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1865

CAPE OF GOOD HOPE
PARLIAMENT
LEGISLATIVE COUNCIL
SELECT COMMITTEE TO
CONSIDER THE COLONIAL
BOTANIST'S REPORT



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REPORT

OF THE

SELECT COMMITTEE

APPOINTED BY THE

LEGISLATIVE COUNCIL

TO CONSIDER THE

COLONIAL BOTANIST'S REPORT.



Published by order of the Legislative Council.
1865.

CAPE TOWN :

SAUL SOLOMON AND CO., STEAM PRINTING OFFICE
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Published by order of the Legislative Council.
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REPORT

OF THE

SELECT COMMITTEE appointed by the **LEGISLATIVE COUNCIL** on the 4th August, 1865, "to consider the Colonial Botanist's Report."

PRESENT :

Mr. VIGNE (Chairman),

Mr. van Breda,
Mr. Busk,

Mr. Wicht.

The Committee appointed by the Honourable the Legislative Council to consider the Colonial Botanist's Report for 1864, beg leave to present their report.

Your Committee are of opinion that the information obtained from the evidence of the Colonial Botanist is of a valuable and, generally speaking, practical character.

From his unavoidable absence on an official tour, the Committee had it not in their power to complete their inquiries; but sufficient information was obtained to satisfy them that there exists a necessity for a change in the system of management of all the forests in the various parts of the Colony,—which, from their great extent, and the valuable timber contained in them, ought to be, and might be made, a source of revenue to the Colony; whereas the trifling amount now received from them is scarcely sufficient to cover the expense of their conservation.

In the opinion of your Committee, the present system on which licences are granted for cutting timber is bad, and should be revised. It yields only a trifling annual income, and is very destructive by waste to the forests themselves, which are every day diminishing in size and value. From the great extent of these forests, and their comparatively slight supervision, a compliance with the conditions of the licences cannot be enforced.

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In the opinion of your Committee, the observations contained in this Report respecting the formation of reservoirs, dams, and vleys or shallow lakes, for the preservation of water, are deserving of serious consideration; and if any expenditure on public works is authorized by Parliament, works of this character should occupy a prominent part.

The Committee, therefore, beg leave to direct the attention of the Council to the further information elicited upon these important subjects by the evidence which they have taken, and to recommend that the same be submitted to His Excellency the Governor for his consideration.

H. T. VIGNE, Chairman.

Committee Rooms, 6th October, 1865.

PROCEEDINGS OF COMMITTEE.

Monday 14th August, 1865.

PRESENT :

Mr. Vigne,
Mr. Cock,

Mr. Busk,
Mr. Wicht.

Resolved, that Mr. Vigne do take the chair.

The Chairman reads Order of Council, dated 4th August, 1865, appointing the Committee.

Dr. J. C. Brown, Colonial Botanist, examined.

Committee adjourns till Wednesday, the 16th instant, at half-past 10 o'clock.

Wednesday, 16th August, 1865.

PRESENT :

Mr. VIGNE (Chairman),

Mr. Pote,
Mr. Wicht,
Mr. van Breda,

Mr. Cock,
Mr. Busk.

Dr. Brown further examined.

Committee adjourns till Monday, the 21st instant, at 10 o'clock.

Monday, 21st August, 1865.

PRESENT :

Mr. VIGNE (Chairman),

Mr. Pote,
Mr. Cock,

Mr. van Breda,
Mr. Busk.

Dr. Brown further examined.

Committee adjourns.

Friday, 6th October, 1865.

PRESENT:

Mr. VIGNE (Chairman),

Mr. van Breda,
Mr. Busk,

Mr. Wicht.

The Chairman submits draft Report.

Agreed to, and the Chairman instructed to report to Council accordingly.

MINUTES OF EVIDENCE.

COMMITTEE ON COLONIAL BOTANIST'S REPORT.

Monday, 14th August, 1865.

PRESENT :

Mr. VIGNE (Chairman),

Mr. Cock,
Mr. Wicht,

Mr. Busk.

Dr. *J. C. Brown* examined.

1. *Chairman.*] You are Colonial Botanist?—Yes.
2. You are aware, Dr. Brown, that this Committee has been appointed to consider your report?—I am.
3. You have bestowed considerable attention on agriculture and arboriculture, and visited various parts of the Colony?—Yes; I have been from this to King William's Town, thence to beyond the Orange River, and from that to Port Elizabeth. I have also visited Clanwilliam.
4. I believe the forests of this Colony are under the supervision of superintendents at present, are they not?—One of them, the forest in the district of Uitenhage, is under Capt. Harison, as conservator of forests. Those of George are under charge of the civil commissioner of George. Those at the Knysna are under the civil commissioner of the Knysna. Those at Katberg and Cedarberg are understood to be under the superintendence of the civil commissioners of those places. I do not know whether it would be premature to speak of the forests of British Kaffraria.
5. We would be glad if you can give us any information regarding them?—In Kaffraria the form of licences is different from that of those given in this Colony, and I am not aware that any conservator has been formally appointed.
6. Has anybody a right to cut wood there?—No one has a right to cut wood without a licence.

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Dr. J.C. Brown 7. Then the duty of the superintendent is to give a licence to cut?—Yes.
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8. What is the nature of the licence to cut wood in the George forests?—At George and the Knysna the licence must specify the description of wood to be felled and removed, and no licence must cover more than two loads of any kind of wood. It must also state the number of men intended to be employed in cutting the wood specified.

9. Mr. *Wicht.*] What is the charge for the licence?—£1; but in Katberg it is understood that the charge per licence is 6s., whilst in Clanwilliam no charge whatever is made.

10. What may be the charge in the Tzitzikama forests?—I presume the same as at George and the Knysna.

11. And in British Kaffraria?—It is there charged by the "saw," or so much for each saw, per three months.

12. Are there any steam saw-mills employed?—There is at least one mill worked by water-power employed in the Kaffrarian forests, and a special arrangement is made, but upon the same principle.

