

ANNUAL ADMINISTRATION REPORT OF THE FOREST DEPARTMENT

FOR THE

YEAR ENDING 31st MARCH 1929

25292

FIRST CIRCLE

CHAPTER I.—CONSTITUTION OF STATE FORESTS.

1. ALTERATION IN AREA.

1. (i) *Reserved forests*.—The total area of reserved forests decreased from 4,065 square miles to 4,059 square miles chiefly due to the disreservation of Interu reserved forest (a Ryots' forest) in Guntur and to the adoption of the correct area of Chintalapudi reserve in *Lower Godavari* division.

In *Vizagapatam* an area of 376 acres (Marripakala Teak Block) was newly constituted reserved forest during the year and in *Nellore* a portion of the area (1,171 acres) of Kothur reserve of *North Cuddapah* division transferred to this circle has been included.

(ii) *Reserved land*.—There was an increase of 11 square miles due to the notification, under section 4 of the Forest Act, of lands taken up for reservation in the Rampa Agency in *Lower Godavari* division.

2. FOREST SETTLEMENT.

2. The settlement of the Marripakala Teak Block (376 acres) in *Vizagapatam* was concluded and the area was notified under section 16.

3. DEMARCATION.

3. There was an expenditure of Rs. 3,528 in connexion with the demarcation of blocks proposed for reservation in—

	MILES.
<i>Ganjam</i> (Balliguda Agency)	28
<i>Upper Godavari</i>	75
<i>Lower Godavari</i> (Rampa Agency)	73

The re-clearing of boundaries was as usual done by the subordinates free of cost and as part of the scheme for fire-protection operations.

Seventeen miles of frontier boundaries were inspected in *Upper Godavari*.

4. FOREST SURVEYS.

4. (a) *By the Madras Survey Party.*—The Madras Survey Party continued to send sketches of the external boundaries of the reserves named in the margin in Gokavaram, Peddapur and Rajahmundry ranges of the *Lower Godavari* division, which were promptly verified.

Name of reserve.	
Gokavaram Range.	Veerabhadrapuram.
	Sadikonda.
	Tirumalayapalem.
	Molleru.
	Mallavaram.
Peddapur Range.	Doramamidi.
	Singampalli.
	Sarlanka.
	Anantaram.
	Vuligogula.
Rajahmundry Range.	Lingamparthi.
	Annaram.
	Raghavapatnam.
	Aminbada.
	Jaddangi.
	Dovancheruvu.

The discrepancy in respect of the external boundary of Upputeru Block II remains still unsettled. The Collector of West Godavari considered that a suit should be filed to get the survey corrected and he has been requested to take immediate steps in the matter.

There was discrepancy in the survey of the village boundaries of Pora and China Yanam in Amalapur taluk and the Collector of East Godavari states that a land complaint has been filed.

(b) *By the Survey of India Party.*—During the year the

Lower Godavari.

1. Devancheruvu Block I.
2. Devancheruvu Block II.
3. Sadikonda.
4. Tirumalayapalem.
5. Mallavaram.
6. Lakkonda.

Rampa Agency.

1. Lakshmipuram.
2. Kannaram.
3. Etupad.
4. Birampalli.
5. Sitapalli.
6. Bolagonda.
7. Bandepalli.
8. Tunnuru.
9. Vemalakonda.
10. Musurumilli.
11. Nurupudi.
12. Velamalakota.
13. Palem.

No. 6 Party of the Survey of India took up the survey on 2" to a mile scale in the *Lower Godavari* division. Six reserves in the *Lower Godavari* division and 13 blocks proposed for reservation in the Rampa Agency (as detailed in the margin) covering an area of 116 square miles including overlaps were surveyed at a cost of Rs. 6,120 against which a sum of Rs. 4,000 was paid during the year. The same Party surveyed on the 1" scale the following reserved forests in the *Upper Godavari* division—total area 225 square miles:—

Kansulur, Lakkavaram, Lakkavaram Extension, Marrigura, Nelakota and Rekapalli Hill.

CHAPTER II.—MANAGEMENT OF STATE FORESTS.

1. REGULATION OF MANAGEMENT.

5. *Preparation and control of working plans.*—In *Lower Godavari* a revised working plan for Upputeru Block II, the original plan for which expired by 1927-28 was sanctioned during the year.

Ganjam.—A new working plan for the Ghumsur forests is being prepared by the Working Plans Circle. The prescriptions of the current Ghumsur Working Plan of 1920 were adhered to with certain duly approved modifications. The Mohiri forests of the Berhampur range continued under the working scheme of 1922.

Vizagapatnam.—The prescriptions of the sanctioned working plans were generally adhered to except that Sarugudu Bamboo Coupe III, Kela bark in Block I of Narasapatnam range and Tangedu bark in Palakonda range were not sold for want of bids.

Fire patrols were not employed in Karaka reserve under Conservator's orders. Even the tracing of fire-lines has been abandoned as there were no fires in recent years due to the coppice growth in the felled areas in the several reserves having ousted the growth of grass.

Upper Godavari.—The working schemes for the teak and non-teak areas in all the ranges except Nugur and the tentative working schemes for bamboo areas in all ranges except Nugur and Cherla continued in force. The scheme for the felling of exploitable trees of valuable species (teak, *Pterocarpus marsupium*, *Anogeisus latifolia* and *Adina cordifolia*) of over 4½ feet in girth under the selection system in the unreserves of Nugur and Cherla ranges was in force.

The re-enumeration of exploitable Yepi (*Hardwickia binata*) trees in the reserves of the Bhadrachellam range progressed with a view to revising the scheme of 1925.

The scheme for the extraction of valuable species in Cherla unreserves is to be revised as the last coupe was worked during the year under report. Enumeration of exploitable trees in Pusuguppa unreserve still available for working has been made during the current year and a scheme will be prepared.

Lower Godavari.—The working schemes for Kopalli, Kovvada and Bedadavole reserves are being revised.

Guntur.—The revised working plan for the Kondapalli reserve returned by the Chief Conservator for amendment in the light of the remarks offered by the Conservator of Forests, Working Plans

Circle, has been sent to Mr. Abdul Karim, Extra Assistant Conservator, for attention. The following revised working plans are under scrutiny :—

Vinukonda-Venkatayapalem working plan dealing with the whole of Vinukonda range and a part of Sattenapalli range.

Repalle working plan dealing with the mangrove forests in the Repalle range lying in the *Guntur* district.

The preparation of a working plan for the mangrove forests in the *Kistna* district has to be deferred as it was found on inspection that the areas are not fit for exploitation for another five years.

Nellore.—The revised working plans for the Sriharikota forests and for the forests in the Sathiavedu range are being scrutinized. The prescriptions of the existing working plan for Sathiavedu forests were generally followed.

2. COMMUNICATIONS AND BUILDINGS.

6. No new work costing over Rs. 5,000 was sanctioned for execution during the year.

7. *Roads and bridges*.—The expenditure on new works was Rs. 1,970 while that on repairs was Rs. 7,062.

The important works were :—

Ganjam.—(1) Metalling the Rambha Rest house road (incomplete).

(2) Commencement of the earthen road from Tilisingi to Tarasingi.

(3) Commencement of the earthen road from Kukuluba to Gayakonda.

Vizagapatam.—About eight miles of roads in several bits covered by the Viraghattam-Donubai road project.

Upper Godavari.—About 5 furlongs of cart tracks in Sitarampuram and Walsugriva reserves.

Lower Godavari.—Feeder road from the Sudikonda reserve to meet the Local Fund road.

Guntur.—Two paths of $3\frac{1}{2}$ miles were cut in Kondapalli reserve to facilitate inspection.

Nellore.—An earthen road of about two miles in Pudupakkam series for extraction of fuel.

8. *Buildings*—The expenditure on new works was Rs. 14,060 and that on repairs was Rs. 17,304.

The chief works are—

Ganjam.—Completion of the rest-house at Bodogundribadi.

Vizagapatam.—Part construction of the rest-house at Donubai and Forest Guard's lines at Somidevalasa.

Upper Godavari.—Range office and quarters at Vararamachendrapuram, rest-house and out-houses at Madhavaraoopeta, subordinates' quarters at Edira, Chendrapatla and Edugurallapalli, Range clerk's quarters at Chintur.

Lower Godavari.—Completion of the Range quarters at Gokavaram and part construction of the rest-houses at Ravigudem and Puliramudugudem.

Guntur.—Inspection shed at Kandlagunta and Adavuladivi.

Tramways-Nellore.—Two miles of tram track were purchased at a cost of Rs. 8,918 for the transport of fuel from the coupes in Sriharikota Island. The revenue realized by the sale of coupes was Rs. 47,569.

9. *Other works*.—The expenditure on new works Rs. 1,155 represents the amount spent on wells in rest-house compounds and subordinates' quarters.

3. PROTECTION OF FORESTS.

(a) General protection.

10. The subjoined statement compares the total number of offences reported during the year with that of the previous year :—

	1927-28.	1928-29.		
		By Forest officers.	By Revenue officers.	Total.
(1) Injury to forests by fire	81	109	3	112
(2) Unauthorized felling	7,216	1,815	803	2,618
(3) Do. grazing	859	518	50	578
(4) Other offences	258	211	63	274
Total ..	4,414	2,693	919	3,612

There was an increase under "Injury to forests by fire" and "Other offences" while there was decrease under "Unauthorized felling and grazing." The increase under "Fires" was principally in *Upper Godavari* due to the inclusion of undetected cases of suspected incendiarism. The increase under "Other offences" is small. The decrease under "Unauthorized felling and grazing" was principally in *Guntur* and *Nellore* due to better protection and

to the transfer of reserves to panchayats. In *Guntur* cattle owners are reported to resort to panchayat forests for grazing. In *Nellore* it is reported that the majority of offences in past years were detected in forests now transferred to panchayats. There was an increase of 164 offences under "felling" in the unreserves in *Lower Godavari* reported by the revenue authorities.

Out of 683 cases prosecuted in courts 328 ended in conviction and 355 ended in acquittal. Of the cases acquitted 396 were settled by the payment of compounding fees in courts. The total amount of compounding fees realized was Rs. 29,167.

The percentage of cases enquired into by District Forest Officers and the Range officers is given below :—

	District Forest Officer.	Extra Assistant Conservators.	Range officers.
	PER CENT.	PER CENT.	PER CENT.
Ganjam	...	1	21
Vizagapatam	...	...	11
Upper Godavari	...	...	25
Lower do.	...	...	23
Guntur	5	...	4
Nellore	1	...	9

11. *Rewards*.—No rewards were granted during the year.

(b) *Protection from fire.*

12. The areas attempted to be protected in the fire season of 1928 and those actually protected are shown in Form No. 31. The area under special protection was 941,252 acres against 914,583 acres in the previous year, the increase being chiefly in *Guntur* district where Kondapalli reserved forest and its extensions were brought under special protection, the system adopted being early burning. The percentage of successful protection was 77 against 75 in the previous year. The cost per square mile of special protection attempted was Rs. 7-2-0 against Rs. 6-15-0 in the previous year. The area under general protection was 780,462 acres, of which 28,565 acres were burnt or 4 per cent.

Ganjam.—The fire season was on the whole less severe than in 1927. The Khonds in general assisted the department in preventing and putting out fires. Rewards to the extent of Rs. 213 were distributed to the Khonds of Pondakhol.

Vizagapatam.—The fires in Sanivaram and Dharakonda reserves were chiefly caused by the Agency hillmen while baking *Bauhinia Vahlia* and boiling sago palm toddy. The Agent personally warned them.

Upper Godavari.—The fire season of 1928 was as dry as that of 1927. A reward of Rs. 2,063 was disbursed to the Koyas and Reddis for successfully protecting the forests.

Lower Godavari.—The settlers of the Peddapur range were granted rewards amounting to Rs. 657 for successful protection. The hillmen (Koyas and Reddis) of Polavaram did not interest themselves in fire protection and the majority of fires occurred in this range, one fire alone covering an area of 5,702 acres in Papi-konda. No rewards were granted to them this year also.

