PART II.

VICTORIA, SOUTH AUSTRALIA, CEYLON.

VICTORIA.

The Hon. J. G. FRANCIS to the Hon. the COLONIAL SECRETARY. Victoria.

SIR,— Chief Secretary's Office, Melbourne, Victoria, 24th March, 1874.

In compliance with your request of the 17th ultimo, to be supplied, for the information of your Government, with copies of the Acts of the Parliament of Victoria, reports, and other published papers, relating to the question of dealing with the forests of this Colony, I have much pleasure in forwarding to you six copies of the Land Act of Victoria, 1869, and of the regulations issued under that Act; six copies of the report of a Board appointed by the Governor in Council, in August, 1867, to inquire into and report upon the best means of securing the permanency of the State forests; and three copies of the first annual report issued by the Department of Agriculture, 1873.

The volume last mentioned will be found to contain two brief reports, dated respectively 1st June, 1873, and 23rd August, 1873, by the Inspector of State Forests.

I regret that I am unable to send you copies of a report on the State forests recently made by Mr. W. G. Ivey to the Minister of Lands, as it is not yet in print, but I enclose a digest of that report, which was published in the *Argus* newspaper of the 28th ultimo.

I have, &c.,

The Hon. the Colonial Secretary of New Zealand, Wellington. J. G. FRANCIS.

EXTRACTS from ABRIDGED REPORT by Mr. W. G. IVEY.

Dandenong Forest.

THE successful efforts of nature to renew the expended timber are very apparent where fire has made a clean sweep of the vegetation existing at the time of its advent. In all these places the young trees exist even too thickly, but though upon the parts of the forest destroyed by the great fires of 1851 there are fine shapely young trees, 80 feet to 100 feet in height, they do not promise any immediate or early supply of timber. Differing from those spots where the old trees were destroyed by fire are those from which timber has been removed by man. Here, as a rule, no number of young trees spring up to take the place of those felled. It seems necessary that a complete clearing of all vegetation by fire should take place before nature puts forth her efforts to re-clothe the soil with timber trees. The question, therefore, arises, whether nature should not be aided by clearing by fire such spots, and also perhaps by sowing upon the surface seed of such species of eucalypti as would seem best suited to the soil and position of any particular spot.

Bullarook Forest.

The cutting of timber is in full play by the four classes, namely, saw-millers, splitters, prop cutters, &c., and firewood cutters. Saw-millers should be compelled to clear the land as they go of all useful timber, and to cut only on such blocks as they would be able to clear yearly. The post-and-rail splitter only needs mention as being equally guilty with the saw-miller in neglecting the regulation as to stacking of tree tops, which regulation seems to be impracticable and not to be enforced, and might with advantage require only heaping and burning at certain stated periods. Firewood cutters frequent only the eastern end of the forest. They should be restricted to certain areas, prohibited from entering upon lands growing young trees, and from cutting immature timber. There could be large areas of stunted timber set aside for firewood altogether, where the soil has not produced, and is not likely to produce, trees of value for other purposes. It is to be regretted that the immense amount of top and lop lying throughout the forest cannot be utilized for firewood. The great bulk is, however, too far from market at present, and must waste unless some systematic attempt were made, by the laying of tramways, to bring it into connection with the main lines of railway. Prop cutters do great damage, and where such is shown, their operations should be stopped at once. To procure an 8 inches prop they often fall a tree 18 inches to 20 inches in diameter, and taking off what they want, leave the butt to waste. Split props are coming into use, but still round ones are necessary in heavy country in alluvial mines, and it would probably be advisable to alter the regulation as to measurement

of trees to be felled, allowing trees 8 inches at the butt to be used, but only under the surveillance of the ranger. A class of men who fell trees for their bark alone should on no account be allowed in the forest. But the selector has been the greatest destroyer of the forest lands in this neighbourhood. The existence of the volcanic soil to the north of the dividing range has been the attraction. A portion still exists within the forest boundary, and is much the best timbered portion enclosed. The rest has fallen into the hands of the selector, who has rung the trees over thousands of acres, and destroyed a crop of timber that was worth to the State much more than the value of the gross produce of all the grain crops produced or likely to be produced, to judge by the prevailing crops of wild shrubs, &c. In three different places, the average of trees left standing, all above 3 feet in diameter, was twenty-five trees per acre, each tree equal to yielding on an average at least 1,800 feet superficial of sawn timber. The smaller trees had all been removed. It seems evident that a selection of forest lands should not be allowed, at least in any such centrally-situated position, until the land has been cleared of timber, or the selector should be himself bound to make use of, economically, the crop of timber upon the land before cultivation were allowed or title granted him. Prop cutters waste much timber, but their efforts to destroy sink into insignificance when placed side by side with the miles of whitened trees sacrificed to the greed of the selector on the north side of the dividing range.

Re-stocking Denuded Areas with Young Trees.—Bullarook gives strong evidence in favour of Nature's efforts being sufficient to re-stock the forests with trees if aided and results protected. In all cases where fire has cleared the ground, a sufficient number of seedlings has appeared; protection and thinning is then all that is required. Destruction by fire is the greatest risk to be provided against, and it should be the chief point of consideration to prevent such accumulations of combustible matters as would support a bush fire of any strength. If saw-millers cleared the land as they went of all useful timber, the land could then be cleared by fire of all vegetation and inflammable matter, leaving a clean seed bed, which might either be left or sown over thinly with seeds of most suitable species of eucalyptus, and then should be absolutely closed against all ingress. Cattle and goats might be allowed to graze, unless injury to young trees be observed by the rangers. At present they do no damage, and do much good in keeping down the grass, thus diminishing the fire risk. As accumulation of combustible matter must be prevented, the frequent use of fire, time and place to be carefully selected, will prove the most successful method. A moderate fire will not injure the young trees when the bark at the butt has become rough, say at the age of three or four years. At this age there will be but little inflammable matter accumulated, especially if the grass has been grazed; and fire should then be used in strips or patches, otherwise, if neglected, materials for a strong bush fire would collect, and after protection from cutting, &c., for years, the whole of the young trees would probably be swept away in a day. When the young trees are eight to ten years old, prop cutters and others might be made use of in thinning them out. This operation at an earlier period would require special employment of labour, but should also be done. As the trees increase in size, a second and more thinnings could be made, until the remaining trees matured and were fit for saw-mill purposes. After every operation each block of young forest trees should be again strictly shut up; and in every case trees should only be removed under the surveillance of the ranger, who should also take charge of the firing, or clearing, or sowing, in fact of all connected with such a system of management as may be introduced.

