceedings of the Madras Government, Revenue Department,
29th May 1874.*

Read again letter from Board of Revenue, dated 25th July, and recorded in G. O.,
18th August 1873, No. 865.

Read also the following:—

No. 274. Proceedings of the Board of Revenue, dated 2nd March 1874,
No. 457.

Read the following letter from Messrs. ARBUTHNOT and Co., to J. GROSE,
Esq., Secretary to the Board of Revenue, dated Madras, 10th February
1874.

REFERRING to our letter to you of 25th November 1873, we forward herewith
plans of Coffee Machinery, and also a short description of the same by Messrs.
Hinde, Massey and Co. of Calicut.

2. Messrs Hinde and Co. state that they cannot supply the required infor-
mation regarding the cultivation of coffee within such limits as their time will
permit, and they refer to Hull's and Subonadier's works on coffee planting in
India and Ceylon for the best and most accurate information on all points relating
to the cultivation. Hull's work is probably procurable from some of the Madras
Booksellers, and the other, if not obtainable here, can be had in Ceylon.

ENCLOSURES Nos. 1 to 3.—Plans.

ENCLOSURE No. 4.

Preparation of the Coffee Bean for Consumption.

WITH this as with all vegetable productions of this class for consumption, machinery has to
play a prominent part in the preparation, and within the last ten years, many and useful machines
have been introduced for the purpose of pulping, peeling, and sizing coffee; the most effective
are the subject of our description and plans.

COFFEE PULPER.—The machine shown upon plan is termed a breast pulper, from the breast
or pulping portion marked A. upon plan coming nearly in contact with the revolving cylinder B.,
a portion of which is shown full size.

The principal portions of this machine are the breast, fluted iron cylinder, and circular sieve.

FLUTED IRON CYLINDER—Consists of an iron cylinder mounted upon a wrought-iron spindle,
accurately turned and fluted in a planing or shaping machine, as per full-sized sketch of fluted
B.; these run the full longitudinal length of the cylinder, and are made as hard as possible to
resist wear.

BREAST.—The breast A. requires care in setting against the cylinder, so that no coffee can
escape being pulped, or the outer skin or pallum taken off—the cherry coffee after being floated with
water from the hopper C. falls into the breast grooves D., and sufficient space is left in the
adjustment to allow of the outer skins to be carried by the flutes of the cylinder into the skin,
tail, or pallum channel E., when it falls into the spout provided for it, and is carried away with the
waste water.

The coffee bean after passing through the breast grooves D. falls out through the opening F.
into a shoot-plate which carries it into the circular sieve, when a circular motion is given to it,
the clean pulped beans falling through the perforation of the sieve into a spout which conveys
it to the fermenting cisterns. Such portions as may not have been properly pulped are thrown
out by the circular sieve at the end, and are again passed through the pulper; the percentage
of unpulped coffee is so small that most of the leading planters in the Wynaad and Ceylon use
the machine without the sieve.

*Proceedings of the Madras Government, Revenue Department,
29th May 1874.*

POWER.—Motive power is imparted direct to the cylinder spindle by means of spur gearing if turbine water wheel, bullock mill, or steam engine is used; and two or more machines are worked according to the size and bearing capacity of the property: the machine in the present instance is shown for hand power and fitted with fly-wheel and handles.

ADJUSTMENT.—One of the most recent improvements to this machine is the adjustment of the breast grooves D., which formerly had to be chipped and filed to suit the size of the coffee: to avoid this difficulty and complete the machine the writer of this hinged the grooves D. and held them in position by the brass set screws G., allowing about $\frac{1}{4}$ of an inch for adjustment, which has been found to answer the purpose required, and provides at the same time for the wear upon the grooves.

PULPING HORSE.—This has not been given, as we believe Messrs. Stanes and Rouse have been requested to furnish plans of same, and description of fermenting and washing coffee: we therefore pass on to coast preparation.

Coast Preparation.

COFFEE PEELER.—The coffee after pulping, fermentation, and drying, is despatched to the curing mills on the coast, where it is again spread out on barbacues and subject to a further drying process in the sun; this lasts on an average from three to four days depending upon the condition of the coffee; when considered sufficiently dry, it is carried to the peeler which removes the husk or chaff, and silver skin.

2. **PEELER.**—This consists of peeler trough wherein the coffee to be peeled is fed. Peeler wheels which peel the same. Scrapers for spreading the coffee in the trough, and sweepers for sweeping out when peeled.