In *Guntur*, early burning was introduced in the Kondapalli reserve and its extensions.

In *Nellore*, modified early burning as in previous year was continued in all the ranges except Sriharikota. The work began in January but was carried on till the end of March due to abnormal rains in February and March.

(c) *Protection from cattle.*

13. The area open to grazing of all animals except goats was 2,206 square miles against 2,225 square miles in the previous year, the decrease being due to the closure of worked coupes. In *Guntur* the closed areas of reserves in the Kistna Revenue district were wrongly shown as open to grazing in the last year's return. Goats were excluded from all the reserves. The grazing incidence in the several districts was—

	1927-28 Acres per cow unit.	1928-29 Acres per cow unit.
Ganjam	6.50	6.06
Vizagapatam	5.00	5.00
Upper Godavari	5.12	4.89
Lower Godavari	2.19	2.10
Guntur	3.15	3.20

In *Nellore* out of 142 kanchas 132 were sold at different rates, including 11 which were given on long lease. Ten kanchas remained unsold for want of demand. In Sriharikota Island where the village lump sum grazing system is in vogue, the protection of recently felled coupes and the coupes under felling is bad. Steps are being taken to afford effective protection to the closed coupes.

The number of cattle licensed to graze on payment was 318,734 against 351,799. The decrease of 6,065 is small when compared with a total of 3½ lakhs of animals.

The number of cattle impounded during the year was 8,970 against 15,785 in the previous year. The decrease was generally due to less number of cattle concerned in grazing offences which showed a decrease during the year.

(d) *Protection against injuries from natural causes.*

14. Climber and creeper cutting has been mentioned in Chapter III. Silviculture.

Guntur.—The destruction of ficus growing on the walls of the Kondapalli Palace bungalow was successful with the use of "mortweed" solution.

Nellore—Parasites.—The important parasites are *Loranthus longifolius* and *Viscum*. Both of these are present throughout the division but their effect is most noticeable in the Sriharikota Island where they attack the nux-vomica tree. Experiments conducted spasmodically from 1921 show that *Loranthus* is more harmful than *Viscum* though much less prevalent.

Prickly-pear.—In Sriharikota it is coming up in areas which have recently been felled over. Eradication has not been done in the immediate past, but it will be taken up this year, coupes will be treated in the two years immediately following felling, by spraying with Arsenic pentoxide solution.

CHAPTER III.—SILVICULTURE.

SECTION 1.—FORMATION AND REGENERATION OF FORESTS.

(i) *General progress of areas under regeneration.*

15. *Ganjam.*—Natural regeneration of Sal on the clear-felled areas continued to be very satisfactory. There was no appreciable flowering of bamboos in Buguda Range or elsewhere.

Vizagapatam.—Natural regeneration of Sal by seed in Palakonda Range and of *Pterocarpus marsupium*, *Terminalia tomentosa*, *Xylia*, *Chloroxylon swietenia* and *Anogeissus latifolia* in Dharakonda and Sanivaram reserves was good. Natural reproduction in the Narasapatam Range was on the whole good.

Seedlings of *Bambusa arundinacea* are coming up profusely. *Dendrocalamus strictus* also seeded in the Dharakonda and Sanivaram reserves and its regeneration is good. Sporadic flowering of *Dendrocalamus strictus* was observed in Burna and Antikonda reserves in the Palakonda Range.

Upper Godavari.—Natural regeneration of *Terminalia tomentosa* and *Pterocarpus marsupium* was good while that of teak and *Xylia* was fair. *Hardwickia binata* did not seed.

Lower Godavari.—Regeneration of teak in the worked coupes of the reserves of Polavaram Range was fair, being best in Bedadavole Felling Series. In Coupe XI of Ammayagoppu valley of Rajavommangi reserve, the area planted with two-year old stump

plants was good. The natural regeneration of hard woods particularly *Terminalia*, *Xylia*, *Pterocarpus marsupium*, *Soymda* and *Lagerstroemia* in Polavaram range was good.

Guntur.—Natural regeneration of Mada (*Avicennia officinalis*) was satisfactory, in the tidal forests of the Repalle range. Regeneration of yepi was good in Vinukonda range and in parts of Sattenapalli range. The regeneration of other species in Kondapalli reserve was fair.

Nellore.—It is satisfactory to note that throughout the forests small seedlings are coming up. This is particularly noticeable in Sriharikota range.

(ii) *Establishment of reproduction under working plans or schemes.*(a) *Mainly natural.*

16. In *Ganjam*, regeneration was entirely natural. In *Vizagapatam* coppice reproduction was good in all the felled coupes. In *Upper Godavari* regeneration fellings at a cost of Rs. 278 were conducted in five coupes (242 acres in all) to be felled five years later with a view to open the canopy and to give more light to teak and *Terminalia* seedlings and to promote seed-bearing and germination of the valuable species. Coppice reproduction in all the felled coupes was good. It was noticed that teak coppice was taller than the coppice of other species especially in the case of coppice not more than three years old. In *Lower Godavari*, regeneration was mainly natural except for one casuarina plantation in the belt of the sandy coastal reserve of Kaudikuppa and in plots where teak was raised artificially near Sudikonda. In all the clear-felled coupes coppice reproduction was good. In *Guntur*, natural regeneration was satisfactory in the mangrove forests. The regeneration by seed was fair in all the ranges. Coppice reproduction was fair. In *Nellore*, reproduction by coppice in all the felled coupes was fairly good. Natural regeneration of *Shorea Thumbuggala* in Kambakkam plateau and of other species, such as, *Eugenia jambolana*, *alternifolia*, etc., was good. Natural regeneration was very good in all the felled coupes especially in the Sriharikota range where many seedlings from 2 feet down to a few inches are seen all over the area.

(b) *Mainly artificial.*

17. *Vizagapatam.*—Sal seed (three bags) was collected at a cost of Rs. 7-8-0 and sown over 18 acres in Sal coupe I of the Palakonda range. A plot of 5 acres in Arlova reserve in Narasapatam range was cleared and the wood was burnt and the ground was ploughed

twice at a cost of Rs. 5 and *Cassia auriculata* was sown as desired by the Deputy Forest Utilization Officer. Teak is growing fairly well near Chinagora of Palakonda range.

Upper Godavari.—The following operations were carried out in the clear-felled and modified taungya coupes during the year.

Walsugriva Coupe No. II.—In April 1928 teak seeds were dibbled 6 feet apart over 10 acres deficient in teak. By way of filling up casualties 1,045 teak stumps were planted 6' x 6' in two rows next to the road in the first week of July 1928, 1,700 germinating teak seeds from dumps were notched in July 1928 and 4,000 germinating teak seeds were notched in August 1928. The cost of these operations was Rs. 5. Weed growth was removed around teak seedlings to a radius of 2 feet and climbers were cut in July and September 1928 at a cost of Rs. 23. The percentage of success was 90 in the case of teak stumps, 8 in the case of dibbling and 40 in the case of notching. The average height of the seedlings was 1 foot in the case of stumps, 6 inches in the case of notching and 3 inches in the case of dibbling. Average height of the teak coppice shoots was 7 feet.

Walsugriva Coupe No. I.—In the first week of July 1928, 11,000 teak seedlings and 1,850 teak stumps were planted by way of filling up casualties. This coupe was clear-felled in 1926-27. Oldest seedlings in this are therefore two years old. Teak seedlings are 3 feet to 8 feet high while the average heights of maddi and yegisi seedlings are 1 foot 3 inches to 1 foot 6 inches respectively.

Ramachendram Coupe No. VIII.—Teak seeds were dibbled, after burning at stakes, 6 feet apart in the second week of April 1928. Germination was satisfactory except in the case of seeds dibbled in ashes. The height of the seedlings which resulted varies from 3 inches to 6 inches. This is a year's growth. In July and August 1928, 8,930 germinating teak seedlings from dumps were notched 6 feet apart at stakes over an area of about 8 acres by the students of the Vernacular Training School, 1928, and the beat staff. Fifty per cent of the plants planted in July 1928 have succeeded while those planted in August 1928 show a much smaller percentage of success. Height of the seedlings one year old varies from 3 inches to 6 inches while that of the coppice shoots of the same age varies from 3 feet to 10 feet.

In coupe I, Peddamidisilernu, clear-felled in 1927-28, the tallest teak coppice shoot is 13 feet 6 inches.

In coupe III, Tunikicheruvu, clear-felled in 1923-24, the tallest teak coppice shoots are 35 feet high and 1½ feet in girth at 4 feet 6 inches; some of these shoots flowered in 1928. In this coupe a few teak coppice shoots showed the following height growth during

the five years of their existence: First year = 6 feet 9 inches, second year = 7 feet 9 inches, third year = 6 feet 7 inches, fourth year = 5 feet 8 inches and fifth year = 2 feet 3 inches. Total height 29 feet. In coupes I, II, III and IV, Dummagudem reserve, clear-felled in 1924-25, 1925-26, 1926-27 and 1927-28, respectively, tallest teak coppice shoots were 25 feet 3 inches, 22 feet, 15 feet and 10 feet 6 inches respectively. In all these four coupes, the coppice of other species was shorter than the teak coppice.

Modified Taungya Coupe No. II, Rekapalli Hill reserve (22 acres).—The area was burnt and ploughed in April 1928. Teak seeds were dibbled at 23,000 stakes 6 feet apart, at 5 seeds per stake on the 19th and 20th April 1928; casualties were filled up with 3,700 teak seedlings from Darapalli nursery on 27th June 1928, 2,000 teak stumps from Darapalli nursery and with 6,000 germinating teak seeds from dumps in July 1928. One thousand six hundred and fifty maddi and 1,150 yegisi germinating seeds from dumps were also notched in July 1928. Further casualties were filled up with 5,000 teak seedlings on 7th August 1928 and 1,250 germinating teak seedlings, 1,000 maddi and 250 yegisi seedlings also were notched in the fourth week of August 1928. In September 1928, 1,025 teak stumps from Venkampalem and Pulusumamidi old nursery were planted. The percentage of success is reported to be 95 in teak stumps, 58 in teak notches, 40 in teak transplants, 25 in maddi notches and 39 in yegisi notches. The height of the seedlings is reported to be about 6 inches. The cost of the operation was Rs. 207.

Modified Taungya Coupe No. III, Rekapalli Hill reserve (20 acres).—The area was taken back from the Koyas on 15th January 1929. The regrowth and the stalks of the field crop were cleared and burnt from 15th March 1929 to 23rd March 1929 at a cost of Rs. 10.

Modified Taungya Coupe No. I, Kansulur reserve (20 acres).—The coupe, having been cultivated by Koyas last year, was resumed from them early in March 1929. It was burnt departmentally, first burning in first week and second burning in the third week of March 1929. This coupe has since been given two rounds of ploughing and then dibbled with teak seeds in April and May. Details of cost will be furnished in the report for 1929-30.

Lower Godavari.—An area of 59 acres of Coupe V of Kandikuppa reserve was planted up with casuarina at a cost of Rs. 995 in July 1928. The casualties were heavy owing to the failure of rains but were filled up as they occurred. The heavy casualties in Coupe IV planted during the previous year were replaced during the year

Guntur.—Sandal was raised in twenty $\frac{1}{4}$ acre plots near water sources in Kondapalli reserved forest and the results were satisfactory.

In the breached Sayudupalem tank bed in Bollapalli Extension 7 Reserve an area of 5 acres was selected and the babul growth was extracted at a cost of Rs. 54 and sold for Rs. 128. The area was fenced and goats and sheep were penned in it and fed with babul pods. The area was then cross ploughed and sown with cotton seeds. The germination of babul was good, the cotton also yielding a good crop. The operation of penning the goats, feeding them with babul pods and sowing babul and cotton seeds was given to a contractor who reaped the cotton crop in return for the work done. The cotton stalks overtopping babul were cut.

Nellore.—In the regeneration sample plot of *Shorea Thumbuggaia* in Kambakkam plateau, dibbling of sandal was done over an area of 5 acres but there was no germination which was due to late sowing, i.e., in November 1928.

18. *Afforestation.*—Nil.

