

## FEDERATED MALAY STATES.

### REPORT ON FOREST ADMINISTRATION FOR THE YEAR 1920.

#### CHAPTER I.

#### CONSTITUTION OF FORESTS.

##### I.—EXPLORATION.

1. PERAK.—The area lying between the Perak and the Kinerling rivers in the Upper Perak district was examined and found to be unusually rich in *merbau*, and to be well stocked with *keruing* and *meranti*. It is proposed to reserve 50,000 acres in this locality.

Further exploration was made of the forest between Gunong Besout and Changkat Mentri in the Batang Padang district. The report had not been received at the end of the year.

2. SELANGOR.—The swamp country between the Selangor and the Bernam rivers was again entered at several points. Enough is now known about it to make it fairly certain that it contains no forest of commercial value.

3. NEGRI SEMBILAN.—Some work was done in examining the forest at the head-waters of the Palong river. It is said to be of fair quality, but no definite proposals as to reservation have been made.

4. PAHANG.—Good forest was found on the Sungei Jinka in the Temerloh district, and 125,000 acres were preliminarily notified for reservation. The area actually reserved will probably be considerably less.

Other areas examined and reported on were Ulu Sungei Bera, the drainage area of the Jelai Kechil, and Bukit Gayang in the Rompin district. Ulu Bera showed nothing of special value. Parts of the Jelai Kechil forests contain good timber and the question of reservation is under consideration. The Bukit Gayang forest is good, and contains *balau* and *kapur*, both timbers of excellent quality.

##### II.—FOREST RESERVE PROPOSALS AND SETTLEMENTS.

5. The area of new reserves finally settled during the year was small, amounting only to 22,975 acres, but good progress was made in the work of settlement, several large areas being ready for final gazetting at the end of the year. These protracted settlements are to be regretted chiefly because they cause delay in dealing with land applications in the vicinity of the proposed reserves, but they are inevitable so long as shortage of senior officers prevents anyone being specially detailed for the work. 1,112,821 acres were in process of settlement at the end of the year.

6. PERAK.—The new proposal referred to as Janing in form I is that mentioned in para. 1. The Bintang Hijau proposal has been extended to include an additional 100,000 acres of the mountain range in the west part of the Upper Perak district.

7. SELANGOR.—There were two new proposals in this State, comprising 35,000 acres and situated in the Ulu Langat district. They are both in mountainous country and are made chiefly for climatic reasons.

8. NEGRI SEMBILAN.—No new settlements or proposals.

9. PAHANG.—One reserve only was finally gazetted. Protracted discussion on claims to rights and privileges delayed several proposals. These were satisfactorily disposed of but too late for the reserves to be gazetted before the end of the year.

##### III.—ALTERATION IN AREA.

10. There were several unimportant extensions to and excisions from reserves. The net addition was 35.7 square miles, and some 330 square miles were ready for final notification at the end of the year.

Changes in the areas of reserved forest in each State are summarized in the following statement:

State.		Area in square miles of reserved forests				Percentage to whole State on 31st December, 1920, of		
Name.	Area in square miles.	on 1st January, 1920.	added	excluded	on 31st December, 1920.	reserved forests.	State land.	alienated land.
			during year.					
Perak ... ..	7,800	822.5	21.4	0.07	843.8	10.8	69.8	19.4
Selangor ... ..	3,200	533.0	2.1	0.02	535.0	16.7	50.2	33.1
Negri Sembilan ... ..	2,550	401.4	1.7	0.06	403.1	15.8	55.8	28.4
Pahang ... ..	14,300	1,121.0	10.6	...	1,131.6	7.9	88.5	3.6
Total ... ..	27,850	2,877.9	35.8	0.15	2,913.5	10.4	76.2	13.4
1919 ... ..	27,850	2,792.4	87.0	1.4	2,877.9	10.3	76.4	13.3
1918 ... ..	27,850	2,241.5	55.11	0.3	2,792.4	10.0	77.1	12.9
1917 ... ..	27,850	1,911.6	333.4	3.5	2,241.5	8.1	79.3	12.6
1916 ... ..	27,850	1,832.5	79.7	0.5	1,911.6	6.9	81.2	11.9

11. The progress of reserve settlement during the past six years may be summarized as follows:

	1915 Acres.	1916 Acres.	1917 Acres.	1918. Acres.	1919 Acres.	1920 Acres.
Reserves finally constituted during the year... ..	215,083	50,653	212,165	352,650	54,786	22,865
Proposed reserves preliminarily gazetted and in various stages of settlement ... ..	190,798	821,608	1,007,270	810,761	790,189	1,112,821
Reservation under consideration but not yet preliminarily notified ... ..	430,800	251,450	140,000	157,450	365,000	500,000
Total area of reserves at the end of the year ... ..	1,172,784	1,223,436	1,434,563	1,787,123	1,841,856	1,864,721

#### IV.—DEMARCATATION AND MAINTENANCE OF BOUNDARIES.

12. One hundred and seventy-four miles of boundary were demarcated at an average cost of \$27.52 a mile, compared with \$19.33 a mile in the previous year (*vide form II*).

It is always difficult to separate the cost of demarcation from that of survey when they are carried out simultaneously. The high cost of the year is due partly to the fact that more survey work than usual was included, and in addition to this wages were abnormally high during the greater part of the year. The cost of new work includes trial lines which have not been utilized.

Existing reserve boundaries were repaired to a total length of 2,319 miles at a cost of \$2.40 a mile.

#### V.—SURVEY.

(*Vide form III*.)

13. The Survey Department completed a topographical survey of the Ayer Itam (Selangor) forest reserve on the scale of four inches to a mile. The area of this reserve is 11,239 acres, and the cost of the work was \$13,692, of which \$3,712 was defrayed by the Forest Department. The survey of the Angsi reserve in Negri Sembilan was completed by the Survey Department, and good progress was made on the South Gemas reserve. In the same State the survey of the Berembun reserve was completed.

14. Two hundred and fifty-seven miles of prismatic compass traverse were made by the Forest Department consisting of paths, and of the boundaries of reserves, coupes, and licensed timber cutting areas.

15. The question of the use of aeroplanes for forest surveys was further considered in conjunction with the heads of other Government departments interested in the matter. The general conclusion arrived at was that aerial photographs might be of great value in reconnaissance work but that before any definite proposal to Government could be justified fuller information was required as to the possibilities of flying in this country and as to aerial photography of forest country in which there are no fixed points.

16. Four of the subordinate forest staff were trained in elementary surveying by the staff of the Superintendent of Revenue Surveys, Perak. The results were very satisfactory, and thanks are due to the Superintendent of Revenue Surveys for his assistance.

## CHAPTER II.

## MANAGEMENT OF FORESTS.

## I.—REGULATION OF MANAGEMENT.

*(a).—Preparation and Control of Regular Working Plans.*

17. For the same reason as in former years—i.e., shortage of staff, it was impossible to make any progress in this direction.

*(b).—Plans of Operations.*

18. Such deviations from the annual plan of operations as occurred were due to lack of supervising officers, and difficulty in procuring labour. The delay in the demarcation of new reserves is to be regretted as it delays settlement, but in the circumstances it was inevitable.

The departmental tapping of gutta-percha was stopped towards the end of the year owing to the fall in prices.

## II.—COMMUNICATIONS AND BUILDINGS.

*(a).—Communications.*

19. Seventy miles and sixty-eight chains of new inspection paths, access roads to reserves, and path traces were made during the year. Of this total 64 miles of completed paths cost \$42.43 a mile.

Four hundred and sixty miles of old paths were repaired at an average cost of \$8 a mile.

*(b).—Buildings.*

20. Expenditure on new buildings amounted to \$57,239, of which \$52,269 was incurred by the Public Works Department. Most of the new buildings were for the accommodation of the subordinate staff. A halting bungalow for senior officers was built in the Rantau Panjang reserve, and new offices were provided at Kuala Pilah. The building programme is much in arrears owing to the rapid rise in the cost of building materials, which rendered the provision in the estimates insufficient to carry out the work required.

21. Maintenance of buildings, including the removal and re-building of the checking stations at Parit and Enggor, cost \$12,604.

*(c).—Other Works.*

22. Nothing calls for special comment. Details of expenditure are given in form V.

## III.—PROTECTION OF FORESTS.

*(a).—Protection against Man.**(i).—CHANGES IN FOREST LAW.*

23. The Forest Rules, 1909, were amended and reprinted. The only important amendments were alterations in the minimum girths for felling certain trees on State land, and the reclassification of timbers for purposes of assessing royalty. Timbers are referred to in the new list by their trade names, and synonyms and botanical names are also given.

*(ii).—FOREST OFFENCES.*

24. Details of the number of cases and persons concerned, together with the amounts of fines inflicted and compensation paid are given in form VI. The total number of cases was slightly below the average of the last few years, but a larger proportion of the cases were compounded, thus saving the time of the courts and of forest officers. The percentage of convictions was 94 as against 91 per cent. in the previous year. Of those cases taken into court the average fine per case was \$37 and the average per person convicted \$22, including cases in which the accused were discharged with a caution. These figures are considerably above the average of former years. Of cases dealt with departmentally the average compensation paid was \$18 per case and \$14 per person as against \$14 and \$12, respectively, in 1919.

25. There were three cases of unlawful collection of gutta-percha, in two of which the offenders were detected and convicted. In one case the offender was imprisoned for three months without the option of a fine, and in the other a fine of \$200 was inflicted. In the third case the offender was known but avoided arrest.

*(b).—Protection against Animals and Insects.*

26. The damage to the *rotan sega* plantation referred to in previous reports continued. No further information as to the cause of the injury has been obtained, but certain suspected larvæ are under observation. It has been noticed that the injury is confined to *rotan* planted in the forest, and that abandoned nurseries in which the plants are now big are not attacked.

27. It is reported that the painting of mangrove radicles with red lead prior to planting failed as a means of protection against the attacks of crabs. Not only did the paint not deter the crabs from attacking the plants, but injury seems also to have been caused by the paint itself.

(c).—*Protection against Plants.*

28. The fungoid pest on the *kapur* in Kanching reserve referred to in para. 45 of the report for 1919 was identified as *Rosellinia bunodes* (B. and Br.) Sacc. It has not caused widespread damage, but its effects are evident in many parts of the reserve. Lately it has been observed chiefly on seedlings. A small gang of coolies are employed continually in pulling up and burning diseased plants, and in liming and trenching the ground in affected areas.

29. The destruction of *bertam* in timber forest is a problem that calls for early solution. Reference is made in para. 36 to the difficulty experienced in obtaining regeneration of a tree crop where *bertam*, and to a less degree *palas*, is plentiful. Cutting the leaves is a temporary expedient only, as the plant survives the cutting and in a year or two begins to throw such heavy shade that seedlings cannot survive. Another undesirable effect of cutting is that the fallen leaves form a litter so dense as to prevent falling seed from reaching the soil in large quantities.

(d).—*Protection against Injury from Natural Causes.*

30. Erosion of the Rungkup forest reserve by the sea was found to be less serious than was first reported. Erosion however is continually going on on many parts of the coast. On the south-west of the Sangga Island mangrove reserve the sea has encroached not less than three-quarters of a mile in the last twenty years. On the other hand, there have been large accretions on the west of Pasir Itam Island and elsewhere, and the new land is well stocked with mangrove.

## IV.—SYLVICULTURE.

(a).—*Natural Reproduction.*

31. The general flowering of forest trees which was reported towards the end of 1919 produced a poor seed crop. In most States this is attributed to drought. During 1920 mangrove fruited well in Perak, and the areas exploited during the year are likely to restock themselves without artificial planting. From August to the end of the year nearly all trees flowered in extraordinary profusion in Perak, Selangor, Negri Sembilan and in Western Pahang, and a heavy crop of seed has already resulted. The dipterocarps were especially prolific, the Kanching camphor reserve producing the biggest seed crop within memory. Experimental clearings in undergrowth were made in various reserves with the object of establishing regeneration of the desired species. Dibbling and broad-cast sowings were also carried out. Gutta-percha flowered, but the resulting seed crop was only moderate in quantity.

(b).—*Artificial Reproduction.*

## (i).—REGULAR PLANTATIONS.

(See form VII)

32. The only new plantation was a small experimental area having for its object the testing of certain trees as to their suitability for forming firewood plantations. *Yemane*, which has given good results in other countries, was tried and also the local *batai*. The former has failed, but the latter shows promise of being useful for the purpose indicated.

33. An eight-acre plantation of *chengal* and *merbau*, which was abandoned in 1917, was reopened and interplanted with *batai*.

34. The rubber plantation at Taiping was leased for \$2,426.40, and \$619.48 was spent on its upkeep.

## (ii).—CULTURAL OPERATIONS.

35. Ten acres were added to the *rotan* plantation in shade at Pondok Tanjong at a cost of \$14.33 an acre. Blanks in the area planted in previous years were filled, the number of plants put out being *rotan semambu* 943, and *rotan sega mas* 9,809. For reasons given in para. 25 there will for the present be no extension to this plantation. This does not mean that *rotan* cultivation is to be abandoned. It is to be tried as a regular plantation on cleared land.

36. The *taban* plantation in shade at Rantau Panjang was extended by 3 acres, planted 8' x 8' with a view to experiments in leaf production. Planted under even light shade *taban* is much slower in growth than that planted in the open. It has been proved on the estate of the Selborne Company in Pahang that it can be successfully cultivated on cleared and clean-weeded land. This company has now 1,000 acres planted.

(c).—*Operations for the Improvement of the Growing Stock.*

37. New improvement fellings were carried out over an area of 676 acres in Selangor. This includes those areas in Ayer Itam and Sungei Buloh forest reserve in which class II poles and firewood were removed by wood-cutters under permit. Four hundred and fifty-four acres of *bertam* and *palas* were cut in Ayer Itam reserve at a cost of \$5.19 an acre, with the object of letting in sufficient light to the soil to allow class I seed to germinate. The utility of this operation remains to be proved. Experience tends to show that the admission of light may benefit the *bertam* to such extent that any regeneration of class I trees that may be obtained will be suppressed by the *bertam* as the latter grows again, unless the cutting is repeated within a year or two. The discovery of a practical means of exterminating *bertam* would simplify the problem. The work in Ayer Itam reserve was done

under contract and was unduly expensive. Similar operations in Ulu Gombak reserve done by daily labour over 130 acres, cost \$2.07 an acre. Ninety-two acres in Sungei Buloh reserve were treated in the usual method of cutting out everything that interfered with class I trees. Sakai labour was employed and the work is said to have been well done.

38. In several reserves considerable areas were exploited under permit for class II poles and firewood and the forest probably benefited thereby, but these areas are not included in form VII under works of improvement because the work was primarily exploitation and involved no expenditure.