3. The peeler is driven by a steam engine of 12-horse power, and revolves twenty revolutions per minute, peeling on the average 140 bushels per hour.

4. To commence work the coffee to be peeled is placed in two or more self-feeding boxes, which empty themselves into the peeler trough by a door, the peeler is started and run up to full speed, the door is then opened and the coffee runs into the trough, the scraper affixed to arm A. spreading it evenly around the trough until such time as a sufficient quantity has been fed in to make the peeler wheels revolve, which impart to the coffee a grinding and rubbing motion, the chaff and greater portion of silver skin being removed. The periphery of the wheels and bottom of peeler trough are ribbed to facilitate the peeling, and in some instances the inner face of the wheel is also ribbed.

5. After peeling for about six minutes the coffee is finished and ready for removal; this is done by slackening of the engine to slow speed, opening the door B., and tilting down the sweepers C. C. affixed with hinges and balance blocks to scraper arms D. D.

6. **FANNING.**—The coffee after peeling is removed to the fanner where the chaff and dust is removed. Plans of this simple machine have not been given. The common barn door fanner being well known to every one.

7. **SIZERS.**—Consisting of perforated zinc or galvanized iron plates mounted upon cylindrical carriers, on an average 15 feet long and 2 feet 6 inches diameter, proportion of lengths of divisions as per plan.

8. These machines are divided into flat bean (circular hole plate) and pea-berry (longitudinal hole plate). The coffee after leaving the fanner is deposited in the flat bean machine hopper A., and falls through the spout shown in section into the sizer which, upon being turned by hand or power, sizes and carries forward the larger beans; the smaller ones falling through their respective openings or perforations in sizer sheets, and into boxes B. B. prepared for their reception.

9. The two larger sizes C. C. are again carried forward and deposited separately into two pea-berry sizers which takes or rolls out the pea-berry at the end of the machine D. The pea-berry are elongated cylindrical bean, takes a rolling motion from the time it enters the sizers,

*Proceedings of the Madras Government, Revenue Department,
29th May 1874.*

passing over the holes in which the flat bean catch and pass through into the respective receivers E. In some of the best mills the small-sized flat bean E. D. is passed through a pea-berry separator, but in small mills it is generally rolled out by the garbling women in flat mat trays, who in a short time become experts in the manipulation.

10. The preparation as regards machinery is now completed, and it is necessary for it to be picked from all beans that may have been injured by the pulper & from other causes; when this operation is completed the coffee is packed in cases, casks, or bags for shipment and to suit the convenience of the purchaser.

(Signed) HINDE, MASSEY AND Co.

THESE papers will be submitted to Government with reference to G. Os., dated 18th June 1873, No. 631, and 18th August 1873, No. 865.

2. The Board are indebted to Messrs. Arbuthnot and Co. and to Messrs. Hinde, Massey and Co. of Calicut for the drawings and the descriptive memorandum which accompanies them.

3. The Commissioner of the Nilgiris is requested to expedite his reply to Board's Proceedings, dated 15th September 1873, No. 1,837.

No. 274A. Proceedings of the Board of Revenue, dated 27th April 1874, No. 976.

Read the following letter from J. B. COCKERELL, Esq., Commissioner of the Nilgiris, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Ootacamund, 18th March 1874, No. 21:—

I should, some time ago, have submitted a reply to the Proceedings of the Board, dated 15th September 1873, No. 1,837, conveying a Proceeding from the Government calling for reports on the subject of the cultivation of coffee and its preparation for the market for the information of the Government of India, had I been able to procure the rough sketches also desired. I have, however, not been able to obtain sketches at all, though Mr. Rouse has been so good as to state he will have sketches made if he finds an opportunity. I asked the District Engineer to have sketches prepared, but the subordinate at his disposal can only make, I believe, plans, and the delineation of coffee-works requires the qualities of a drawer in perspective as well of a plan-drawer. A subordinate of Captain Morant visited the Runnymede estate, and saw the buildings and machinery. He estimated it would occupy him some weeks to make plans with the accuracy required. Looking at the difficulty of obtaining sketches, I endeavoured to procure printed illustrations of Gordon's Pulpers, which are the machines in use at Runnymede, and of a water-wheel, but in vain. No one on the Hills happens to have illustrations of pulpers, and I am not aware whether illustrations of water-wheels are to be had in India at all. As Messrs. Hinde, Massey & Co., have submitted illustrations of the Gordon machine ordinarily in use, I deem it better not further to delay my report.