(iii) *Plantations and other forms of regeneration not under working plans or schemes.*

19. *Ganjam.*—Ten cents planted with red sanders in Napier's Park in September 1923 contains 115 trees. They are thriving. Out of the 86 red sanders plants in the plot opened in 1926 only 28 survive.

Vizagapatam.—The orange tope at Busilikota is in good condition and the produce is leased out annually.

Upper Godavari.—Old *Taungya Coupe No. II of Rekapalli Hill reserve.*—Climbers and bamboos interfering with teak were cut back by the students of the Vernacular Training School in June 1928.

Lower Godavari, Peddapur range.—The 10-acre plot in coupe I of Ammayagoppu Valley (Rajavommangi reserve) which has been podued for two years was made ready for regeneration with teak in 1929. An area of 7 acres adjoining this 10-acre plot was clear-felled and burnt in 1927-28 and was regenerated in 1928-29 with teak at a cost of Rs. 100 by (i) sowing, (ii) by planting 2-year old stumps and (iii) by transplanting 1-year old plants with root fully intact but with the shoot cut down to 2 inches. The growth in the portion of the area planted with 2-year old plants is more vigorous so far, and the tallest plant is now eight feet.

Gokararam range.—In addition to the three 2-acre teak plots raised in 1927-28 in the Mallavaram reserve, two more teak plots (2 acres each) were raised in Tirumalayapalem 'A' Series, Coupe

IX and Mallavaram 'C' Series, Coupe IX, by dibbling seeds at stake. The work was done late and the result was not satisfactory in spite of constant attention in working up the soil and weeding.

One year old teak seedlings were transplanted in a quarter acre adjoining the 2-acre plot in Tirumalayapalem, Coupe IX, during the early rains. These seedlings came up very well, the tallest plant being about $3\frac{1}{2}$ feet high.

The total expenditure on the formation of the 1928-29 teak plots was Rs. 71 while the expenditure on the maintenance of the old teak plots was Rs. 36.

(iv) *Tending.*

20. *Upper Godavari.*—Teak seedlings were tended by cutting weeds, climbers and regrowth, etc., in all clear felled and modified taungya coupes.

Lower Godavari.—The 15-acre casuarina plantation of 1923 (Kandikuppa reserve) planted 6' x 6' was thinned as follows:—

A third of the area where the stocking was complete was thinned by a 50 per cent mechanical thinning.

A third was thinned by a 50 per cent mechanical thinning by cutting alternate trees in each row and in the remaining third, a thinning on ordinary principles was carried out.

The financial result was satisfactory, the net revenue amounting to Rs. 94 per acre.

The 5-acre casuarina plantation of 1923 (Kandikuppa reserve) planted 9' x 9' was very lightly thinned. In Rajavommangi reserve weeding, working up the soil, etc., was done in teak plots, at a cost of Rs. 100. Similar work was done by the subordinates in the old plots of Vatangi and Lododdi reserves. The Osurpad regeneration area was weeded thrice at a cost of Rs. 18 owing to thick weed growth.

(v) *General.*

21. *Vizagapatam.*—The sandal sowings in the Narasapatam and Palakonda ranges were not successful during the year.

All the sandal plants in reserves and rest-house compounds are growing well and many have become seed bearers.

Seven thousand palmira seeds were sown round felled coupes in Arlova, Madalammakonda and Pedimikonda reserved forests in Narasapatam Range, but there is no germination yet.

Sowing of sal seeds in patches and stump planting.—One thousand one hundred and fifty sal seedlings raised in the nursery at Donubai were stumped and planted in sal coupe I, Palakonda Range, in places where sal seedlings were absent.

Sal seeds were sown in coupe I in 1,800 pits 6 feet apart at 8 to 10 seeds in each pit. An enumeration in February 1929 showed 1,824 seedlings in 235 patches and 246 seedlings in 46 lines. Only 169 seedlings were found surviving in May 1929.

Dibbling.—One hundred and seventy-one sal seedlings survived in 25 mounds in the two plots of half acre each dibbled in Burna reserve near Mekava village last year.

Sowing.—The sal seedlings which resulted from the sowings in one acre in Burna near Polla Podu were 1,018, of which 181 were surviving in May 1929.

Weeding.—The mounds were cleared of all weeds and creepers.

Upper Godavari.—Sandal sowings were abandoned under Conservator's orders.

Lower Godavari.—The natural regeneration of timber species in most of the reserves was good.

SECTION 2.—TENDING OF THE GROWING STOCK.

22. *Ganjam.*—The following works were carried out during the year:—

(1) Heaping and burning of refuse and cutting back switch growth in

Coupe X, Plains Sal Timber Working Circle, Series I, in Gallery reserved forest (138 acres) at a cost of Rs. 552.

Coupe X, Plains Sal Timber Working Circle, Series II, Kriamba reserve (39 acres) at a cost of Rs. 155.

Coupe VI, Ravine Working Circle, Rambha reserve (45½ acres) at a cost of Rs. 83, after reclearing (see below).

Coupe VII, Ravine Working Circle, Rambha reserve (42 acres) at a cost of Rs. 190.

(2) (a) Cleaning in Coupe IX, Plains Sal Timber Working Circle, Series I, Brahmanasayi reserve (130 acres) at a cost of Rs. 390.

(b) Cleaning in Coupe IX, Plains Sal Timber Working Circle, Series II, Kriamba reserve (43 acres) at cost of Rs. 78.

(c) Reclearing in Ravine Coupe VI of Rambha reserved forest (47 acres) at a cost of Rs. 117-9-0.

(3) (a) Second cleaning in Coupe VIII of Series I, Plains Sal Timber Working Circle of Brahmanasayi reserve (128 acres) at a cost of Rs. 352.

(b) Second cleaning over the burnt areas of the Plains Sal Timber Working Circle coupes of Buguda Range (48 acres) at a cost of Rs. 95.

(4) Thinnings were done in

Coupe V of Plains Sal Timber Working Circle, Series I, of Kukuluba Range (134 acres) at a cost of Rs. 281.

Coupe V, Plains Sal Timber Working Circle, Series II, of Buguda Range (39 acres) at a cost of Rs. 51.

Coupes I and II of Ravine Working Circle of Rambha reserve at a cost of Rs. 371.

Thinnings were also done in the Pole Working Circle in Mojjogoda Range over 26 acres at a cost of Rs. 39.

Russellkonda Range over 420 acres at a cost of Rs. 399.

Bontha Range over 51 acres at a cost of Rs. 135.

Buguda Range over 393 acres at a cost of Rs. 514.

Surada Range over 649 acres at a cost of Rs. 1,008.

Vizagapatam.—Creeper cutting in the Sal area of Coupe I was done at a cost of Rs. 18 at Re. 1 per acre. In the felled coupes creeper cutting was done by contractors. A sum of Rs. 3 was spent for the eradication of lantana in the Arlova reserved forest in the Narasapatam Range to remove the menace at the outset.

Upper Godavari.—Creepers were cut by the subordinates in the reserves during their patrol.

Lower Godavari.—Creepers were cut in felled coupes of Gokavaram Range at a cost of Rs. 79. In the Polavaram Range cleaning and creeper cutting were done in the worked timber coupes of Kopalli and Bedadavole reserves while soft wooded species in the unworked teak areas of Kovvada and Bedadavole reserves were girdled at a cost of Rs. 233.

Nellore.—Climbers and Euphorbia were cut by fuel contractors and subordinates. The felled coupes were fenced by contractors.

CHAPTER IV.—EXPLOITATION.

(a) SYSTEM OF MANAGEMENT.

(i) Major produce.

23. The silvicultural systems in force were:—

Clear felling—Ganjam.—In the Goomsur forests clear fellings were carried out in both the series of the Plains Sal Timber Working Circle and the Ravine Working Circle as detailed below:—

Series I—Periodic Block 1.—Residual growth in Coupe X (Ambazara reserved forest) should have been clear felled and the area regenerated during the year. Owing to inaccessibility of the locality the coupe could not be sold. Coupe X of this series, area 136 acres, was therefore located in the Miniari block (Gallery

reserved forest) and the standing growth was sold in two halves for Rs. 9,448. The deviation was sanctioned by the Chief Conservator.

Three hundred reject logs of 2,798 cubic feet felled during the mill felling in the original Coupe X in Ambazora reserved forest during 1927-28 were sold during the year for Rs. 262-5-0.

The standing growth in Coupe XI of 134 acres which is to be regenerated in February 1930 was sold in two bits for Rs. 13,270 with voidah from 1st March 1929 to 15th February 1930.

Series II—Periodic Block I.—Kriamba Coupe X of 39 acres was sold standing for Rs. 2,037-12-0 after the removal of timber fit for the sawmill in 1927-28.

Coupe XI of 37 acres was similarly sold for Rs. 2,627. This coupe will be regenerated in February 1930. Six hundred and forty-seven reject logs of 4,175 cubic feet in this coupe felled during the mill felling were sold for Rs. 1,136.

Ravine Working Circle.—Standing growth in the balance of 5 acres of Rambha Ravine Coupe V was sold at Rs. 12 per acre and that in Coupe VII, 42 acres, was sold at Rs. 30-2-0 per acre for Rs. 1,265. These two areas were regenerated in 1929.

Coupe VIII of 113 acres was sold in February 1929 with voidah from 1st March 1929 to 15th February 1930 for Rs. 2,938. This coupe will be regenerated in February 1930.

Five thousand three hundred and eighty-two cubic feet of timber fit for the sawmill was extracted from compartment 3 of Kriamba reserved forest of which 2,904 cubic feet were carted to the mill. Seven thousand two hundred and sixty-seven cubic feet of reject timber including balance of 1927-28 timber was sold for Rs. 1,971.

Twenty-one thousand six hundred and fifty-two cubic feet of reject timber in stock in compartment 5 of Kriamba reserved forest was sold during the year for Rs. 5,649.

Similarly 7,439 cubic feet of reject timber in compartment 4 was sold for Rs. 2,470.

Ten thousand five hundred and fifty-three cubic feet of reject timber in compartments 2 and 5 (a) of Darpangia reserved forest was sold for Rs. 2,528.

Vizagapalam.—The growth in 2 acres of Chinamangalapuram tope was clear-felled by a contractor and the tope was disforested during the year.

Sal Coupe II of 18 acres was clear felled. The yield of saleable timber was 2,514 cubic feet. About 100 cart-loads of small stuff which does not pay the cost of transport to Veeraghattam was sold in the coupe for Rs. 75.

Three hundred and twenty-seven cubic feet of saleable timber was also removed during the year from Coupe I of 1927-28.

Upper Godavari.—Clear-fellings were done departmentally in two coupes in each of the Marrigudem and Bhadrachalam ranges and one coupe in each of the Pulusumamidi and Cherla ranges. The financial results are shown in the following table:—

Range.	Reserve.	Area in acres.	Gross expenditure.	Gross revenue.	Cost per acre.	Net revenue per acre.
			RS.	RS.	RS.	RS.
Pulusumamidi ..	Walsugriva coupe II.	31	1,132	8,894	37	250
Marrigudem ..	Sitarampuram coupe IV.	36	2,057	17,519	63	420
	Ramachendram coupe VIII.	56	2,222	12,196	40	176
Bhadrachalam ..	Dumugudem coupe IV.	73	2,247	8,909	31	91
	Tonikicheruvu coupe VIII.	36	1,353	10,412	38	252
Cherla ..	Peddamidisilera coupe I.	25	753	2,723	30	79

The yield of timber (all species) from the above 6 coupes was 8,277, 15,488, 13,480, 8,986, 8,515 and 3,499 cubic feet of which 4,755, 9,069, 8,457, 7,039, 6,161, and 2,630 cubic feet respectively was teak.

Lower Godavari.—Timber coupes V (a) and VII of 40 and 54 acres in Kopalli and Bedadavole reserved forests respectively were worked through the agency of a contractor. All saleable timber was extracted and the refuse was burnt. The resulting coppice shoots of teak, Terminalia and Pterocarpus and other important species were tended.

