M.R.O. 14—10,000—21-4-22

MADRAS RECORD OFFICE.

Government of Madras.

Revenue **DEPARTMENT.**

G.O. No. 1786 Press ~~Mis.~~

68-69

Dated 4—10— 1869.

Not to be folded or roughly handled

No. 68. Read the following letter from H. CLEGHORN, Esq., M.D., Conservator of Forests, to J. D. BOURDILLON, Esq., Secretary to Government, Revenue Department, Fort St. George, dated Madras, 3rd September 1860, No. 146.

SIR,

In obedience to the Orders of Government, I have the honor to forward the Report of Mr. W. G. McIvor, Superintendent of the Government Garden at Ootacamund, for the past year 1859-60.

2. The Report is brief, but I can certify from personal inspection that there is a progressive improvement in the appearance of the garden and in the increase of the general collection. Particular attention is paid to plants used for food or articles of medicine, or likely to become of commercial value.

3. An active interchange of seeds and when possible of living plants, is kept up with kindred institutions in Ceylon, Calcutta, Mauritius, and Melbourne. It is specially desirable to reciprocate with the Government Gardens at the two places last named, as the productions of New South Wales appear to suit the Neilgherry Hills in a remarkable manner.

We are likewise endeavouring to establish a system of exchange with persons at Hongkong and Saint George's Sound.

4. FINANCES.—The accounts of the Gardens for 1859-60 have been forwarded to the Board of Revenue for examination and submission to Government, as directed in Extract Minutes of Consultation, dated 15th March 1859, No. 323, Revenue Department.

The marginal Abstract from a revised account current is correct. The Statement of receipts and expenditure shows that the garden is not self-supporting, but the amount of sale and distribution is rapidly increasing, and considering the large extent of the garden devoted to ornamental purposes, I consider the result highly satisfactory.

Abstract of the Accounts of the Government Garden, Ootacamund, from 1st May 1859 to 30th April 1860.

Dr.

	Rs.	A.	P.
To Garden Establishment from May 1859 to April 1860....	2,157	4	6
„ Salary of Superintendent from do. to do.....	2,400	0	0
„ Garden implements, stationery and sundry expenses.....	449	2	3
„ Messrs. Sutton and Sons for seeds.....	180	6	0
„ Amount transferred to Messrs. Arbuthnot and Co.....	74	15	1
	5,261	11	10
Balance of Cash in hand.....	174	11	2
Total Rupees..	5,436	7	0

Cr.

	Rs.	A.	P.
By balance of Cash in hand....	127	13	11
At credit with Messrs. Arbuthnot and Co.....	74	15	1
By Government allowance from May 1859 to April 1860, at 100 Rupees per mensem....	1,200	0	0
„ Cash received on account of Superintendent's salary from May 1859 to April 1860, at 200 Rupees per mensem....	2,400	0	0
„ Sale proceeds of plants, seeds &c.	1,583	10	0
„ Donation.....	50	0	0
Total Rupees..	5,436	7	0

5. CATALOGUE.—The garden is now in the 12th year of its existence, and a classified catalogue of the plants growing in it, with a column indicating the native country, would be useful and interesting; this I hope Mr. McIvor will furnish with his next Annual Report.

6. The loss sustained by the drenching in the surf of the consignment from Messrs. Veitch and Co., is much to be regretted. The different public gardens have been liable to suffer in this way, I hope that the Madras Pier now under construction, will relieve us from further apprehension on this account.

The proposal that Mr. Dawson should take charge of cases when returning in November is judicious, as in sending exotics it is of very great consequence to entrust them to some one who understands their management. If Government will place a small sum* at my disposal, I will make the necessary arrangements in England.

* Say 250 Rupees.

7. The hints for the treatment of Vegetables and Flowers are good and calculated to be useful, I would recommend that they should be printed on *thin* paper, a copy be inserted into each packet of seeds leaving the garden. The actual cost of each copy, which would be very trifling, would be charged to the purchaser.

8. CINCHONA.—The advantages likely to be derived from the introduction of this valuable plant in Southern India have been fully considered in a separate Report, and arrangements having been ordered for the safe transmission of the plants, I need not further allude to it at present.

Procs. of Govt., dated 18th August 1860, No. 1220.

regard

BRIEF HINTS FOR THE TREATMENT OF VEGETABLE AND FLOWER SEEDS.

1. The proper treatment of seeds when committed to the ground for the purpose of germination is an operation requiring much greater skill and experience than can be conveyed by any instructions; this paper is therefore written merely with a view of bringing to the notice of the reader, the principles which govern the vegetation of seeds, and it is left to the intelligent reader to adapt the circumstances to his individual case, as the most absurd mistakes are frequently made by adhering to instructions, when the circumstances of the case are not in accordance with that treated of.