EXTRACTS from the REPORT of the BOARD* appointed in 1867, to INQUIRE and REPORT on the best means of SECURING the PERMANENCY of the STATE FORESTS of VICTORIA, &c.

The extensive use of Soft Woods for Building Purposes, and the importance of introducing Pine Timber Trees into the State Forests.

The absence of trees in Victoria suitable for conversion to many of the purposes connected with buildings, has necessitated the importation of large quantities of soft wood timber, in deals and sawn stuff, to meet the requirements of our building trade.

In the early periods of the gold fields, when the demand for buildings, caused by the large influx of population, was most pressing, very many houses were constructed of pine timber, owing to the dear rates of skilled labour at that time, and to the facility with which they could be erected of this material. According to the returns kindly furnished to us by the Hon. J. G. Francis, Commissioner of Customs, a copy of which is given in Appendix No. 2, attached to this report, it appears that the imports of timber into Victoria, in 1853 and 1854, reached the enormous values of £1,474,168 and £1,481,050 respectively. After that period, however, the use of weather-boards was greatly superseded by stone and bricks in the erection of houses of a more substantial and imposing character, and these imports fell off considerably down to the year 1859; but from that time to the end of the year 1866 they represented a fluctuating annual value ranging from £271,848 to £377,458—the annual values of our imports of soft woods, since the year 1851, having been from 70 to 80 per cent. of the total amounts in the returns for all kinds of timber.

From the 1st January, 1852, to the 30th June, 1867, the Colony has expended in the purchase of foreign timber the enormous sum of £8,392,551.

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* The members of the Board were Mr. C. W. Ligar, Surveyor-General; Mr. Brough Smyth, Secretary for Mines; Mr. W. W. Wardell, Inspector-General of Public Works; Mr. Thomas Couchman, Chief Mining Surveyor; Mr. Clement Hodgkinson, Assistant Commissioner of Lands and Survey.

Well-seasoned pine timber possesses the valuable properties of being easily worked and but little liable to shrink or warp when exposed to the atmosphere. Among the many useful things into which it is chiefly converted may be mentioned flooring, skirting, and weather boards; joists, rafters, doors, window frames, laths, and battens, for buildings; and it is also used for boat and yacht building.

From examples of the growth of pines, embodied in this report, it would appear that the kinds of soft wood conifers from which our imported deals and sawn timber are mostly obtained, grow vigorously and with great rapidity in the gardens and grounds around Melbourne, and it is presumed that they would thrive quite as well on properly selected sites in the State forest reserves. We are therefore of opinion that, by judicious planting operations, we might, at no distant time, become independent of foreign countries as regards this timber, and open up a large field for remunerative labour, in the conversion of it to the various purposes for which it is required.

The following is an estimate of the probable yield per acre that plantations of pines would produce in this Colony, in situations suitable for their culture, on the supposition that they are planted at the maximum distance of 5 feet apart:—

	Number of Trees Felled.	Estimated Number of Pit Props.	Estimated quantity, in superficial feet, of Boards from 6 inches to 8 inches wide, and 1 inch thick.
First thinning in 10 years	500	500	...
Second „ 15 „	500	1,250	...
Third „ 21 „	250	1,000	...
Fourth „ 27 „	200	800	27,000
Fifth „ 33 „	150	450	58,500
Sixth „ 40 „	142	426	114,456
	1,742	4,426	199,956

The above estimate is intended to represent the production of land planted only with pines; but, as it would be desirable to cultivate many other kinds of valuable non-indigenous and indigenous timber trees, the system of mixed plantations should in most cases be adopted, in which pines would bear a large proportion, and would shelter and nurse the growth of the less hardy trees in their early stages.

In thus directing attention to the commercial value of pine timber, we would recommend the extensive introduction of coniferous trees into the State forests of Victoria.

The Influence of Forests on Climate.

Irrespective of the advantages to be derived from a cheap and abundant supply of useful timber, we would remark that the systematic planting and conserving of forest trees in this Colony would, in all probability, effect a most beneficial and desirable change in our climate, locally, by modifying extremes of temperature, and increasing the humidity of the air, by causing a more continuous rainfall in districts that are now subject to long and excessive droughts.

In illustration of this branch of the subject, we would observe that trees screen the sun's rays from the earth in a greater or less degree; and they are supposed to act as a mechanical impediment to the passage of winds, even to some considerable distance above their height, and to exercise a beneficial influence upon lands lying to leeward of them, by protecting them in a great measure from the effects of cold or parching winds.

Trees increase the humidity of the air. They absorb large quantities of moisture from the earth through their roots, the most of which is returned to the atmosphere by transpiration, or exudation from their leaves and branches. They also lower the temperature of the air in their immediate vicinity, by the large surfaces presented by their leaves and branches, which are either cooled by radiation, or, when moist, lowered to the temperature of evaporation.

The vegetable mould formed by the decomposition of leaves and wood not only enriches the surface soil, but causes it to become much more absorbent, and, from its spongy nature, to retain a large portion of the rainfall that would otherwise drain away by percolation at great depths, or flow off rapidly by surface channels. It is chiefly due to this that in dense forests heavy rains do not cause such violent floods as in open country.

It is well known that the clearing of forests in the Alpine districts of France was attended with disastrous consequences: it greatly increased the violence of floods, and decreased the regular supply of water from springs and surface drainage. The excessive degradation of the mountain slopes, caused by the rapid drainage and violence of the floods, since the clearing of the forests in some of these districts, has silted up river beds and laid waste large areas of fertile land.

Many other instances might be cited referring to lands in Spain, in Palestine, and other parts of Asia and in Northern Africa, that were once fertile and flourishing, and which have now become arid wastes by the destruction of their forests. On the other hand, the aridity of large tracts of land in the Landes, and in Algeria, has been subdued by the planting of those tracts with forest trees.

PART II. Victoria.

According to Schubler, if we represent the power of calcareous sands to retain heat at 100, other earths retain heat in the following proportions :—

Siliceous sand	95·6
Arable calcareous soil	74·3
Argillaceous earth	68·4
Garden earth	64·8

As siliceous sand enters largely into the composition of the soils of Victoria, it follows that the temperature of the earth might be beneficially lowered by protecting large areas from the influence of the sun's rays.

Without committing ourselves to the theories advanced by many writers, we may yet assume with safety that a well-timbered country will possess a climate cooler and moister than one in the same latitude, and otherwise geographically similarly situated, which is deficient in forests.

In the State Forest Reserves the present Conditions under which Licenses are issued for obtaining Timber should be abolished, and new Conditions imposed.