13. Have you any idea of the quantity that can be cut with one saw in three months?—I cannot tell.

14. What check is there that the party who pays so much for a licence takes away only a certain quantity?—In the George and Knysna forests the regulation is that no timber is to be removed from the place where it is worked, nor is any to be sold till it has been inspected by the ranger, and the proper endorsement made by him on the licence. Nor is any timber to be taken to any private homestead to be dressed. This must be done on the ground before it leaves the forest.

15. Mr. *Busk.*] Are these rules strictly adhered to?—I believe not.

16. Mr. *Wicht.*] You do not know what is the charge per saw in British Kaffraria?—It is 50s. for three months; but I believe the arrangement has not been found to work well.

17. Are licences a sufficient protection to the forests?—They might be if the system were properly wrought out; but that is difficult, and probably impossible, without increasing the number of rangers.

18. Are you aware that under Mr. Montagu, a former Colonial Secretary, the system of licences was done away

with, and that he rather encouraged the sale of forest land to private individuals?—I have heard that Mr. Montagu was opposed to granting licences, and that he proposed the sale of the forests.

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19. Did that promote the sale of Crown lands?—I cannot tell.

20. Parliament then reverted to the old system of granting licences. How many years is that about, do you recollect?—I suppose about ten years.

21. Did not those who had bought ground consider themselves ill used when the licence system was re-adopted?—They did. I am aware of the fact.

22. Is there much wood destroyed in these forests?—A great deal. There is very much waste.

23. A number of young trees are cut down to get at a large one?—In that way a great deal is destroyed; and also frequently a tree is half felled, and found unsuitable, and it is left to decay. Sometimes large valuable trees are cut down, and only a small portion of them used. Perhaps a few beams of twenty feet long are required; these are cut out, and the rest left to decay. One case of this kind is mentioned in my report on the Conservation of the Forests, appended to the Colonial Botanist's report for 1863. The tree measured three feet six inches in diameter, and twelve-inch beams only were required. No other appliances than the axe and the adze being at command, it was cut to the required length, and chips were cut off the one side and the other till it was reduced to a slab twelve inches thick, and this was sent to a saw-mill to be cut into such breadths as were desired.

24. Mr. *Busk*.] Is the charge for licences, then, only calculated for the worked timber?—Yes. In the forests of George and the Knysna a load of wagonwood consists of two complete "loops." A load of yellowwood consists of eighty cubic feet, if one log, or of fifty planks of twenty feet by twelve inches by one inch. A load of stinkwood consists of ten planks, twenty feet by twelve inches by three inches, or fifty cubic feet.

25. Would it not be an improvement to alter the terms of the licences to rough measurement, in order to prevent the waste exemplified in your previous answer?—I fear it would be impracticable, more especially in regard to wagonwood.

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26. *Mr. Cock.*] Would that apply also to large trees out of which beams and planks are cut?—It is not impossible to carry out such a measure, but it would be difficult. It is very desirable that the forest-rangers should mark the trees to be cut down; but that, at present, is found to be almost impracticable; and it would add to the difficulty if he had not only to mark the tree, but to calculate the measurement of it. I should also anticipate unceasing disputes between the ranger and the wood-cutter in respect to the measurement.

27. *Chairman.*] What is the entire revenue derived from the forests?—It appears to have been last year under £275.

28. *Mr. Wicht.*] And what is paid to the rangers?—Something under £1,000. The revenue is something under £275 over the expenses of conservation and rangers. The expense of conservation of the George forests was last year about £65 over the revenue, and that is the case with others. The Knysna forest and that of the Tzitzkamma are those from which alone a free revenue appears to be derived.

29. *Chairman.*] Has there been any alteration with regard to revenue during the last few years?—About three years ago the amount of proceeds was about £750, now it is less than £275.

30. *Mr. Busk.*] Can you suggest any mode by which the waste, an instance of which you have quoted, can be prevented in future?—In my original report, already referred to, I suggest that encouragement should be given to private parties to erect saw-mills; the encouragement I contemplate being, granting to them for a definite period of considerable duration the exclusive privilege of cutting timber in a well-defined locality of considerable extent, upon terms satisfactory to all concerned,—satisfactory to them and remunerative to the community for what is cut down or otherwise destroyed.

31. *Chairman.*] In your opinion, have the forests increased or diminished within these last few years in size?—They are being considerably diminished.

Wednesday, 16th August, 1865.

PRESENT :

Mr. VIGNE (Chairman),

Mr. Wicht,

Mr. Busk,

Mr. Pote.

Dr. *Brown* further examined.

32. *Chairman.*] You have stated to the committee that considerable diminution has taken place of late years in the extent of the colonial forests. Have you any suggestions to offer in regard to their preservation, or the planting of trees?—I reported fully upon the subject last year. Queries have been issued from the Colonial Office relative to statements in that report, and all of the replies received to these queries, together with a great deal of additional information, have come into my possession, any portion of which I am prepared to communicate to the committee.

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33. You referred to a letter to the Colonial Secretary. Will you state the nature of that report?—In that report I gave illustrations of meteorological laws regulating evaporation, adduced a number of facts to show that the destruction of trees desiccated the climate, reported a number of facts illustrative of the waste of timber going on in the forests of the Colony, and suggested certain measures with a view of arresting this destruction of forest timber, and replacing, by plantations, the trees destroyed.

34. You state that you have received replies to the queries issued from the Colonial Office. Will you state the nature of these replies?—One of the queries was, "To what extent are your observations in accordance with those reported by the Colonial Botanist?" Most of the gentlemen furnishing replies confirm all I alleged, more especially in regard to the great destruction of timber going on in the forest, and the probability of this increasing the aridity of the climate.