#### V.—EXPLOITATION.

##### (a).—*Timber, Fuel and Charcoal.*

##### (i).—FROM RESERVED FORESTS.

39. The total outturn of wood, in all forms, from reserved forests was 365,769 tons, which is practically the same as the outturn of 1919. Class I timber shows an increase of 1,927 tons due to the granting of a concession in the Lesong forest reserve in Pahang. There was also an increase in the outturn of poles from inland forests (*vide paras. 36 and 37*). Poles for the construction and maintenance of marine fish traps were for the first time cut free of cost. As only straight poles of particular sizes can be utilized for this purpose there is necessarily selection in the cutting, with the result that no harm is done to the forest. The inconvenience to the fishermen in obtaining licences and removal passes was always considerable and the remission of these obligations has been much appreciated. There was a decrease in outturn of 7,783 tons under firewood.

40. Two hundred and nineteen thousand eight hundred and sixteen tons of mangrove firewood and poles were disposed of through the Government depôt at Port Weld compared with 178,643 tons in 1919. Of this total, 140,361 tons were delivered to the Federated Malay States Railways and 79,455 tons to the general public and other Government departments. At the beginning of the year the demand was greater than the supply, but as the price of tin fell the demand for mining purposes decreased. An increase in the rates paid to the contractors necessitated a small increase in the price charged for the wood, but the present price of \$6 a ton weight f.o.r. Port Weld compares very favourably with the cost of fuel elsewhere. During the year the management of the depôt was taken over by the Controller of Timber Supplies, who will in future deal with sales and distribution, the Forest Department concerning itself solely with the work of the contractors in the forest.

41. The Dredge Fuel Supply Association, a company formed by a combination of the tin dredging companies working in the Larut district of Perak, continued its operations and handled 25,077 tons of mangrove firewood during the year.

42. Owing to the fact that parts of incompletely exploited coupes of former years were worked again it is not possible to state exactly the total area of mangrove reserves under exploitation during the year. It is, however, certain that the area allowed by the working scheme was not exceeded. For the same reason the outturn per acre cannot be given in all cases. Reference to appendix B will show that in those coupes for which figures are available the outturn per acre was very satisfactory. Six coupes yielded over 80 tons per acre, and one of those in Selangor reached the unusual figure of 112 tons per acre. The net revenue per acre from coupes of which both the area and outturn are known rose from \$40 to \$70 in Perak and from \$46 to \$55 in Selangor.

43. Licences were issued to cut limited quantities of *chengal* in reserves in Perak for the special purpose of constructing the pontoons of tin dredges on mining properties near the reserves. This timber is required in large sizes up to 46 feet in length and 16 by 14 inches in section. With the existing primitive methods of exploitation the difficulties of handling these big logs are considerable. It is, therefore, important to avoid long distance transport. With the exception of that in Pahang all other exploitation of class I and II timber in reserves was done in connection with firewood cutting and had for its main object the improvement of the rest of the growing stock and the establishment of a new crop of class I trees by natural regeneration.

44. Pahang reserves yielded 5,899 tons of class I timber, mostly from Lesong reserve. The work of a firm which had a ten year agreement to work a part of this reserve was so unsatisfactory that steps were taken to terminate the agreement, and at the end of the year there remained a further period of four months during which timber might be removed.

Further details are given in form VIII.

##### (ii).—FROM STATE AND ALIENATED LAND.

45. The total outturn of timber, firewood and charcoal from these sources was 642,793 tons as compared with 628,850 in 1919. Of this total the quantity taken under free grants is estimated at 42,522 tons, chiefly mining firewood.

46. The Railway Department took over from contractors 102,764 sleepers as against 158,752 in the previous year. Sixty per cent. of these sleepers were of *resak*, thirty-three per cent. of *merbau* and seven per cent. of *chengal*. A very small and negligible number of *tembusu* sleepers were cut.

47. Particular attention was paid to improving the methods of licensed timber cutters with the objects of avoiding waste, and of completing the exploitation of the forest systematically. The means employed to effect improvements were the reduction in area of the forest allotted to many licensees who in the past had areas out of all proportion to the size of their labour forces. Areas have been more clearly defined both on the licences and on the ground, and as far as possible there has been insistence on the utilization of species other than those in general demand. There is still room for further improvement on these lines, but it is necessary to proceed with caution as any regulation which is unacceptable to the wood-cutter tends to increase the price of timber and to deter others from entering the business.

48. The demand for timber, particularly for the better qualities, was very strong except in the last month or two of the year. This demand, which was general throughout the Peninsula, combined with the high rates of wages prevalent for Chinese labour, and a shortage of that labour, resulted in prices being unusually high.

49. The chief reason for the present difficulty in obtaining timber is the fact that no new roads have been opened up during the last few years. Development in this direction has not kept pace with the increase of population. Most of the good timber within buffalo haulage distance of the old roads and of the railway is exhausted, and the forests that can be worked by river transport are gradually being stripped. This applies to State and alienated land only. There are many forest reserves which could be profitably exploited, but these should remain closed until proper plans for working them can be drawn up, and this cannot be done until our knowledge of the forest has been very considerably increased by research. Experiments are being made with caterpillar tractors for the haulage of logs in the forest. If these are successful and the cost is not excessive considerable areas which are now inaccessible will become available for timber cutting.

50. In the early part of the year there was a great dearth of mining firewood, due chiefly to difficulties connected with transport, and at one time accentuated by a strike among the mangrove wood-cutters. In Kinta a firewood pool was formed among the principal consumers, which under the management of an officer of the Railway Department succeeded in effecting a great improvement in the methods of distribution. With the fall in the price of tin at the end of the year the demand decreased and the position became easier. A recrudescence of the trouble is to be expected with a rise in the price of tin so long as improvements are not effected in the transport both by rail and road.

(b).—Other Forest Produce.

(i).—FROM RESERVED FORESTS.

51. Gutta-percha tapping on contract was continued in Larut Hills, Trolak, Behrang, and Rantau Panjang reserves. The total outturn was 1,577 lbs. of clean gutta, and sales produced \$4,407, as compared with 1,009 lbs. and \$4,711, respectively, for 1919. The revenue does not represent the actual value of the year's outturn, as some of the 1919 crop was included in the 1920 sales, and some of the 1920 crop was in stock at the end of the year under review. In Trolak reserve 202 *taban merah* trees were tapped and yielded only 4.3 ozs. per tree, as compared to an yield of 11.4 ozs. per tree from 1,335 trees in Behrang reserve. The difference is probably due chiefly to the fact that the Trolak trees have been tapped four or five times before, whereas the Behrang trees have been tapped only once or twice.

52. In Rantau Panjang reserve 1,651 *taban merah* trees were tapped and the yield is reported to have been 3.9 ozs. only per tree, but there appears to be some doubt as to the correctness of this figure.

53. At the waterfall plantation in the Larut Hills reserve 188 *taban putih* trees produced 53 lbs. of gutta, with an average of 4.5 ozs. a tree. The net profit per lb. was 68 cents.

54. The price of gutta-percha fell considerably during the year. Five dollars and six cents per lb. was obtained in February, whereas at the end of the year the best offer was \$3.15. The average cost of collection was about \$1.90 per lb. Tapping operations were reduced when the price fell. The receipts for the year were \$4,407 and expenditure \$2,760. There remained 42 lbs. of *gutta taban putih* and 611 lbs. of *taban merah* unsold at the end of the year.

55. The revenue from all minor produce from reserves was \$13,711 as against \$11,359 in 1919. The outturn of *damar* was 1,068.45 pikuls, or 218.50 pikuls more than in the previous year.

(ii).—FROM STATE AND ALIENATED LAND.

56. The total revenue fell from \$57,264 in 1919 to \$44,309. The decline is due to the reduced quantity of gutta-percha collected from trees on land about to be alienated. In Western Pahang 2,284 lbs. were obtained compared with 6,066 lbs. in 1919. The privately owned factory erected in 1919 at Kuantan for the extraction of gutta from the leaves of *taban merah* was dismantled during the year with a view to its being re-erected in a more central position. As a result of this both the royalty on the leaves and the outturn of the factory was reduced by half.

Further details are given in form IX.

## (c).—Summary of Outturn.

57. The outturn of all kinds of forest produce is summarized in the following statement, and compared with the corresponding figures for 1919. Produce cut free of royalty is excluded.

Kind of produce.		From reserved forests.	From other forests.	Total.	
				for the year.	for previous year.
Timber and poles	Tons	23,825	165,092	188,917	172,905
	Rev. \$	2,298.90	401,706.10	404,005	412,235.44
Fuel and charcoal	Tons	337,765	435,169	772,934	783,055
	Rev. \$	1,217,622.48	311,215.76	1,528,838.24	1,322,978.95
Canes	...	2,485.83	17,044.56	19,530.39	19,569.80
Rubber	...	2,755.15	1,250.44	4,005.59	1,285.39
Gutta-percha	lbs.	1,577	6,013	7,590	14,605
	Rev. \$	4,407.29	9,565.63*	13,972.92	26,847.28
Damar	Pkls.	1,068.45	5,901.70	6,970.15	7,803.11
	Rev. \$	2,715.95	6,283.96	8,999.91	8,047.63
Other produce	...	1,347.15	10,165.11	11,512.26	12,873.91
Total revenue	\$	...	...	1,990,864.31	1,803,838.40

\* Excludes \$850.50 paid by the Selborne Plantation Co. for seed collecting area in the Trolak reserve.

## CHAPTER III.

## ECONOMIC FORESTRY, SYLVICULTURAL EXPERIMENTS, AND RESEARCH.

58. The time of the Forest Research Officer (Dr. Foxworthy) was again chiefly devoted to the study of the timbers of the Peninsula, and the results of his labours will appear shortly in the form of the first number of a new publication to be known as the "Malayan Science Bulletin." This work, entitled "Commercial Woods of the Malay Peninsula," is now in the press.

59. One hundred and twenty-five sets of samples of the timbers of the country were distributed, and the demand for them continues.

60. Two hundred and thirty pieces of wood were supplied to the Controller of Timber Supplies for mechanical tests. The results of 689 tests of these and of wood supplied in the previous year were summarized by the Controller and published at the Government Press under the title "Report on the Results of Mechanical Tests carried out on some Malayan Timbers." This is to be regarded as a preliminary report only. Much yet remains to be done in this direction.

61. The timber durability tests were extended, 248 pieces of 37 kinds of wood being added during the year. The testing ground now contains 859 standard sized pieces of about 70 different kinds of wood. There are also several hundred smaller pieces supplied by the Controller of Timber Supplies. Samples of wood were obtained from India and Burma and placed in the testing ground for comparison with local kinds. Seventy specimens treated with various preservatives were put down during the year. In the absence of any adequate mechanical appliance for ensuring the penetration of the preservative into the wood it has only been possible to soak the samples in the preservative. Durability tests have now been completed on 405 pieces representing 20 different kinds of wood.

62. Apart from the study of timber it has been possible to accomplish but little in the investigation on forest products. Such records as we possess have been put into better order, and there has been prepared a rough draft of a manuscript dealing with the various kinds of forest produce and with market conditions. The urgency of research on a more extended scale is obvious when the great commercial possibilities of the many products of our forests are considered. The following articles may be mentioned: rotan, fibre, damar, wood-oil, vegetable oils, wood distillation products, tannin, gutta-percha, and paper-making materials.

63. Enquiries were received during the year as to the possibilities of paper and pulp making from bamboo andalang, and of motor spirit manufacture from *nipah*. Exclusive rights for a limited period were granted to a company which proposes to establish a wood distillation business in Pahang.

64. Samples of wood which it was thought might be suitable for the shafts of golf clubs were sent to England. *Tampinis* was received with great favour by club makers, and enquiries are being made into the possibilities of establishing locally a shaft-making industry.

65. The Conservator of Forests while on leave in England was commissioned, in co-operation with an Engineer of the Railway Department, to enquire into wood-working industries with a view to introducing improvements and economies into local trades. The report of the commission has not yet been received.

66. Some material for the investigation of certain insect pests was collected. In the absence of an officer of the Forest Department who could devote sufficient time to this subject it was necessary to send the material elsewhere. The Entomologist of the Department of Agriculture is dealing with some of this work, and Mr. Beeson, the Zoologist of the Forest Research Institute, at Dehra Dun, has kindly undertaken to assist in the matter. Mr. Beeson has already shown that the injury to *chengal* timber which is so generally obvious in the form of small holes is due to a curculionid beetle, and that the attacks begin while the tree is very small and continue throughout its life.

67. The publications of the year were a report on "Wood in the Malay Peninsula; its use, misuse, and future provision" by the Conservator of Forests, and a report by the same officer on the general position of the country as regards forestry written for the Imperial Forest Conference which was held in London in July, and which the Conservator of Forests himself attended. The former of these was accompanied by illustrative maps of the whole Peninsula and of each of the Federated States. The report on mechanical timber tests has already been referred to in para. 59.

68. The work of preparing the museum has continued and there are now more than one hundred large specimen planks in place, while 675 small wood samples, collected with herbarium material, have been prepared and placed in cases, where they are available for study and comparison. The minor products part of the museum has not been developed pending the re-roofing of the building which is necessary before exhibits can safely be installed in the galleries.

69. Additions to the herbarium during the year have totalled about 750 numbers, including very valuable collections from the Temerloh and Kuantan districts of Pahang. We still have only very incomplete collections, even from the better known districts; while, from Kelantan and Trengganu, we have nothing at all, and only the scantiest amount of material from Kedah and Johore. The collections from Temerloh and Kuantan as well as from other parts of Pahang extend our knowledge of the quantity and distribution of commercial woods already known, and indicate the probable existence of many others which have yet to be discovered. The local herbarium now contains in the neighbourhood of 6,000 numbers, representing about 2,100 species, of which about 1,600 are tree species. We now have material to illustrate about one half of the known tree species of the Peninsula.

The records of the herbarium are in distinctly better condition than formerly. We have received during the year about 750 identifications from Mr. Burkill, Director of the Botanical Gardens at Singapore, to whom we are much indebted.

In the first half of the year large shipments of duplicates were made to other herbaria. The first set (numbering about 1,800 specimens) was sent to Mr. H. N. Ridley, F.R.S., at Kew, for use in connection with the Flora of the Peninsula, which he is preparing. The second set was sent to the Botanic Gardens, Singapore, and the third set to the herbarium of the Bureau of Science at Manila.

70. Particular attention was given by the Forest Research Officer to the study of the genus *Dryobalanops*, which comprises the locally well-known *kapur*, one of our most valuable woods and one of the few which occur gregariously. A monograph on this subject has been prepared, but is withheld from publication pending the comparison of local herbarium material with that at Kew, which work has been undertaken by Mr. Ridley.