The conditions required to produce germination in all seeds are, moisture, heat, and air; the first element, moisture, must be supplied, but not in an unlimited quantity, or the seeds will rot, as is the case with seeds which grow in water, because the power of respiration in the seed is impeded by the water, and it is unable to decompose the quantity of water it absorbs, which collects in the seed and becomes putrid. There must, therefore, be some water, but not too much, and it is generally considered that a mixture of sand and loam is the best soil in which to raise seeds, because the sand keeps the loam from adhering together when watered, and this allows the excess of water to pass through (or drain off), while the loam by the force of attraction retains as much water among the cavities of the soil as is required for the purposes of germination: clay or clay loam retains too much moisture, and seeds sown in such soils are sure to rot. The quantity of moisture must not be too great, and it must be uniform also, that is, the seed beds must not be soaked with water one day and the next allowed to become dry, because the changes the seed undergoes in germination must take place without interruption, or the seed will die. To preserve uniformity in this respect, great care is required, and the seed-beds should be carefully shaded with fern, or the cut branches of trees having small leaves: seeds when sown in patches in the flower border are best shaded by an inverted basket being placed over them.

2. *Of the second element, Heat.*—Nature has in this country provided an abundant supply at all seasons, for the purpose of germination. European vegetable and flower seeds will vegetate freely in a temperature of 55, and sustain without injury a temperature of 75 to 80 degrees.

3. *Air.*—Seeds will not germinate if out of the reach of atmospheric air, that is, they will not grow if buried too deep; yet, a certain degree of darkness is favorable to germination, and thus nearly all seeds require to be slightly covered with earth when sown, and especially in bright weather to be shaded as above directed.

4. *The covering of earth* over the seed is intended to answer two purposes; first, to preserve a uniform degree of moisture around the seeds and to secure to them a certain degree of protection from the light. *Shade* is intended for the same purposes, and with very small seeds which will not bear much covering of earth, shade is indispensable; thus, no more earth should be used as a covering than is necessary to secure the degree of moisture and darkness required: small seeds have not the power of upheaving the soil, and therefore are not covered with earth when sown, but merely pressed gently into the soil, and shaded, in order to preserve moisture and partial darkness around the seeds.

5. *Preparation of the Soil.*—Land should never be dug or mixed during heavy rains, as the working or mixing of all soils when wet, is, according to the nature of the soil, more or less injurious. The best time for digging and mixing soils is when rather dry than otherwise. The ground intended for seed-beds should be dug over to the depth of 10 or 12 inches, and if the land is heavy, largely mixed with sand and with rotted manure; the beds should then be marked off 4 feet wide, with small paths about 1 foot wide between each, the earth being thrown from the paths on to the beds, until the path is 2 or 3 inches lower than the surface of the bed. The beds thus prepared are raked level and the seeds sown. If flower seeds are sown in patches in flower borders, the ground should be prepared as for seed beds.

6. *Sowing.*—Peas are sown in double rows 3 feet to 4½ feet apart, according to the size of the variety used; at these distances, two small lines or trenches are made about 1½ inches deep, and the pea seeds sown in them and covered with about three-quarters of

an inch of soil, thus leaving the row about half an inch lower than the level of the ground—this is done in order to facilitate shading and watering. Bean seeds are sown in the same manner as pea seeds, but in single rows, 2 feet apart.

Beetroot, Spinach, Carrots, and Parsnips are sown in rows 20 inches or 2 feet apart, made similar to the rows for peas; but the trenches not so deep, about half an inch being sufficient. The beetroot and spinach may be covered with about half an inch of soil, while a quarter of an inch will be a sufficient covering for the carrots and parsnips. *Turnips* are also sown in rows 20 inches or 2 feet apart; the rows should be raised 2 or 3 inches above the surface of the ground, in order to allow the roots to swell freely. Swedish turnips may be sown in beds and transplanted as cabbages; but none of the above will bear transplanting, and therefore should be sown where they are intended to come to maturity.

7. *Brussels Sprouts, Brocoli, Cabbages, Cauliflower, Knolcole, Lettuce, Endive, Cucumber, Vegetable Marrow, and Tomatoes,* should be rather thickly sown in beds prepared as described at paragraph 5, and lightly covered with earth, being shaded at the same time. When the seeds are sown and covered, the beds should be pressed down or lightly beat on the surface with the back of the mamooty or spade: when the plants are 2 or 3 inches high, they are carefully transplanted where they are permanently to remain.