35. From whom were those replies received?—The circular was addressed to all civil commissioners of districts in which there are forests; to all conservators of forests; to all forest rangers; and to upwards of forty gentlemen residing in different parts of the Colony of whom it was supposed

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that they might be able and willing to supply information such as was desired. Replies to these queries were received from the following six gentlemen, taking an interest in the conservation and utilization of the forests, viz.: J. Blake, Esq., civil commissioner and conservator of forests in the district of the Knysna; W. D. Vigrim van Alphen, Esq., civil engineer, George; Capt. Harrison, conservator of forests in the district of Uitenhage, and resident at the Tzitzikamma; Mr. Pillans, ranger of Crown forests in district of Van Staden's River; Mr. Nightingale, Ranger of Crown forests in district of Alexandria; and Mr. Small, of the firm of Messrs. Haynes and Small, formerly proprietors of Victoria saw-mill in forest near King William's Town. Replies were also received from the following eleven gentlemen who have given attention to the planting and culture of trees, viz.: Lieutenant-Colonel Blagrave, late of Wynberg, and formerly assistant superintendent of canals and forests in Scinde; E. L. Layard, Esq., F.Z.S., M.E.S., &c., and curator of South African Museum; R. H. Arderne, Esq., one of the commissioners of Cape Town Botanical Gardens, formerly timber merchant in Cape Town; J. C. Holding, Esq., secretary to the Western Province Agricultural Society; A. G. Mathieson, Esq., overseer of plantations on the white sands of the Cape Flats; J. Templeman, Esq., nurseryman and seedsman, Cape Town; F. Metcalf, Esq., Voerhoeden, Caledon; the Hon. H. T. Vigne, Esq., M.L.C., Tygerhoek, Zonder End River; W. Tuck, Esq., superintendent of Botanic Garden, Graham's Town; J. Leonards, Esq., Somerset East; and A. V. Jackson, Esq., Lower Nelspoort. Besides these replies received by the Colonial Secretary in answer to the circular, several communications upon one or other or all of the subjects referred to in it have been made to myself by gentlemen to whom copies of the circular had been transmitted. Relating to forest economy, there have been seven communications, from the Hon. H. Barrington, of Portland, near Belvidere, Knysna; C. Sutherland, Esq., resident at the Knysna, and for many years past connected with the timber trade of that port; T. Bain, Esq., superintendent of road now being made through the forests of the Knysna and in the district beyond; Dr. Lawrence, medical officer at convict station in the Knysna forest; C. L. Stretch, Esq., civil engineer, formerly

engaged in prosecuting preliminary arrangements necessary for the making of these roads; Mr. Falconer, formerly connected with saw-mill in Pirie Bush, near King William's Town; and from a gentleman whose communication was marked "private," and must therefore be considered anonymous. From gentlemen taking an interest in arboriculture there have been received eight communications, from P. B. Richardson, Esq., Schoonberg, Langekloof; Walter Smith, Esq., Hermitage, Oatlands, Graham's Town; the Rev. W. R. Thomson, Stockenstrom, Kat River; Robert Hart, sen., Esq., Somerset East; Messrs. Parkes Brothers, Wheatlands, Graaff-Reinet; — Hobson, Esq., Ebenezer, Graaff-Reinet; Dr. Meullen, Colonial Botanist, Melbourne; and E. Brown, Esq., Launceston, Tasmania. Relative to the meteorological connection of rain-fall and vegetation,—besides several which were anonymous, consisting of published statements forwarded to me, there have been two communications received from W. L. Blore, Esq., Wynberg, secretary to the South African Meteorological Society, and Mr. N. R. Janesch, police magistrate, St. Helena.

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36. Will you state the general bearing of these replies?—To the first query, the replies, as I have already mentioned, are corroborative of what is stated in the report. The second query was, "What is your opinion in regard to the practicability and expediency of carrying out any or all of the suggestions he (the Colonial Botanist) has made?" Most of the answers go to show that it is practicable and expedient to carry out such suggestions. The third query was, "What other suggestions can you offer as a means of counteracting the evils upon which he has reported?" Several suggestions are embodied in the replies received; one of which is the establishment of a Forest Academy, which is recommended by more than one of the gentlemen replying to the query. Another is, the obtaining a report from some party in Europe qualified to ascertain the economic uses to which our timber can be applied. The fourth query is, "What information can you supply in regard to the soil and situations to which different species of indigenous trees are confined?" The information goes to show that they are almost exclusively confined to mountain kloofs. The fifth query is, "Are you acquainted with any experiments which have been made in this Colony in raising from seed trees of South African or

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foreign species ; and if so, what were the results, and what were supposed to be the causes of success or failure?" On this subject much information has been supplied. The sixth query is, "What trees do you consider most likely to prove profitable in cultivation, what are the grounds on which your opinion rests, and what is the course of procedure you would recommend as most likely to secure success?" In answer to this, a large mass of information has been received, tending to show that is most expedient to attempt the artificial cultivation of Australian and European trees.

37. *Mr. Wicht.*] If the Australian trees are exposed to frost, does it not tend to destroy them?—It does, but there are many districts of the Colony not subjected to frost ; and there are European and other cone-bearing trees which can withstand intense frost.

38. *Chairman*] What sort of trees do you think ought to be planted as the best species for this climate?—Bluegum and other species of Eucalyptus ; blackwood, and other species of Acacia ; cluster-pine, or spar-denue ; stone-pine, or kroon-denue ; and different species of oaks.

39. Do not pines stand drought better than any other tree?—I cannot say that they stand it better than all other trees, but they do withstand drought, and grow in sandy soil.

40. *Mr. Pote.*] They love a rocky habitat, do they not?—Several do.

41. *Chairman.*] Why are Australian trees preferable?—This is a climate according to their native habitat, and, as a general rule, we find that plants manifesting some of the specific qualities which the species of Eucalyptæ do thrive well in other districts than those in which they are indigenous. For example, it is alleged by Darwin : "Widely-ranging species, abounding in individuals, which have already triumphed over many competitors in their own widely-extended homes, will have the best chance of seizing on new places, when they spread into new countries. In their new homes they will be exposed to new conditions, and will frequently undergo further modification and improvement ; and thus they will become still further victorious, and will produce groups of modified descendants."