71. Four new sample plots were established during the year, one in connection with investigations into the silviculture of *taban merah* and three with the objects of ascertaining the effects of thinnings in mangrove forest on the rate of growth of the remaining growing stock, and of observing the effects of such thinnings on natural regeneration.

72. Experiments to test the germination of seed on land which has been dredged for tin gave hopeful results only in the case of *halban*. Further experiments are required. If it is found that *halban*, a wood of considerable value, can be grown economically on such land, very useful information will have been acquired.

73. An experiment was instituted some years ago with the object of testing a theory that mangrove would survive its early troubles better if seed was planted after the first leaves had appeared and the radicle has put out rootlets. It is now possible to say that there is no advantage in such planting. Incidentally to this conclusion it appears that *bakau minyak* is more liable to the attacks of crabs than is *bakau kurap*.



CHAPTER IV.  
FINANCIAL RESULTS.

74. The revenue and expenditure for the year are summarized in the following statement, and are compared with estimates and with the figures of former years. The estimated expenditure does not include the salaries of the clerical establishment or temporary allowances, both of which are included in the figure given under personal emoluments:

State.	Revenue.	Expenditure.			Surplus or deficit.	Percentage of expenditure to revenue and remarks.
		Personal emoluments.	Other charges.	Total.		
	\$	\$	\$	\$	\$	
Conservator ...	...	261,373	32,369	293,742	-293,742	Apparent errors in this statement are due to the elimination of cents
Perak (Taiping) ...	1,470,194	80,810	1,146,918	1,227,728	+242,466	
Perak (Batu Gajah)	135,574	36,758	17,451	54,209	+ 81,365	
Selangor ...	185,767	71,001	40,092	111,093	+ 74,674	
Negri Sembilan ...	111,250	51,114	28,775	79,889	+ 31,361	
Pahang (W) ...	76,387	37,492	29,074	66,566	+ 9,821	
Pahang (E) ...	40,544	23,500	14,861	38,361	+ 2,183	
Total ...	2,019,716	562,048	1,309,540	1,871,588	+148,128	92.6
Approved Estimates, 1920	a 1,596,000	281,147	1,254,495	1,535,642	+360,358	80.9
Revised Actuals, 1919	b 1,838,850					
Actuals, 1919 ...	1,832,515	323,560	1,018,078	1,341,638	+490,877	73.2
Average actuals for five years, 1914-18	702,956	239,084	144,881	383,965	+318,991	54.6

75. Revenue and expenditure are both the highest on record, due in both cases to the mangrove firewood working in Perak; *vide* para. 39 *supra*. Personal emoluments include \$51,800 paid during the year in respect of salaries and temporary allowance for 1919 which became due retrospectively under orders passed in 1920. Omitting this payment the surplus for the year was \$209,928, and the surplus shown for 1919 should be reduced by a like amount.

CHAPTER V.  
ADMINISTRATION AND GENERAL.

76. It is disappointing to have to record that no new appointments were made to the senior staff during the year. The salaries of three additional Assistant Conservators of Forests were provided in the budget, but efforts to obtain suitable men met with no success. Nominations have been made among men who are still undergoing training in England, and of these one is to be detailed as Assistant Forest Research Officer.

77. One Assistant Conservator of Forests was seconded for duty in Johore. The Federated Malay States could ill afford to spare the services of a senior officer, but the needs of the State of Johore were known to be great, and it was felt that the general interests of the Peninsula would best be served by giving the Johore Government an opportunity of organizing their Forest Department on right lines without further delay. One of the immediate results of this transfer was that the Conservator of Forests' office was again without a European Assistant.

78. Two probationary rangers were trained locally during the year with satisfactory results. They both give promise of becoming useful officers within the limits imposed by their education and training.

79. Among the subordinate staff there were one death and nineteen resignations. Ten subordinates were dismissed. Six Sakais were appointed forest guards in Perak, and so far they have proved as satisfactory as they have been in previous years in Selangor. They are employed entirely on work in the forest, and are particularly useful in that they can recruit labour from among their own families and relations who would usually be unwilling to work under a Malay forest guard.

80. The division of Perak into two charges was completed, and arrangements were being made at the end of the year whereby the Deputy Conservator of Forests, Perak North, will undertake the supervision of forest work in Penang, Province Wellesley, and of the Tanjong Burong mangrove reserve in the Dindings, and the Deputy Conservator of Forests, Perak South, will be in charge of the rest of the Dindings. The reason for excluding the Tanjong Burong reserve from the rest of the Dindings is that it is more convenient to work it in conjunction with the adjoining mangrove reserve in Perak North.

81. The transfer of the management of the Port Weld and Taiping firewood depôts to the Timber Department has been referred to in para. 39.

82. Mr. G. E. S. Cubitt, Conservator of Forests, went on long leave in May, from which time the writer acted in the appointment.

KUALA LUMPUR,  
16th April, 1921.

B. H. F. BARNARD,  
Acting Conservator of Forests, F.M.S. and S.S.

## APPENDIX A.

## LIST OF TREES, ETC., MENTIONED IN THE REPORT.

Vernacular or English name.	Botanical name.	Uses.
Bakau Kurap ... ..	<i>Rhizophora mucronata</i> , Lam. ...	Firewood
Bakau Minyak ... ..	" <i>conjugata</i> , L. ...	"
Balau ... ..	<i>Shorea</i> spp. ... ..	Timber
Batai ... ..	<i>Albizzia moluccana</i> , Miq. ...	Firewood
Bertam ... ..	<i>Eugeissonia tristis</i> , Griff. ...	Thatch
Camphor ... ..	<i>See</i> Kapur ... ..	Timber
Chengal ... ..	<i>Balanocarpus</i> spp. ( <i>B. maximus</i> , King and <i>B. Heimii</i> , King). ...	Timber, damar
Gutta-percha ... ..	<i>Palaquium</i> spp. ... ..	Gutta-percha
Halban or Leban ... ..	<i>Vitex</i> spp. ... ..	Timber
Kapur ... ..	<i>Dryobalanops aromatica</i> , Gaertn. f.	Timber and camphor
Keruing ... ..	<i>Dipterocarpus</i> spp. ... ..	Timber, wood-oil
Lallang ... ..	<i>Imperata cylindrica</i> , Beauv. ...	
Mangrove ... ..	<i>Rhizophora</i> , <i>Bruguiera</i> and <i>Ceriops</i> spp. ... ..	Firewood, fishing stakes
Meranti ... ..	<i>Shorea</i> spp. ... ..	Timber
Merbau ... ..	<i>Intsia</i> ( <i>Atzelia</i> ) spp. ... ..	"
Nipah ... ..	<i>Nipa fruticans</i> , Wurmb. ... ..	Thatch
Palas ... ..	<i>Licuala</i> spp. ... ..	"
Resak ... ..	<i>Shorea</i> spp. and <i>Vatica</i> spp. ...	Timber
Rotan sega mas ... ..	<i>Calamus caesius</i> , Bl. ... ..	Canes
Rotan Semambu ... ..	" <i>scipionum</i> , Lour ... ..	"
Taban merah ... ..	<i>Palaquium oblongifolium</i> , Burek...	Gutta-percha
Taban putih ... ..	" spp. ... ..	"
Tampinis ... ..	<i>Sloetia sideroxylon</i> , T. and B. ...	Timber
Tembusu ... ..	<i>Fagraea gigantea</i> , Ridley ... ..	"
Yemane (Burmese) ... ..	<i>Gmelina arborea</i> , L. ... ..	"

APPENDIX B.

SUMMARY OF OUTTURN FROM MANGROVE RESERVE COUPES.

Name and No. of coupe.	Area in acres.	Outturn in tons.				Revenue.			Expenditure.			Surplus.			Remarks.
		Pre-vious.	Of the year.	Total.	Total per acre.	Previous.	Of the year.	Total.	Pre-vious.	Of the year.	Total.	Per acre.	Per ton.	Total.	
						\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
PERAK.															
S. W. Circle ... 9/18	600	27,106	25,205 <sup>a</sup>	52,311	87.18	30,728 11	11,918 63	42,646 74	168 00	Nil	168 00	70 79	.81	42,478 74	} Completely exploited
Sangga ... 14/17	400	34,100	3,247	37,347	93.37	b ...									
General all other coupes ...	b ...	b ...	211,077 <sup>c</sup>	211,077	b ...	b ...	1,248,437 00 <sup>d</sup>	1,248,437 00	b ...	1,104,128 33 <sup>f</sup>	1,104,128 33 <sup>f</sup>	b	b		
Taiping Depôt... ..	...	...	<sup>e</sup> ...	...	...	...									
Port Weld Depôt ...	...	...	<sup>e</sup> ...	...	...	...									
Total ...	...	...	239,529	...	...	...	1,260,355 63	...	...	1,104,128 33	...	...	...	156,227 30 <sup>g</sup>	
SELANGOR.															
Jugra ... 1/18	245	8,121	4,277	12,398	50.60	8,243 46	2,333 74	10,577 20	...	2 77	2 77	43 16	.85	10,574 43	} Exploitation not complete
Do. ... 1/19	20	237	495	732	36.60	313 46	217 43	530 89	...	...	...	26 54	.72	530 89	
Do. ... 2/19	45	1,064	3,979	5,043	112.08	899 79	1,692 24	2,592 03	...	...	...	57 60	.51	2,592 03	} Exploitation complete
Klang ... 5/18	341	26,447	2,465	28,912	84.78	21,806 50	1,056 52	22,863 02	525 55	133 68	659 23	65 11	.76	22,203 79	
Do. ... 2/19	154	5,317	3,518	8,835	57.37	7,408 89	1,618 97	9,027 86	216 65	246 78	463 43	55 61	.96	8,564 43	} Exploitation not complete
Do. ... 3/19	240	9,972	4,776	14,748	61.45	12,784 36	2,166 41	14,950 77	217 65	248 14	465 78	60 35	.98	14,484 98	
Do. ... 5/19	185	5,350	3,151	8,501	45.95	8,796 38	1,372 39	10,168 77	218 08	246 78	464 86	52 45	1 14	9,703 91	} Exploitation not complete
Do. ... 7/19	200	12,437	5,668	18,105	90.52	13,351 01	2,527 44	15,878 45	216 65	246 78	463 43	77 07	.85	15,415 02	
Do. ... 11/19	110	...	...	...	...	...	...	...	3 46	...	3 46	deficit of \$3.46		Not leased	
Do. ... 12/19	36	902	624	1,526	42.38	1,855 86	288 27	2,144 13	216 65	196 28	412 93	48 08	1 13	1,731 21	} Exploitation complete
Do. ... 13/19	30	165	623	788	26.26	429 37	287 31	716 68	176 76	150 51	327 27	12 98	.49	389 41	
Do. ... 8/14 <sup>h</sup>	136	...	957	957	7.03	...	4,429 73	4,429 73	...	170 63	170 63	31 31	4 45	4,259 10	} Exploitation incomplete complete
Banjar ... 1/19	59	733	127	860	14.57	1,314 99	53 28	1,368 27	5 30	...	5 30	23 10	1 58	1,362 97	
Do. ... 2/19	200	232	398	630	3.15	435 91	579 88	1,015 78	3 60	...	3 60	5 06	1 60	1,012 19	} Exploitation not complete
Do. ... 1/20	75	...	637	637	8.50	...	767 78	767 78	...	...	...	10 23	1 20	767 78	
Other Coupes <sup>h</sup> ...	2,414	116,857	44,915	161,772	67.01	137,237 58	19,939 97	157,177 55	3,495 77	2,469 31	5,964 08	62 64	.93	151,213 47	Mostly incomplete
Total Selangor ...	4,380 <sup>i</sup>	187,834	76,610	264,444	60.38	214,877 56	39,331 36	254,208 92	5,296 12	4,111 66	9,380 78	55 89	.93	244,828 14	

(a) Includes 9 tons poles.

(b) No accurate figures available.

(c) Includes 979 tons poles.

(d) Vide Appendix D, also includes \$3,604 premiums.

(e) Included in figures above.

(f) Vide Appendix D, also includes \$1,435.33 salaries and allowances of forest guards.

(g) Surplus of year.

(h) Includes coupes 2/18, 3/18, 4/18, 6/18, 1/19, 4/19, 6/19, 8/19, 9/19, and 10/19, the outturn of which could not be kept distinct.

(i) Excludes area of coupe 11/19 unleased.

APPENDIX B—(cont.)

SUMMARY OF OUTTURN FROM MANGROVE RESERVE COUPES—(cont.)

Name and No. of coupe.	Area in acres.	Outturn in tons.				Revenue.			Expenditure.			Surplus.			Remarks.
		Previous.	Of the year.	Total.	Total per acre.	Previous.	Of the year.	Total.	Pre-vious.	Of the year.	Total.	Per acre.	Per ton.	Total.	
						\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
COMPLETED COUPES (Klang Island coupes 3/18 and 4/18 excluded as in "A" above).															
Klang ... .. 5/18	341	26,447.00	2,465.00	28,912.00	84.78	21,806 50	1,056 52	22,863 02	525 55	133 68	659 23	65.11	.76	22,203 79	
Do. ... .. 12/19	36	902.00	624.00	1,526.00	42.38	1,855 86	288 27	2,144 13	216 65	196 28	412 93	48.08	1.13	1,731 20	
Do. ... .. 13/19	30	165.00	623.00	788.00	26.26	429 37	287 31	716 68	176 76	150 51	227 27	12.98	.49	389 41	
Banjar ... .. 1/19	59	733.00	127.00	860.00	14.57	1,314 99	53 28	1,368 27	5 30	...	5 30	23.10	1.58	1,362 97	
Total ..	466	28,247.00	7,839.00	32,086.00	68.85	25,406 72	1,685 38	27,092 10	924 26	480 47	1,304 73	55.21	.80	25,687 37	
NEGRI SEMBILAN.															
Sepang ... .. 10/19	73	995.70	410.44	1,406.14	19.26	1,055 18	182 87	1,238 05	153 35	95 37	248 72	13.55	.71	989 33	Not yet completely exploited
Total N. Sembilan ...	73	995.70	410.44	1,406.14	19.26	1,055 18	182 87	1,238 05	153 35	95 37	248 72	13.55	.71	989 33	
PAHANG EAST.															
Kuantan Mangrove C. 17	70	244.49	14.88	259.37	3.70	95 32	13 63	108 95	...	...	...	1.55	.42	108 95	
Rompin Mangrove (Proposed reserve) ...	?	...	271.12	271.12	?	...	76 03	76 03	...	...	...	?	.28	76 03	
Total Pahang ...	?	244.49	* 286.00	530.49	?	95 32	89 66	184 98	...	...	...	...	.70	184 98	
SUMMARY.															
Perak ... ..	?	?	239,529.00	?	?	?	1,260,355.63	?	?	1,104,128.33	?	?	?	156,227 30	
Selangor ... ..	4,380	187,834.00	76,610.00	264,444.00	60.38	214,877 56	39,331.36	254,208 92	5,296 12	4,111.66	9,380 78	55.89	.93	244,828 14	
Negri Sembilan ... ..	73	995.70	410.44	1,406.14	19.26	1,055 18	182.87	1,238 05	153 35	95.37	248 72	13.55	.71	989 33	
Pahang ... ..	?	244.49	286.00	530.49	?	95 32	89.66	184 98	?	?	?	?	.70	184 98	
Total F.M.S. ...	?	?	316,835.44	?	?	?	1,299,959.52	?	?	?	?	?	2.34	402,229 75	

\* Outturn as per form VIII ... .. 304.50 tons.  
 " " this form ... .. 286.00 "

difference 18.50 tons of class II firewood removed from the Bukit Goh Reserve.