8. *Transplanting.*—Cabbage, Cauliflower, Brussels Sprouts, Knolcole, and Brocoli, are transplanted in rows from 18 inches to 22 inches apart, and the same distance apart in the rows; Lettuce and Endive, in rows 14 inches apart, and 1 foot apart in the rows; Cucumbers and Vegetable Marrow, in rows 6 feet apart and the plants 2 feet apart in the rows; Tomatoes, in rows 4 feet apart, the plants being 2 feet in the rows. Transplanting should be performed when the weather is cloudy or wet, the plants being shaded and watered immediately they are put into the ground. The object of this watering being to settle down the soil about the roots, therefore a copious watering is always required after transplanting.

9. *Flower seeds.*—All that has been said with reference to vegetable seeds, is applicable to flowers; but, as the seeds of many flowering plants are very small, and consequently weak and delicate in proportion to their size, much greater care is necessary in their treatment. When seeds are sown in pots, great care should be taken to ensure proper drainage, for unless this is attended to they are almost certain to rot. The best way to drain flower pots is to fill them nearly half full with fragments of broken bricks or broken pots, placing the largest pieces at the bottom and the smaller at the top; cover this with a thin coat of moss or rotten turf, on this place the soil, which should be largely mixed with sand and slightly pressed down. When the pot is filled to within an inch of the top and the surface made smooth, the seeds being sown on this surface are covered with a little fine soil or sand, the smaller sorts of seeds being merely pressed into the earth: all seeds in pots will vegetate much sooner and certain if shaded for a short time by an inverted basket being placed over the seed pot. This should also be done when flower seeds are sown in patches in flower borders. When the seedlings are fairly rooted and well above the ground all shade should be removed, otherwise they will "damp off."

10. *Seed-sowing, remarks on.*—In forming seed-beds, prefer a light sandy soil free from salts, thoroughly drained and well enriched with stable manure, which should be soaked in a pit of water for at least a month previous to being used, in order to destroy all grubs and larva of insects which may be in it. If these are not destroyed, they devour the seeds or young plants immediately after or before they come above the ground. If the soil is infested with grubs, they may be destroyed by pouring boiling water over the beds intended to receive the seeds; after this operation, the beds being allowed to become partially dry on the surface, are raked over, and the seeds sown. If the weather is dry, the first watering seeds receive after sowing should be rather copious than otherwise, in order to settle down the soil; but after this first watering, water should be rather sparingly applied, but at regular periods (say every evening): seeds should always be watered with a watering pot and rose. Tank water to be used if procurable in preference to that from wells. Flooding the soil by running water over it should be carefully avoided, as also throwing water on the beds from chatties. Plants should never be watered when the sun is shining, as it scorches and dries up the leaves, and if often repeated will destroy the plants.

FRUIT TREES, REMARKS ON.

11. *Fruit trees* of all sorts, and in fact almost every other description of perennial plant, can be conveyed by bangy, during the months of January, February and March, to any distance and in perfect safety, packed in deal boxes or baskets among dry moss—the bangy parcel of 100 tolas weight conveying about twelve plants.

12. On the receipt of plants forwarded by bangy, they should be immediately unpacked and put into pots or baskets in the verandah, the soil about the roots being kept moist, but not too wet: if pots are used, they should be thoroughly drained with fragments of broken bricks or pots being placed at the bottom, as described in paragraph 13. When the plants have begun to shoot they may be transferred from the verandah to where they are permanently to remain. In transplanting them attend to the instructions given at paragraph 8.

13. *Potting plants.*—This is performed by placing a quantity of broken bricks or small stones about 2 inches deep over the bottom of the pot, the smallest of the broken bricks or stones being placed at the top; over this is placed a little moss, rotten turf, or any other open material, which will prevent the earth from mixing with the drainage in the bottom of the pot; a little soil is put over this. The plant being now placed in the pot with one hand, the earth is put in with the other, and the roots carefully spread out. When the pot is filled with earth it should be firmly pressed down and the plant immediately watered; care should be taken not to bury any portion of the stem, and the earth should not on any account be more than half an inch above the uppermost roots.

14. *Remarks.*—Apples, Pears, Plums, Peaches and Nectarines, cannot, in the Madras Presidency, be successfully cultivated on the plains, but will succeed in localities elevated from three to five thousand feet above the level of the sea. In such localities, prefer the standard tree to the espalier, but when the elevation exceeds 6,000 feet, the espalier is best suited to ripen the fruit. These plants will succeed on the plains in many parts of Bengal, N. W. Provinces, Agra, and also in several parts of the Bombay Presidency.