42. You state in your letter to the Colonial Secretary, quoting from a report as to the conservation and extension of forests, the following statement : "The expense incurred

annually in the conservation of the forests seems to be about £1,300. By the sale of licences to cut timber there is received about £2,050 per annum, leaving a balance of £750." Upon what is that estimate founded?—It is founded upon the reports of the conservators for the preceding year.

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43. Can you give us any information as to what was the expense of the conservation of forests when they were closed, when no licences were granted?—The expense of keeping the forests of George and the Knysna closed was £370 per annum, for which expense of outlay no return was received.

44. Mr. *Wicht.*] I believe it was on the ground of expediency that the forests were reopened, and the people formerly employed there complaining that they had no means of livelihood. But in your experience, with regard to these abandoned forests, have you seen trees springing up indigenously?—Yes; but most of the trees are of slow growth. All our valuable trees are of slow growth.

45. In what time do the valuable indigenous trees arrive at maturity, such as the yellowwood, assagai, and stinkhout?—I will furnish the committee with the several periods of their growth by quoting a

Memorandum showing the different Woods of value in the forests of George, and the age at which they are fit to be cut for Trade; furnished by Mr. Haswell to the Hon. Major Hope, when that Gentleman visited the Forests as a Special Commissioner in 1855.

- 1.—Yellowwood.—Grows from seed only; must be 40 or 50 years old before useful timber can be cut from it.
- 2.—Stinkwood.—Shoots from the stump when cut; it also grows from seed; must also be 40 or 50 years old to give good timber.
- 3.—Assegai.—Grows from seed, and also shoots from the stump; is used for wagonwood; becomes useful after 7 or 8 years growth.
- 4.—White Pear.—Grows from seed, and shoots from the stump; of slow growth, and must be 20 or 30 years old to be useful for wagonwood.
- 5.—Saffran.—Grows the same, and requires the same time to be useful as wagonwood.
- 6.—White Eels.—Grows as the others, and requires from 30 to 50 years before useful; it is used for boat-building, for wagon sides, and chests.
- 7.—Red ditto.—Ditto ditto ditto.

- Dr. J. C. Brown.* 8.—Ironwood.—Grows from seed; of slow growth; used for wagons and for firewood.
 Aug. 16, 1865. 9.—Buckenwood.—Grows as the last, and short; used sometimes for wagonwood.
 10.—Red Pear.—Grows from seed and shoots; used for wagon and mill-work.

46. With regard to the oak, does it not require a peculiar soil to come to maturity?—It does. Soil that contains a small quantity of iron is favourable to it. As a general rule, soil suitable for the vine is favourable for the oak.

47. It requires more moisture than the pine?—It does. The pine grows upon comparatively barren spots.

48. *Chairman.*] Can you inform the committee to what extent the Crown forest lands were sold when the licences were withheld?—No; that was before I came to the Colony.

49. Can you inform us what revenue was received from the forests previous to licences being withheld?—No; I know nothing of the pecuniary returns of the forests previous to 1861.

50. Have you any idea what is the market value of timber cut from the forests at present?—I suppose it to be upwards of £12,000 from all parts. In forming this rough estimate I proceed upon the return of Captain Harison, conservator of the forests in George, for the year 1861. He gives the market value of timber removed from the Tzitzikamma, Olifants Hoek, Klein and Van Staden's Rivers, and Zuurberg; and it is nearly ten times the amount received for licence fees and waste wood sold. Finding that last year there were received from all the forests a gross amount of £1,463, I consider I am safe in proceeding on the assumption of the correctness of Captain Harison's estimate, and stating the market value of the timber removed to be upwards of £12,000.

51. *Mr. Wicht.*] Does this include freight, and the expense of bringing it to market?—I do not know. I presume not. I think it was as taken out of the bush, and then sold.

52. *Mr. Pote.*] During your residence in the Colony, have you had your attention directed to diseases in cereals?—I have, both as regards the rust in wheat and the rust in oats.

53. And to the orange and apple disease?—I have gone into the consideration of the orange disease fully; but I have only lately heard of the apple disease.

54. And also to the *oidium* in the vine?—I have. In regard to that I may say there is no improvement on the old plan of dusting with sulphur. In *Dr. J.C. Brown.*
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55. As this is an inquiry of great importance to the public generally, would you favour the committee with your views upon it?—I will.

Monday, 21st August, 1865.

PRESENT :

Mr. VIGNE (Chairman),

Mr. Wicht,

Mr. Busk,

Mr. van Breda,

Mr. Cock,

Mr. Pote.

Dr. *Brown* further examined.

56. Mr. *Pote*.] You promised, Doctor, at our last meeting, to lay before the committee your views on the diseases in cereals?—I have prepared a report on the rust in wheat, and the rust in oats. I am prepared either to read it or present it as an annexure to my annual report. Aug. 21, 1865.

57. Would you briefly state the purport of it?—It shows that what is termed "rust" in plants, as is generally understood, is the effect of a fungoid growth, *i.e.* the growth of a small fungus, the spores or seeds of which are infinitesimally small. These float about, often filling the atmosphere, and wherever they fall on prepared soil they germinate and grow. I have reason to believe that the disease may have been introduced into this Colony in the seed. The practical suggestions I am prepared to give are substantially those given in a letter annexed to the report of the Colonial Botanist for 1863, the sum of which is, "It seems to follow that if the ripening of the grain can be made to take place either at an earlier or a later period than the period at which warm foggy weather occurs, the evil will be diminished."

58. Mr. *Cock*.] Then I suppose dry, hilly situations will be preferable, not being exposed to fog and moisture?—Generally.

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59. Mr. *van Breda.*] Do you think the same observation also applies to barley?—The disease in barley has not been reported to me until now; but the same remarks apply to the rust in whatever grass-plants it attacks; and I believe that, substantially, the same remarks will apply to smut, red robin, and other affections of the cereals.