## APPENDIX C.

## STATEMENT OF SLEEPERS PAID FOR DURING THE YEAR.

Species.	Class I No.	Class II No.	Class III No.	Cross- ings No.	Rejec- tions No.	Total.		Revenue.
						No.	Tons.	
								\$ c.
PERAK (Taiping).								
Chengal ...	1,037	90	14	...	...	1,141	51	250 48 $\frac{1}{2}$
Merbau ...	3,891	138	50	...	...	4,079	185	906 48 $\frac{1}{2}$
Resak ...	629	24	6	...	1	660	30	88 01 $\frac{1}{2}$
Tembusu ...	151	12	2	...	...	165	7	21 78
Total ...	5,708	264	72	...	1	6,045	273	1,266 76 $\frac{1}{2}$
PERAK (Batu Gajah).								
Chengal ...	593	5	1	...	...	599	27	134 41 $\frac{1}{2}$
Merbau ...	2,506	34	5	...	...	2,545	115	570 27 $\frac{1}{2}$
Total ...	3,099	39	6	...	...	3,144	142	704 69
SELANGOR.								
Chengal ...	79	...	...	16	...	95	6	28 89
Resak ...	699	52	14	91	1	857	47	138 83
Total ...	778	52	14	107	1	952	53	167 72
NEGRI SEMBILAN.								
Chengal ...	80	...	...	28	...	108	5	37 46
Merbau ...	3,218	118	22	510	8	3,876	175	1,102 90 $\frac{1}{2}$
Resak ...	10,947	939	69	692	45	12,692	577	2,027 46 $\frac{1}{2}$
Total ...	14,245	1,057	91	1,230	53	16,670	757	3,167 83
PAHANG.								
Chengal ...	4,236	130	18	679	3	5,066	293	1,449 97
Merbau ...	20,867	1,472	244	1,167	87	23,837	1,185	5,803 61
Resak ...	41,187	2,963	263	2,514	117	47,044	2,359	7,879 41
Total ...	66,290	4,565	525	4,360	207	75,947	3,837	15,132 99
ALL STATES.								
Chengal...	6,025	225	33	723	3	7,009	382	1,901 22
Merbau ...	30,482	1,762	321	1,677	95	34,337	1,660	8,383 27 $\frac{1}{2}$
Resak ...	53,462	3,978	352	3,297	164	61,253	3,013	10,133 72
Tembusu ...	151	12	2	...	...	165	7	21 78
Total ...	90,120	5,977	708	5,697	262	102,764	5,062	20,439 99 $\frac{1}{2}$

APPENDIX D.

FIREWOOD DEPOT, PORT WELD AND TAIPING

SUMMARY FOR YEAR 1920.

FIREWOOD AND POLES.		REVENUE.	CONSUMERS ACCOUNT.			EXPENDITURE.			
To whom supplied.	Quantity tons.	Cash book, IA and IB.	Debit on 1-1-20.	Debit or credit on 31-12-20.	Difference.	Expenditure return, IA and IB.	1919 payments made in 1920.	1920 payments made in 1921.	Difference.
		\$	\$	\$	\$	\$	\$	\$	\$
Railway, P. Weld	97,663	1,219,921	77,289	- 89,567	102,201	1,086,962	47,169	62,900	15,731
.. Prai	40,321								
.. T. Anson	2,377								
Taiping Depôt	9,161								
General ...	70,294 *								
Total ...	219,816	1,219,921	- 77,289	-102,201	- 24,912	1,102,693 =	True expenditure		
	True revenue...	1,244,833							

SUMMARY OF ABOVE.

Total net revenue	...	...	...	1,244,833
.. expenditure	...	...	...	1,10,6293
∴ net profit	...	...	...	<u>142,140</u>

\* Includes 988 tons of poles.

## Form I.

AREA OF CONSTITUTED AND PROPOSED RESERVED FORESTS<sup>1</sup>

Civil district.	Name of forest.	Constituted reserves.				Proposed reserves preliminarily notified but not constituted.	No. of notification and remarks.
		Area on 1-1-1920.	Added during year.	Excluded during year.	Area on 31-12-1920.		
		Acres.	Acres.	Acres.	Acres.	Acres.	
PERAK.							
Upper Perak ... ..	Padang Chong	8,943	...	45	8,898	...	3712 of 21-7-20 and 5606 of 11-10-20
Do. ... ..	Lapang Ninering	14,900	...	...	14,900	...	
Do. ... ..	Janing ... ..	...	...	...	...	50,000	5607 of 23-12-20
Do. ... ..	Piah ... ..	90,000	...	...	90,000	100,000	3634 of 1916
Upper Perak, Selama, Larut and K. Kangsar	Bintang Hijau ...	...	...	...	...	327,600	5608 of 17-12-20
Selama ... ..	Ijok ... ..	11,661	...	...	11,661	...	
Selama, Krian, and Larut	Pondok Tanjong	26,496	198	...	26,694	...	2284 of 4-6-20
Krian ... ..	Kurau mangrove	2,054	...	...	2,054	...	
Do. ... ..	Semanggol ...	2,778	...	...	2,778	...	
Matang ... ..	Bukit Naga ...	...	...	...	...	2,530	3507 of 13-8-20
Krian and Matang ...	Matang mangrove	96,367	...	...	96,367	1,730	5126 of 19-11-20
Larut ... ..	Assam Kumbang	35	...	...	35	...	
K. Kangsar and Larut	Larut Hills ...	21,000	...	5	20,995	9,200	5609 of 17-12-20 and 5338 of 3-2-20
K. Kangsar, Larut and Matang	Bubu ... ..	...	...	...	...	90,000	3836 of 24-12-15
Kuala Kangsar ... ..	Chior ... ..	10,700	...	...	10,700	...	
Do. ... ..	Plus ... ..	13,600	...	...	13,600	...	
Do. ... ..	Bruas ... ..	16,355	...	...	16,355	...	
Do. ... ..	Parit ... ..	24,044	...	...	24,044	...	
K. Kangsar and Kinta	Kledang Saiong	80,200	...	...	80,200	7,032	4691 of 22-10-20
Kinta ... ..	Tanjong Toh Alang	8,870	...	...	8,870	...	
K. Kangsar and Lower Perak	Raja Hitam ...	...	13,500	...	13,500	...	1539 of 23-4-20
Lower Perak ... ..	Pulau Tiga ...	395	...	...	395	...	
Do. ... ..	Changkat Jong	9,650	...	...	9,650	...	
Do. ... ..	Telok Bharu ...	1,356	...	...	1,356	...	
Do. ... ..	Rungkup ...	10,081	...	...	10,081	...	
Do. ... ..	Erong ... ..	15,500	...	...	15,500	...	
Batang Padang ... ..	Kroh ... ..	10,400	...	...	10,400	...	
Do. ... ..	Chikus ... ..	13,454	...	...	13,454	...	
Do. ... ..	Bikum ... ..	9,350	...	...	9,350	...	
Do. ... ..	Trolak ... ..	18,085	...	...	18,085	...	
Do. ... ..	Besout ... ..	4,865	...	...	4,865	...	
Do. ... ..	Behrang ... ..	5,241	...	...	5,241	...	
	Total Perak ...	526,380	13,598	50	540,028	588,092	
	Square miles ...	822.5	21.4	.07	843.8	918.9	
SELANGOR.							
Ulu Selangor ... ..	Bukit Kutu ...	15,770	...	...	15,770	...	
Do. ... ..	Kuang ... ..	2,508	...	...	2,508	...	
Do. ... ..	Kanching ... ..	1,180	...	...	1,180	...	
Do. ... ..	Bukit Belata ...	32,100	...	...	32,100	...	
Do. ... ..	Rantau Panjang	23,395	...	...	23,395	...	
Do. ... ..	Bukit Tarek ...	11,474	...	...	11,474	...	
Do. ... ..	Semangko ... ..	3,430	...	...	3,430	...	
Do. ... ..	Gading ... ..	13,375	...	...	13,375	...	
Do. ... ..	Batang Kali ...	...	...	...	...	22,700	3206 of 15-8-19
Ulu Selangor and Kuala Lumpur	Bukit Lagong ...	7,650	...	...	7,650	...	
Kuala Selangor ... ..	Banjar ... ..	6,876	...	...	6,876	...	
Do. ... ..	Bukit Badong ...	4,415	...	...	4,415	...	
Do. ... ..	K. Bernam ... ..	4,700	...	...	4,700	...	In charge of D.C.Fts., Perak South
Kuala Selangor and Klang	Bukit Cheraka ...	24,263	...	...	24,263	...	

## Form I—(cont.)

## AREA OF CONSTITUTED AND PROPOSED RESERVED FORESTS.—(cont.)

Civil district.	Name of forest.	Constituted reserves.				Proposed reserves preliminarily notified but not constituted.	No. of notification and remarks.
		Area on 1-1-1920.	Added during year.	Excluded during year.	Area on 31-12-1920.		
		Acres.	Acres.	Acres.	Acres.	Acres.	
SELANGOR—(cont.)							
Klang ... ..	Klang Islands ...	21,233	...	...	21,233		
Do. ... ..	Pulau Lumut ...	15,506	...	...	15,506		
Do. ... ..	Telok Gedong ...	5,820	...	...	5,820		
Do. ... ..	Kapar ... ..	12,690	510	...	13,200	...	2031 of 21-5-20
Do. ... ..	Pulau Tengah ...	930	...	...	930		
Klang and K. Langat ...	Telok ... ..	8,856	...	...	8,856		
Do. ... ..	Jugra Island ...	8,551	700	...	9,251	...	2953 of 16-7-20
Kuala Langat ... ..	Kelambu ... ..	8,620	...	...	8,620		
Kuala Lumpur ... ..	Weld's Hill ...	43	...	...	43		
Do. ... ..	Sungei Buloh ...	16,205	...	...	16,205		
Do. ... ..	Circular Road ...	78	...	...	78		
Do. ... ..	Ulu Gombak ...	43,093	...	...	43,093		
Do. ... ..	Ampang ... ..	7,132	141	...	7,273	...	1756 of 7-5-20
K. Lumpur & U. Langat	Bkt. S. Puteh ...	4,617	...	18	4,599	...	3258 of 30-7-20
Ulu Langat ... ..	Gunong Hitam...	5,170	...	...	5,170		
Do. ... ..	S. Lallang ... ..	12,965	...	...	12,965		
Do. ... ..	Ayer Itam ... ..	11,239	...	...	11,239		
Do. ... ..	Bangi ... ..	2,214	...	...	2,214		
Do. ... ..	B. Tunggul ... ..	1,980	...	...	1,980		
Do. ... ..	B. Enggang ... ..	3,045	...	...	3,045		
Do. ... ..	Arang ... ..	...	...	...	...	10,000	1540 of 23-4-20
Do. ... ..	Endang ... ..	...	...	...	...	25,000	2487 of 18-6-20
	Total Selangor	341,123	1,351	18	342,456	57,700	
	Square miles ...	533	2.1	.02	535	90.1	
NEGRI SEMBILAN.							
Jelebu ... ..	Triang ... ..	23,265	...	...	23,265		
Jelebu and Kuala Pilah	Pasoh ... ..	57,498	...	...	57,498		
Jelebu, Kuala Pilah, and Seremban	Berumbun ... ..	52,650	...	...	52,650		
Kuala Pilah ... ..	Senaling-Inas ...	19,941	...	...	19,941		
Do. ... ..	Serting ... ..	3,908	...	...	3,908		
Do. ... ..	Kopis ... ..	6,791	...	...	6,791		
Do. ... ..	Bahau ... ..	19,109	501	...	19,610	...	Survey correction
Do. ... ..	Jeram Padang N.	1,700	...	...	1,700		
Do. ... ..	" " S.	1,856	...	...	1,856		
Kuala Pilah, Seremban and Tampin	Angsi ... ..	...	...	...	...	50,000	2303 of 21-7-16
K. Pilah and Tampin ...	Jelai-Gemas ...	...	...	...	...	22,500	228 of 17-1-19
Seremban ... ..	Senawang ... ..	1,864	...	...	1,864		
Do. ... ..	Lenggeng ... ..	3,722	625	...	4,347	...	Survey correction
Do. ... ..	Labu ... ..	13,858	...	...	13,858		
Tampin ... ..	Gunong Tampin	5,689	...	...	5,689		
Do. ... ..	Gemas ... ..	10,042	...	...	10,042		
Do. ... ..	Tebong ... ..	6,549	...	...	6,549		
Do. ... ..	South Gemas ...	15,000	...	2	14,998	...	3983 of 10-9-20
Coast ... ..	Sepang ... ..	1,651	...	...	1,651		
Do. ... ..	Sendayan ... ..	2,862	...	...	2,862		
Do. ... ..	Jimah ... ..	1,326	...	...	1,326		
Do. ... ..	Pasir Panjang ...	1,335	...	...	1,335		
Do. ... ..	" " Puteh ... ..	55	...	...	55		
Do. ... ..	Port Dickson ...	12	...	...	12		
Do. ... ..	Sungei Menyala	6,244	...	40	6,204	...	3984 of 10-9-20
	Total N.S. ...	256,927	1,126	42	258,011	72,500	
	Square miles ...	401.4	1.7	.06	403.1	113.2	