Selection fellings—Ganjam.—Five hundred and four logs of 4,580 cubic feet of mill timber in Darpangia reserved forest and 102 logs of 1,417 cubic feet in Brahmanasayi reserved forest which were cut and brought to stock in the previous year, were carted to the saw mill.

Selection fellings in Chandragiri reserved forest were carried out during the year. The yield was 225 logs of 2,934 cubic feet of which 183 logs of 2,773 cubic feet were carted to the saw mill.

The reject timber in the selection working circle which was sold during the year is shown below:—

			RS.
Chandragiri	reserved forest	13,664 cubic feet	2,687
Darpangia	"	77,077 "	15,676
Brahmanasayi	"	30,027 "	7,377
Kriamba	"	6,604 "	2,066

Vizagapatam.—One thousand nine hundred and fifty-nine cubic feet of Sal timber was extracted from Block II (coupes X to XIII) in Palakonda range.

Improvement fellings—Ganjam—Series—I Periodic Block II.—One hundred and eighty-four logs of 872 cubic feet of mill timber in stock at the close of the previous year were carted to the saw mill. 22,906 cubic feet of reject timber in stock was sold for Rs. 7,221 during the year.

Series I—Periodic Blocks III and IV.—Mature trees fit for the saw mill were extracted from the Tiki reserved forest. The total yield was 1,869 logs of 17,237 cubic feet of which 316 logs of 3,147 cubic feet were carted to the mill. One thousand two hundred and ninety-six logs of 10,083 cubic feet were sold for Rs. 2,367. The remaining quantity was sold during the current year. No other improvement fellings were carried out in the area.

Simple coppice.—The fuel coupes in all the divisions were worked under the simple coppice system. In the *Lower Godavari* division a contractor used a mechanical cross-cut saw worked by a 7 h.p. Petter's Oil Engine for billeting casuarina trees in Kandikuppa reserved forest. Thereby he reduced his costs and saved time.

Unregulated fellings.—These were as usual confined to the unreserved lands and to the Rampa forests.

In *Upper Godavari*, these were confined to the unreserves, which are under the control of the Forest department. The fellings were carried out in coupe XI of Cherla range unreserves and coupe VI of Nugur range unreserves.

The timber extracted from coupe VI together with 69 standing trees in that coupe and 234 trees marked for felling in coupe VII of Nugur range were sold to a contractor for Rs. 16,368.

11,145 cubic feet of timber extracted from coupe XI of Cherla range, of which 844 cubic feet was teak, was sold for Rs. 13,791.

Taungya—Upper Godavari.—The saleable timber extracted departmentally from the modified taungya coupe IV of Pulusumamidi range and coupe II of Lakkavaram range was carted to the river bank and sold in October 1928. The financial results are noted below :—

Coupe number.	Number of logs.	Quantity.	Cost of working.	Revenue realized.
IV of Pulusumamidi range ..	2,685	CFT. 15,776	RS. 1,504	RS. 10,596
II of Lakkavaram range ..	1,671	5,241	538	1,952

The right to cut and remove saleable timber from modified taungya coupe V of Pulusumamidi range 20 acres was sold for Rs. 1,040. Coupe III of Lakkavaram range could not be sold for want of bidders. It will be worked departmentally during the current year. These areas will be handed over to Koyas for cutting and burning the valueless timber and for raising field crops. They will be taken back from the Koyas after harvest, for regeneration.

(ii) *Minor produce.*

24. *Bamboos and minor produce.*—Three methods of extraction were in vogue, viz., (1) departmental collection, (2) leasing the right of collection and (3) collection on permits.

The first method was resorted to only to meet the requirements of the department for repairs to buildings, etc. The produce was generally leased out to contractors except in the Sriharikota range of *Nellore* district where the minor forest produce was collected departmentally through the Yanadies.

The right to collect seigniorage from the purchasers at shandies for minor produce purchased from the hillmen was leased out to contractors as usual in *Vizagapatam*.

Collection on permits was allowed from forests, not leased out in *Upper Godavari*, in Rampa and in the unreserves of the *Lower Godavari* Division. In *Guntur* permits are reported to have been issued for stone whenever there was demand.

Strychnos Nux-vomica.—In *Upper Godavari* there was no demand during the year. In *Lower Godavari* the right to collect was sold for Rs. 270.

Cassia auriculata bark.—The right to collect this item was leased out in *Narasapatam* range of *Vizagapatam* and the *Lower Godavari*, *Guntur* and *Nellore* divisions.

Cassia fistula.—The right to collect this produce was leased out in Balliguda Agency and in the Russellkonda range in *Ganjam* and in *Upper Godavari*.

Tuniki leaves.—The right to collect Tuniki leaves for beedies was leased out in *Upper Godavari* for Rs. 2,000.

Fodder grass and hay—Ganjam.—The right to cut grass in Napier's Park reserved forest was leased out for Rs. 14.

Lower Godavari.—Free removal of fodder and thatch grass was allowed for domestic purposes as in the previous year from all reserved forests except Coringa, Coringa Extension and Kandikuppa where the right to remove was leased out for Rs. 695. The annual lease amount of Rs. 1,200 on account of fodder grass in Samalkota cantonment ground for the year 1927-28 and the same amount was collected for 1928-29 also during the year.

(b) AGENCY OF EXPLOITATION.

(i) Departmental Agency.

25. The outturn of major produce by departmental agency is compared with that of the previous year in the following table :—

Year.	Timber in thousands of cubic feet.	Fuel in thousands of cubic feet.	Bamboos value.	Minor forest produce value.
1927-28	658	191	RS. 278	RS. 13,527
1928-29	212	67	359	8,294

The large decrease under timber was in *Ganjam*, due to the stoppage in May 1928 of all fellings for the Russellkonda saw mill.

The decrease under fuel was accounted for by the non-working of indicator areas and to there being no top portions of trees felled for Russellkonda saw mill supplies.

The increase under bamboos is due to extraction of bamboos for reconstruction of sheds for District Forest Office clerks at Kunavaram, which had been burnt.

The decrease under minor forest produce was, in *Vizagapatam*, *Upper Godavari*, *Lower Godavari*, due to less collection of seeds for departmental sowing and in *Nellore* to less receipts in Sriharikota Island.

(ii) By purchasers.

26. The following statement shows the quantity of major produce and the value of minor produce removed by purchasers during the year and in the previous year :—

Year.	Timber in thousands of cubic feet.	Fuel in thousands of cubic feet.	Bamboos.	Grass and grazing.	Other minor produce.
1927-28	697	5,044	RS. 1,01,232	RS. 1,15,006	RS. 1,06,342
1928-29	605	5,327	1,28,312	1,15,087	1,18,503

The decrease under timber was in *Vizagapatam* due to handing over of some reserves in the Sarvasidhi Range and in *Guntur* due to less removals of trees on darkhast lands.

The increase in fuel was in *Guntur* and *Nellore* due to a larger number of fuel coupes having been sold in 1928-29 as per working plans under preparation.

The increase under bamboos was in *Upper* and *Lower Godavari* due to keener competition at the sales of bamboo coupes.

The increase under minor produce is due to raising the seigniorage rate on tamarind by 50 per cent in *Lower Godavari*, to sale of

the right to collect Tuniki leaves in *Upper Godavari* and to a larger amount of tree owners' fees realised.

(iii) & (iv) By right-holders and under privileges and free grantees.

27. The following table shows the quantity and value of the produce removed under this head :—

	Timber in thousands of cubic feet.	Value.	Fuel in thousands of cubic feet.	Value.	Bamboos.	Grazing.	Other produce.	Total.
Right-holders ..	3	RS. 375	..	RS. ..	RS. 63	RS. 2,748	RS. ..	RS. 2,686
Free grantees ..	465	62,036	67	8,059	841	12,733	4,486	88,165

Ganjam.—The Khonds of Chokkapad Khandam have a right to free removal of timber, etc., for their domestic and agricultural purposes and free grazing of cattle. They were allowed to enjoy their rights during the year.

The Khonds elsewhere than in Chokkapad were granted concessions for rendering necessary help in putting out fires.

Lower Godavari.—The Koyas and Reddis of the Agency continued to enjoy the right of free removal of unclassified timber for domestic and agricultural purposes.

Free grants.—Free grants were made chiefly for rebuilding houses burnt by fire or destroyed in floods. In *Nellore* free grants ordered on a very extensive scale during the year also as a result of the cyclone of November 1927 were availed of.

In *Vizagapatam* free grazing to the extent of Rs. 964 was allowed in Dharakonda and Sanivaram reserved forests to the neighbouring hill villages for services rendered in fire protection.

The fuel supplied to the Port Conservancy Board, Cocanada, from the Coringa extension reserved forest is also shown under free grants.

(c) OUTTURN AND SOURCES OF FOREST PRODUCE.

28. The total outturn from all agencies is compared in the following statement :—

Year.	Timber in thousands of cubic feet.	Fuel in thousands of cubic feet.	Bamboos.	Gross value of minor forest produce, including grass and grazing
1927-28	1,750	5,431	RS. 1,02,212	RS. 2,51,356
1928-29	1,286	5,461	1,29,575	2,61,351

The yield of timber from unreserves as compared with that from reserved forests is high only under 'Purchasers' in *Lower Godavari*, *Guntur* and *Nellore* and under 'Free grants' in all districts except *Ganjam*. The reasons are that in *Lower Godavari* removals of timber from Rampa are effected on permits, that all trees standing on darkhast lands are classed as timber by the Revenue Department who collect such revenue and that all free grants are made as far as possible from unreserves.

CHAPTER V.—FINANCIAL RESULTS.

29. The following figures show the financial position of the Circle compared with the previous year :—

	1927-28.	1928-29.
	RS.	RS.
<i>Receipts.</i>		
Revenue	8,18,385	11,35,573
Deduct refunds	— 5,960	— 2,503
Net Revenue	8,12,425	11,33,070
<i>Expenditure.</i>		
(b) Conservancy and Works	2,06,162	1,37,769
(c) Establishments	5,10,879	4,92,185
52-A. Capital outlay on Forests	27,020	39,861
Total expenditure	7,44,061	6,69,815
Surplus	68,364	4,63,255

The following statement shows the financial position of the divisions during the year under report :—

	Revenue.	Expenditure.	Deficit or surplus.
	RS.	RS.	RS.
Ganjam	3,73,394	1,87,307	+ 1,86,087
Vizagapatam	56,206	45,871	+ 10,335
Upper Godavari	1,53,413	1,13,063	+ 40,350
Lower Godavari	2,57,614	1,07,723	+ 1,49,891
Guntur	1,54,242	78,938	+ 75,304
Nellore	1,37,904	88,523	+ 49,381
Direction	297	48,380	— 48,083
Total	11,33,070	6,69,815	+ 4,63,255

The above shows that all the divisions worked at a profit. The surplus in *Ganjam* was due to adjustments of profits from a Government Commercial undertaking (Russellkonda saw mills) and recovery of investments in the same. The surplus in *Upper Godavari* was

due to keen competition and good prices at the timber and bamboo sales in the year under report. The surplus in other divisions is normal.

The important variations are explained below :—

RECEIPTS.

VIII. (a) Timber and 'bamboos removed by Government Agency.—

The increase under 'timber' was due to the sale of large quantities of timber unfit for the saw mills in *Ganjam*, to greater quantity of Sal timber extracted in Palakonda range in *Vizagapatam*, to better prices realized for timber extracted departmentally in *Upper Godavari* and to credit of the value of timber sold in the previous year from Ammayagoppu valley in *Lower Godavari* in the accounts of the year under report.

The decrease under 'Firewood and charcoal' was mainly in *Guntur* due to non-working of indicator areas.

VIII. (b) Timber and other produce removed from the forests by consumers and purchasers.

	RS.
By Forest department	59,888
By Revenue Department	7,325

By Forest department.—The increase occurs under 'timber', 'firewood and charcoal' and 'bamboos' and was due to sale of timber coupes in *Ganjam* in which stood mature timber of saw mill quality, to better prices realized for fuel and bamboo coupes in general and to the sale of seven fuel coupes in Sriharikota range, *Nellore*, during the year under report against three in the previous year.