15. *Soil, Situation, and Planting.*—The above trees succeed best in a deep, rich loam, on an open bottom or subsoil not retentive of moisture, and in situations shaded from the sun by hills, banks, or even trees (if at a good distance). In localities where the monsoon rains are heavy, prefer planting on hillocks of earth raised about 2 feet above the surface, and avoid the practice of planting in pits, except the climate be generally dry, and the subsoil gravel or resting on rock.

16. *Pruning.*—The object of pruning standard trees, is simply to admit light and air among the branches, to preserve the fruit-bearing parts, and the symmetry of the head by causing it to spread equally, and to remove such branches as are diseased. In pruning, the parts to be taken away must be carefully separated by a clean smooth cut, close to the branch from which they are removed.

17. *Grape Vine.*—There are varieties of this valuable fruit suited to almost every climate of India, from the hottest parts of the plains to the temperate regions of the mountains.

18. *Soil, Planting and Training.*—The soil best suited to the vine, is a compost of the following in equal parts (well mixed together, but not much broken): Chunam rubbish, crushed bones, scrapings of roads, brown turfy loam (as full of grass fibre as can be procured), and stable dung—the loam should be laid up in a long narrow heap for about six or eight months before being used, so that the fibre it contains be thoroughly decayed. On the plains, and on all level situations, to prevent the vine borders being flooded during the monsoons, it is necessary to raise them above the surface, which is easily done by rough brick walls, the back wall (to which a trellis-work should be attached, sloping about 50 degrees from the wall to train the vines on) 4 feet high, and the front one about 3 feet, the width between the walls 12 feet, and the length according to the number of vines planted; the ground should slope gently from the back to the front wall, which ought to be in the pigeon-hole manner, to allow of the drainage water to escape. The entire space between the two walls should be covered over one foot thick with rough stones at the bottom and small ones at the top; then cover the stones with a thin turf, the grassy side down, to prevent the earth mixing with them—fill up the

space between the walls with the compost above described. On the top of this, near the back wall that supports the trellis-work, the vines should be planted 7 feet apart, and the young plants cut down to within three buds (or eyes) of the ground; these three buds will then begin to grow. As soon as they are long enough, select the two best, and train them horizontally along the lowest rail of the trellis, and when each shoot has extended 3 feet, turn them up the lattice work in a perpendicular direction for 3 or 4 feet or more, according to their strength, then the top must be pinched off, and all side branches that may be produced must also be pinched off above the first leaf.

19. In the dry season when the leaves fall, each shoot is cut off where it was turned upwards; when the plant begins to grow again, all the buds along the horizontal parts will make shoots. Select from these seven shoots, one at the extremity, a second a foot from that, and a third a foot from the second, the fourth in the centre or where it was first headed down, and three on the other horizontal branch. These should be trained perpendicularly till they reach the top of the trellis, which may be 7 or 8 feet high; they should then be stopped by pinching off the top and treating all lateral and side shoots that are produced as before directed.

20. When the leaves fall the third year, each alternate shoot is cut down to within two eyes of the horizontal stem, and the others left 5 or 6 feet long to produce fruit; when they begin to grow again, the best shoot is selected from those that had been cut down to two eyes, and trained up to the top of the trellis, and treated in every respect as before.

21. The next year when the leaves fall, they are cut down to about 18 inches under the top of the trellis, and those that have produced fruit are cut down to within two eyes of the horizontal stem and so on, for any number of years.

22. *Fig.*—Like the vine, there are varieties of the fig suited to almost every climate of India.

Soil, Planting, Pruning and Training.—The fig requires a light rich soil thoroughly drained, and on that account should always be planted on hillocks 10 feet apart, the bottom filled with stones, and the soil laid over them. The fig requires no pruning further than is necessary to keep it in shape, and to remove all suckers by cutting them clean off where they are produced. When the tree grows too luxuriant, it should be trained horizontally on espalier rails, which will induce it to produce fruit, but generally it succeeds best as a standard.

23. *Remarks.*—All fruit-bearing trees and shrubs require to be abundantly supplied with water as soon as the first leaves begin to expand, and until the fruit sets; when the fruit begins to color, water should be given sparingly, and when it is nearly ripe, withheld altogether. The grape vine and some others will not set fruit if the weather is wet at the time of flowering; therefore, if the vine naturally come into flower in wet weather, the time of flowering must either be retarded by thatching the border with straw, so as to prevent the rain-water getting to the roots and thus causing vegetation, or accelerated by watering, so that they may come into flower and set their fruit before the heavy rains. All soils should be mixed and dug when in a dry state, and the trees planted when the weather is cloudy and wet.