2. Mr. Thomas Stanes writes to me: "The account given by Messrs. Hinde, Massey & Co. of the preparation of the coffee-bean for the market is exactly the same as that followed by Messrs. Stanes and Rouse at our works at Coimbatore."

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*Proceedings of the Madras Government, Revenue Department,
25th May 1874.*

3. I visited Runnymede lately. The coffee is treated in a wooden building, with open sides supporting a loft with a tile roof. Water is carried along a wooden trough from a dam on the hill-side into the loft, and falls on a water-wheel 12 feet in diameter which is fixed in one of the open sides of the lower storey. This wheel, in full play, makes between six and seven revolutions a second. The wheel gives motion to two Gordon's Pulpers set side by side in the lower storey. One of the pulpurs is a double-disc machine, and the other has a single drum. The coffee, when picked, is carried by the pickers to the loft to which a ladder gives access, and is there thrown into a hopper, whence it passes to a screen moved by a handle. This machine is, in fact, nothing more than a sifting machine of the pattern employed on the Sydapet Government Farm. The screen throws the larger-sized berries into one shoot, and the smaller drop through it into another shoot. The first shoot conveys its contents to the disc-pulper, and the other to the drum instrument. The coffee passes through these pulpurs in the manner described by Messrs. Hinde, Massey & Co. Each pulper pulps 35 bushels an hour. A ton of coffee contains 90 bushels.

4. The pulped coffee is deposited in vats lined with asphalt, which are disposed by the side of the pulpurs, and there it lies for 24 hours. At the end of this time, it is put into a machine, which, as far as I know, is the only one of the description on the Hills. This machine, which receives motion from the water-wheel as I understood, is a design of Mr. Stanes. It is a wooden vat in which a spindles revolves armed with spokes. Each spoke is furnished with a brush made of cane bruised in a manner to separate the fibres and convert the end of the cane into a brush. The brushes press the coffee against the sides of the trough, and remove the viscid material adhering to the berries after passing through the pulpurs.

5. When the coffee has been passed through this machine, it is washed in large open tanks to which it is passed from the pulping buildings by a stream of water, and, finally, it is spread on barbacues, 76 feet by 33 feet, which are nothing more than open platforms of brick and chunam, faced with tar. The coffee remains three whole days to dry on the barbacues in sunny weather; of course, it is shifted into a store at night.

6. The coffee-pulp on the Runnymede estate is carried direct from the pulpurs by means of water to open vats where it lies until brought into use as manure.

7. A small proportion of the coffee is found shrivelled and diseased. This coffee does not pass through the pulping house. It is dried and put into a coffee-grinder on a large scale, where the berries are broken into fragments. These fragments are afterwards separated from the husk by women with winnowing baskets and the coffee receives the name of "cleaned coffee." It is of very inferior quality.

SUBMITTED to Government in continuation of Board's Proceedings, dated 2nd March 1874, No. 457.

*Proceedings of the Madras Government, Revenue Department,
29th May 1874.*

No. 275.

ORDER THEREON, 29th May 1874, No. 652.

Miscellaneous.

ORDER that the foregoing papers, together with the drawings received with the Board's Proceedings of 2nd March last, be forwarded to the Government of India, with reference to the letter from that Government, dated 10th June 1873, No. 194.

(True Extract.)

(Signed) C. G. MASTER,
Acting Secretary to Government.

To the Board of Revenue.

Exd. F. R. Bantleman.

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No. 457.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 2nd March 1874.

Read the following letter from Messrs. ARBUTHNOT and Co., to J. GROSE, Esq., Secretary to the Board of Revenue, dated Madras, 10th February 1874:—

REFERRING to our letter to you of 25th November 1873, we forward herewith plans of Coffee Machinery, and also a short description of the same by Messrs. Hinde, Massey and Co. of Calicut.

2. Messrs Hinde and Co. state that they cannot supply the required information regarding the cultivation of coffee within such limits as their time will permit, and they refer to Hull's and Subonadier's works on coffee planting in India and Ceylon for the best and most accurate information on all points relating to the cultivation. Hull's work is probably procurable from some of the Madras Booksellers, and the other, if not obtainable here, can be had in Ceylon.

ENCLOSURES Nos. 1 to 3.—Plans.