	RS.
Profits from Government commercial undertakings	+ 36,539
Recoveries of investments in Government commercial undertakings	+ 1,40,185

Relate to the Russellkonda saw mill.

EXPENDITURE.

	RS.
8. b. Conservancy and Works	— 68,393
52-A. Capital outlay on forests	+ 12,841

The decrease under 8. b. Conservancy and Works was chiefly under 'Timber' (— Rs. 62,392), 'firewood' (— Rs. 2,105), and renewals and replacement of stores, tools and plant (— Rs. 3,885). Under 'timber' the decrease was due to the contraction of departmental fellings in *Ganjam* owing to the closure of the saw mill.

Under 'firewood and charcoal' the decrease was due to non-felling of indicator areas and under "renewals of stores, tools and plant," to the steam launch 'Thistle' being idle owing to boiler trouble. This was partly counterbalanced by increase in *Nellore* under II Timber and other produce removed by purchasers due to the adjustment of Rs. 5,000 being the refund to panchayats on account of the pay of watchers.

52-A. *Capital outlay on forests*.—The chief variations were under "purchase of live stock" (+ Rs. 4,234), "purchase of stores, tools and plant" (+ Rs. 5,629), "demarcation" (+ Rs. 1,674) and "surveys" (+ Rs. 3,350).

Under "live stock" the increase was due to purchase of the baggage elephant, 'Anarkali,' for *Upper Godavari*; under "stores, tools and plant" to purchase of two miles of tram line against one mile in the previous year in *Nellore*; under "demarcation" to the demarcation of unreserve blocks in *Upper Godavari* and in *Rampa*; and under "surveys" to the payment of Rs. 4,000 towards the cost of the survey of *Rampa* by the Survey of India party.

Establishment—Rs. 18,694.—The decrease occurs chiefly under "pay of establishment, permanent" (—Rs. 13,662), "travelling allowance, non-voted" (—Rs. 2,992) and "contract contingencies" (—Rs. 1,442).

The decrease under "pay of establishment, permanent" was due to reduction of staff owing to the handing over of reserves to panchayats, under "travelling allowance, non-voted," to there having been fewer number of Imperial officers in 1928-29 and under "contract contingencies" to economy.

The outstandings of revenue at the close of the year amounted to Rs. 52,711 of which Rs. 16,749 fell due within the year.

Of the revenue realized in the year 44 per cent was from major produce, 32 per cent from minor produce and 24 per cent from other sources.

Of the expenditure 18 per cent relates to 'exploitation', 18 per cent to 'improvement and up-keep of forests' and 64 per cent to 'miscellaneous' items.

CHAPTER VI.—RESEARCH AND EXPERIMENTS.

(a) RESEARCH.

30. No research work was done in this circle but the District Forest Officer, *Lower Godavari*, consulted the Forest Research Officer (1) on the introduction of teak in the upland reserves of *Rajahmundry*, *Peddapur* and *Gokavaram* ranges and (2) on the best method of restocking the parras (saline flats which are blanks) in

the *Coringa* reserve with tree growth. The Forest Research Officer's suggestions on (1), viz., notching at stakes germinating teak seeds from dumps, were closely followed. In the case of (2), his view supported by the Imperial Silviculturist and the Forest Botanist was that it was useless to attempt to restock such localities where the soil is highly impregnated with salt.

(b) EXPERIMENTS.

31. *Vizagapatam*.—Sal was sown over one acre in mounds in conjunction with field crops in the experimental plot in the *Burna* reserved forest near *Polla* in *Palakonda* range in June 1928. This area was cleared in 1927-28. It was a thorough failure on account of the creeper field crops (e.g., country beans, etc.) which smothered the sal seedlings. An enumeration on 21st November 1928 showed 1,961 seedlings 1" to 6" high; but on 10th May 1929 there were only 181 seedlings. A greater number of seedlings was observed in places where there was more lateral shade of coppice and scrub forest, while there were no seedlings in fully exposed places.

In *Sal Coupe I* of *Burna* reserved forest patch sowings of sal (in patches 1' × 1') were done in June 1928. On 21st November 1928, 1,824 seedlings were counted in 235 patches. These patches serve as dry nurseries from which seedlings will be stumped out in places where there are no seedlings.

Nursery sal seedlings near the Donubai Rest-house.—One thousand one hundred and fifty sal seedlings were stumped out in blanks in *Sal Coupe I* of *Karnamdongu Sal* area during the last rains of June 1928. Only 216 stump plants were counted on 21st November 1928. Thus, sowing is the best and cheapest method of artificially regenerating sal in *Palakonda* range as is the case in other sal tracts.

Upper Godavari.—Experimental plots were opened in *Tuniki-cheruvu* and *Bandirevu* reserves in 1922 and in *Ramachendram* reserve in 1924 with a view to find out the rate of girth increment of individual satinwood trees in a mixed crop and in a pure crop. The plots in *Tuniki-cheruvu* and *Ramachendram* reserves were continued during the year. In *Bandirevu* reserve the trees lost their numbers. Most of the trees measured on 16th October 1928 in the *Ramachendram* reserve plot showed a girth increment of $\frac{1}{4}$ " to $\frac{1}{2}$ " during the last two years.

In view of a demand which is expected from the United States of America for laurel wood (*Terminalia tomentosa*), two samples of heartwood 6" × 3" × $\frac{1}{2}$ " were sent to *Dehra Dun* for report. The report from *Dehra Dun* states that laurel is the trade name approved by the Empire Forestry Association and the Government

of India for all *Terminalia tomentosa*, and records that the samples sent from the division were not 'figured', but were plain straight grained wood, while the samples from the West Coast are 'figured'. Material for microscopical examination has been taken and a further report is awaited. The Dehra Dun report concludes as follows:—

"Figure has always been rather an enigma and even in the same locality it is only some trees which have it. In Bombay Presidency there is a lot of figured stuff as well as plain, but in the Central Provinces and United Provinces figured laurel is quite rare, the usual run being very dull and straight grained. Dark coloured straight grained timber is quite nice of course and for certain purposes more suitable than figured wood, but for high-class cabinet work, well figured laurel is one of the most handsome woods in the world and will always fetch a price which is much higher than that for straight grained wood."

Lower Godavari.—The undermentioned teak plots thrive well:—

Tirumalayapalem Reserve, Plot No. 4 in Coupe No. VII opened in 1927						
A. Series.						
Do.	do.	5	do.	VIII	do.	1927.
Do.	do.	6	do.	IX	do.	1928.
Mallavaram Reserve,	do.	2	do.	VIII	do.	1927.
C. Series.						
Do.	do.	3	do.	IX	do.	1928.
Rajavommangai Reserve.	do.	12			do.	1921.
Do.	do.	13			do.	1922.
Vatangi Reserve	do.	14			do.	1921.
Do.	do.	15			do.	1922.
Do.	do.	16			do.	1922.

All these plots were weeded in July 1928.

In the plots in Mallavaram reserve 70 per cent of the plants in the dibbled areas and 88 per cent in the notched areas survived and were in good condition. The casualties were replaced and the tallest plant on 22nd January 1929 was 9½ feet high at age nineteen months. A leaf defoliator attack was noticed in one of the plots.

Of the three plots in Tirumalayapalem reserve, one in Coupe VIII was remarkably good, especially in the dibbled portion. The tallest plant in January 1929 was about 18 feet high aged nineteen months.

In a plot of 7 acres in Ammayagoppu Valley (Rajavommangai reserve) the portion of the plot planted with stumps two years old was more successful than the one sown. In this there were many casualties owing to the bad drainage in some places and to the effect of the hot weather.

The two podu areas in Polavaram Range, which were stump-planted and were condemned by the Conservator in December 1927 showed some improvement in 1928-29 after the rains but are a failure.

Guntur.—The experiments in Palnad Range for improving the growth by sowing seeds of *Albizia lebbek*, *Albizia amara*, *Chloroxylon swietenia*, *Melia indica*, *Acacia sundra*, etc., are declared to have been a failure. The soil is laid bare by clear felling and it is difficult for seedlings to survive the hot weather, especially as the rainfall is scanty. The experiments will not be continued. The result in the 2½ acre sample plot opened in 1927-28 by clear felling and sowing near Srigriripad is also a failure.

The experimental plot of 3 acres in Venkatayapalem reserve opened in 1926-27, where seeds of different species were sown, was maintained but due to dryness the experiment is practically a failure. The species which are expected to survive, such as Sundra and Yepi, reproduce abundantly by nature.

The half acre plot sown with Nim in Venkatayapalem reserve is a complete failure.

In the Mada experimental plots in Repalle Range, girth measurements could not be recorded as the labels tied to the trees disappeared. No doubt they were removed out of mischief.

Observations in the experimental plots opened in Bollapalli and Guttikonda reserves with a view to find out a cheap and efficient method of regenerating the Yepi forests and referred to in the previous report show that though germination was satisfactory, the survivals after the rains were few. The experiments are continued for another year.

Nellore.—Dibbling of sandal seeds was done on a small scale in Udayagiri and Sathiavedu Ranges. The result in Sathiavedu was not satisfactory, while the propagation is rather hopeful in Udayagiridurgam Hill.

Three small plots of 2 acres each were selected in Rapur, Udayagiri and Kanigiri Ranges in which all undergrowth was cut and promising young stems of *Pterocarpus santalinus*, *Hardwickia binata*, *Anogeissus latifolia* and *Chloroxylon swietenia* were retained. Badly formed, old and hollow stems of these species were cut back. The objects of the experiment are (1) to obtain reliable data of the height and girth increment of these species (2) to check the coppice growth of these species and (3) to compare the rate of growth by retaining all the coppice shoots in some and by reducing the coppice shoots to one or two in the others.

The plots have been fenced.

CHAPTER VII.—ADMINISTRATION.

32. The following officers held charge of the Circle during the year under review :—

	From	To
Mr. D. T. Barry	1st April 1928	6th June 1928.
Mr. F. R. Madan	7th June 1928	31st July 1928.
Mr. J. H. Longrigg	1st August 1928	31st March 1929.

33. *Russellkonda Saw Mill*.—In their Order No. 504, Development, dated 20th March 1928, the Government ordered that the Russellkonda Saw Mill should be closed with effect from 1st July 1928. Messrs. Parry & Co. completed handing over of the mill and properties by 10th July 1928. Since then the disposal of the property and winding up of the concern is being attended to by the Forest Department.

By 31st March 1929 all the properties except the buildings and machinery had been disposed of for the amounts noted below :—

	RS.	A.	P.
Depot shed at Berhampur and Lorry shed at Russellkonda.	2,020	0	0
Furniture	454	13	0
Wooden sleepers of tram-line	400	0	0
Tram rails transferred to Public Works Department.	1,296	2	0
Motor lorry	4,300	0	0
Ford car	500	0	0
Bicycle	40	0	0
Loose tools transferred to Olavakot	113	0	0
Spare parts (band saws, etc.) transferred to Olavakot.	1,407	0	0
Tools and general stores auctioned	226	2	9
Stationery sold in auction and transferred to District Forest Officer, Ganjam, by book transfer.	47	1	6
Uncut logs in stock of 10,924 cubic feet sold in auction, including 3,465 cubic feet of support logs, the value of which is to be adjusted to the credit of Forest Department.	11,100	9	3
Sawn timber, 15,600 cubic feet, at Russellkonda sold to Mr. V. Kameswararao at Rs. 1-14-0 per cubic foot.	29,251	0	0
Piasal scantlings at Russellkonda sold in auction, 844 cubic feet.	963	0	0
Sal scantlings at Berhampur, 1,187 cubic feet sold in auction.	2,972	12	6
N.G. sleepers at Berhampur delivered to Dewan, Parlakimedi Estate, 6,352 cubic feet.	14,245	1	0
Miscellaneous receipts	323	13	9
Total ...	69,660	7	9

Out of this amount Rs. 3,014-12-9 was outstanding at the end of the year. Since the close of the year orders have been issued to transfer to Nellore 8 pairs of steel tram wheels, one turn table, 100 steel sleepers, 40 fish plates, 6 tram trucks without wooden frames, 12 bearings and 4 brackets for wheels at an estimated value of Rs. 313-12-4. This leaves only the buildings with their furniture and the machinery to be disposed of.