## Form I—(cont.)

## AREA OF CONSTITUTED AND PROPOSED RESERVED FORESTS.—(cont.)

Civil district.	Name of forest.	Constituted reserves.				Proposed reserves preliminarily notified but not constituted.	No. of notification and remarks.
		Area on 1-1-1920.	Added during year.	Excluded during year.	Area on 31-12-1920.		
		Acres.	Acres.	Acres.	Acres.	Acres.	
PAHANG (W)							
Lipis ... ..	Sungei Kerpan	323	...	...	323		
Do. ... ..	.. Mangsok	671	...	...	671		
Do. ... ..	.. Putat ...	2,040	...	...	2,040		
Do. ... ..	Kechau ...	10,000	...	...	10,000		
Do. ... ..	Benchah ...	11,330	...	...	11,330		
Do. ... ..	Yong ... ..	97,000	...	...	97,000		
Do. ... ..	Tekam ... ..	120,000	...	...	120,000		
Do. ... ..	Som ... ..	32,750	...	...	32,750		
Do. ... ..	Jelai ... ..	...	6,800	...	6,800	...	4440 of 8-10-20
Raub ... ..	Ulu Dong ...	2,814	...	...	2,814		
Do. ... ..	Bilut ... ..	48,466	...	...	48,466		
Do. ... ..	Rotan Tunggal	1,695	...	...	1,695	29	5767 of 31-12-20
Do. ... ..	Kelau ... ..	12,000	...	...	12,000		
Do. ... ..	Jahit ... ..	768	...	...	768		
Raub and Temerloh	Kemasul ...	111,593	...	...	111,593		
Do. ... ..	Lakum ... ..	72,000	...	...	72,000		
Temerloh ... ..	Kerdau ... ..	15,060	...	...	15,000		
Do. ... ..	Jinka ... ..	...	...	...	...	125,000	1292 of 10-5-18
Raub Bentong ...	Benus Telemong	...	...	...	...	70,000	2723 of 2-7-20
Do. ... ..	Bukit Raka ...	...	...	...	...	9,000	4692 of 22-10-20
PAHANG (E)							
Kuantan ... ..	Baloh ... ..	28,894	...	...	28,894		
Do. ... ..	Bukit Goh ...	20,939	...	...	20,939		
Do. ... ..	Kuantan ... ..	1,424	...	...	1,424		
Do. ... ..	Berkelah ...	15,500	...	...	15,500		
Do. ... ..	Lepar ... ..	...	...	...	...	64,200	1178 of 7-4-16 and 1348 of 20-4-16
Do. ... ..	Chini ... ..	...	...	...	...	36,000	2749 of 14-9-17
Pekan ... ..	Riyam (Menchali)	1,522	...	...	1,522		
Do. ... ..	Perah ... ..	503	...	...	503		
Do. ... ..	Lesong ... ..	108,700	...	...	108,700		
Do. ... ..	Mentas ... ..	1,435	...	...	1,435		
Do. ... ..	Pulau Lang ...	59	...	...	59		
Do. ... ..	Aur ... ..	...	...	...	...	40,000	3056/18
Do. ... ..	Rompin ... ..	...	...	...	...	300	3939 of 10-10-19
Do. ... ..	Bukit Cheraï ...	...	...	...	...	50,000	3982 of 10-9-20
	Total Pahang ...	717,426	6,800	...	724,226	394,529	
	Square miles ...	1,120.9	10.6	...	1,131.6	616.4	
SUMMARY.							
Perak ... ..	...	526,380	13,698	50	540,028	588,092	
Selangor ... ..	...	341,123	1,351	18	342,456	57,700	
N. Sembilan ...	...	256,927	1,126	42	258,011	72,500	
Pahang ... ..	...	717,426	6,800	...	724,226	394,529	
	Total ...	1,841,856	22,975	110	1,864,721	1,112,821	
			+ 22,865				
	Square miles ...	2,877.9	35.8	.15	2,913.5	1,738.7	
	1919 ...	1,787,123	55,694	961	1,841,856	790,189	
			+ 54,733				

Form II.

RECORD OF DEMARCATION AND MAINTENANCE OF BOUNDARIES FOR 1920.

State.	DEMARCATED DURING YEAR.		PREVIOUSLY DEMARCATED AND REQUIRING MAINTENANCE.				Total demarcated at close of year.	STILL REQUIRING DEMARCATION.		Demarcation abandoned or not required.	Total length of boundaries.	EXPENDITURE.				Remarks.				
	With rentis.	Without rentis.	With rentis.		Without rentis.			With rentis.	Without rentis.			New work.		Repairs.						
			Repaired	Not repaired.	Repaired or found in order.	Wanting repairs or not inspected.						With rentis.	Without rentis.	With rentis.	Without rentis.					
	1	2	3	4	5	6		7	8			9	10	11	12		13	14	15	16
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	\$	c.	\$	c.	\$	c.	\$	c.	
Perak (Taiping) ...	44	...	443	17	306	32	842	171	92	205	1,310	1,081	15	...	...	2,276	65 <sup>a</sup>			
„ (Batu Gajah) ...	...	...	135	28	27	...	190	26	5	...	221	...	...	...	...	258	45			
Selangor ...	10	...	279	101	227 <sup>b</sup>	...	667 <sup>c</sup>	28	5	8	708	728	20 <sup>d</sup>	...	...	750	01			
Negri Sembilan ...	41	4	443	...	94	...	582	...	...	...	582	1,600	89	...	...	1,492	69 <sup>f</sup>			
Pahang West ...	55	...	154	120	68	26	423	13	23	116	575	1,004	23	...	...	714	90 <sup>e</sup>			
„ East ...	20	...	47	160	46	87	360	112	...	...	472	373	40	...	...	405	00	10	00	
Total ...	170	4	1,501	426	818	145	3,064	350	125	329	3,868	4,787	92			5,898	20		10	00

174

1,927

963

475

\$5,808.20

\$10,696.12

Boundary plates ... 122.00

\$10,828.12 Total paid from vote VI a

(a) Excludes \$30, cost of plates bought in previous years.

(b) Eight miles abandoned.

(c) Variation from figures given for 1919 due to revision of calculations.

(d) Includes cost of prismatic compass survey.

(e) Excludes \$106.75, cost of plates bought in previous years.

(f) Excludes \$330, cost of plates bought in previous years.

## STATEMENT OF SURVEYS DURING THE YEAR 1920.

Locality and nature of survey.	By Survey Department.				By Forest Department.				Remarks.
	Acres.	Miles.	Chains.	Expenditure.	Acres.	Miles.	Chains.	Expenditure.	
				\$ c.				\$ c.	
PERAK (Taiping).									
Paths—Trolak Forest Reserve ... ..	...	...	...	...	...	1	10	...	By forest staff
„ Behrang Forest Reserve ... ..	...	...	...	...	...	...	19	...	„
„ Larut Hills Forest Reserve ... ..	...	...	...	...	...	3	74	92 85	Paid from vote V a
Sample plots Behrang Forest Reserve ... ..	...	...	...	...	...	...	35	...	By forest staff
„ Mangrove ... ..	...	...	...	...	...	...	50	...	„
Padi planting—P. Tanjong Forest Reserve ... ..	...	...	...	...	...	4	13	15 00	Paid from vote VI b
Three-hundred acres excision P. Tanjong Forest Reserve ... ..	...	...	...	...	...	...	73	4,20	„
New Mangrove coupes ... ..	...	...	...	...	...	18	41	...	By forest staff
Licences working area ... ..	...	...	...	...	...	27	74	148 50	Paid from vote VI b
New Forest Reserve boundaries—									
Bubu ... ..	...	...	...	...	...	1	52	...	Paid from vote VI a
Bintang Hijah ... ..	...	...	...	...	...	50	10	...	„
Piah Extension ... ..	...	...	...	...	...	21	14	...	„
Total ...	...	...	...	...	...	130	65	260 35	
SELANGOR.									
New paths—									
Rantau Panjang ... ..	...	...	...	...	...	2	20	...	By forest staff
Ulu Gombak ... ..	...	...	...	...	...	4	40	...	„
Ayer Itam ... ..	...	...	...	...	...	4	00	10 00	Paid from vote VI b
Boundaries of Kapar extension ... ..	...	...	...	...	...	6	40	...	By forest staff
Pintu Gedong fuel coupes ... ..	...	...	...	...	...	9	20	...	„
Do. pole coupes ... ..	...	...	...	...	...	4	40	...	„
Pulau Lumut Do. ... ..	...	...	...	...	...	6	00	...	„
Jugra fuel coupes ... ..	...	...	...	...	...	1	00	...	„
Ayer Itam—Topo. survey ... ..	11,239	...	...	9,980 00	...	...	...	3,712 00	Field work complete
New Boundaries—									
Batang Kali ... ..	...	...	...	...	...	3	00	...	Paid from vote VI a
Endong ... ..	...	...	...	...	...	7	00	...	„
Total ...	11,239	...	...	9,980 00	...	48	00	3,722 00	

Form III—(cont.)

STATEMENT OF SURVEYS DURING THE YEAR 1920.—(cont.)

Locality and nature of survey.	By Survey Department.				By Forest Department.				Remarks.
	Acres.	Miles.	Chains.	Expenditure.	Acres.	Miles.	Chains.	Expenditure.	
NEGRI SEMBILAN.									
Angsi Reserve ... ..	...	62	50	7,082 04	...	...	...	...	Completed
South Gemas Reserve ... ..	...	36	25	2,733 55	...	...	...	...	Completed
Jeram Padang North Reserve ... ..	...	...	...	210 88	...	...	...	...	Not completed
Berembun Reserve ... ..	...	8	20	653 45	...	...	...	...	Completed.
Access road reserves—									
Senawang to Seremban-K. Pilah road ... ..	...	3	77	486 78	...	...	...	...	
Re-establishing boundary marks									
Pasir Puteh Reserve ... ..	...	...	10	14 60	...	...	...	...	
Triang Reserve—survey of path No. 1 ... ..	...	...	...	...	...	1	60	4 50	Paid from vote VIb
Gunong Angsi Reserve ... ..	...	...	...	...	...	21	79	...	"    VIa
Jelai—Gemas ... ..	...	...	...	...	...	20	53	...	"
Total ... ..	...	111	22	11,181 30	...	44	32	4 50	
PAHANG.									
Boundary surveys—									
Lepar Forest Reserve ... ..	...	3	70	...	...	...	...	...	In course of revenue survey
Rompin Mangrove Reserve ... ..	...	...	...	...	...	11	00	80 40	Completion of survey
Aur Reserve ... ..	...	...	...	...	...	9	40	218 10	Western boundary along the Sungei Aur— inclusive of \$40.80, cost of boat hire and transport
Temerloh—Manchis path ... ..	...	...	...	...	...	1	40	25 20	
Bolok—Jemampong path (Temerloh district) ... ..	...	...	...	...	...	11	60	68 00	Includes \$25, cost of band chain—vote VIb
Grand total ... ..	11,239 (17.5 sq.m.)	115	12	21,161 30	...	33	60	391 70	

## COMMUNICATIONS AND BUILDINGS, 1920.

NEW WORK UNDERTAKEN DURING THE YEAR.						ALTERATIONS AND REPAIRS EXECUTED DURING THE YEAR.							
Roads and Bridges.			Buildings.		Other works.		Roads and Bridges.			Buildings.		Other works.	
Description of road or path.	Miles.	Cost.	Description of building.	Cost.	Description of work.	Cost.	Description of road and nature of repairs.	Miles.	Cost.	Description of building and nature of repairs.	Cost.	Description of work and nature of repairs.	Cost.
	M. Ch.	\$ c.		\$ c.		\$ c.			\$ c.		\$ c.		\$ c.
PERAK.													
Inspection paths— Larut Hills Reserve	1 54	476 28 <sup>a</sup>	Temporary buildings— Coolie lines	442 00 <sup>b</sup>	Well for Forest Ranger's quarters, K. Kangsar	150 00	Paths— Larut Hill Forest Reserves	15½	e	General repairs— K. Kangsar ...	820 66	Water Supplies— Larut Hill quarters	59 75
Trolak Forest Reserve	5 56	654 75	Pondok Tanjong Forest Reserve	284 95 <sup>c</sup>	Levelling sites Forest Ranger's quarters, Kuala Kangsar	65 00	Pondok Tanjong Forest Reserve	21¼	130 63	Batang Padang ...	518 70	Klian Intan Checking Station	22 00 <sup>g</sup>
Pondok Tanjong Reserve	0 35	39 37	Three buildings for mangrove coupe guards	650 00	Forester's quarters, Semat	30 65	Trolak Reserve ...	40	450 80	Larut, Krian and Matang	54 00	Grass cutter Deputy Conservator of Forest's compound	144 00
Behrang Reserve...	0 19	21 00	Quarters for Forest Guards at Jelapang Road		Forest Guard's quarters, Larut Hill	7 70	Behrang Reserve	12	88 50	Perak (South) ...	1,443 00	Removing and re-building quarters Larut Hills	450 00
Total ...	8 04	1,191 40			Draining Forester's Quarters at Parit	18 45	Gunong Besout Reserve	9½	145 91	Bentang Checking Station		Upkeep of grounds Perak	84 20
Path Trace— Larut Hill Forest Reserve	4 00	92 85	By P.W.D.		Canal at Sungei Kalumpang	100 00	Bikam Reserve ...	24	425 00			Upkeep of grounds Perak (South)	20 60
Road Trace— Trolak Forest Reserve	0 26	65 00	Quarters for Forest Ranger and Forest Guard, Pasir Itam	6,250 00	By P.W.D.		Total ...	122¼	1,240 84	Compartment boundaries—		Removal and re-building, Parit Checking Station	1,240 00
Inspection paths— Parit Reserve ...	0 72	476 07	Checking Station and Forest Guards quarters, Tanjong Toh Alang	151 51	Bath house at Sungei Siput	600 00	Trolak ...	9	180 00	Total ...	405 00 <sup>f</sup>	Removal and re-building Checking Station, Enggor	1,320 00
By P.W.D.							Inspection paths— Pulau Tiga Reserves	3					
Approach road to Kota Checking Station		184 14					Changkat Jong Reserve	3½					
							Parit Reserve ...	13					
							Tanjong Toh Alang Reserve	7½					
Total ...	13 22	2,009 46	Total ...	8,478 46 <sup>d</sup>	Total ...	971 80	Total ...	170½	1,645 84	Total ...	7,278 70	Total ...	1,330 55

a. Including \$190.28 paid by C.L.R. Larut.

b. Paid from vote VI e.

c. Paid from vote II.

d. Plus \$700 paid for work of 1919.

e. By forest staff.

f. Paid from vote VI g.

g. Paid from vote V b.