In all the extensive reserves for State forests, the existing system of obtaining timber under wood licenses, and licenses to occupy sites for saw-mills, should be abolished, and in lieu thereof, a system should be adopted of letting to companies or individuals the exclusive right to cut timber on specified portions, subject to conditions calculated to insure the permanency of the forests, by the prevention of undue waste of felled timber, the protection of young indigenous trees, and the fostering of the growth of such non-indigenous trees as may from time to time be planted out in the denuded portions of the original forest.

As these conditions would have to be very stringent, the rent to be paid for the exclusive right to cut timber on any specified portion of land in a State forest reserve might be made correspondingly moderate, provided that a guarantee was given for strict compliance with the conditions.

Nature of the new Conditions under which Licenses should be issued.

The conditions under which the exclusive right might be granted under license to cut timber on a tract of land in a State forest should be somewhat as follows :—

(1.) That no tree shall be felled of less diameter than 18 inches, unless the licensee be specially authorized to cut such timber under exceptional circumstances.

(2.) That, within a period of three months from the felling of any tree, the portion thereof not required for timber shall be cut up and stacked, with a view either to use or sale as firewood, or for burning where stacked during the ensuing winter months, together with any prostrate dead timber on the tract held under license. The gradual clearance from the ground of dead timber shall be effected by and at the cost of the licensee.

(3.) No tree on the tract held under license shall be used merely for the purpose of obtaining bark therefrom.

(4.) The licensee shall be responsible for the protection from injury, by working bullocks or other stock, of any non-indigenous trees that may from time to time be planted by the State within the boundaries of the land in his occupation. The licensee shall also be required to protect young seedling indigenous trees, with which object in view neither the licensee nor any of the persons employed by him shall be allowed to depasture goats on the tract of land held by him under license.

SOUTH AUSTRALIA.

South Australia.

SIR,— Surveyor-General's Office, 28th October, 1873.

Having inspected, with Mr. E. Smith, nurseryman, the proposed forest reserves north and south of Adelaide, I have the honor to make the following suggestions for the consideration of the Hon. the Commissioner :—

1. That the reserves be divided into three classes—northern, southern, and central—as follows, viz. :—

Northern District { Reserves at the Never Never Ranges and Springs, Hundred of Bundaleer; Wirrabara Forest, south of White Park; east slopes of Mount Remarkable; and travelling stock reserves in the Hundreds of Wongyarra, Appila, Crystal Brook, Whyte, Anne, Black Rock Plain, Mannanarie, Yongala, Ayers, Hanson, Blyth, Everard, Boucaut, Goyder, Redhill, Barunga, Cameron, Kulpara, Kadina, Clinton, Terowie, Hallett, Kingston, Kooringa, Apoinga, and the Government Reserve adjoining Penwortham, Hundred of Clare.

Southern District	Mount Gambier Mount Burr Mount McIntyre Mount Muirhead Flat South-east of, and adjoining south end of, Rivoli Bay Cave Range, south of Naracoorte Land near Cockatoo Lake Glen Roy Flat Border Town Travelling stock reserves in the Hundreds of Jessie, Hynam, and Lochaber, and that running north and south through the Hundred in Naracoorte.
Central District	Government Farm Reserve, Waterfall Gully Mount Lofty Reserve Travelling stock reserves in the Hundreds of Julia Creek, English, Neales, Dutton, Anna, North Rhine, Angas, Finniss, Mobilong, Monarto, Ridley, Burdett, Seymour, Malcolm, and Bonney.

The reserves in the above districts comprise a total area of three hundred square miles.

2. That the reserves in question be proclaimed in the *Government Gazette*, as provided in section 9, "Waste Lands Alienation Act, 1872," and that regulations for their management be compiled in terms of clause 51, which enables the Governor in Council to make and publish regulations for carrying out the object of the Act (No. 18 of 1872): Provided that such are laid before Parliament.

3. That an officer, thoroughly and practically acquainted with forest culture in all its branches, be appointed as Conservator of Forests; and that he be instructed to prepare lists of seeds to be ordered, and to obtain the necessary labour to establish nurseries for forest trees at Mount Gambier, in the Southern District; the Springs, Bundaleer, in the Northern District; and at the Government Farm, in the Central District; so that a commencement may be made without delay, and that the nurseries be gradually extended to the Cave Range and Border Town, in the South, and Wirrabara Forest and the Penwortham Reserve, in the North—making a total of seven nurseries to supply stock for the three districts, *i.e.*, three for the South, three for the North, and one at Government Farm, for the Central District.

4. That the duties of the Conservator of Forests be to advise the Commissioner on all subjects connected with forest culture, the establishment of nurseries, appointment of necessary labour, raising suitable young stock from seed, and transplanting the same on the reserves into soil adapted to the culture of the particular plants, fencing portion of reserves planted; prune, lop, and thin out young trees, and mark those for sale that attain maturity.

5. That the formation of forests be proceeded with gradually, and in such a manner that, whilst a thoroughly organized system of raising, planting, and protecting be at once provided for, care be taken not to unnecessarily interfere with free access to existing forests; or, to render it more difficult to persons to obtain and remove timber than can be done by the public at large, under the present regulations—for instance in the Wirrabara Forest such portions only will be first planted and protected from which the valuable timber has already been removed, and where only sufficient remains to form protection for young stock; a similar course being adopted in all cases where existing forests are now being made use of.

6. That the trees selected for cultivation shall, in all cases, be such as are best adapted for use in manufacture, building, fencing, mining, &c., and not merely for ornamental purposes, and that they comprise various eucalypti, such as jarrah, red and blue gums, tooart, &c.; pines, such as the *Pinus insignis, maritima, canariensis, halepensis,* and Waymouth; with oak, beach, walnut, sycamore, poplar, willow, cedar, chestnut, ash, sandalwood, olive, and locust trees. As the sheaoak and blackwood will spring up abundantly where the land is protected from stock, it is not considered necessary to include them in the list.

7. That, in the reserves, trees be planted in the first instance 10 feet apart, or say 435 to the acre. That in five years' time every second tree be removed and sold for rails, or other suitable purpose, leaving the remaining trees 20 feet apart. At the end of another five years a similar thinning out and sale to take place, leaving the remaining trees 40 feet apart, when that portion of the forest may be considered established, and the trees be allowed to attain maturity, and only to be removed on being properly marked for falling by the Conservator.

8. That sufficient area be at once protected, viz., 7,000 acres, or say eleven square miles, to receive the plants that would be raised during the first season at the three nurseries, viz., the Springs, Bundaleer; Mount Gambier, and Government Farm, say 1,000,000 plants from each, and that such area form a portion of each of the reserves in the respective districts, and that the area protected be increased each year, so as to be capable of receiving the stock raised from the nurseries as they are increased, until the whole seven have been established.