In G.O. Mis. No. 1158, dated 9th July 1929, Government have sanctioned the transfer of the buildings and furniture to the Public Works Department at their book value. The transfer has since been effected. The disposal of the machinery is being dealt with by the Chief Forest Engineer.

34. The proposal to transfer the Kanigiri Range of the *Nellore* division to the *South Kurnool* division of the II Circle has been approved by the Chief Conservator and the notification regarding the transfer has been sent up.

A portion of the Kothur Reserved Forest (1,171 acres) was transferred from the *North Cuddapah* division to the *Nellore* division.

35. Mr. P. Govinda Menon, Extra Assistant Conservator of Forests, completed his reconnaissance of the Golconda Agency forests and his report was submitted to the Chief Conservator of Forests.

36. The final report on the Balliguda forests in *Ganjam* prepared by Mr. Said-ud-din Ahmed, Extra Assistant Conservator of Forests, was also submitted during the year.

37. M.R.Ry. V. N. Seshagiri Rao Avargal, Extra Assistant Conservator, made considerable progress in the selection and demarcation of blocks proposed for reservation in the Rampa Agency of the *Lower Godavari* division.

38. *Tours*.—The Chief Conservator visited *Ganjam* in January 1929.

The Conservator spent 170 days in camp touring in all the divisions of the Circle except *Upper Godavari*.

All the District Forest Officers spent more than the prescribed minimum in camp except the District Forest Officer *Upper Godavari* who was excused from touring owing to ill-health.

39. *Inspection of District Forest and Range offices*.—The Conservator inspected all the District Forest offices except *Upper Godavari*.

All the Range offices in the Circle except two, one in *Upper Godavari* and one in *Lower Godavari*, were inspected.

40. *List of offices audited*.—The Accountant-General's staff inspected the accounts of all the divisions in the Circle for 1927-28 and the result was generally satisfactory.

41. *Vernacular Training School.*—The session of the Vernacular Training School in *Ganjam* which commenced on 7th January 1928 closed on 19th June 1928. M.R.Ry. M. Narasinga Rao Nayudu, Ranger, Fifth grade, was Senior Instructor while A. Neeladri Rao, Forester, Third grade was the Junior Instructor. In this session, 24 students were trained of whom 5 were deputed from Bihar and Orissa. All the students were awarded certificates 10 having been placed in the first class and the remaining 14 in the second class. The conduct, discipline and health of the students were very satisfactory.

The first session of the subsidiary Vernacular Training School sanctioned in G.O. No. 979, Development, dated 1st July 1927, for training subordinates in the *Upper Godavari* division opened on 1st June 1928 and ended on 31st August 1928. M.R.Ry. T. M. Duraiswamy Pillai, Ranger, Fifth grade, the Instructor, carried out his duties commendably. Twelve students were trained and awarded certificates. The health of the students was uniformly good.

42. *Health of establishment and sanitation.*—The health of the establishment was as usual bad in the Agency tracts of the Circle, in Kukuluba and Bontha Ranges of *Ganjam* and in the Sriharikota Range of *Nellore*. Three forest guards in *Vizagapatam*, a Forester and a peon of the District Forest office, *Upper Godavari*, and a Forester and a Range Clerk in *Lower Godavari* fell victims to malaria.

CHAPTER VIII.—GENERAL.

43. *Formation and management of panchayats (to include the forest village system).*—All the ryots' forests in the Circle having been handed over to the Revenue Department, the formation and management of panchayats rests with that department.

The three reserves in *Lower Godavari*, viz., Kogida, Murari and Rameswaram mentioned in the last year's report were handed over to panchayats from 1st July 1928.

The forest village system is not in force in this Circle.

44. *Measures for improving local supplies and facilities (including water-supply, manure leaves, etc.).*—The wants of the people in the matter of small timber and fuel were met in all the divisions. There is no demand for manure leaves in the Circle.

As regards water-supply, the public were given permission to repair 18 kuntas in *Guntur*, and in *Nellore* ponds and tanks in grazing blocks were repaired by the department at a cost of Rs. 303.

45. *Timber transit rules.*—The rules are reported to have worked satisfactorily. In *Upper Godavari* the land transit rules were extended to the Bhadrachalam taluk.

In *Guntur* the transit rules were extended to Tenali, Repalle and Bapatla taluks.

The proposal to introduce timber transit rules in *Nellore* has been approved by the Chief Conservator of Forests and the draft rules will be submitted shortly.

46. *Jungle tribes—Ganjam.*—The Khonds continued to be on good terms with the department.

Vizagapatam.—The Hill tribes availed themselves of the privileges conferred on them.

An extent of 100 acres of land was given in the previous year free for cultivation to 20 families in Busilikota Settlement with a view to develop labour supply in the interior of the Sanivaram reserved forest. Three of the settlers are reported to have left the village when there were some casualties on account of smallpox. Full advantage has not yet been secured from this settlement.

Upper Godavari.—The Koyas and Peddis who form the chief source of labour supply continued to be useful and they were employed on all sorts of departmental works. Money rewards to the extent of Rs. 2,063 were disbursed to them during the year for successful fire protection. These tribes also enjoy the privilege of removing free, timber (except reserved trees), fuel and minor produce for domestic and agricultural purposes. In the Bhadrachalam taluk they enjoy the concession of free grazing and of poduing in unreserves.

Lower Godavari.—The settlers in the Agency tracts rendered help to the department in return for which they were allowed the concession of grazing their cattle at one anna per cow or buffalo. Rewards were also given to them for successful fire protection in Peddapur Range.

Guntur.—The question of granting to the Chenchus in Palnad Range lands in the reserved forests for cultivation with a view to settle them down has been reported on to the Chief Conservator after the close of the year (vide this office R.O.C. No. 1834-25-D, dated 26th July 1929).

Nellore.—The Yanadis in the Sriharikota Range continued to be employed on the departmental collection of minor forest produce and they earned Rs. 3,375 during the year as wages; in addition a reward of Rs. 1,460 was granted to them in cash and kind. They appreciate the system of accumulating deposits in the Postal Savings Bank and the total amount of deposits of 70 accounts was Rs. 814 as against Rs. 756 in the previous year. It is reported that they know what is due to them for their minor forest produce collections and for their work, calculating to the nearest pie.

47. *Mining and quarrying.*—Mica mining is being carried on in some of the ryots' forests in *Nellore* which are under the control of the Revenue department. There are no mining operations elsewhere in the circle. In *Upper Godavari* the Public Works Department was allowed free quarrying of gravel in the reserves and unreserves, under the Agent's Standing Orders. In *Lower Godavari* a sum of Rs. 74 was realized on account of the removal of metal and gravel from reserves.

48. *Livestock--Elephants.*—A female elephant was purchased during the year at a cost of Rs. 4,005 at Sonepur in Bihar for use in the *Upper Godavari* division. The elephant by name Anarkali was escorted by a forester, a mahout and a cavadi. The distance to Kunavaram was 838 miles. The march lay through Bihar, the Orissa Feudatory States and the Jeypore Estate, and occupied 87 days. The total number of elephants at the end of the year was 3.

Other animals.—At the beginning of the year there were 16 buffaloes, 15 in *Ganjam* and 1 in *Nellore*. In *Ganjam* 3 died and 12 were sold owing to the stoppage of timber operations due to the closure of the Russellkonda Saw Mill. There was one buffalo at the end of the year.

49. *Veterinary establishment.*—The services of the Inspector of Livestock at Calicut were secured for the purchase of the elephant at Sonepur in November 1928.

50. *Wild animals--Ganjam.*—As usual tigers were a source of trouble round about Tarasingi and in the Agency. The man-eater which haunts the neighbourhood of Chandragiri has been inactive since November 1928. The District Forest Officer reports that it was wounded by a local shikari and has perhaps died of its wounds. However Mr. Minchin caught a glimpse of it in March 1929, a large animal with faded coat. Three proscribed rogue elephants in the same reserve are still at large but have not been in evidence of late.

51. *Civil suits--Lower Godavari.*—The plaintiff in the Naramamidi bark suit which was decided in favour of Government has appealed against the District Munsif's judgment and the result of the appeal is awaited.

Nellore.—The two suits filed by the ex-contractor Chenchuram Nayudu were decided in favour of Government by the Sub-Judge, *Nellore*. The contractor has appealed to the High Court.

52. *Control of unreserved lands by the Forest department--Upper Godavari.*—The unreserves in the division are under the control of the department. Departmental extraction of timber is done in the unreserves in the Nugur and Cherla Ranges.

Lower Godavari.—Some of the unreserves in the Agency portion of Yellavaram, Chodavaram and Polavaram divisions continued under the control of the department. In Peddapur and Gokavaram ranges five "special unreserves" were formed with a view to prevent podu and destruction of the growth in them by goats.

53. The relations between the Revenue and the Forest departments were cordial.

ENCLOSURE

REPORT ON EACH FOREST DISTRICT FOR 1928-29.

GANJAM.

Description.—The main seat of forest activity is in the Ghumsur and Surada taluks where extensive Sal forests have been long under close management. These forests supplied the Russellkonda Saw mills (1922-28) with timber. The three reserves in the Mohiri hills near the coast contain fuel and bamboos and are important as water catchment areas. The Eastern Ghats known as the Maliahs occupy the western part of the district. There-in the forests of Bulliguda Agency form part of the District Forest Officer's charge since 1st July 1927. They are capable of producing fine sal but have largely been spoiled by the Khonds through their shifting cultivation (podu). The importance of these forests as a water catchment and as the source of large rivers is great. Parlakimedi Maliahs is a separate charge managed by a Special Forest Officer under the Agent to the Governor in Ganjam. The people there are Savaras and the forest blocks comprise 177 square miles; they have been notified under section 26. Figures relating to Parlakimidi Maliahs are not included in the figures which follow.

Area.—Reserved forests 625 square miles.

2. *How the forest district is split up into subordinate and executive charges.*—The whole division is divided into nine ranges consisting of 71 beats.

3. *Cost of administration—*

	rs.
Pay of officers	42,724
„ rangers	27,423
„ subordinates	41,682
„ clerical staff	17,411

4. *Cost under other important heads—*

Timber	22,539
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52-A. Capital Outlay.

Roads—	
New works	1,163
Works in progress	216
Buildings—	
New works	53
Works in progress	1,618
Other works—	
New works	302
Demarcation	792

5. *Income from main sources—*

	RS.
Timber	79,723
Fuel—	
Forest department	35,368
Revenue department	6,964
Bamboos—Forest department	7,061
Grazing	9,353
Profits from Government commercial undertakings—Russellkonda Saw mill	44,929

6. *The chief work done in the forest district is—*

- (i) in Ghumsur, the supply of timber (mainly sal) from four felling series, Sal poles from about eighteen felling series; fuel and bamboos;
- (ii) in the Mohiri hills, supply of fuel and bamboos;
- (iii) in the Maliahs, restriction of shifting cultivation (podu), to be followed by forest settlement, conservancy and general development by roads and buildings.

VIZAGAPATAM.

Description.—The Eastern Ghats occupy a great part of the district and are malarious. These are the Agency tracts. The Palkonda forest range contains sal forest on the hills and on the plains. This is the southern limit of the species.

The plains portion of the district has numerous isolated hills and such of them as are reserved forests are densely clad with trees and contain felling series for small timber and fuel.

The Golconda (Gudem) Agency is nearly all forest but much of it is as yet almost unknown country. In this tract the District Forest Officer is styled Special Forest Officer and works under the Agent to the Governor.

None of the forests either in the plains or the Agency has contour maps by the Survey of India and forest work has been greatly hampered in consequence. Figures relating to Golconda Agency are not included in the figures which follow:—

Area—

	SQ. MILES.
Reserved forest	307
Reserved lands	2

2. *How the forest district is split up into subordinate administrative charges.*—The whole forest division except Golconda Agency Range is split up into two ranges consisting of 24 beats under eight sections.