## COMMUNICATIONS AND BUILDINGS, 1920.—(cont.)

NEW WORK UNDERTAKEN DURING THE YEAR.							ALTERATIONS AND REPAIRS EXECUTED DURING THE YEAR.						
Roads and Bridges.			Buildings.		Other works.		Roads and Bridges.			Buildings.		Other works.	
Description of road or path.	Miles.	Cost.	Description of building.	Cost.	Description of work.	Cost.	Description of road and nature of repairs.	Miles.	Cost.	Description of building and nature of repairs.	Cost.	Description of work and nature of repairs.	Cost.
	M. Ch.	\$ c.		\$ c.		\$ c.			\$ c.		\$ c.		\$ c.
SELANGOR.													
Inspection paths—			Rantau Panjang		New fences—		Repairs to reserve			General upkeep—		Caretakers wages	434 91
Rantau Panjang ...	1 20	137 00	Felling area		Kuala Kubu	27 00	paths—			(a) Checking	820 21	and upkeep of	
Ulu Gombak ...	4 60	580 00	temporary quar-		Forester's quar-		Rantau Panjang...	9	36 80	Stations and		grounds, wells,	
Ayer Itam ...	4 00	400 00	ters—		ters		Kuang ...	5	25 00	quarters, Ulu		etc.	
			Paid from vote II	58 45	Circular Road	45 00	Telok ...	2½	6 00	Selangor			
			Latrine, Pudu	40 64	Forester's quar-		Ulu Gombak ...	10	30 00	Kuala Lumpur ...	590 33		
			Ranger's quar-		ters		Sungei Buloh ...	16	55 40	Coast ...	606 82		
			ters				Bangi ...	12½	20 25	Ulu Langat ...	325 73		
							Ayer Itam ...	10½	54 75				
							Bukit Tunggai ...	9½	10 50	(b) Reserve quar-	70 00		
							Weld's Hill ...	4½	235 70	ters, Bukit			
							Circular Road ...	¾	62 05	Belata halting			
							Bukit Kutu Sana-	3	180 50	bungalow			
							torium			Kanching Forest	83 80		
										Guard's quarters			
										Rantau Panjang	58 84		
										lines			
										Ulu Klang Forest	115 30		
										Guard's quarters			
										Klang Gates	31 50		
										Forest Guard's			
										quarters			
										Circular Road	90 90		
										lines			
										Sungei Lalang	19 80		
										halting bunga-			
										low			
										Sungei Buloh	12 50		
										Halting bunga-			
										low			

			Circular Road Foresters and Forest Guard's quarters	2,550 00									
			Bangi Forest Guard's quarters	2,000 00									
			Ulu Langat Forester's quarters	2,239 00									
			Kajang Forest Guard's quarters	2,000 00									
Total ...	11.40	1,667 00	Total ...	31,881 99	Total ...	197 40	Total ...	83½	716 95	Total ..	2,825 73	Total ...	434 94

NEGRI SEMBILAN.

Inspection paths— Berembun Reserve	7 2)	502 90	Additions to Kuala Pilah Town Checking Station	144 00	Fences to Checking Stations— Bahau Titi Ulu Klawang Pertang	237 50	Inspection paths— Sendayan Labu paths Nos. 1, 2 & 3	21 60	120 00	General repairs ...	1,008 24	Caretaker's wages, upkeep of grounds, wells, etc.	437 88
Senaling Inas Reserve	2 20	150 30	<i>By P. W. D.</i>				Senawang Nos. 1-6	11 20	31 70				
Kepis Reserve ..	5 00	237 10	New Forest and Agricultural Offices, Kuala Pilah	4,352 91		Lenggeng No. 1...	60	10 00					
Pasoh Reserve...	40	19 75	Barrack quarters (standard type) for two Forest Guards, Kepis Reserve	2,500 00		Angsi No. 1 ...	6 00	34 60					
			Barrack quarters for three Forest Guards, in Tampin town	3,427 50		Berembun No. 4 widening and improving	3 40	282 65					
						Senaling Inas Nos. 1-6 & 11-15	14 40	45 69					
						Kepis Nos. 8, 10, 11 & 1-6 & part of 9	14 40	41 79					
						Pasoh No. 1 ...	15 00	19 09					
						Serting (cost of point, etc.)	...	7 89					
						Tebong No. 1 ...	8 00	39 90					
						Gemas No. 1 ...	10 00	49 50					
						Gunong Tampin No. 1	3 40	9 80					
						Gemas-Pallong state boundary patrol N. S. Johore	12 00	51 75					
						Pasir Panjang Nos. 1, 2 & 4	2 40	13 60					
						Maintenance of occupation crossing	...	15 00					
Total ...	15 00	910 05	Total ..	10,424 41	Total ...	237 50	Total ...	123 20	772 96	Total ...	1,008 24	Total ...	437 88

## COMMUNICATIONS AND BUILDINGS, 1920.—(cont.)

NEW WORK UNDERTAKEN DURING THE YEAR.							ALTERATIONS AND REPAIRS EXECUTED DURING THE YEAR.						
Roads and Bridges.			Buildings.		Other works.		Roads and Bridges.			Buildings.		Other works.	
Description of road or path.	Miles.	Cost.	Description of buildings.	Cost.	Description of work.	Cost.	Description of road and nature of repairs.	Miles.	Cost.	Description of building and nature of repairs.	Cost.	Description of work and nature of repairs.	Cost.
	M. Ch.	\$ c.		\$ c.		\$ c.			\$ c.		\$ c.		\$ c.
PAHANG.													
Inspection paths— S. Benchah to S. Kera	4 20	140 70	Ranger's quarters permanent— Bukit Kota Check- ing Station ...	2,100 00	Fencing Checking Stations— Kuala Berau ...	10 50	Inspection paths Inspection paths Bukit Goh Res.	70 73 12 00	468 35 65 20	General repairs— Pahang (West) Pahang (East)...	993 92 497 71	Caretaker's wages Tembeling halt- ing bungalow and up Pahang (W) keep of grounds Upkeep of grounds etc. Pahang (E)	336 17
Manchis crossing the Kemasul Reserves	8 19	98 00	Bukit Kota Forest Guards' tem- porary quarters	400 00	Wells to Checking Stations Bukit Kota	16 00	Replacing bridge over drain, Pekan Checking station	...	11 80				67 40
K. Kaung to Bolok Kerdau Rly. Station through Kerdau Reserve	5 48 10 63	81 50 154 45	Labok Kulit ...	150 00	Tembeling ... 1st Mile Lipis Road	12 00 40 00							
Access reserve path to Kerdau Reserve from Rly. mile 84	2 16	27 10	<i>By P.W.D.</i> Tembeling Guards' and Foresters quarters Ketari-Bentong Checking Station	1,000 00 725 00	Checking Station No. 30, Bentong Mempateh ... Mentakab ... halting bungalow, Chermang	10 00 50 60 25 00 22 75							
			<i>Special Expenditure.</i> Quarters at Galing Rompin ... " ... " ... Latrine, Rompin	850 00 600 00 600 00 30 00									
Total ...	31 06	501 75	Total ...	6,455 00	Total ...	211 85	Total ...	82 73	545 35	Total ...	1,491 63	Total ...	403 57
SUMMARY.													
PERAK ...	13 22	2,009 46	...	8,478 46	...	971 80	...	170 40	1,645 84	...	7,278 70	...	330 55
SELANGOR ...	11 40	1,667 00	...	31,881 99	...	197 40	...	83 40	716 95	...	2,825 73	...	434 94
NEGRI SEMBILAN...	15 00	910 05	...	10,424 41	...	237 50	...	123 20	772 96	...	1,008 24	...	437 88
PAHANG ...	31 06	501 75	...	6,455 00	...	211 85	...	82 60	545 35	...	1,491 63	...	403 57
Total ...	70 68	5,088 26	Total ...	57,239 86	Total ...	1,618 55	Total ...	460 00	3,681 10	Total ...	12,604 30	Total ...	1,606 94



## SUMMARY OF FOREST OFFENCES FOR THE YEAR 1920.

State.	Pending from previous year.		New Cases.						Grand total of pending and new cases.		Cases disposed of												Confiscated property sold or released (sections 48 and 51).		Compensation for damage to trees or timber (section 49).		Still pending.									
			Unauthorized felling, removal, or appropriation of Forest Produce.		Other offences.		Total.				Convictions.						Acquitted or discharged (without caution).		Total.																	
											Imprisonment without option of fine.		Fined or compounded.		Cautioned and discharged.		Total.																			
			Cases.	Persons.	Cases.	Persons.	Cases.	Persons.			Cases.	Persons.	Cases.	Persons.	%	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.							%	Cases.	%	Cases.	Persons.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
Perak (Taiping) ...	A	...	...	70	121	2	3	72	124	72	124	3	3	53	98	2,133	00	11	16	67	117	4	6	71	123	26	1 089	51	3	852	40	1	1			
	B	...	...	129	167	...	...	129	167	129	167	...	...	127	164	2,074	04	2	3	129	167	...	...	129	167	72	1,471	54	...	...	...	...	...	...		
	C	...	...	3	3	...	...	3	3	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Total	...	...	202	291	2	3	204	294	204	294	3	3	180	262	4,207	04	13	19	196	284	4	6	200	290	98	2,561	05	3	852	40	1	1				
Perak (Batu Gajah) ...	A	2	2	32	48	2	2	34	50	36	52	1	1	27	30	876	00	4	7	32	38	4	14	36	52	16	205	20	1	140	00	...	...			
	B	...	...	66	68	1	1	67	69	67	69	...	...	67	69	1,597	00	...	...	67	69	...	...	67	69	36	673	80	...	...	...	...	...	...		
	C	...	...	11	31	...	...	11	31	11	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	23	82	...	...	...	...	...	...		
Total	2	2	109	147	3	3	112	150	114	152	1	1	94	99	2,473	00	4	7	99	107	4	14	103	121	54	902	82	1	140	00	...	...	...	...		
Selangor ...	A	...	...	19	31	9	36	28	67	28	67	3	3	22	43	1,515	00	1	18	26	64	2	3	28	67	10	39	47	...	...	...	...	...			
	B	...	...	66	81	1	1	67	82	67	82	...	...	67	82	1,216	00	...	...	67	82	...	...	67	82	16	568	95	...	...	...	...	...	...		
	C	...	...	17	21	...	...	17	21	17	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	64	50	...	...	...	...	...	...		
Total	...	...	102	133	10	37	112	170	112	170	3	3	89	125	2,731	00	1	18	93	146	2	3	95	149	32	672	92	...	...	...	...	...	...			
Negri Sembilan ...	A	1	1	6	6	...	...	6	6	7	7	...	...	6	6	149	00	1	1	7	7	...	...	7	7	2	6	50	...	...	...	...	...	...		
	B	1	1	66	69	2	2	68	71	69	72	...	...	66	69	1,765	80	1	1	67	70	...	...	67	70	7	385	44	2	547	05	2	547	05	2	2
	C	...	...	1	1	4	4	5	5	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	2	2	73	76	6	6	79	82	81	84	...	...	72	75	1,914	80	2	2	74	77	...	...	74	77	9	391	94	2	547	05	2	547	05	2	2	
Pahang (W) ...	A	4	5	21	26	...	...	21	26	25	31	...	...	23	28	879	42	...	...	23	28	2	3	25	31	7	289	50	...	...	...	...	...	...		
	B	...	...	45	56	6	6	51	62	51	62	...	...	49	59	460	00	...	...	49	59	3	3	52	62	2	25	20	...	...	...	...	1	2		
	C	...	...	1	1	...	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	00	20	...	...	...	...	1	1		
Total	4	5	67	83	6	6	73	89	77	94	...	...	72	87	1,285	42	...	...	72	87	5	6	77	93	10	314	90	...	...	...	...	2	3			
Pahang (E) ...	A	...	...	1	1	...	...	1	1	1	1	...	...	1	1	25	00	...	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	
	B	...	...	27	46	5	84	32	130	32	130	...	...	26	49	372	50	...	...	26	49	2	2	28	51	...	...	...	...	...	...	...	4	79		
	C	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	28	47	5	84	33	131	33	131	...	...	27	50	397	50	...	...	27	50	2	2	29	52	...	...	...	...	...	...	...	4	79			
Total for F.M.S.	A	7	8	149	233	13	41	162	274	169	382	7	7	132	206	5,577	42	17	42	156	255	12	26	168	281	61	1,630	18	4	992	40	1	1			
	B	1	1	399	487	15	94	414	581	415	582	...	...	402	492	7,431	34	3	4	405	496	5	5	410	501	133	3,124	93	2	547	05	7	83			
	C	...	...	33	57	4	4	37	61	37	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	88	52	...	...	...	1	1			
Grand Total	8	9	581	777	32	139	613	916	621	925	7	7	534	698	13,008	76	20	46	561	751	17	31	578	782	203	4,843	63	6	1,539	45	9	85				

NOTE.—In column 1  
A—Cases taken into Court.  
B—Cases dealt with departmentally.  
C—Undetected cases.

## WORKS OF REPRODUCTION AND IMPROVEMENT.

Reserve.	Kind of plantation or nature of work done.	Area in acres.					Receipts.		Charges.		Remarks.
		On 1-1-20.	Added during year.	Excluded.	Retreated.	On 31-12-20.					
							\$	c.	\$	c.	
1	2	3	4	5	6	7	8	9	10	11	

## I.—REGULAR PLANTATIONS.

Perak—											
Matang ... ..	Mangrove ... ..	482	...	...	2	482	...	...	...	a	a By forest staff
Kuala Krau ... ..	" ... ..	151	...	...	...	151	...	...	...	...	...
Asam Kumbang ... ..	Para rubber ... ..	35	...	...	35	35	2,426 40*	...	619 48	VIg	* Lease of tapping rights
Pondok Tanjong ... ..	Rotan (Nursery) ... ..	...	...	...	...	...	...	...	20 10	VIe	...
Kroh and Klian	...	...	...	...	...	...	...	...	...	VIe	...
Instan ... ..	Ch. Station planting fruit trees	...	...	...	...	...	...	3 50	...	...	...
Total Perak ... ..		668	...	...	37	668	2,426 40	3 50	639 58	...	...
Selangor—											
Circular Road ... ..	Various ... ..	78	...	...	...	78	29 50	...	1,060 89	VIe	...
Weld Hill Reservoir ... ..	Para rubber ... ..	6	...	...	...	6	103 25	...	...	...	...
Sungei Buloh	Batai and yemane ... ..	...	2	...	...	2	...	259 80	131 55	VIIIa	...
	chengal and merbau ... ..	...	8	...	...	8	...	298 10	...	VIe	...
Ulu Gombak ... ..	Yemane ... ..	...	$\frac{1}{2}$	...	...	$\frac{1}{2}$	...	60 00	...	VIe	...
Klang Island ... ..	Mangrove ... ..	83	...	...	...	83	...	72 00	...	VIIIa	...
Jugra " ... ..	" ... ..	18	...	...	...	18	...	...	...	...	...
Kuang ... ..	Para rubber and coconuts ... ..	2	...	...	...	2	37 50	...	5 00	...	...
Total Selangor ... ..		187	$10\frac{1}{2}$	...	...	$197\frac{1}{2}$	170 25	689 90	1,287 34	...	...
Negri Sembilan—											
Senawang ... ..	Para rubber ... ..	$3\frac{1}{2}$	...	...	...	$3\frac{1}{2}$	...	...	...	...	...
Total N. Sembilan ... ..		$3\frac{1}{2}$	...	...	...	$3\frac{1}{2}$	...	...	...	...	...
Total F.M.S. ... ..		$858\frac{1}{2}$	$10\frac{1}{2}$	...	37	869	2,596 65	693 40	1,926 92	...	...