60. Mr. *Cock.*] Have you been able to discover a remedy for these diseases?—None other than bathing the seed.

61. Mr. *Pote.*] Then there is no remedy you are aware of but that practised by the farmers now in reference to rust in wheat and other grain?—None. But I consider it desirable that more attention should be given to the principle upon which my suggestion in regard to period of ripening is founded.

62. How do you account for the fact that where lands lie contiguous to each other, sown with the same seed, and subjected to the same mode of culture, one piece will develop the rust and the adjoining piece will escape?—Assuming the fact to be so, there are at least two modes in which it may be brought about. The wheat in the one field may be more advanced in growth than the wheat in the other, and the stalk and leaf be then in a state to supply the proper soil for the germination of the spores. Or, from the direction of the wind, spores may be blown upon the one and not upon the other. You require spores and the proper soil. If you have not both at the same time you will have no rust. When I speak of the soil, however, I mean, not the earth, but the surface of the straw.

63. But does not rust attack grain in all stages of its growth, except when it becomes too ripe?—The stage of growth at which it is most injurious is when the ear is filling. If it attack the straw earlier, it produces little effect upon the grain; or if it appear later it produces little effect, and therefore it is not likely to be remarked. But if at any period of growth there be a thin film of decaying matter on the surface of the leaf or straw, and spores be borne by the atmosphere upon it, the disease will appear.

64. Do not the spores interfere with the rising and circulation of the sap in the plant?—My belief is that the rootlets of the fungi penetrating the cellular tissue of the plant do affect the sap, and prevent its ministering to the full and perfect development of the grain.

65. Would not the rust, if it assail the wheat at an earlier date, retard the developement of the plant, and prevent its growth?—I cannot answer the question from personal observation, but I hold that in every case the fungoid growth must be injurious to the plant.

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66. *Chairman.*] Are you aware of any greater inclination in the hollow-strawed wheats to take the rust than in the solid-strawed wheat?—No facts bearing upon this have been observed by me or reported to me until now.

67. *Mr. Pote.*] Do you know anything of the nature of the giant wheats?—No, except that Mr. Sheriff, of Mungoswells in East Lothian, and other experimenters, have gone on selecting productive ears and sowing them in successive years until a sufficient quantity for sale had been produced.

68. *Mr. van Breda.*] Are you aware that if you get seed from any place about twenty miles distant from the place where you intend to sow, neither rust nor any disease have so much effect?—It is generally understood that change of soil is favourable to the developement of a stronger plant better able to resist disease.

69. But would you recommend when no change can be made that they should use other manure than is customarily taken, in order to give the grain what it would get in another place?—It is so difficult to ascertain the material which it would be necessary to supply, and the quantity would be infinitesimally small. I consider that there would be more expense in the present state of agriculture in the Colony to carry out this measure than could be gained by it.

70. But I presume you would generally recommend change of seed?—Yes; and if possible, seed produced in a district where rust does not exist.

71. *Mr. Pote.*] At what interval would you require the seed to be changed?—Every year, if possible. And two farmers could easily arrange to interchange seed annually.

72. For instance, Caledon could exchange with Koeberg, and *vice versa*?—Yes; or even farmers living twenty miles apart.

73. *Mr. Cock.*] May not the poverty of the plant sometimes arise from the shallow ploughing; and would not deep ploughing be more beneficial to the plant?—Much more beneficial, even although it should only bring up a small quantity of pot-clay to mingle with the soil. The sowing of

Dr. J.C. Brown. deep-rooted plants alternate years, also, is very important ;
 Aug. 21, 1865. and if, with this drainage, can be combined, the benefit will
 be the more marked.

74. What do you mean by deep-rooted plants?—Turnips, mangel-wurzel, and similar plants.

75. But would not the wheat itself strike deeper, provided the ploughing were deeper, and consequently give greater strength to the plant?—It would. But alternating the crop of wheat with a crop of beans, mangel-wurzel, or lucerne, would greatly improve the sub-soil for a subsequent crop.

76. In the Eastern Province there is really no occasion for drainage generally ; is it not so?—I have already stated in one of my published reports that paradoxical, as it may appear, in this Colony drainage is not less necessary than irrigation ; and this opinion I find confirmed by the observations of others. Within these last few days, I have had a communication from a lady residing near Graham's Town, detailing the marked benefit seen on one of the fields on her husband's farm from drainage.

77. Speaking of deep ploughing, what is your opinion ; supposing that deep furrows are made between every line of sowing with the drill?—It would be advantageous ; but unless you have skilled ploughmen, the expense would be greater than deep ploughing the whole field.

78. But I am supposing after you have sub-ploughed, in sowing your seed with the drill, you leave an open furrow between each line of drill, would that not give strength to the seed sown?—It would, if there be an excess of moisture in the soil. I fear that otherwise, it would not, to the extent of the expense incurred.

79 *Chairman.*] You suggest in your letter to the Colonial Secretary, "the establishment of an experimental farm, where the probability of profit being realized by the culture of different crops and the utilization of their products may be tested, and whence information on practical subjects connected therewith may be supplied to all requiring it." Upon what scale would you recommend such an institution to be formed ; and what part of the country do you consider best adapted for this purpose?—In an annexure to the report of the Colonial Botanist for 1864, I have given in detail my views of what is required on an experimental farm. I use the term

“experimental farm” in contradistinction to “model farm,” attaching no importance whatever to the latter. I have had correspondence with agriculturists in different part of the Colony, some of whom advocate the establishment of an experimental farm upon a large scale. My own views are very decided in favour of a small scale; and what is principally required is, exact detailed statements as to the soil used; the hours occupied in preparing the soil, sowing, and reaping; cost of labour, cost of seed, and market value of produce,—in order that it may be seen whether it would be profitable or unprofitable in altered circumstances to carry on the cultivation of that particular plant upon a large scale. With regard to the situation, it ought to be near some large central market, that agriculturists might have an opportunity of visiting it, as well as of reading what reports may be published.