9. That the Conservator be required to keep records of the several portions of each forest as they are planted, and of the trees planted therein, so that no doubt may exist as to the ages of trees grown, and that the requisite sequence be preserved, and the different portions of the forest availed of in proper rotation. These records should be illustrated by a plan showing the portions of the reserve planted and protected, and the portions from which timber of various kinds may be removed, and under what conditions.

10. That, as most of the travelling stock reserves comprise rich lands upon open plains, and upon which, from their bleak nature, it might be difficult to grow young trees without protection, the Conservator should be required in such localities to plant suitable shrubs of rapid growth, which might be permitted to remain until the young trees attain sufficient strength to do without such protection.

11. That, prior to the fencing in of any forest reserve, roads be laid out so as to give access to each portion of such reserve, and that the fences be so placed as to obstruct the traffic as little as possible, proper swing gates being placed upon such roads. This is the more essential in reserves for travelling stock, as in many cases the best lines of road wind from one side of the reserve to the other, and rarely continue in the middle or on one side.

12. The present system in granting licenses for cutting and removing timber from Crown lands, must remain intact until the timber upon the protected portions is ready to be cut, when regulations will require to be framed to meet all the circumstances of the case; meanwhile, it will only be necessary to exempt, by strict regulation and *Gazette* notice, with heavy penalty for infringement, those portions of the reserves that are from time to time planted and protected.

13. That forest reserves be allowable within hundreds, though excluded by resolution of the House of Assembly on Mr. Krichauff's motion, carried the 3rd May, 1872 (Votes and Proceedings, page 129). The resolution in question was passed prior to the "Waste Lands Alienation Act, 18, of 1872," which includes all land within the First Schedule of that Act as liable to be surveyed for selection under its provisions. This, to a certain extent, makes it imperative that the whole of the land within the limits of that Schedule shall ultimately be proclaimed into hundreds, otherwise the land could not be open for selection. To exempt, therefore, forest reserves from hundreds, since the passing of that Act, would be either to place such reserves outside the Schedule, or require the revision of a large number of hundred boundaries, so as to exclude them; and inasmuch as timber will be largely required by persons holding lands within the hundreds upon the plains, it will simplify the question much if reserves be allowed within hundreds—more especially as the travelling reserves form a large proportion of the total area proposed to be planted—and will be doubly convenient and valuable, from their proximity to agricultural lands almost destitute of timber.

14. Assuming that the above suggestion be adopted, and a Conservator of Forests, with the requisite staff, for the seven nurseries be appointed, the probable expense of the Department for the first year would be £14,357 10s., as detailed below:—

	£ s. d.	£ s. d.
One Conservator of Forests, at £400 per annum (and travelling expenses)	400 0 0	
		400 0 0
One Head Gardener for each nursery, at £150 (and cottage)	1,050 0 0	
One working man ditto, at £125, ditto	875 0 0	
Two boys ditto, at £40, ditto	560 0 0	
Two horses and cart ditto, at £60	420 0 0	
Shed and hut accommodation ditto, at £100	700 0 0	
Nursery implements ditto, at £20	140 0 0	
		3,745 0 0
Travelling expenses to Conservator	100 0 0	
Purchase of seed	500 0 0	
1,000 boxes for raising seed (for each nursery, at 9d.) £37 10s. ...	262 10 0	
100,000 3½-inch flower pots ditto, at £4 10s. per 1,000, £450 ...	3,150 0 0	
Extra assistance during planting season	5,000 0 0	
Fencing for protection of planted portion of reserves	1,200 0 0	
		10,212 10 0
Total		£14,357 10 0

The expense for the second and following years, deducting the price of flower pots, seed boxes, cottages, implements, and horses (but allowing for contingencies, tear and wear, breakage, &c.), say, will be, in round numbers, £10,500 a year.

This amount need not be at once expended if the suggestion of commencing with but three nurseries be adopted, as in that case provision in proportion only will be required.

15. The seed which cannot be obtained in the Province should at once be ordered from England, through Mr. Hackett, or any other respectable seedsman, in order that its quality may be guaranteed.

16. Five years must elapse after commencement of operations before any return on the outlay can be expected; then, assuming that the whole seven nurseries be established at once, and the 7,000,000 trees be planted during the first planting season (10 feet apart, as proposed in paragraph 7), every second tree, or three and a half millions in all, might be removed and sold at £1 per hundred, realizing £35,000 in cash. This amount would continue to be realized for each of the following four years, when it would be largely increased by the second removal of every other tree from the blocks first planted, and which would then remain a forest—the trees being 40 feet apart, and only cut on arriving at maturity, and as marked for sale by the Conservator.

The expenditure to carry out this scheme, therefore, would during the first year be, say, £14,500, the eleven following years at, say, £10,500 a year (£115,500). Total expenditure in twelve years, when all the forests would be fenced and planted, £130,000.

The revenue derived during the same period would be,—

	£
For the first five years	—
Sixth year	35,000
Seventh year	35,000
Eighth year	35,000
Ninth year	35,000
Tenth year	70,000
Eleventh year	70,000
Twelfth year	70,000
Total	£350,000

£70,000 would continue to be the revenue until the end of the seventeenth year, when it would again decrease to £35,000, that is, to the end of the twenty-first year, when the country would be in possession of 300 square miles of matured forests.

Of course, the above calculations do not take into account failure here and there in the growth of trees, but they are sufficient to show the value of the work, and that there is every probability of its being self-supporting in addition to its vast importance.

As this scheme in no way interferes with Mr. Krichauff's Bill, it is not alluded to in the present report.

I have, &c.,
G. W. GOYDER,
Surveyor-General.

The Secretary, Crown Lands and Immigration.

CEYLON.

CORRESPONDENCE ON THE SUBJECT OF THE CONSERVATION OF CROWN FORESTS.

The Earl of KIMBERLEY to Governor the Right Hon. W. H. GREGORY.

(Ceylon, No. 134.)

Ceylon.

SIR,— Downing-street, 13th June, 1873.

I have the honor to transmit to you copy of a letter addressed to me by the Director of the Royal Gardens, Kew, on the subject of the destruction of the forests in Ceylon. The efforts which you have already made in this direction, as referred to by Dr. Hooker, have not escaped my notice, and I read with satisfaction the remarks upon the preservation of the forests, contained in your speech at the opening of the Council in September last. I was glad to find provision in the Estimates of the year for the expenditure required to give effect to your proposals.

2. As, however, I observe that you dwell rather upon the loss of valuable timber, than upon the injury to climate caused by extensive clearings, I take the opportunity afforded to me by Dr. Hooker's letter, of directing your particular attention to the very serious consequences to the climate of the Island which may result from the further destruction of the forests, and of strongly impressing upon you the importance of effective steps being at once taken to preserve the timber, as far practicable, on lands over which the Crown has control.