## WORKS OF REPRODUCTION AND IMPROVEMENT.—(cont.)

Reserve.	Kind of plantation or nature of work done.	Area in acres.					Receipts.		Charges.				Remarks.
		On 1-1-20.	Added during year.	Excluded.	Retreated.	On 31-12-20.			Creation.		Upkeep.		
							\$	c.	\$	c.	\$	c.	
1	2	3	4	5	6	7	8	9	10	11			

## II.—CULTURAL OPERATIONS.

(Planting in shade in the forest.)

## Perak—

Pondok Tanjong ...	Chengal, merbau, kulim, and kamuning	537	...	...	...	537						
Bikam ...	Rotan sega ...	193	10	...	193	203	...	143 33	c 582 01			VIe.(c) includes \$70.86 replacing block Nos. and Posts but not \$442 cost of new lines
" ...	Chengal ...	1,067	...	...	...	1,067						
" ...	Merbau ...	30	...	...	...	30						
Trolak ...	Taban ...	204	...	...	...	204						
Behrang ...	" ...	2	...	...	...	2						
	Total Perak ...	2,033	10	...	193	2,043	...	143 33	582 01			

## Selangor—

Rantau Panjang ...	Taban ...	1,376½	3	...	72	1,379½	...	101 00	{ 52 50 11 00 13 00 75 00	Seed collection Upkeep nursery New nursery
Kanching ...	Camphor ...	14	...	...	...	14	...	101 00	151 50	VIe
" ...	" ...	...	...	...	...	...	...	38 18	...	Apparatus for sowing
	Total Selangor ...	1,390½	3	...	72	1,393½	...	139 18	151 50	

## Negri Sembilan—

Senawang ...	Penak, merbau, and taban ...	415½	...	...	415½	415½	...	...	173 65	All plantations
Senaling-Inas ...	Penak, merbau, tembusu, penaga, and gelam	228	...	...	...	228	...	...	...	
Serting ...	Penak, merbau, and tembusu ...	29	...	...	...	29	...	...	...	
Kepis ...	" " " ...	263	...	...	263	263	...	...	31 20	Partly upkept by forest guards without cost
Pasir Panjang ...	Damar laut ...	86	...	...	86	86	...	...	16 00	" "
	Total N. Sembilan ...	1,021½	...	...	764½	1,021½	...	...	220 85	29 cents per acre

## WORKS OF REPRODUCTION AND IMPROVEMENT.—(cont.)

Reserve.	Kind of plantation or nature of work done.	Area in acres.					Receipts.	Charges.		Remarks.
		On 1-1-20.	Added during year.	Excluded.	Retreated.	On 31-12-20.				
							\$	c.	\$	
1	2	3	4	5	6	7	8	9	10	11

## II.—CULTURAL OPERATIONS.—(cont.)

(Planting in shade in the forest.)—(cont.)

Pahang—

Bilut	Chengal and kulim planted in lines	65	...	...	...	65				
Baloh	Chengal	47	...	...	...	47				
Bukit Goh	"	7	...	...	...	7				
"	Rotan sega	15	...	...	...	15				
Kuantan Mangrove	Mangrove	$\frac{1}{4}$	...	...	...	$\frac{1}{4}$				
Pulau Lang	"	...	2	...	...	2	...	7 00	...	VIc
	Total Pahang	$134\frac{1}{4}$	2	...	...	$136\frac{1}{4}$	...	7 00	...	
	Total F.M.S.	$4,579\frac{1}{4}$	15	...	$1,029\frac{1}{2}$	$4,594\frac{1}{4}$	...	289 51	954 36	

Perak—

## III.—WORKS OF IMPROVEMENT.

Pondok Tanjong	Improvement fellings	2,612	...	...	...	2,612				
Larut Hills	"	70	...	...	30	70	379 30i	...	96 60	*VI f. (i) Sale of gutta
Chikus	"	215	...	...	...	215				
Bikam	"	2,728	...	...	...	2,728				
Trolak	"	4,861	...	...	250	4,861			1,926 00	VI f. for 3rd and 4th times
Besout	"	1,202	...	...	212	1,202			1,696 00	VI f. for 2nd time
Behrang	"	2,191	...	...	356	2,191			3,678 61	VI f. for 4th time
Pulau Tiga	"	199	...	...	...	199				
Parit	Cleanings	1,194	427	...	...	1,621	...	2,254 96		
Tanjong Toh Alang	Improvement fellings	245	...	...	...	245				
	Total Perak	15,517	427	...	848	15,944	379 30	2,254 96	7,397 21	

## WORKS OF REPRODUCTION AND IMPROVEMENT.—(cont.)

Reserve.	Kind of plantation or nature of work done.	Area in acres.					Receipts.		Charges.		Remarks.	
		On 1-1-20.	Added during year.	Excluded.	Retreated.	On 31-12-20.						
							\$	c.	\$	c.		
1	2	3	4	5	6	7	8	9	10	11		
III.—WORKS OF IMPROVEMENT.—(cont.)												
Selangor—												
Rantau Panjang ...	Improvement fellings ...	2,918	...	...	537	2,918	...	...	2,340	12	VIIIa (S. P. 17)	
Kuang ...	" " ...	1,534	...	...	...	1,534	...	...	...	...		
Kanching ...	" " ...	1,180	...	...	433	1,180	...	...	1,406	89		
Bangi ...	" " ...	2,214	...	...	211	2,214	...	...	742	62		
Sungei Lalang ...	" " ...	1,938	...	...	...	1,938	...	...	...	...		
Bukit Tunggul ...	" " ...	1,794	...	...	49	1,794	...	...	344	95		
Ayer Itam ...	Bertam cutting ...	470	454	...	...	924	...	2,355	50	...		
Sungei Buloh ...	Improvement fellings ...	2,261	92	...	331	2,353	...	302	60	1,130		20
Ulu Gombak ...	Bertam cutting ...	679	130	...	...	809	...	269	40	...		
Weld's Hill ...	General maintenance ...	39	...	...	39	39	...	...	...	550		96
Bukit Puteh ...	Improvement fellings ...	16	...	...	...	16	...	...	...	...		
Bukit Cheraka ...	" " ...	1,443	...	...	...	1,443	...	...	...	...		
Total Selangor ...		16,486	676	...	1,600	17,162	...	2,927	50	6,495		74
Negri Sembilan—												
Senawang ...	Improvement fellings ...	1,737 $\frac{1}{2}$	...	...	142 $\frac{1}{2}$	1,737 $\frac{1}{2}$	...	...	231	05	Compartment Nos. 6 and 7	
Labu ...	" " ...	45	...	...	...	45	...	...	...	...	...	
Kepis ...	Improvement clearings and fellings	993	187	...	...	1,180	...	373	10	...	" No. 11	
Gemas ...	Improvement clearings ...	135 $\frac{3}{4}$	...	...	...	135 $\frac{3}{4}$	...	...	...	...	...	
Sendayan ...	Improvement clearings and fellings	540	443 $\frac{3}{4}$	...	...	983 $\frac{3}{4}$	...	737	10	...	" Nos. 2, 3 and 4	
Senaling-Inas ...	" " " ...	1,443	212	...	...	1,655	...	563	80	...	" " 15 and 16	
Serting ...	" " " ...	970	199	...	...	1,169	...	285	30	...	" No. 10	
Pasoh ...	" " " ...	1,555	119	...	...	1,674	...	269	00	...	" " 8	
Bahau ...	Improvement clearings ...	9 $\frac{1}{2}$	...	...	...	9 $\frac{1}{2}$	...	...	...	...	...	
Pasir Panjang ...	" " ...	57	...	...	...	57	...	...	...	...	...	
Port Dickson, 1st mile	" " ...	10	...	...	...	10	...	...	...	...	...	
Triang ...	Improvement clearings and fellings	...	10	...	...	10	...	96	60	...	Experimental plot No. 2	
Total N. Sembilan ...		7,495 $\frac{3}{4}$	1,170 $\frac{3}{4}$	...	142 $\frac{1}{2}$	8,666 $\frac{1}{2}$	...	2,324	90	231	05	

Form VII—(cont.)

WORKS OF REPRODUCTION AND IMPROVEMENT.—(cont.)

Reserve.	Kind of plantation or nature of work done.	Area in acres.					Receipts.		Charges.		Remarks.		
		On 1-1-20.	Added during year.	Excluded.	Retreated.	On 31-12-20.	\$	c.	Creation.			Upkeep.	
									\$	c.		\$	c.
1	2	3	4	5	6	7	8	9	10				

Pahang—

III.—WORKS OF IMPROVEMENT.—(cont.)

Bencha ... ..	Improvement fellings in favour of getah taban	1,000	756	...	...	1,756	...	875	80	...	Vote VI f
Ulu Dong ... ..	" " " " " "	400	...	...	...	400					
Riyam ... ..	Improvement fellings ... ..	769	...	...	...	769					
Lesong ... ..	" " " " " "	960	...	...	...	960					
Perah ... ..	" " " " " "	503	...	...	...	503					
Mentas ... ..	Bertam cutting ... ..	200	...	...	...	200					
Bukit Goh ... ..	Improvement fellings ... ..	1,351	...	...	...	1,351					
Baloh ... ..	" " " " " "	1,067	...	...	...	1,067					
Total Pahang ... ..		6,250	756	...	...	7,006	...	875	80		
Total F.M.S. ... ..		45,748 $\frac{3}{4}$	3,029 $\frac{3}{4}$	...	2,590 $\frac{1}{2}$	48,778 $\frac{1}{2}$	379 30	8,383	16	14,124	00

SUMMARY.

All reserves ...	{	Regular plantations ... ..	858 $\frac{1}{2}$	10 $\frac{1}{2}$	...	37	869	2,596	65	693	40	1,926	92
		Cultural operations ... ..	4,579 $\frac{1}{4}$	15	...	1,029 $\frac{1}{2}$	4,594 $\frac{1}{4}$	...	289	51	954	36	
		Works of improvement... ..	45,748 $\frac{3}{4}$	3,029 $\frac{3}{4}$	...	2,590 $\frac{1}{2}$	48,778 $\frac{1}{2}$	379 30	8,383	16	14,124	00	
		GRAND TOTAL ... ..	51,186 $\frac{1}{2}$	3,055 $\frac{1}{4}$	...	3,657	54,241 $\frac{3}{4}$	2,975 95	9,366	07	17,005	28	

## OUTTURN OF TIMBER AND FUEL FOR 1920.

State.	By Government and Purchasers.								By Free Grantees.					Grand Total.
	Class IA.	Class IB.	Class IC.	Class II.	Poles.	Fuel.	Charcoal.	Total.	Timber.	Poles.	Fuel.	Charcoal.	Total.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
RESERVED FORESTS.														
Perak (Taiping) ...	50	14	25	88	3,572	239,360	...	243,109	...	3,726	342	...	4,068	247,177
Perak (Batu Gajah) ...	481	8	201	21	2,895	12,938	...	16,544	...	...	...	...	...	16,544
Selangor ...	22	415	109	266	8,762	84,212	...	93,786	...	...	...	...	...	93,786
Negri Sembilan ...	89	82	157	21	648	408	...	1,405	51	60	...	...	111	1,516
Pahang (West) ...	...	...	...	...	...	543	...	543	...	...	...	...	...	543
Pahang (East) ...	367	5,138	394	...	...	304	...	6,203	...	...	...	...	...	6,203
Total 1920 ...	1,009	5,657	886	396	15,877	337,765	...	361,590	51	3,786	342	...	4,179	365,769
" 1919 ...	640	3,393	991	278	13,950	345,548	...	364,800	...	236	...	...	236	365,036
" 1918 ...	488	282	1,223	97	10,068	285,787	2	297,947	71	408	223	...	702	298,649
" 1917 ...	144	103	1,710	124	11,253	188,958	5	202,597	303	522	10	...	835	203,132
" 1916 ...	105	57	39	20	7,657	149,252	...	157,130	124	888	...	...	1,012	158,142
UNRESERVED FORESTS.														
Perak (Taiping) ...	11,140	3,818	32,497	1,480	14,768	110,406	6,143	180,252	...	...	...	...	...	180,252
Perak (Batu Gajah) ...	2,945	2,334	10,452	583	14,082	105,098	3,551	139,045	...	...	...	...	...	139,045
Selangor ...	2,188	1,833	8,651	518	11,564	102,372	7,543	134,669	792	176	2,444	...	3,412	138,081
Negri Sembilan ...	6,644	3,898	10,664	249	3,302	68,912	2,455	96,124	745	3,462	34,903	...	39,110	135,234
Pahang (West) ...	6,599	3,101	2,659	152	1,275	21,690	399	35,875	...	...	...	...	...	35,875
Pahang (East) ...	1,031	4,194	1,717	1	753	6,338	262	14,296	...	...	...	...	...	14,296
Total 1920 ...	30,547	19,178	66,640	2,983	45,744	414,816	20,353	600,261	1,537	3,638	37,347	...	42,522	642,783
" 1919 ...	30,392	20,342	50,393	3,615	48,911	417,359	20,148	591,161	1,294	5,103	31,293	...	37,690	628,850
" 1918 ...	30,773	15,700	57,387	4,278	60,676	430,193	18,026	617,033	7,028	5,663	39,953	...	52,644	669,677
" 1917 ...	28,843	10,315	57,108	3,447	42,420	350,062	19,048	511,243	6,687	3,813	46,178	...	566,78	567,921
" 1916 ...	21,470	10,944	51,880	2,972	38,240	498,718	16,327	640,551	7,846	11,276	124,200	235	143,557	784,108
TOTAL FOR RESERVED AND UNRESERVED FORESTS. *														
1920 ...	31,556	24,835	67,526	3,379	61,621	752,581	20,353	961,851	1,588	7,424	37,689	...	46,701	1,008,552
1919 ...	31,032	23,735	51,384	3,893	62,861	762,907	20,148	955,960	1,294	5,339	31,293	...	37,926	993,886
1918 ...	31,261	15,982	58,610	4,375	70,744	715,980	18,028	914,980	7,099	6,071	40,176	...	53,346	968,326
1917 ...	28,987	10,418	58,818	3,571	53,673	539,020	19,053	713,540	6,990	4,335	46,188	...	57,513	771,053
1916 ...	21,575	11,001	51,919	2,992	45,897	647,970	16,327	797,681	7,970	12,164	124,200	235	144,569	942,250

NOTE.—Apparent discrepancies in this form are due to the elimination of fractions.

Form IX.

OUTTURN OF MINOR FOREST PRODUCE.