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WITH this as with all vegetable productions of this class for consumption, machinery has to play an important part in the preparation, and within the last ten years, many and useful machines have been invented for the purpose of pulping, roasting, and sizing coffee; the most effective are the subject of our description and plans.

COFFEE PULPER.—The machine shown upon plan is termed a breast pulper, from the breast or pulping portion marked A. upon plan coming nearly in contact with the revolving cylinder B., a portion of which is shown full size.

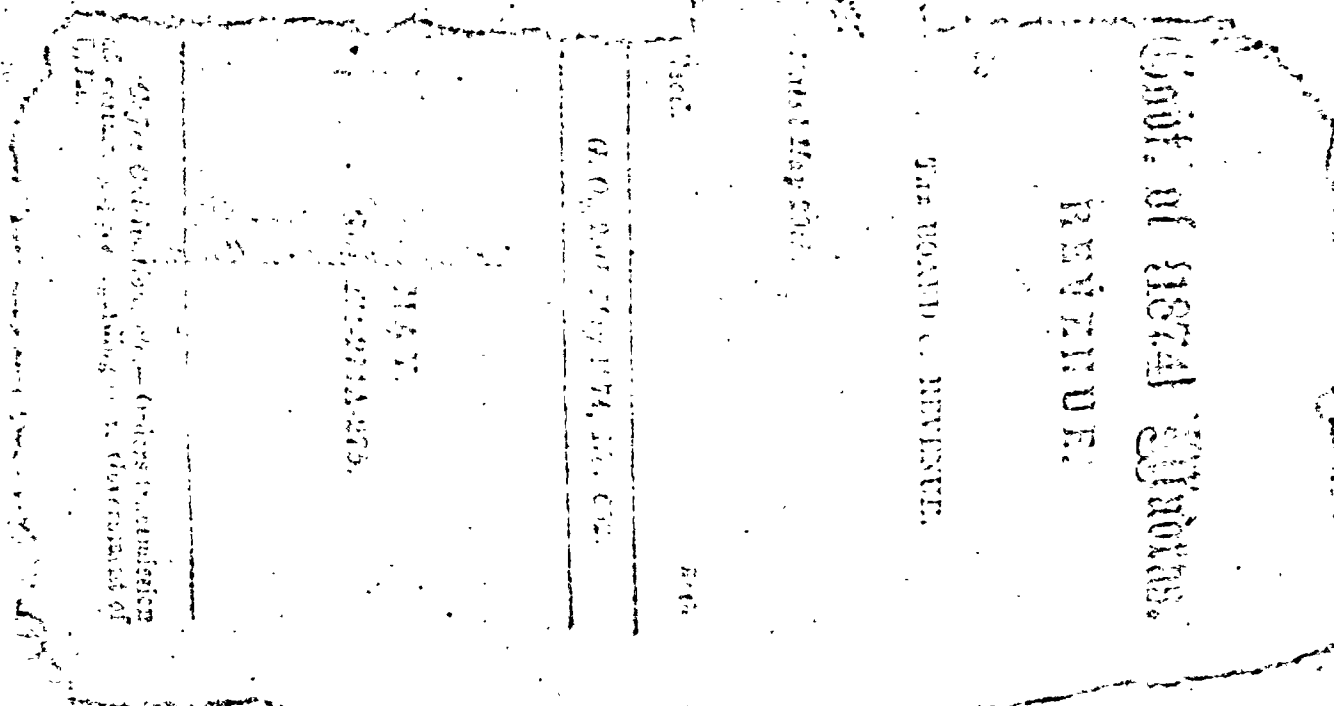
The principal portions of this machine are the breast, fluted iron cylinder, and circular sieve.

FLUTED IRON CYLINDER.—Consists of an iron cylinder mounted upon a wrought-iron spindle, accurately turned and fluted in a planing or shaping machine, as per full-sized sketch of fluted B.; these run the full longitudinal length of the cylinder, and are made as hard as possible to resist wear.

BREAST.—The breast A. requires care in setting against the cylinder, so that no coffee can escape being pulped, or the outer skin or pallum taken off—the cherry coffee after being floated with water from the hopper C. falls into the breast grooves D., and sufficient space is left in the adjustment to allow of the outer skins to be carried by the flutes of the cylinder into the skin, tail, or pallum channel E., when it falls into the spout provided for it and is carried away with the waste water.