3. I am aware of the difficulties which you and your Council may meet with, especially at the present moment, when the prosperity of the coffee trade encourages the planters to extend their operations; but the experience of Mauritius and other countries has so clearly shown the evil effect upon climate resulting from the destruction of forests, and the uselessness of half measures, that I desire to impress forcibly upon your Government the necessity of taking thoroughly effectual action.

4. It is of course unnecessary that I should observe upon the high authority with which Dr. Hooker speaks on a question of this nature, and I shall await with interest your reply to this Despatch. It will be a question for your consideration whether a Commission should be appointed to report upon the whole question.

I have, &c.,
KIMBERLEY.

Enclosure.

Dr. HOOKER to the Earl of KIMBERLEY.

MY LORD,— Royal Gardens, Kew, 27th May, 1873.

In the annual report recently made by the Director of the Royal Botanic Garden, Prérádeniya, Ceylon, Dr. Thwaites alludes to the extensive felling of the forests in Ceylon for coffee and other planting. This is a subject which Mr. Thwaites has already brought under my notice in previous correspondence, and I am aware that His Excellency Mr. Gregory is taking active steps in the matter; nevertheless, the mischief done in other colonies is especially to be guarded against in this case. The planting of tea and coffee has suddenly become an object of active, and, to some extent, almost of speculative enterprise. The soil and climate are equally

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suited for the growth of vegetable products more remunerative than any hitherto introduced into the Island. There is reason to fear that districts may be hastily cleared of forest under these inducements, which it may prove impracticable to permanently occupy when the fertility of the soil has been lowered by a few years' cultivation.

It is principally on climatic considerations that the cutting down of forests seems to require Government supervision. There is good reason to think that in tropical countries the removal of wood operates effectively in reducing the rainfall. There can, at any rate, be no doubt that the presence of forests plays a most important part in storing the rainfall, and yielding up gradually to the streams a continuous supply of water—a thing, I need hardly say, in a hot country of primary importance.

Moreover, the rain is retained by forests on the surface of the ground; it gradually permeates to the subsoil, and so feeds the underground water-bearing strata, upon which springs and wells must eventually depend. If the forest is indiscriminately removed, the rain runs off as fast as it falls, and washes away the superficial and fertile soil with it.

The mischief already done in Mauritius and various West Indian Islands is so widely spread (being in some indeed irreparable), and the feeling of the colonists against any interference on the part of the Government is apt to be so determined, that I venture to press upon your Lordship my own opinion as to the urgency of active steps being taken in the case of an Island so beautiful, and at present so fertile, as Ceylon.

I have lately received an account of the deterioration of the climate of some of the Leeward Islands, which affords a melancholy confirmation of what I have urged above:—

"The contrast between neighbouring Islands similarly situated is most striking. The sad change which has befallen the smaller ones is, without any doubt, to be ascribed to human agency alone. It is recorded of these that in former times they were clothed with dense forests, and their oldest inhabitants remembered when the rains were abundant, and the hills and all uncultivated places were shaded by extensive groves. The removal of the trees was certainly the cause of the present evil. The opening of the soil to the vertical sun rapidly dries up the moisture, and prevents the rain from sinking to the roots of plants. The rainy seasons in these climates are not continuous cloudy days, but successions of sudden showers, with the sun shining hot in the interyals. Without shade upon the surface the water is rapidly exhaled, and springs and streams diminish."

It is not, however, simply to the restriction of the removal of existing forest that I would venture to direct your Lordship's attention, but also to the object, no less important, of making new plantations of forest trees useful for timber and in the arts. Such plantations would serve the double object of retaining the desired humidity, and of yielding a revenue to the Island.

I have, &c.,
Jos. D. HOOKER,
Director.

His Excellency the GOVERNOR to the Earl of KIMBERLEY.

(No. 237.)

MY LORD,— Queen's House, Colombo, Ceylon, 31st July, 1873.

I have the honor to acknowledge the receipt of your Lordship's Despatch No. 134, of the 13th June, together with the copy of a letter from the Director of the Royal Gardens, Kew, on the subject of the destruction of the forests in Ceylon.

2. I am gratified to find that your Lordship approves of the policy I have pursued in arresting the destruction of the forests in this colony, which has, in some districts, been progressing with hardly any restraint since the British occupation of the Island. Your Despatch will have the effect of strengthening my hands in the determination I have come to, of maintaining considerable Crown reserves in the coffee districts, against which, no doubt, I may expect some outcry.

3. As the subject of the preservation and encouragement of the growth of timber in this Island is of such great importance, I have no hesitation in going generally into the subject.

4. I had not been in Ceylon more than a few months when I was astonished by seeing vast tracts of jungle country through which I passed, utterly denuded of all valuable timber, and converted into low, useless, and unhealthy scrub. That these tracts were eminently fitted for the growth of timber, was apparent from the size of the few trees which here and there had escaped the general havoc.

5. The diminution of timber in the Island is to be attributed to four causes:—

First, and chiefly, chena cultivation;
Second, absence of all system in the cutting of timber in the Crown forests, and of replanting;
Third, sale of valuable forest at inadequate value;
Fourth, want of proper reserves being maintained in the coffee districts.

First, in regard to chena, it is desirable to give some information as to this system of cultivation.

It may be briefly described as the rotation of soil instead of the rotation of crops. The cultivator proceeds to cut down and burn a block of forest; in this he sows a crop of a grain called kurakkan, or some other fine or hard grain, as it is termed, and after that another crop of the

same description. The soil being then exhausted for about fifteen years, he proceeds to cut down a fresh patch and subject it to a similar process.

It requires the greatest care and attention on the part of the Government Agents and the headmen to prevent constant encroachments on the forests. In too many cases the headmen connive; in some they are themselves implicated; and it requires unceasing vigilance on the part of the Government Agents to resist a system to which the natives are, from their disposition and character, attached, and which is in some cases a necessity, and must be admitted to a large degree.

The natives are attached to it because, whereas the rice crop is not more than ten-fold, they obtain forty-fold from kurakkan on young chena, and even five-hundred-fold from old and rich forest, together with the second crop. It suits their indolent habits, because, whereas paddy cultivation requires work and attention, chena is the easiest and laziest cultivation. The seed once thrown in the ground, nothing more remains than to surround the patch with fence-sticks till it grows up, and in the meantime they can loll about the village in idleness.

It is for this miserable cultivation that the finest and most valuable timber has been exterminated. The larger and older the timber, the more irresistible is the desire to fell it.