(Signed) W. G. McIVOR,
Superintendent.

GOVERNMENT GARDENS,
Ootacamund, 26th July 1860.

No. 69. ORDER THEREON, 4th October 1860, No. 1,785.

1. Dr. Cleghorn forwards with his remarks Mr. McIvor's Report on the Government Gardens at Ootacamund for the year 1859-60. This Report, Government are glad to observe has been transmitted more promptly than the last.

2. Few remarks are necessary. The gardens are progressing, in spite of the difficulty experienced in procuring labor, and of the accidental loss of a consignment of plants and seeds from England. With regard to the latter and in view to the avoidance of similar occurrences, the course pointed out in the Postscript to the Conservator's letter of 31st July 1860, No. 83, relating to the arrangements for the reception of Quinine yielding Cinchonas might be followed with advantage in all cases. Dr. Cleghorn should communicate with Mr. Brown on the subject.

3. The Governor in Council approves of the proposal to take advantage of Mr. L offer to select and bring out from Home any plants which may be required. He au an advance of 250 Rupees to be made to Dr. Cleghorn for this purpose.

4. Respecting Mr. McIvor's remarks on the introduction of the Cinchonas the Gov observe that the subject has received full attention in their Order of 18th August last, N Public Department.

5. The Government authorize the printing of 2,000 copies of the "Hints for the tr of seeds" which form an enclosure to the Report on thin paper as suggested by the Cons The Superintendent Government Press will state the actual cost in order that the same charged to the purchasers. A portion might be distributed to other gardens at the Conse discretion.

6. Ordered that 200 copies of Dr. Cleghorn's letter and the report be printe the foregoing remarks appended and that the usual number be forwarded to the Right able the Secretary of State for India.

(Signed) C. G. MASTER,
Deputy Secretary to Governm

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Rev Department

№ 1785

Proceedings of the Madras Government
Under date the 4th ~~September~~ October 1860.

Read the following letter
from the Conservator of Forests

Submitting the Report of Mr.
W. S. McIvor Supt. of the Go-
vernment Garden at Ootacamund
for the past year 1859/60.

(Received 8th Sept 1860 № 146)

Dr Cleghorn forwards
with his remarks Mr. McIvor's
report on the Government
gardens at Ootacamund for
the year 1859-60. This report
government are glad to observe
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seeds from England. With

regard

regard to the latter and in view to the avoidance of similar occurrences, the course pointed out in the Postscript to the Conservators letter of 31st July 1860 No. 83 relating to the arrangements for the reception of the Quinine yielding Cinchonas might be followed with advantage in all cases. Dr. Oleghorn should communicate with Mr. Brown on the subject.

3 The Governor in Council approves of the proposal to take advantage of Mr. Davidson's offer to select and bring out from home any plants which may be required. He authorizes ~~an advance of 250 Rs to be made to Dr. Oleghorn of the sum asked for in para 6 of his letter (viz Rs. 250) two hundred and fifty~~ an advance for this purpose.

Respecting

Respecting Mr. McIvor's remarks on the introduction of the Cinchonas the Government observe that the subject has received full attention in their order of 18th August last, No. 1220 Public Dept.

5 The Government authorize the printing of 2000 copies of the "Hints for the "treatment of seeds" which form an enclosure to the report on their paper as suggested by the Conservator. The Superintendent Government Press will state the actual cost in order that the same may be charged to the purchasers. A portion might be distributed to other gardens at the Conservator's discretion.

6 Ordered that 200 copies of Dr. Oleghorn's letter and the

(5)

Report on the Govt gardens at Ootacamund for 1859/60.

the Report be appended into the foregoing remarks & appended and that the usual number be forwarded to the Right Honorable the Secretary of State for India.

Ogle

4 Copies
Conservator of Forests. Dist 25
12 Board of Revenue
3 Accountant Genl
3 Civil Auditor
1 Asst Govt Secy
4 Distr Offrs

Copy in a letter to Engr.
D/ 10th October 1860 No 109.

Pro. 30th October & Mis=
No. 22.

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1220 Pubr
18.8.60

Revenue 1860 Dept.
Pro. of Govt for October.

No 1785.

Pro. of the Madras Govt.
D/ 4th October 1860.

From Conservator of Forests, D/ 17 Augt/61
Ce No. 2030 (reference to para 3 of the order)
in favr to Dept. No 1778

On the Report of
Mr. Mc Ivors report on
the Government Gardens
at Ootacamund for the
year 1859-60.

No. 68 & 69.