Description of produce.	Perak (Taiping).		Perak (Batu Gajah).		Selangor.		Negri Sembilan.		Pahang (West).		Pahang (East).		Total.	
	Quantity.	Revenue.	Quantity.	Revenue.	Quantity.	Revenue.	Quantity.	Revenue.	Quantity.	Revenue.	Quantity.	Revenue.	Quantity.	Revenue.
		\$ c.		\$ c.		\$ c.		\$ c.		\$ c.		\$ c.		\$ c.
RESERVED FORESTS.														
Rotan ... ..	...	1,574 35	...	245 47	...	287 10	...	...	...	...	...	378 91	...	2,485 83
Bamboo ... ..	...	...	...	...	...	441 51	...	...	...	...	...	...	...	441 51
Damar ... .. pikuls	...	...	...	...	...	...	1,048.07	2,665 00	20 38	50 95	...	...	1,068.45	2,715 95
Nipah ... ..	...	10 00	...	...	...	156 00	...	...	...	...	...	161 66	...	327 66
Gutta-percha ... lbs.	1,194	2,469 99	...	...	383	1,937 30	...	...	...	...	...	...	1,577	4,407 29
Rubber (cultivated) ...	...	2,426 40	...	...	...	128 75	...	...	...	...	...	...	...	2,555 15
„ (wild) ... pikuls	...	...	...	...	...	...	60.70	200 00	...	...	...	...	60.70	200 00
Miscellaneous ... ..	...	454 28	...	...	...	123 70	...	...	...	...	...	...	...	577 98
Total ... ..	...	6,935 02	...	245 47	...	3,074 36	...	2,865 00	...	50 95	...	540 57	...	13,711 37
UNRESERVED FORESTS.														
Rotan ... ..	...	2,770 24	...	2,875 31	...	1,921 73	...	456 38	...	4,114 97	...	4,905 93	...	17,044 56
Bamboo ... ..	...	562 27	...	628 54	...	1,940 31	...	22 02	...	497 00	...	121 34	...	3,771 48
Wood-oil ... .. gallons	...	...	...	...	...	1,728	...	116 50	...	...	8,120	365 42	9,848	481 92
Damar ... .. pikuls	34.63	69 27	...	...	3,240.26	972 08	2,309.12	4,627 00	205.39	571 69	112.30	43 92	5,901.70	6,283 96
Torches ... .. number	...	...	...	...	...	...	1,062	1 50	...	...	59,643	127 73	60,705	129 23
Nipah ... ..	...	23 74	...	186 80	...	31 00	...	56 00	...	...	...	1,156 77	...	1,454 31
Gutta-percha ... lbs.	389.08	79 58	...	...	...	...	...	...	2,284.33	8,609 65	3,339.67	876 40	6,013.08	9,565 63
Rubber (cultivated) ...	...	...	...	...	...	734 80	...	...	...	...	...	...	...	734 80
„ (wild) ... pikuls	...	...	...	...	...	...	123.54	125 00	4.90	390 64	...	...	128.44	515 64
Animal products ... ..	...	...	...	...	...	...	...	...	...	...	...	21 59	...	21 59
Miscellaneous ... ..	...	1,046 36	...	913 72	...	586 98	...	207 94	...	233 29	...	1,318 29	...	4,306 58
Total ... ..	...	4,551 46	...	4,604 37	...	6,186 90	...	5,612 34	...	14,417 24	...	8,937 39	...	44,309 70
Reserved Forests ... ..	...	6,935 02	...	245 47	...	3,074 36	...	2,865 00	...	50 95	...	540 57	...	13,711 37
Grand Total ... ..	...	11,486 48	...	4,849 84	...	9,261 26	...	8,477 34	...	14,468 19	...	9,477 96	...	58,021 07



## STATEMENT OF REVENUE.

Revenue detailed.	Perak (Taiping).	Perak (Batu Gajah).	Selangor.	N. Sembilan.	Pahang (West).	Pahang (East).	Total (Estimated).	Total (Receipts).	Surplus.	Deficit.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
<b>I.—FOREST PRODUCE REMOVED FROM THE FORESTS BY DEPARTMENTAL AGENCY—</b>										
(a) Timber Estimated	7,000 00	...	...	...	...	...	7,000 00			
Actual ...	2,298 90	...	...	...	...	...	...	2,298 90	...	4,701 10
(b) Firewood and charcoal Estimated	1,100,000 00	...	...	...	...	...	1,100,000 00			
Actual ...	1,217,622 48	...	...	...	...	...	...	1,217,622 48	117,622 48	
(d) Rubber Estimated	3,000 00	...	...	...	...	...	3,000 00	...	...	3,000 00
(e) Gutta-percha Estimated	4,000 00	...	2,000 00	...	10,000 00	...	16,000 00	...	...	...
Actual ...	2,469 99	...	1,937 30	...	8,609 65	...	...	13,016 94	...	2,983 06
(g) Other Produce	...	...	...	...	...	3 00	...	3 00	3 00	
Actual ...	...	...	...	...	...	...	...	...	...	...
<b>II.—FOREST PRODUCE REMOVED FROM THE FORESTS BY CONSUMERS OR PURCHASERS—</b>										
(a) Timber Estimated	140,000 00	55,000 00	50,000 00	60,000 00	50,000 00	45,000 00	400,000 00			
Actual ...	141,185 54	51,518 46	55,703 02	73,647 61	52,203 38	27,448 09	...	401,706 10	1,706 10	
(b) Firewood and charcoal Estimated	60,000 00	95,000 00	130,000 00	24,000 00	8,000 00	3,000 00	320,000 00			
Actual ...	85,215 10	75,151 11	113,189 65	26,149 23	8,924 37	2,586 30	...	311,215 76	...	8,784 24
(c) Canes Estimated	3,500 00	5,000 00	2,000 00	500 00	3,000 00	3,000 00	17,000 00			
Actual ...	4,344 59	3,120 78	2,208 83	456 38	4,114 97	5,284 84	...	19,530 39	2,530 39	
(d) Rubber Estimated	...	...	450 00	...	...	50 00	500 00			
Actual ...	2,426 40	...	863 55	325 00	390 64	...	...	4,005 59	3,505 59	
(e) Gutta-percha Estimated	500 00	...	...	...	...	1,500 00	2,000 00			
Actual ...	930 08	...	...	...	...	876 40	...	1,806 48	...	193 52
(f) Damar Estimated	50 00	...	100 00	3,250 00	500 00	100 00	4,000 00			
Actual ...	69 27	...	972 08	7,292 00	622 64	43 92	...	8,999 91	4,999 91	
(g) Other produce Estimated	2,000 00	1,000 00	3,000 00	500 00	1,000 00	2,500 00	10,000 00			
Actual ...	2,096 65	1,729 06	3,279 50	403 96	730 29	3,272 80	...	11,512 26	1,512 26	

Form X—(cont.)

STATEMENT OF REVENUE.—(cont.)

Revenue detailed.	Perak (Taiping).	Perak (Batu Gajah).	Selangor.	N. Sembilan.	Pahang (West).	Pahang (East).	Total (Estimated).	Total (Receipts).	Surplus.	Deficit.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
III.—DRIFT, WAIF, SEIZED, AND CONFISCATED FOREST PRODUCE—										
Estimated ...	700 00	1,500 00	300 00	100 00	300 00	100 00	3,000 00			
Actual ...	2,563 70	902 82	645 42	391 94	314 90	139 00	...	4,957 78	1,957 78	
IV.—MISCELLANEOUS—										
(a) Compensation and fines Estimated ...	2,000 00	1,000 00	4,000 00	1,000 00	300 00	200 00	8,500 00			
Actual ...	2,815 44	3,027 00	3,990 75	2,312 85	406 00	372 50	...	12,924 54	4,424 54	
(b) Reimbursements										
Estimated ...	100 00	50 00	100 00	100 00	100 00	50 00	500 00			
Actual ...	5,413 75	...	195 41	19 58	...	...	...	5,628 74	5,128 74	
(c) Other sources										
Estimated ...	1,000 00	250 00	1,500 00	1,000 00	500 00	250 00	4,500 00			
Actual ...	742 04	124 90	2,781 71	251 35	70 00	517 00	...	4,487 00	...	13 00
Total Estimated ...	1,323,850 00	158,800 00	193,450 00	90,450 00	73,700 00	55,750 00	1,896,000 00	...	143,390 79	
.. Receipts ...	1,470,193 93	135,574 13	185,767 22	111,249 90	76,386 84	40,543 85	...	2,019,715 87	20,674 92	20,674 92
Surplus ...	146,343 93	...	...	20,799 90	2,686 84	...	...	...	123,715 87	
Deficit ...	...	23,225 87	7,682 78	...	...	15,206 15	...	...		

## STATEMENT OF EXPENDITURE.

	Conservator.		Perak. (Taiping).		Perak. (Batu Gajah).		Selangor.		N. Sembilan.		Pahang (West).		Pahang (East).		Total.	
	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
OTHER CHARGES, ANNUALLY RECURRENT.																
I. FOREST PRODUCE REMOVED FROM THE FORESTS BY DEPARTMENTAL AGENCY—																
(a) Timber ... ..	...	...	757	25	...	...	...	...	...	...	...	...	...	...	757	25
(b) Firewood and charcoal ... ..	...	...	1,086,204	71	...	...	...	...	...	...	...	...	...	...	1,086,204	71
(c) Gutta-percha ... ..	...	...	2,718	38	...	...	774	77	...	...	3,028	89	...	...	6,522	04
II. FOREST PRODUCE REMOVED FROM THE FORESTS BY CONSUMERS AND PURCHASERS ... ..																
	...	...	284	95	150	45	138	55	...	...	150	00	103	90	827	85
III. DRIFT, WAIF, SEIZED, AND CONFISCATED FOREST PRODUCE ... ..																
	...	...	15	00	...	...	...	...	...	...	...	51	00	...	66	00
IV. STORES—																
(a) Bicycles ... ..	101	08	820	84	498	00	997	20	800	00	491	58	160	00	3,868	70
(b) Boats and launches ... ..	...	...	6,371	35	181	75	1,582	45	994	29	381	82	276	98	9,788	64
(c) Motor cars ... ..	1,600	00	...	...	...	...	...	...	...	...	...	...	...	...	1,600	00
(d) Tools and plant ... ..	234	61	191	45	84	60	180	64	139	60	174	00	94	21	1,099	11
(e) Survey and mathematical instruments ... ..	133	93	...	...	...	...	...	...	...	...	...	...	...	...	133	93
(f) Books, maps, etc. ... ..	1,133	08	276	94	118	41	255	79	188	62	149	38	148	31	2,270	53
(g) Furniture ... ..	34	50	49	95	25	70	21	34	100	00	42	90	77	70	352	09
(h) Uniforms ... ..	336	92	6,096	35	3,211	75	4,303	77	3,098	66	2,286	30	1,799	87	21,133	62
(i) Miscellaneous ... ..	549	55	126	99	27	78	98	26	81	18	90	83	66	40	1,040	99
V. COMMUNICATIONS AND BUILDINGS—																
(a) Roads and bridges ... ..	...	...	2,399	81	476	07	1,833	95	1,683	01	970	10	77	00	7,439	94
(b) Buildings ... ..	...	...	3,356	63	2,093	82	2,866	37	1,152	24	993	92	497	71	10,960	69
(c) Other works ... ..	...	...	500	00	20	60	632	34	437	88	548	02	67	40	2,206	24
VI. ORGANIZATION, IMPROVEMENT AND EXTENSION OF FORESTS—																
(a) Demarcation ... ..	...	...	3,357	80	258	45	1,478	21	3,226	08	1,719	18	788	40	10,628	12
(b) Surveys ... ..	3,712	00	167	50	...	...	10	00	4	50	93	20	298	50	4,285	70
(c) Cultural operations ... ..	...	...	1,190	94	...	...	1,804	57	220	85	...	...	7	00	3,223	36
(f) Works of improvement ... ..	...	...	7,397	21	2,254	96	9,078	29	2,555	95	875	80	...	...	22,162	21
(g) Other works ... ..	...	...	1,187	08	...	...	207	35	150	92	144	55	54	60	1,744	50
VII. ALLOWANCES—																
(a) Personal ... ..	...	...	371	34	168	00	840	66	...	...	235	00	501	69	2,116	69
(b) Travelling ... ..	2,809	13	17,569	44	5,999	69	10,123	96	10,948	01	11,751	45	6,999	69	66,201	37
(c) Bicycles ... ..	5,784	96	279	86	...	...	132	00	80	52	132	00	...	...	6,409	34
(d) Motor car ... ..	2,946	12	1,080	00	1,065	00	669	88	1,035	00	1,279	68	...	...	8,075	68
VIII. MISCELLANEOUS—																
(a) Research and collection of specimens ... ..	2,343	75	591	55	121	00	986	42	965	77	220	04	206	62	5,435	15
(b) Rewards ... ..	20	00	...	...	...	...	...	...	...	...	...	...	...	...	20	00
(c) Other charges ... ..	760	50	807	36	199	92	418	31	326	66	279	22	149	99	2,941	96
Total Other Charges, Annually Recurrent ... ..	22,500	13	144,170	68	16,955	95	39,435	08	28,189	74	26,037	86	12,426	97	1,289,716	41

Form X-- (cont.)

STATEMENT OF EXPENDITURE.--(cont.)

	Conservator.	Perak (Taiping).	Perak (Batu Gajah).	Selangor.	N. Sembilan.	Pahang (West).	Pahang (East).	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
SPECIAL EXPENDITURE.								
IV. STORES--								
(a) Bicycles ... ..	4,720 80	...	...	...	...	...	...	4,720 80
(b) Boats and Launches ... ..	305 00	1,562 08	300 00	371 10	...	72 00	...	2,610 18
(e) Survey and mathematical instruments	...	185 76	194 50	96 30	75 50	89 50	154 04	795 60
(g) Furniture ... ..	1,115 55	199 82	...	189 50	272 50	199 43	...	1,976 80
(i) Miscellaneous ... ..	...	...	...	...	...	175 00	200 00	375 00
V. COMMUNICATIONS AND BUILDINGS--								
(b) Buildings ... ..	1,800 00	700 00	...	...	...	2,500 00	2,080 00	7,080 00
(c) Other works ... ..	57 56	100 00	...	...	237 50	...	...	395 06
UNPROVIDED.								
Dutch translation ... ..	1,870 00	...	...	...	...	...	...	1,870 00
TOTAL SPECIAL EXPENDITURE ...	9,868 91	2,747 66	494 50	656 90	585 50	3,035 93	2,434 04	19,823 44
GRAND TOTAL ...	32,369 04	1,146,918 34	17,450 45	40,091 98	28,775 24	29,073 79	14,861 01	1,309,539 85