It is a wretched system in every respect, as bad for the cultivator as for the Government. It confirms his natural laziness and indifference. It discourages any attempts at permanent improvement by draining, clearing, and manuring; a close, unhealthy jungle takes the place of open forest. It interferes with paddy cultivation; chenas are cleared at the time of the year when the tanks should be repaired and the bunds exposed and strengthened—that is, at the dry season. They have to be fenced just when the paddy fields should be watched and watered.

On the other hand, as said before, this chena is in some cases a necessity. In the great and neglected district of Nuwaraklàwiya, in which stands the city of Anuràdhapura, there are 1,574 villages and 1,600 tanks. Not one tank has a proper sluice, and in some seasons the villagers are unable to obtain water except for a very small portion of their land. "Give us water, and then you can speak to us about chena," is their universal language to me in my journeys.

In all the Central Province chena is admitted on certain recognized principles. Every paddy field has attached to it a piece of high land, technically known as its appurtenance, and no proof is required to establish a private right to this appurtenance, which is in ordinary cases in the proportion of three to one to the mud land; that is, a paddy field of two acres would be allowed an appurtenance of six acres of high land. In some districts where the chenas are poor, a larger extent is given. No objection whatever exists to these appurtenances, nor to the cultivation of chena on Crown land by license, care being taken that no encroachment is allowed on land containing valuable timber. A certain amount of chena is necessary for the occasional cultivation of fine grain, for fence-sticks and small wood for agricultural purposes, and for the pasture of cattle.

But the subject is embroiled by constant encroachments beyond the legitimate appurtenance, and by claims against the Crown—some fraudulent, some legitimate.

I have therefore considered it necessary to take this chena question seriously up, and by appointing surveyors solely for the work, to have claims defined, examined into, and settled, and appurtenances marked out. I trust, though considerable time must elapse before the completion of this work, that each year will see it on a better footing.

As irrigation is extended, chena will be checked and reduced. In the Eastern Province, where paddy cultivation has been so greatly extended, chena is almost entirely forbidden, and it is a remarkable fact that when you enter the Eastern Province from the Northern, the boundary is defined by the fine and valuable forest on the one side and the low jungle on the other. I have also made it a point of impressing on the Government Agents the necessity of warning their headmen that future encroachments on valuable forest land will be published with severity.

Secondly, the absence of all system in cutting timber in the Crown forests.

The plan hitherto pursued of felling timber has been extremely defective. The timber trader applies for a license to cut a certain number of logs. He is supposed to be supervised by the headmen, but as the trees are scattered here and there at long distances, no real supervision is exercised, and he is enabled to cut pretty well as he likes, and to stow away the trees until an opportunity arrives for their removal. I mentioned in my Address to the Legislative Council last year, that in the Trincomalee district alone the timber which was fraudulently cut and hidden in the jungle, but which was discovered by large rewards being offered, sufficed to supply the wants of the timber trade in the Eastern Province during the year 1872.

Nor is that all. The wasteful mode of cutting the timber is lamentable. The tree is allowed to fall without any precaution or previous lopping, and brings destruction to all the saplings within its reach. One log is perhaps cut out, and the rest of the tree, most valuable timber, is left to rot.

This is not so bad as the destruction caused by chena, for the forest recovers itself, and though the Government loses the royalty on the timber fraudulently appropriated, still it is not converted into ashes, but is applied to use.

All this has been going on for years, and no care has been taken to replant the forest so cut down; the consequence is, that all valuable timber has disappeared from the most accessible parts of the Island, and that a country preeminently fitted for the growth of every kind of valuable tropical timber—teak included—has been reduced to the condition of having to import the very article which it is most fitted to produce.

I trust that the appointment of Foresters and strict supervision of the forests will now effectually arrest the evil. The replanting of the blocks in places easy of access will be proceeded with, and I shall endeavour to introduce largely the growth of teak into the Island. The Dutch were well aware of the value of this tree, and made extensive plantations of it. Some of the piles recently taken out of the Màtara Bridge, of Ceylon teak, although after fifty years' use, were perfectly sound in the core; and there are several bridges in the Southern Province with teak beams and planking, thoroughly sound though laid down fully half a century ago.

I do not expect at first to recoup the expense of the forestal establishment by corresponding increase of revenue; but I have no doubt that the revenue will increase, and that each year will, if the Foresters do their duty efficiently, add to the wealth of the Island by the preservation of existing forests and by the replanting of large tracts now denuded of all valuable timber. With this object I propose to establish a large number of small nurseries in connection with the tanks under the irrigation guardians. This will involve but a very trifling expense, as hardly any would exceed a quarter of an acre in extent.

Thirdly, the sale of forest land at inadequate value.

On this point I need say but little, as I trust the practice has been finally put an end to. It has been too often the custom for Government Agents, in order to swell the revenues of their Provinces, or perhaps from carelessness and indifference, to allow fine forest land in the most accessible places to be sold at the upset price of £1 per acre. This has prevailed in the Southern and North-Western Provinces. The land is bought, not by cultivators, but by timber dealers, merely for the sake of the trees, a portion of which fully repays the whole cost of the land. The block, when the timber is cut out, is allowed to lie waste and to become overgrown with close pestilential jungle.

The remarks of the Auditor-General, Mr. Douglas, apply forcibly both to this and the preceding head:—

"To sum up this portion of the subject, the evil at the root of the whole timber question would appear to have been the policy of Government in endeavouring to obtain for the moment the maximum amount of revenue out of its forests, with the minimum of expenditure, if indeed it may not be said without any expenditure at all, leaving the future to take care of itself. The end of such a system is very obvious, and unless effectual measures are taken to prevent it, is not far distant."

Fourthly, the want of proper reserves of Crown forests being maintained in the coffee districts.

To this subject your Lordship's Despatch is chiefly directed, and I am glad to be able to reassure you on the main point of Dr. Hooker's letter, that the clearing for coffee cultivation, both in regard to what has been cleared and what is likely to be cleared, is so infinitesimal (though doubtless large in acreage), compared with the enormous extent of forest above the height at which it is supposed coffee can be cultivated, that no apprehension whatever need be felt as to any injury to the climate arising on this account.

It is generally considered that coffee planting cannot be pursued with advantage at an elevation much beyond 5,000 feet, but the great mountain ranges in the Central Province run up to between 7,000 and 7,500 feet, leaving a zone of 2,000 feet untouched. On ascending the top of the highest mountain, Pidurutalágala, 8,296 feet, which is clothed with wood to the summit, the eye wanders over a tract of apparently unbounded forest, amid which the tilled patches are almost lost.