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80. Mr. *van Breda*.] Would you include experiments with different kinds of manure?—Yes, certainly. And in my report for 1864, at pages 76 to 80 are given illustrations, of how I consider accounts of such experiments ought to be preserved.

81. Have you any information with regard to manuring with guano, as to what length of time you may continue to use it on the same land?—As long as you please. Its effect is limited to the season in which it is used. You may go on applying it for twenty years, provided the crop requires it. Most of the beneficial effects are experienced only in the year when it is employed, but not all the effects, for the luxurious growth which it induces tends generally to improve the land.

82. Have you observed that land manured for several successive years with guano becomes exhausted, and will produce nothing?—It will always produce something, but may fail to produce the crops, required, because the luxuriant growth to which it has ministered may exhaust some other constituent of the soil necessary to the production of that plant.

83. What sort of manure would you most recommend for wheat?—It would depend entirely on the character of the soil. If it be clay, what is required is simply sand.

84. Do you consider that the use of powdered lime on the surface would be at all serviceable in checking rust?—I

Dr. J. C. Brown. question if it would have much effect in preventing rust. But lime, as a manure, is much required in this Colony; and I fear we are pursuing a suicidal policy in exporting quantities of bones from this Colony, where both the lime and the phosphorus in the bone are so much wanted for agricultural purposes. In Europe they know the value of these substances, and therefore they hold out the bribe of a high price to induce us to export them. It would be far better if they were kept and used here.

85. *Chairman.*] In a dry climate like this, what soil is best suited for wheat?—Sandy soil, on the whole.

86. *Mr. Cock.*] A great deal of the soil in the Eastern Province will not bear manure, being rank and strong. Are you aware of this?—I am now aware of it.

87. Then do you not consider it would be a great advantage if you had an opportunity of travelling and coming into communication with the farmers in various parts of the Colony?—Very great. I have traversed some parts of the Colony at my own expense, I proceed to-morrow on a similar professional tour, and arrangements have been made for conferences being held with agriculturists in villages on my route, and at farms in central positions. At such conferences I have received a great deal of information calculated to be useful in other districts, and have, I believe, supplied information deemed valuable by those who attended the conferences in question. The only difficulty is the want of pecuniary means, the whole of the expenses of such journeys having to be made from my own resources. I have, however, no reason to complain, as I was distinctly informed before leaving England what the terms of the engagement were. In illustration of the importance of such tours through the Colony, I may state that my time has been occupied constantly with correspondence arising out of my tour of 1863, but the whole of the letters I received came from those parts of the country through which that tour led me. From other parts I have scarcely had a single letter, showing by contrast the effect of such communication with the farmers.

88. *Chairman.*] Can you analyse earth yourself, or do you know anybody else in the Colony that can do so?—I could in five minutes put any farmer upon a simple plan of analysing earth so far as he requires to analyse it; and there are in Cape Town, Graham's Town, the Knysna, and pro-

bably in other parts of the Colony, gentlemen competent to give correct analyses of soils.

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89. Mr. *Cock*.] Have you ascertained by analysis what soil is the most favourable for the production of wheat?—I have not done it personally, but I know that a silicious soil, or soil containing a quantity of silex, is favourable. With silex, lime, and phosphorus you may raise wheat anywhere.

90. Would it not be desirable to analyse the soil of a farm subject to rust, and of others that never have rust, in order to see what difference exists between them?—I do not anticipate that the result of the analysis would throw much light upon the rust, but the information would be valuable for other purposes, and of far more value than the cost.

91. Mr. *Pote*.] Have you anything you can communicate with regard to the scale disease of the orange tree?—I have prepared and produce the draft of a report upon the subject of the scale, which, if desired, can be appended as an annexure to the report of the Colonial Botanist for the current year.

92. Mr. *van Breda*.] There is also a disease of the walnut, the chesnut, and the apple tree; have you also given attention to these?—It is only of late that I have heard of the disease affecting the apple tree, and now only hear of a similar disease affecting the chesnut and walnut trees. If specimens of these diseases be sent to me, I shall with pleasure examine and report upon these also in the report of the Colonial Botanist.

93. *Chairman*.] Have you anything to recommend on the subject of forest economy?—I have brought with me statements of the revenue and expenditure of the forests for the last four years. From these it appears that the forests in the district of George, in 1860, yielded a revenue of £312 7s. 7d., and the expenditure that year was £234; showing an excess of revenue of £78 7s. 7d. In 1861, the revenue was £293 18s. and the expenditure £234; showing an excess of revenue of £58 11s. (For 1862, I have not been able to obtain returns). In 1863, the revenue was £188; the expenditure £234; showing a deficit of £46. In 1864, the revenue was £164 17s. 5d., and the expenditure £234, showing a deficit of £69 2s. 7d. Thus there was an excess in the first two years of £138, and in the last two years a deficit of £115 2s. 7d. On the four years, therefore, there