The coffee bean after passing through the breast grooves D. falls out through the opening F. into a shoot-plate which carries it into the circular sieve, when a circular motion is given to it, the clean pulped beans falling through the perforation of the sieve into a spout which conveys it to the fermenting cisterns. Such portions as may not have been properly pulped are thrown out by the circular sieve at the end, and are again passed through the pulper; the percentage of unpulped coffee is so small, that most of the leading planters in the Wynad and Ceylon use the machine without the sieve.

4



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ADJUSTMENT.—One of the most recent improvements to this machine is the adjustment of the breast grooves D., which formerly had to be chipped and filed to suit the size of the coffee: to avoid this difficulty and complete the machine the writer of this hinged the grooves D. and held them in position by the brass set screws G. allowing about $\frac{1}{4}$ of an inch for adjustment, which has been found to answer the purpose required, and provides at the same time for the wear upon the grooves.

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3. The peeler is driven by a steam engine of 12 horse power, and revolves twenty revolutions per minute, peeling on the average 140 bushels per hour.

4. To commence work the coffee to be peeled is placed in two or more self-feeding boxes, which empty themselves into the peeler trough by a door, the peeler is started and run up to full speed, the door is then opened and the coffee ~~falls into the trough~~ spreading it evenly around the trough until such time as a sufficient quantity has been fed in to make the peeler wheels revolve, which impart to the coffee a grinding and rubbing motion, the chaff and greater portion of silver skin being removed. The periphery of the wheels and bottom of peeler trough are ribbed to facilitate the peeling, and in some instances the inner face of the wheel is also ribbed.

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berry are elongated cylindrical bean, takes a rolling motion from the time it enters the sizers, passing over the holes in which the flat bean catch and pass through into their respective receivers E. In some of the best mills the small-sized flat bean E. D. is passed through a pea-berry separator, but in small mills it is generally rolled out by the garbling women in flat mat trays, who in a short time become experts in the manipulation.

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(Signed) HINDE, MASSEY AND Co.

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3. The Commissioner of the Nilgiris is requested to expedite his reply to Board's Proceedings, dated 15th September 1873, No. 1,837.

(True Copies and Extract.)

H. Hinde
Acting Sub-Secretary.

To the Acting Secretary to Government, Revenue Department, with three plans.

.. Messrs. Arbuthnot and Co.

.. Messrs. Hinde, Massey and Co.

.. the Commissioner of Nilgiris.

Copy to the Inspector of Forests.

Exd. W. H. French.

No. 976.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 27th April 1874.

Read the following letter from J. R. COCKERELL, Esq., Commissioner of the Nilgiris, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Ootacamund, 18th March 1874, No. 21:—

I should, some time ago, have submitted a reply to the Proceedings of the Board, dated 15th September 1873, No. 1,837, conveying a Proceeding from the Government calling for reports on the subject of the cultivation of coffee and its preparation for the market for the information of the Government of India, had I been able to procure the rough sketches also desired. I have, however, not been able to obtain sketches at all, though Mr. Rouse has been so good as to state he will have sketches made if he finds an opportunity. I asked the District Engineer to have sketches prepared, but the subordinate at his disposal can only make, I believe, plans, and the delineation of coffee-works requires the qualities of a drawer in perspective as well of a plan-drawer. A subordinate of Captain Morant visited the Runnymede estate, and saw the buildings and machinery. He estimated it would occupy him some weeks to make plans with the accuracy required. Looking at the difficulty of obtaining sketches, I endeavoured to procure printed illustrations of Gordon's Pulpers, which are the machines in use at Runnymede, and of a water-wheel, but in vain. No one on the Hills happens to have illustrations of pulpers, and I am not aware whether illustrations of water-wheels are to be had in India at all. As Messrs. Hinde, Massey & Co., have submitted illustrations of the Gordon machine ordinarily in use, I deem it better not further to delay my report.

2. Mr. Thomas Stanes writes to me: "The account given by Messrs. Hinde, Massey & Co. of the preparation of the coffee-bean for the market is exactly the same as that followed by Messrs. Stanes and Rouse at our works at Coimbatore."