I have requested the Surveyor-General to furnish me with an estimate of the forest cleared and standing in the Central Province. It is only a rough estimate, of course, but it will at once show your Lordship that the great bulk of the mountain woodland is untouched.

	Acres.
Coffee land sold	395,645
Planted	210,170
Private forest standing	85,475
Private chenas and patanas	100,000
	395,645
Unsold chenas, waste lands, forest, and heavy jungle ..	1,657,620
Lakes	48,000
Rivers	14,000
	1,719,620

The total number of acres of coffee land sold in the whole Island is estimated at 450,000 acres, of which 231,000 are planted. The total number of acres of forest and heavy jungle is estimated at 6,192,389 acres; while chenas, waste lands, lakes, and rivers are taken at 7,513,855 acres.

As only an infinitesimal proportion of these chena and waste lands are not under vegetation, your Lordship will perceive how small a proportion of the soil of Ceylon is exposed to desiccation,

and I regret to add that the amount of forest still available for coffee is but of small extent, unless cultivation under shade is adopted, and coffee planting is carried on in comparatively low districts.

When addressing my Council last year, I had made every inquiry into the climatal branch of the subject, and did not allude to it, believing it to be unnecessary; and I have the full authority of Mr. Thwaites to state that he has no apprehensions in regard to the climate being affected by the coffee clearings, past and to come, but that he considers it to be highly expedient that reservations of Crown forests should be maintained, especially on the crests of the hills in the coffee districts, and in the hill districts immediately facing the dry low land of the northern and other portions of the Island.

I entirely concur in the views of Mr. Thwaites, not only for climatal reasons, but in the interests of the planters themselves. Nothing can be more short-sighted than clearing the crests of the hills. The mischief arising from doing so is felt not only in the loss of valuable soil, which is at once carried away from the plantations by the torrents which rush down from these hill tops; these reserves also act as screens against the wind—one of the great drawbacks to the success of the crop—and they maintain springs and moisture, which are of great value to the planter. The want of fuel, too, in a few years after a plantation is cleared, makes itself felt, and the coolies are dissatisfied and unwilling to remain if compelled to go long distances to obtain sticks to cook their provisions. Moreover, wherever there is a native population, it is an act of downright cruelty to them to allow tracts of forest land, especially those small patches which grow in the vicinity of the grassy prairies, known here as "patanas," to be cleared.

In these patches the natives obtain their fence sticks, wood for fuel and for building, and shelter for their cattle, and it is almost tantamount to expulsion to clear them. On the other hand, their fertility makes them to be sought after by the planters.

Before the receipt of your Lordship's Despatch, I had issued instructions to the Government Agent of the Central Province on this subject. You will see by them that I have desired that in all future sales of forest land for coffee planting, reserves of Crown land are to be maintained, the crests of the hills are to be preserved, and the wooded ravines in the "patanas" are to be generally excluded.

The Government Agent for the Central Province, Mr. Parsons, and the Surveyor-General, quite concur in my views upon this subject, so much so that there would henceforth have been no need for these instructions; but I considered it necessary that there should be no doubt as to the policy of the Government for the future, and that these definite instructions would enable them to resist the constant pressure to put up lots of land which it is expedient to retain as the property of the Crown.

In regard to that portion of Dr. Hooker's letter referring to the denuded condition of some of the smaller West India Islands, I may take this opportunity of mentioning that Sir Hudson Lowe, when in Ceylon, imported from Brazil the lantána as an ornamental plant. It is now overspreading the Island below a certain elevation, between 2,000 and 3,000 feet. It is stated that the moisture retained in the soil by the dense vegetation of this plant, combined with the humus formed by the decay of its leaves, is already renovating land abandoned and worn out. Mr. Thwaites is of opinion that it might be introduced with advantage into these West India Islands, and ultimately prepare the soil for the replanting of them.

May I request your Lordship to allow me to lay your Despatch and Dr. Hooker's letter, with my reply, before the Legislative Council, should I consider it expedient to do so, and also to permit Dr. Hooker to see these remarks on his letter. If Dr. Hooker had been in the Island during the almost constant rain which has prevailed in the coffee districts since May, he would not be apprehensive of the desiccation of Ceylon.

I am, &c.,

W. H. GREGORY.

P.S.—I enclose for your Lordship's information rules which I have issued for the guidance of Conservators of Forests.

Enclosure.

RULES for the guidance of CONSERVATORS of FORESTS.

IT will fall within the duties of the Inspectors of Forests,—

1. To ascertain and mark down the localities in which the forests have been least disturbed; to find out the kinds of trees occurring in them; and to arrive at some kind of calculation as to the proportion respectively of those trees which are of most value. In cases of difficulty in determining the kinds, specimens should be sent to the Pérádeniya Botanic Garden for identification: a small branchlet with a few leaves upon it would be sufficient.

2. To devote particular attention to those forests from which much valuable timber had been already taken. It would, no doubt, be found that a considerable number of young trees of the most important kinds were growing upon the land. These should be the objects of especial care, and worthless scrub and entangling creepers should be cleared away from about them, so that their growth be unimpeded. It should be borne in mind that much time and trouble may be saved by taking care of valuable young plants already in existence, instead of raising fresh supplies from seed for the same localities.

3. To raise, under certain circumstances, trees of valuable kinds from seed. Before this is undertaken, due consideration should be given as to the conditions necessary for insuring success.

Good drainage is absolutely necessary. It would be useless to plant in swampy ground.

There must be a good supply of water, at a convenient distance.

The ground selected for a plantation should be cleared without burning, so that every particle of vegetable matter may be available for the nourishment of the young trees to be put in.

Seeds should be sown as soon as possible after being gathered, and should by no means be dried previously in the sun. Many kinds of seeds are spoilt for germinating after they have become partially dry, the large fleshy or oily seeds especially.

Seeds not perfectly ripe should never be sown, as such invariably produce weakly plants, if they come up at all.

In a dry climate it will be necessary to raise seeds either in pots or boxes, or in very carefully prepared beds, sheltered from the sun. The earth in which the seeds are sown should be kept always moist, though not too wet, and particular care should be taken that the necessary watering is not omitted after the seeds have begun to germinate.

Seeds, when sown, should not be put in too deep, and the covering layer of soil should be mixed with a large proportion of sand.

The seeds of ebony, tamarind, and ná (*Mesua ferrea*) may be sown in beds, but it would be best to raise the seeds of satinwood, mahogany, mililla (*Vitex altissima*), halmalilla (*Berrya ammonilla*), paloo (*Mimusops indica*), and tammanna (*Mischodon zeylanicus*) in pots or boxes.