Dr. J. C. Brown. was an excess of £23 3s.; being an average annual excess of £5 15s. 9d.—The forests in the district of Knysna in 1861 yielded a revenue of 1,285, and the expenditure was £451; showing an excess of £834. In 1862, the revenue was £1,087 10s., and the expenditure £416; excess £671 10s. In 1863, revenue £735 4s.; expenditure £422; excess £313 4s. In 1864, revenue £635 17s. 6d.; expenditure £422; excess £213 17s. 6d. In these four years, therefore, the Knysna forests produced an excess of revenue over expenditure of £2,032 11s. 6d.; being an average annual excess of £508 2s. 7½d.—With regard to the forests in the district of Uitenhage, these are all under the superintendence of one conservator, and a portion of his salary ought to be assigned to each ward; but the statements of accounts laid before Parliament make it more convenient to reckon the salary, &c., of the conservator as the expenditure at Zitzikama, and the salary or allowance to forest-rangers as the expenditure at the several wards intrusted to their charge.—The forests in the Zitzikama in 1861, yielded a revenue of £645 19s. 4d. (the market value of timber removed being £6,142 19s.), and the expenditure was £278; showing an excess of £367 19s. 4d. In 1862, the revenue was £541 16s. 1d.; expenditure £278; excess £263 16s. 1d. In 1863, revenue £377 17s. 11d.; expenditure £254; excess £83 17s. 11d. In 1864, revenue £534; expenditure £254; excess £280. Excess in four years £995 13s. 4d.; average annual excess £248 18s. 4d.—The Olifant's Hoek forests produced in 1861, a revenue of £63 13s. 1d. (market value of timber removed £410); the expenditure being £97; showing a deficit of £33 6s. 11d. In 1862, the revenue was £61 1s. 6d.; expenditure £97; deficit £35 18s. 6d.; 1863, revenue £35 16s.; expenditure £85; deficit £49 4s.; 1864, revenue £60 15s.; expenditure £85; deficit £24 5s. Deficit in four years £142 14s. 5d.; average annual deficit £35 13s. 7d.—The Klein and Van Staden's River forests produced in 1861 a revenue of £30 10s. (market value of timber removed £360); and the expenditure was £50 10s.; showing a deficit of £19 10s. In 1862, the revenue was £41 10s.; expenditure £50; deficit £8 10s. In 1863, revenue £8 10s.; expenditure £50; deficit £41 10s. In 1864, revenue £19; expenditure £50; deficit £31. Deficit in four years £100 10s.;

average annual deficit £25 2s. 6d.—The Zuurberg forest in 1861 produced a revenue of £66 3s. 10d. (market value of timber removed £492); and the expenditure was £140; showing a deficit of £73 16s. 2d. In 1862, the revenue was £27 14s. 1½d.; expenditure £183; deficit £155 5s. 10d. In 1863, revenue £41 4s.; expenditure £165; deficit £123 16s. In 1864, revenue £48 16s. 3d.; expenditure £165; deficit £116 3s. 9d. Deficit in four years £469 1s. 9d; average annual deficit £117 5s. 5d.—From the statements made, it appears that last year the total revenue from the whole of the forests was £1,466 6s. 2d; and the total expenditure was £1,210. There was an excess of revenue over expenditure on the forests of the Knysna and Tzitzikama of £493 17s. 6d.; but a deficit in the case of the forests of George, Olifant's Hoek, Klein and Van Staden's Rivers, and Zuurberg, of £240 11s. 4d.; leaving a clear excess of free revenue of £253 6s. 2d. Two years ago the free revenue was £750; and the average free revenue for the four years reported was £584 15s. 2½d. or £331 9s. above that of the last year. The free revenue during the period diminished year by year.

94. Mr. *van Breda*.] Can you recommend any other mode of taking care of the forests than what is now pursued under the superintendents?—Without disturbing existing arrangements much might be done; but to secure the full benefit of the forests to the Colony, my belief is that very great changes will be necessary.

95. Will you give us an idea of the changes you would recommend?—I consider it expedient that whatever changes are made, the expense should be met out of the revenue to be derived from the forests; and to show what can be done by simply appropriating the free revenue of the forests to the improvement of the forest economy of the Colony, I would submit for consideration the following measures: I. With a view to the conservation of the existing forests against the ravages of fire, I recommend: First, the publication and enforcement of the law of the Colony in regard to bush fires. And, secondly, the offer of a reward for such information as may lead to the conviction of the offenders, to be paid to forest-rangers and others alike. II. With a view to the conservation of the forests against reckless and illegal destruction of timber by wood-cutters, I recommend: First,

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Dr. J.C. Brown. the republication and enforcement of the law of the Colony in regard to the cutting of timber. Secondly, the procuring of accurate reports and diagrams of the boundaries of private property bordering on forests belonging to the Crown. Thirdly, an increase, if necessary, of the number of rangers, and of the remuneration allowed to them for their services. Fourthly, the commissioning of some one acquainted with forest economy to visit all the forests of the Colony, and, after inquiry and personal observation, to report what practicable regulations would secure a greater measure of uniformity of usage in the management of the forests, and what special regulations may be further required for the management of any. III. With a view to the promotion of arboriculture throughout the Colony, I recommend: First, that seeds, and to some extent seedling trees, obtained from the forests, and also seeds of Australian and European trees, such as blue-gums, Port Jackson willows, black-woods, oaks, pines, &c., be placed at the command of civil commissioners, with permission to employ prisoners in sowing or planting these in suitable places within the districts over which they are appointed. Secondly, that such seeds and seedlings be placed also at the command of municipalities, agricultural societies, divisional councils, and other official bodies holding land in trust for the benefit of the community. Thirdly, that arrangements be made for the supply of such seeds and seedlings on reasonable terms to the public so long as this may be deemed necessary, or possible without interfering injuriously with the accomplishment of the same thing by private enterprise. IV. With a view to the developing of our timber trade, and so making the forests a more productive source of revenue, I recommend: First, the preparation of a detailed report of each forest, specifying the boundary and extent of each patch or clump; the different kinds of timber trees growing in each of them; the numbers, either proportional or absolute, of each different kind; the general magnitude they have attained, and the situations they generally occupy, stating what numbers or what proportions are of easy access, or of difficult access, or in situations altogether inaccessible, but which may be made accessible at a moderate expense. At present, we cannot tell what we have. Suppose a demand were to arise for a particular kind of timber, and the purchaser were to say, "I