3. *Cost of administration—*

	RS.
Pay of officers	8,986
„ rangers	4,163
„ subordinates	11,118
„ clerical staff	4,930

4. *Cost under other important heads—*

	52-A. Capital.	RS.
Roads and bridges—		
New works	—	594
Works in progress	—	206
Buildings—		
New works	1,317	
Works in progress	120	

5. *Income from other sources—*

Timber	9,487
Fuel	9,563
Bamboos	19,449
Other minor produce	9,713

6. *The chief work done in the forest district—Plains.*—Supply of small timber, fuel and bamboos to the population near the forests. Some fair sal timber is worked from Palakonda Range, where a new road system is being completed.

Golconda Agency.—A start has been made to work out big timber for sale at Narasapatam (Vizagapatam district) and Yeleswaram (Godavari district). The small forest staff is concerned to restrict unauthorized shifting cultivation (podu) by hillmen.

UPPER GODAVARI.

Description.—This forest division lies entirely in the Koya Agency on the left bank of the Godavari river. It contains many broken hill ranges. The elevation is from 200 feet to 3,900 feet. The tract is malarious. The forest is deciduous and contains teak, *Terminalias*, *Pterocarpus marsupium*, *Hardwickia binata*, *Xylia* and a few rosewood. Bamboos specially *Dendrocalamus* are very abundant in the south and east parts of the division. The river is the main line of communication with the outside world. The District Forest Officer's headquarters is Kunavaram, but he is permitted to spend six weeks in the year at Rajahmundry when his office also moves there.

Area.—Reserved forests 830 square miles. In addition about 370 square miles of unreserved lands are under the control of the Forest department.

2. *How the forest district is split up into subordinate administrative charges.*—The whole forest division is divided into six ranges consisting of 53 beats under 15 sections.

3. *Cost of administration—*

	RS.
Pay of officers	9,901
„ rangers	21,196
„ subordinates	26,297
„ clerical staff	13,762

4. *Cost under other important heads—*

Timber	13,220
Regeneration—	
Sowing and planting	982

52-A. Capital.

	RS.
Roads and bridges—	
New works	390
Works in progress	527
Buildings—	
New works	1,879
Works in progress	4,264

5. Income from main sources—

Timber	1,02,589
Bamboos	30,816
Grazing	7,208

6. The chief works done in the forest district are—

- (1) timber exploitation which is a new development since 1921;
 - (2) regeneration (a) by modified taungya, (b) naturally;
 - (3) reservation of additional timber bearing areas (about 68 square miles); and
 - (4) fire protection.
- Bamboo coupes produce a good revenue.

LOWER GODAVARI.

Description.—Divisible into three zones—(a) the mangrove swamps of the Godavari Delta, (b) the central laterite belt containing mixed deciduous forests, (c) the Rampa Agency and the Papi hills (2,000 feet) containing timber and bamboos. Rajahmundry is the biggest market for timber and bamboos on the East coast.

Area.—Reserved forests 568 square miles.

2. *How the forest district is split up into subordinate administrative charges.*—The whole forest division is divided into five ranges consisting of 54 beats under 19 sections.

3. Cost of administration—

	RS.
Pay of officers	13,601
„ rangers	11,880
„ subordinates	23,158
„ clerical staff	9,692

4. Cost under other important heads—

52-A. Capital.

Roads and bridges—	
Works in progress	225
New works	...
Buildings—	
New works	1,038
Works in progress	2,667
Other works—	
New works	299

5. Income from main sources—

	RS.
Timber—	
Forest department	20,349
Revenue department	10,752
Fuel	73,273
Bamboos	63,070
Grazing	20,371
Other minor produce—	
Forest department	23,064
Revenue department	29,196

6. *The chief work done in the forest district.*—Supply through coupe contractors of about 10,000 tons of mangrove fuel to Cocanada town and port and other towns of the delta. Supply through coupe contractors of small timber, fuel and bamboos to Rajahmundry, Peddapur, Samalkota and other places in Rajahmundry and Peddapur taluks from a number of reserved forests in the plains and detached hills of those taluks. Rampa produces much timber, bamboos and minor forest products which are collected by hill-men and removed by purchasers from whom seigniorage is collected. Rampa bamboos find their way to all parts of the delta, to Kistna and even to Guntur. There are two teak felling series in Polavaram Range which supply Ellore and other markets, including Rajahmundry.

Introduction of teak in selected plots in Tirumalayapalem and Mallavaram reserves and in Ammayagoppu valley.

GUNTUR.

Description.—The division includes the whole of the Guntur and Kistna revenue districts. There is a belt of mangrove swamp forests along the coast. It supplies fuel and grazing. Fuel is taken to Bezwada, Tenali and Bundar and to big villages in Tenali, Repalli and Divi taluks.

The grazing grounds immediately to the west of the delta are managed by panchayats under the Revenue department.

The reserved forests in the Guntur district still further west and north-west are mostly on low hills and are worked for local supply of small timber, fuel and grazing. These forests are of great climatic importance.

The Kondapalli reserve in Kistna district is worked for small timber, fuel and bamboos for Bezwada (10 miles).

Area.—Reserved forests 910 square miles (612 square miles under Forest department, 298 square miles under panchayat management).

2. *How the forest district is split up into subordinate administrative charges.*—The whole division is divided into four ranges consisting of 55 beats under 16 sections.

3. Cost of administration—

	RS.
Pay of officers	10,245
„ rangers	6,677
„ subordinates	28,613
„ clerical staff	10,279

4. Cost under other important heads—

52-A. Capital.

	RS.
Buildings—	
New works	1,019
5. Income from main sources—	
Timber—	
Forest department	750
Revenue department	1,306
Fuel—	
Forest department	37,548
Revenue department	13,932
Bamboos	7,628
Grazing	51,590
Minor forest produce—	
Forest department	8,182
Revenue department	18,478

6. *The Chief work done in the forest district.*—Fellings in the mangrove forests, in Kondapalli reserve and in the upland reserves in the taluks of Vinukonda, Palnad and Sattenapalle; regulation of grazing and protection of the forests (a very difficult matter).

NELLORE.

Description.—This forest division lies in the revenue districts of Nellore and Chingleput. It comprises—

(1) *Sriharikota Island.*—The reserved forest is 25,317 acres of pure sand. It is densely wooded with dry evergreen species, e.g., Maba and Memecylon of no great size. The forest department restarted casuarina planting in 1929, by the seashore. There are many private plantations of casuarina in the island. There are no roads. Extraction of fuel is by tramways to the Buckingham Canal for the Madras market.

(2) *Sathiavedu range* (Chingleput district) consists of seven blocks of forest containing scrub jungle (dry evergreen). A part of the fuel yield is exported to Madras. The area is 51,012 acres.

(3) The hill ranges known as the Veligondas along the western boundary of Nellore where it adjoins Kurnool and Cuddapah. These forests are of climatic importance. They are distant from markets. They are not under felling at present. They require rest and conservancy.

Area.—Reserved forests 820 square miles.

2. *How the forest district is split up into subordinate administrative charges.*—The whole division is divided into five ranges consisting of 33 beats under 12 sections.

3. Cost of administration—

	RS.
Pay of officers	9,617
„ rangers	10,221
„ subordinates	23,296
„ clerical staff	11,122

4. Cost under other important heads—

Purchase of stores	8,918
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5. Income from main sources—

RS.

Firewood—	
Forest department	60,093
Revenue department	5,969
Grazing	23,536
Other minor produce—	
Forest department	17,163
Revenue department	5,360

6. *The chief work done in the district.*—The chief activity is in Sriharikota Island where an area of 1,400 acres approximately is clear felled annually for fuel supplies to Madras.

Minor forest produce collection is important there especially of nux-vonica, soapnuts and tamariud. It is done for the department by the aboriginal tribe of Yanadis. In the Veligondas protection from man and conservancy are foremost. In the reserves in Chingleput district there are 19 fuel felling series for local consumption and for Madras. Sandalwood has been introduced on the Udayagiri and Kamibakkam Hills.

SUMMARY OF PROGRESS DURING THE FIVE YEARS
1924-25 TO 1928-29.

1. The following is a summary of the progress made in forest administration in this Circle during the quinquennium ending 1928-29.

The important events in this Circle during the period under review were—

(1) The Kistna Forest Division was abolished from July 1924.

(2) With the abolition of the Third Territorial Circle and the constitution of the Working Plans Circle in its place from 1st May 1925, the Nellore Forest Division of the old Third and the Guntur Forest Division of the Second Circles were transferred to this Circle.

(3) Orders were passed on the reclassification of forests into provincial and ryots' forests. In accordance with this classification all the ryots' forests except one in Lower Godavari were transferred to the control of the Revenue department.

(4) With the transfer of the ryots' forests six ranges were abolished, Sarvasiddhi in Vizagapatam, Ellore, Bezwada and Bandar ranges of the old Kistna Forest Division and Nellore and Kavali ranges of the Nellore district. A range called the 'River Range' was revived in Lower Godavari Division.

(5) A special officer of the rank of Extra Assistant Conservator was appointed in 1926 for the selection and demarcation of blocks for reservation in the Rampa Agency and work continues.

(6) A special officer of the rank of Extra Assistant Conservator toured in the Golconda Agency of Vizagapatam and submitted a report on the forests in this tract in 1928.

(7) The Balliguda Agency in Ganjam was transferred from the control of the Agent to the District Forest Officer from 1st July 1927. Selection and demarcation of blocks for reservation are proceeding.

(8) The saw mill at Russellkonda, opened in February 1922, was closed on 10th July 1928. The mill was operated throughout by Messrs. Parry & Co., Madras, as managing agents. It was well managed and efficient. During its whole period of rather over six years, the volume of logs put through the saws was 969,474 cubic feet, mainly sal. It was all supplied departmentally. The outturn was 369,322 cubic feet of sawn timber which corresponds to a conversion percentage of 38.09. Total sales realized about Rs. 10,30,000 for some 352,300 cubic feet of sawn timber plus side slabs, etc. In the result the greatest part of the mature and over-mature sal trees in the Ghumsur sal forests which were in any way accessible with the existing road system were felled, to the great benefit of the forests.

The local timber and coupe contractors were all petty men without capital who could not exploit standing timber on the scale which was desirable.

2. *Administration and control.*—The following officers held charge of the Circle during the quinquennium under review:—

	From	To
Mr. D. T. Barry ...	1st April 1924 ...	7th May 1925.
Mr. A. A. F. Minebin.	8th May 1925 ...	2nd April 1926.
Mr. R. D. Richmond ...	3rd April 1926 ...	16th April 1927.
Mr. A. M. C. Little-wood.	17th April 1927 ...	9th November 1927.
Mr. D. T. Barry ...	10th November 1927.	6th June 1928.
Mr. F. R. Madan ...	7th June 1928 ...	31st July 1928.
Mr. J. H. Longrigg ...	1st August 1928 ...	31st March 1929.

3. *Changes in the controlling and executive charges.*—The Sathiavedu range of the old Chingleput district was transferred to the control of the District Forest Officer, Nellore. A portion of the Kothur reserved forest of North Cuddapah Division was transferred to Nellore.

The jurisdiction of the District Forest Officer, Guntur, extends in addition to the Guntur revenue district to the whole of the Kistna Revenue district and that of the District Forest Officer, Lower Godavari, in addition to a portion of East Godavari district to the whole of the West Godavari revenue district.

4. *Forest legislation.*—Nil.

5. *Hill tribes.*—The Khonds in Ganjam continued to help the department in the protection of forests in return for the concession of free removal of forest produce. In Vizagapatam, the hill tribes availed themselves of the privileges conferred on them. Land was given free for cultivation at five acres per family to develop labour supply in the interior of Sanivaram reserved forest. In the Godavaris, the Koyas and Reddis continued to help the department in carrying out works and in fire protection. Money rewards were granted to them for successful fire protection. In the Polavaram Agency of the Lower Godavari Division these tribes ceased to interest themselves in fire protection during the past two years and forfeited their rewards. In Nellore the Yenadis continued to be employed on the departmental collection of minor forest produce and their condition is improving.