In a moist climate, such seeds as those of jack (*Artocarpus integrifolia*) and del (*Artocarpus nobilis*) may be sown in the places the plants are to permanently occupy, but the seeds of champac (*Michelia champaca*), calamander (*Diospyros quæsita*), and some others of the ebony tribe, and of the nadoon (*Pericopsis mooniana*), &c., had better be raised in beds.

Of the teak (*Tectona grandis*), a most valuable timber tree, and to the planting of which it is desired that particular attention be given, the seeds do not come up freely, and should be immersed in warm water for twenty-four hours before they are sown, and the beds into which they are put should be well littered with decaying leaves.

Transferring the various kinds of young plants from the seed-beds to the nurseries, and from these latter to where they are to be planted out, requires most careful manipulation, so that no injury may be done to the tender roots. It must not be supposed that seedling tree plants in general will bear without injury the treatment that young coffee plants can bear when being transplanted.

When the seedlings are an inch or so in height they should be moved into the nurseries and planted in rows, each seedling at a sufficient distance from its neighbours to allow of its being taken up, when sufficiently large for planting out, with a good ball of earth about its roots, and without disturbance to the roots of the contiguous plants.

If bamboo stems can be procured of sufficient size for making into pots for the young seedlings, these latter should be transferred from the seed beds into such pots, in which they might remain until large enough to be planted out.

Bamboo pots are made by cutting the bamboo stem across under each of its nodes or knots; the partition or diaphragm at the node forms the bottom of the pot, and an aperture has to be made in it to allow superabundant moisture to escape when the plant is watered.

In transferring the young plant to the plantation from the bamboo pot, the latter must be split down on opposite sides into two halves, one of which can be carefully lifted off, and then the other; and the plant can then be put into the hole prepared for its reception, taking care it is a little raised above the level of the soil to allow for sinking, since a depression in the ground about a young plant is particularly to be avoided, as causing a settlement of water in wet weather.

In dry weather regular watering would be necessary until the roots of the young plants had reached a depth where there should be a sufficient constant supply of moisture for their requirements.

The plantation of young trees should be kept well littered with dead leaves, cut grass, or branches of otherwise useless trees or shrubs (lantána, &c.) Certain soft-wooded, rapidly-growing trees should be planted as nurses for the more valuable plants, to protect them from too much sun. The branches of these soft-wooded trees could be lopped at stated times, and used for littering the soil, with great advantage to the valuable young trees, as furnishing them with a good manure.

By order of the Governor,
ARTHUR N. BIRCH,
Colonial Secretary.

Colonial Secretary's Office, Colombo,
29th July, 1873.

The Hon. the COLONIAL SECRETARY to the GOVERNMENT AGENT, Central Province.
(No. 300.)

SIR,— Colombo, 3rd July, 1873.

I am directed by the Governor to acquaint you that the complete denudation of the

forests, for the purposes of coffee planting, has become a serious evil. It is an evil which presses hard on the natives, who are in consequence debarred from obtaining fence-sticks and wood for building and agricultural purposes. It is an evil which will ere long make itself felt among the planters themselves, when they find themselves unable to procure timber for general use, and specially firewood for their coolies.

For these reasons I am to instruct you that, in laying out future allotments of land for sale, certain reservations should be maintained, and it is highly important that the small detached valleys among the patanas, among which timber grows, should on no account be sold, except in localities where it is clear that there is no population to be affected. You should take an opportunity of pointing out to the surveyors the reservations you consider necessary; they can then be marked out and laid down on a map.

I am, &c.,
JOHN DOUGLAS,
Acting Colonial Secretary.

The Earl of KIMBERLEY to Governor the Right Hon. W. H. GREGORY.

(Ceylon, No. 256.)

SIR,— Downing Street, 31st October, 1873.

I have to acknowledge the receipt of your Despatch No. 237, of the 31st of July, respecting the measures proper to be taken to arrest the destruction of forest in Ceylon.

I have read your report with much interest, and I trust that the measures which you are now taking will be attended with success.

I communicated your Despatch to Dr. Hooker, and I transmit to you a copy of a letter received from him in reply.

You are at liberty to lay this correspondence before Council, or make it public in any other manner you may see fit.

I have, &c.,
KIMBERLEY.

Enclosure.

Dr. HOOKER to Mr. HERBERT.

SIR,— Royal Gardens, Kew, 22nd October, 1873.

I herewith return Governor the Right Hon. W. H. Gregory's Despatch, and the rules for the conservation of the Ceylon forests, which Lord Kimberley has been good enough to forward for my perusal.

This able and exhaustive document has interested me greatly, and given me much new information regarding a Colony in which I have long taken an active interest.

I am extremely glad to find from it that I had exaggerated the amount of forest destruction attributable to coffee planting, a matter in which it appears that I have been misinformed by some of the most intelligent of the planters with whom I am acquainted, and who probably included the chena cultivation in the same category with the coffee.

The duty of conserving the natural resources of the colonies for the benefit of future generations, whilst encouraging a fair use of them by the present, is becoming the most pressing and arduous duty of those entrusted with their government, and Mr. Gregory's enlightened views and energetic action leave nothing to be desired in this respect in so far as the Island of Ceylon is concerned.

I observe in a marginal note an allusion to the cultivation of tea and chocolate in the hitherto uncleared parts of the Island. The introduction of the tea plant (due, I believe, to Dr. Thwaites) will, should no unforeseen cause interfere, no doubt be carried on in the upper regions of Ceylon to an immense extent, and be exceedingly profitable.

This will inevitably lead to the destruction of the forests in those regions where it is, as Governor Gregory's Despatch points out, of paramount importance that they should be preserved.

With the view of obtaining reliable data for the guidance of the Government in future, I would suggest that comparative observations of the rainfall and humidity should, as soon as possible, be systematically made on both the leeward and windward slopes of several remote stations in the mountain region. Such observations are of the simplest description, and require neither skilled observers nor costly instruments, and those for rainfall might be made with self-registering gauges, inspected once a week, or even less frequently. The results should be reported upon annually, and every publicity given to the reports.

With regard to chocolate, for which the lower parts of the Island are probably exceedingly well suited, it will interest Lord Kimberley to know that Dr. Thwaites has sent samples of Ceylon chocolate to Kew, which I have had reported upon by two of the principal English importers, and the reports have been sent to the colony. The samples are promising, but not yet fit for the market. As the cultivation improves, the quality will also, and I look hopefully to this improvement being soon realized; meanwhile I have sent to Dr. Thwaites full instructions as to the curing of the seed, together with samples of the best kinds procured from the West Indies, as standards to be worked up to in Ceylon.

I am, &c.,
Jos. D. HOOKER,
Director.

R. G. W. Herbert, Esq., Under Secretary.