3. I visited Runnymede lately. The coffee is treated in a wooden building, with open sides, supporting a loft with a tile roof. Water is carried along a wooden trough from a stream on the hill-side into the loft, and falls on a water-wheel 12 feet in diameter, which is fixed in one of the open sides of the lower storey. This wheel, in full play, makes between six and seven revolutions a second. The wheel gives motion to two Gordon's Pulpers set side by side in the lower storey. One of the pulpers is a double-disc machine, and the other has a single drum. The coffee, when picked, is carried by the pickers to the loft to which a ladder gives access, and is there thrown into a hopper, whence it passes to a screen moved by a handle. This machine is, in fact, nothing more than a screening machine of the pattern employed on the Sydapet Government Farm. The screen throws the larger-sized berries into one shoot, and the smaller drop through it into another shoot. The first shoot conveys its contents to the disc-pulper, and the other to the drum instrument. The coffee passes through these pulpers in the manner described by Messrs. Hinde, Massey & Co. Each pulper pulps 35 bushels an hour. A ton of coffee contains 90 bushels.

30/10/74 No. 145-46
- 18 August - 133-34
- 24 Sept - 144-45
- 10 Dec - 63-64

Received 1874. 27th April
BOARD OF REVENUE
MADRAS.
No. 958

PROCEEDINGS, 2ND MARCH 1874, No. 457.

Copy sent 26/7/74.
Encl. 3

Received 6.

X Encl. 3

MARCH.
No. 457.

Coffee Machinery.—Letter from Messrs. Arbuthnot and Co., forwarding plans of—and a short description of the same of—Messrs. Hinde, Massey and Co. of Calcutta, and mentioning names of certain books in which accurate information will be found regarding cultivation of coffee, submitted to Government. Nilgiri Commissioner to expedite reply to Beattie's Proceedings, dated 15th September 1873, No. 1,837, calling for a descriptive account of Mr. Stanes' coffee pulping-houses on Coonoor Ghat and his works at Coimbatore.

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5029 May/74 No. 652

4. The pulped coffee is deposited in vats lined with asphalt, which are disposed by the side of the pulpers, and there it lies for 24 hours. At the end of this time, it is put into a machine, which, as far as I know, is the only one of the description on the Hills. This machine, which receives motion from the water-wheel as I understood, is a design of Mr. Stanes. It is a wooden vat in which a spindle revolves armed with spokes. Each spoke is furnished with a brush made of cane bruised in a manner to separate the fibres and convert the end of the cane into a brush. The brushes press the coffee against the sides of the trough, and remove the viscid material adhering to the berries after passing through the pulpers.

5. When the coffee has been passed through this machine, it is washed in large open tanks to which it is passed from the pulping buildings by a stream of water, and, finally, it is spread on barbacues, 76 feet by 33 feet, which are nothing more than open platforms of brick and chunam, faced with tar. The coffee remains three whole days to dry on the barbacues in sunny weather; of course, it is shifted into a store at night.

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SUBMITTED to Government in continuation of Board's Proceedings, dated 2nd March 1874, No. 457.

(A true Copy and Extract.)

C. Calam
Acting Sub-Secretary.

To the Acting Secretary to Government, Revenue Department.

Copy to the Commissioner of the Nilgiris.

.. to the Inspector of Forests.

.. to the Superintendent of Government Farms,

with Board's Proceedings, dated 2nd March 1874, No. 457.

Exd. F. R. Bantleman.

Coffee.—Reply of Nilgiri Commissioner to Board's Proceedings calling for report on cultivation of— and its preparation for market, submitted to Government.

APRIL
No. 976.

Received

27th April 1874.
Encl:

PROCEEDINGS, 27th April 1874, No. 976.

MADRAS.

BOARD OF REVENUE,

APRIL 1874. Recd-

27th April

Revenue Dept.

S. 652

652

Proceedings of the Madras Government

Under date the 29th May 1874

Read again letter from Board of

Revenue dated 25th July, and forwarded

in G.O. 18: August 1873 No. 865-

Read also the following Proceedings

of the Board of Revenue.

Submg letter from Inspector of Forests

to the forwarding plans of coffee machinery and a

short description of the same by Messrs. Hindle, Messrs.

H. & Co. of Calcutta, and mentioning names of persons to be

employed in the cultivation of coffee &c.

14-8-2? March 1874 No. 657

Submg reply of Nilgiri Commissioner

to the Board: calling for report on cultivation of coffee

and its preparation for market.

27th April - - - No. 976

Orders that the

forwarding papers, together with

the drawings received with

the Board's Proceedings of 2nd

March last, be forwarded to

the Govt. of India, with

reference to the letter

from

from that Govt dated 10th
June 1873 M: 154.

QUL

7th of June 1873

Ex. 2225

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