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require stinkwood; how many cubic feet can you furnish annually?" There is not a man in the Colony who can tell. *Dr. J. C. Brown.*
 "How many stinkhout trees of three feet diameter have you?" *Aug. 21, 1865.*
 Not a man in the Colony can tell whether there are a thousand or a hundred thousand. "What is the extent of your forests? Are there a hundred square miles, or six hundred square miles?" It is the same. We cannot tell any customer what we have. In order to obtain proper reports on this subject, it would be perhaps necessary to get surveys made by professional men; but this done, the various forest rangers might furnish accounts of the different clumps, at very little expense. I have here a map of the Knysna forests by the Surveyor-General, with the particulars of their contents furnished by Mr. Bain; but when we get beyond this, between the Knysna and the Tzitzikama forests there is a large space of unexplored forest. Of the Tzitzikama forest I have a similar chart, with annotations, furnished by Capt. Harison. But of the intervening forest, nobody can tell what is its extent, or what it contains. Nobody has ever been through it; although I believe Mr. Bain has offered to take a pack ox, and, with six coloured men, cut his way through and report. And even the Knysna forest is but little known. A gentleman from the Knysna writes to me by last mail that he observes that in the Government returns the property in that district is valued at £77,000, but he says if the Government would open up the forest, it would be worth, perhaps, £400,000. It is very desirable to have some accurate information on this subject. The reports which I suggest would entail some expense for surveys; but the rangers could provide the particulars as to the contents. Secondly, I recommend the preparation of a report on the fitness of the timber of different trees growing in this Colony for employment in turning, veneering, and other modes of manipulation, founded on experiments to be made by some properly qualified person. I believe there is a great deal of information available on this head which only requires to be collected and tabulated. This would incur some little expense, but not great. And, thirdly, I recommend the procuring information in regard to the most approved measures of forest economy which are applicable to the management of the forests of this Colony by commissioning some one acquainted with these forests to visit the forest schools of Germany, and, if it be thought desirable, to visit

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also the forests in other parts of Europe, and report thereafter what is seen, or suggested by what is seen there, applicable to the management of forests in this country, whether relating to matters connected with private enterprise or Government control.

96. You are aware there is an importation of foreign wood into this Colony, for sleepers for railways, and purposes of that nature. Do you not think that this Colony is able to supply timber well adapted for such purposes?—I am aware of the fact; and there will always be an importation of timber into the ports of the Colony, so long as it can be imported at a lower price than it can be cut and brought to these ports from our forests. But there are districts of the Colony so far from any port that timber could be raised there at a much lower rate than that at which foreign timber can be conveyed from the port. It is also ascertained that much of our forest timber is suitable for railway purposes; but I think it not improbable that, if the economic uses to which that timber could be put were ascertained, it would be found that its price in the market of the world is such that it would be extravagance to employ it as railway sleepers, and more economical to sell it for other purposes, even though iron or timber sleepers should be imported from Europe.

97. Would you recommend our colonial wood as sleepers. Is it equal to those imported?—The best authority on that subject is Mr. Bourne, who, I believe, has made experiments on the subject, the results of which I have not seen. But I have with me records of experiments made by others, which show that several of our indigenous trees yield a timber well adapted for such purposes. The Cape cedar is fast disappearing from the Cedar Bergen; but it supplies a wood which seems almost indestructible by damp. I was told in the district of Clanwillian of posts which after thirty years' exposure in the ground were not decayed to a greater depth than the thickness of a sheet of paper; and a post which must have been in the ground a hundred years was still immovable.

98. You have observed that there are few new plantations going on in this country, and that in a few years there will be few plantations left, owing to the destruction going on. Do you consider that the Government should give encouragement or support to any one who can show the greatest number of trees planted?—Yes.

99. Is there any further observation you would wish to offer in connection with the development of the agricultural resources of the Colony?—I can only state, briefly, that every month is adding to my knowledge of these resources; that I see no probability of our vegetation ever obtaining the luxuriance seen in some tropical regions; but that I see no limits to the increase of which our marketable products are susceptible. Some of the measures which I deem requisite to this end I have enumerated in a letter to the Hon. the Colonial Secretary, appended to the report of the Colonial Botanist for 1864. These are the following:

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1. An attempt to arrest the desiccation of the soil and climate, which has been, and is being occasioned by the burning of the veld, by the partial or entire abandonment of the prevalent practice.
2. An attempt to counteract the desiccation of soil and climate which has already been effected by the destruction of herbage and bush in time past, by the general and extensive planting of forest trees.
3. An attempt to increase still further the humidity of the climate, by the formation of inland sheets of water, either with or without appliances for the irrigation of arable land.
4. The establishment of an experimental farm, where the probability of profit being realized by the culture of different crops and the utilization of their products may be tested, and whence information on practical subjects connected therewith may be supplied to all requiring it.
5. The procuring from other countries information, over and above what is accessible in the Colony, in regard to arboriculture and forest economy, in regard to methods of conducting experimental farms, and in regard to markets which are open for our products, the uses to which these products are applied, and the possibility of presenting them in a state calculated to secure a greater demand or higher prices.

To the statements made in support of these suggestions in the letter referred to, I would respectfully solicit the attention of the committee. They will be found in pages 149, 150 of the report. Not less important than these suggestions do I deem the attention which is being given to measures calculated to facilitate the transport of agricultural products. It would be easy to increase these products at once; but the expense of transport would render the increase unremunerative. While such matters may engage the attention of the Executive and the Legislature, I deem it of importance that

Dr. J. C. Brown. attention should be given by agriculturists to the improvement of the quality, rather than to the increase of the quantity, of any one of our agricultural products. In illustration of the importance of this, I would refer to the remarks I have made in letters appended to my reports on wine-making, and on the preparation of aloes. And as one means towards the accomplishment of all that is desired, I consider it expedient that there should be some one official of whom it might be required to report upon all communications made to the Government on subjects connected with irrigation, forest economy, arboriculture, horticulture, agriculture, and botany. Such an official does the Baron van Collet D'Escury appear to have been, while having the designation of Inspector-General of Lands and Forests; and in other lands similar duties have been discharged by officials under other designations. The grounds upon which I consider it expedient that some one should be charged with such duties I shall hold myself prepared to state in detail if ever the measure come under discussion, and a statement of those grounds should be required. Beyond these, I have no further observations to offer, but any information in my possession is at the command of the committee, either now or afterwards.

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