6. *Changes in area.*—The total areas of reserved forests, reserved lands and leased forests at the beginning and end of the quinquennium are shown below:—

	Area at commencement of the quinquennium.	Area at the end of the quinquennium
	SQ. MLS.	SQ. MLS.
Reserved forests ...	4,012	4,059
Reserved lands ...	12	12
Leased forests ...	2	2

The increase under reserved forests was chiefly due to the transfer of the Sathiavedu Range of the old Chingleput Forest Division to Nellore.

7. *Further Reservation.*—Progress has been made in the selection of blocks for reservation in the Balliguda Agency in Ganjam and in the Rampa Agency in Lower Godavari. An area of 11 square miles was notified under section 4 in Rampa during the last year of the quinquennium. In Upper Godavari fifteen blocks of about 68 square miles of unreserves in the Bhadrachalam and Nugur taluks were selected for reservation and the preliminary demarcation of these blocks was progressing.

8. *Forest Settlement.*—The settlement of 11 square miles notified in Rampa during 1928-29 was pending at the close of the quinquennium. The settlement of 11 square miles pending at the end of the previous quinquennium was completed.

9. *Demarcation.*—The total length of boundary demarcated at the end of the quinquennium was 4,947 miles against 7,010 miles at the commencement. The decrease is principally due to the exclusion of the boundaries of Ryots' forests handed over to panchayats.

10. *Forest Surveys.*—The work done by the Survey of India during the quinquennium was—

1924-25.—Traversing the boundary between the Bastar State and the Nugur taluk in Upper Godavari to settle the boundary dispute. The disputed portion still remains to be settled. Survey of Bellamkonda and Venkatayapalem reserves in Guntur.

1925-26.—Survey of five reserved forests in Polavaram and Ellore Ranges in Lower Godavari.

1926-27.—Nil.

1927-28.—Special survey on 2 inches to 1 mile scale of Kondapalli Reserved Forest and its extensions in Guntur division.

1928-29.—Special survey on 2 inches to a mile scale of 6 reserves in Lower Godavari division and 13 blocks proposed for reservation in Rampa, covering an area of 116 square miles including overlaps. The work is continuing.

The Madras Survey Party traversed the external boundaries of mangrove reserves in Guntur and some of the reserves in Lower Godavari.

11. *Working Plans.*—No new Working Plans were sanctioned during the quinquennium except a revised Working Plan for Upputuru Block II in Lower Godavari. The area under Working Plans at the commencement of the quinquennium was 1,456 square miles while the area at the end of the quinquennium was 1,320 square miles. The decrease represents the areas of Reserved Forests under Working Plans which were handed over to panchayats and certain areas in Guntur division for which revised plans have been

taken up, the original plans having become obsolete. The revision of the Ghumsur Working Plan in Ganjam has been taken up by the Working Plans Conservator.

12. *Communications and Buildings.*—The average annual expenditure on new works during the quinquennium was Rs. 17,395. There were no works of any magnitude requiring special mention.

13. *Forest Offences.*—The average annual number of offences during the quinquennium under review was 5,515 against 5,372 in the previous quinquennium. The increase was about 3 per cent but it would have been greater had not the Ryots' forests been transferred to the panchayats in the latter part of the quinquennium.

14. *Fire Protection.*—The area attempted to be protected, the area burnt and the area actually protected during the quinquennium under review as compared with the previous quinquennium are given below:—

	Area attempted to be protected.	Area burnt.	Area actually protected.
	SQ. MLS.	SQ. MLS.	SQ. MLS.
Quinquennium ending 1928-29	1,504	177	1,327
Quinquennium ending 1923-24	2,144	173	1,971

The percentage of failure increased from 8 to 12 due to unfavourable fire seasons and to more complete and accurate reporting of forest fires. The decrease in the area attempted to be protected is due to the transfer of the Ryots' forests to panchayats.

15. *Protection from cattle.*—Goats were entirely excluded from reserved forests. The average area open to all animals except goats was 2,538 square miles against 2,591 square miles in the previous quinquennium. The decrease is due to the transfer of reserves to panchayats and to the closure of worked coupes to grazing.

16. *Yield and Outturn.*—The average annual outturn of major and minor produce is noted below:—

	Timber and fuel in thousands of	Bamboos.	Minor forest produce including grass and grazing.
	C. FT.	RS.	RS.
Quinquennium ending 1928-29	7,489	1,31,195	3,16,738
Quinquennium ending 1923-24	6,818	...	...

The increase in timber and fuel is due to fellings for Russellkonda Saw-mills throughout the quinquennium, to the extraction of Sal timber in Vizagapatam and to the expanded working of fuel coupes in the Sriharikota Range of Nellore.

It has not been possible to compare the outturn under bamboos and minor produce with the previous quinquennium as figures for Guntur and Nellore districts separately for these years are not available.

17. *Financial results.*—The average annual financial results for the two periods were as follows:—

	Revenue. RS.	Expenditure. RS.	Difference. RS.
Quinquennium ending 1928-29	10,23,148	7,16,336	3,06,812 surplus.
Quinquennium ending 1923-24	8,70,907	7,79,337	91,570 surplus.

The greater surplus during the quinquennium under review is accounted for by better prices realized for forest produce generally and to an adjustment in 1928-29 of about Rs. 1,87,000 in Ganjam under 'Recoveries of Investments from Government Commercial undertakings' and 'Profits from Government Commercial undertakings' relating to Russellkonda Saw-mill. The less expenditure is due to there having been no work involving large capital outlay as there was in the previous quinquennium in Ganjam.

18. *Forest Education—Madras Forest College.*—The one forester who was undergoing training at the end of the last quinquennium returned with a Higher Standard certificate, 10 foresters were deputed during the quinquennium under review, of whom 6 returned with Higher Standard certificates and 4 were at the College when the quinquennium closed.

19. *Vernacular Training School.*—A session of the Vernacular Training School was held regularly in Ganjam during the first four years of the quinquennium taking in all 139 foresters and forest guards. Of these two were removed, one owing to ill-health and the other for breach of discipline. Of the number trained, 16 belonged to Bihar and Orissa, 9 to the Orissa Feudatory States and 2 to the Court of Wards, Madras. The results of training were satisfactory. No school was considered necessary in 1929, for lack of men to be trained.

20. *Subsidiary Vernacular Training School.*—This was opened in Upper Godavari, the course being for three months for training foresters and forest guards of that division, especially in the operations peculiar to the division. The first session was held from 1st June 1928 to 31st August 1928 in which 12 students were satisfactorily trained.

WALTAIR,
3rd September 1929.

J. H. LONGRIGG,
Acting Conservator of Forests, 1 Circle.

ANNUAL ADMINISTRATION REPORT OF THE FOREST DEPARTMENT

FOR THE
YEAR ENDING 31st MARCH 1929

SECOND CIRCLE

CHAPTER I.—CONSTITUTION OF STATE FORESTS.

1. ALTERATION IN AREA.

1. *Reserved forests*.—The total area of the reserved forests at the beginning of the year was 5,844 square miles and at the end of the year, 5,838 square miles, the difference being due to—

(1) the transfer of 1,171 acres of part of the Kothur reserve from *North Cuddapah* to Nellore (1st Circle) on grounds of administrative convenience,

(2) the disreservation of 24 acres in the *South Kurnool* for a Local fund road,

(3) the decrease of 1,342 acres in the Kaligara reserve (ryots' forest) of the *Anantapur* district owing to an error in the area previously adopted, and

(4) the disreservation of 707 acres in *Anantapur* and 354 acres in *Kurnool West*, for assignment to depressed classes for cultivation.

2. *Reserved lands*.—Nil.

2. FOREST SETTLEMENT.

3. Nil.

3. DEMARCATION.

4. No new demarcation was undertaken during the year.

Rupees 272 in *Kurnool East* and Rs. 292 in *Kurnool South* were spent on re-clearing boundary lines to a length of 38 and 62 miles respectively. In *Kurnool West* Rs. 278 were spent on the maintenance of boundaries of which Rs. 228 related to the re-clearing of the common boundary between *Kurnool West* and *Kurnool East*

from the Kistna river to Rollapenta. The frontier boundary ($7\frac{1}{2}$ miles) between the Banganapalli State and the British territory was also maintained at a cost of Rs. 18.

North Cuddapah spent Rs. 75 for re-clearing the district boundary between Cuddapah and Kurnool districts in the Nallamalais of Porumamilla Range.

Three thousand two hundred and twenty-four miles of boundary lines elsewhere in all the divisions were maintained by the beat subordinates free of cost.

4. FOREST SURVEYS.

5. There was no survey either by the Survey of India or by the Madras Survey Party during the year.

Surveys of coupes, rectification of boundaries, preparation of coupe maps, etc., were done by the local forest subordinates.

The record copies of all maps were kept posted up to date.

CHAPTER II.—MANAGEMENT OF STATE FORESTS.

1. REGULATION OF MANAGEMENT.

Preparation and control of working plans.

(a) Preparation.

6. The total area under working plans and schemes at the beginning of the year was 1,069 square miles, to which was added an area of 1,507 square miles on account of the completion during the year of a single working plan for all the reserves comprised in each of the divisions of *Cuddapah North* and *Kurnool East*, the aggregate area under working plans and schemes at the close of the year being thus 2,576 square miles against 4,380 square miles of reserves under departmental control in the whole Circle.

7. The working plan for all the reserves in each of the *Anantapur* and *Cuddapah South* divisions reported, in the last annual report, as under preparation, was nearing completion at the close of the year. The Nallamalais of the *Kurnool West* division were inspected by the Conservator, III (Working Plans) Circle, during the year and, as a result thereof, an Extra Assistant Conservator was posted for the preparation of a working plan for these areas, and the field-work connected therewith was nearing completion at the close of the year. For the remaining area of reserves in the same division, comprised in the Yerramalais, the draft working plan prepared in the previous year was found faulty in many respects and the preparation of a more satisfactory plan, which involved some additional field-work, was undertaken at the close of the year under report.

In respect of the areas not covered yet by a duly sanctioned working plan in the *Kurnool South* division to which reference was made in the last annual report, the District Forest Officer was able to submit, only after the close of the year under report, a preliminary 'Working Plan reconnaissance report' on which orders have been passed for the preparation of a working plan on the lines indicated by the Conservator.

In all the divisions, however, the forests were worked during the year on the bases of working plans either already sanctioned or under preparation.

(b) Control.

8. The prescriptions of the working plans were generally adhered to and the annual control returns were duly submitted to, and reviewed by, both the territorial and working plan conservators.

For deviations, if any, from the authorized prescriptions, proper sanction has, as a rule, been obtained.

2. COMMUNICATIONS AND BUILDINGS.

9. No new works costing over Rs. 5,000 were sanctioned during the year.

(a) Roads and bridges.

10. *New works.*—The only new work of the year was the construction of a road, $3\frac{1}{2}$ furlongs, connecting the forest buildings at Ganjuvaripalle (*Kurnool East*) with the adjoining village road. The cost of construction including acquisition (Rs. 72) was Rs. 137. In *Kurnool West*, a sum of Rs. 416 was spent on blasting, in connexion with the widening and improvement of the Mantralakanama ghat road.

The total expenditure on new works during the year was Rs. 553 against Rs. 1,207 in the previous year.

11. *Maintenance.*—The aggregate length of all roads, cart-tracks and bridlepaths in the Circle, during the year, was 949 miles with a capital cost of Rs. 2,11,667, of which 234 miles were repaired during the year at a cost of Rs. 7,923 against 310 miles at a cost of Rs. 18,073 in the previous year.

The fall in expenditure was due generally to closer scrutiny of estimates and to confining the repairs to where they were really necessary.

12. The statement below shows the length of roads in each division, the length repaired during the year and the expenditure thereon:—

Division.	Length of roads in the division.			Length repaired.	Cost.	
	MILES.			MILES.	RS.	
Anantapur	...	...	...	55	21	1,050
Kurnool East	...	...	...	317	62	2,036
Kurnool South	...	...	...	122	67	1,547
Kurnool West	...	...	...	130	22	1,086
Cuddapah North	...	...	...	128	25	697
Cuddapah South	...	...	...	197	36	1,498

The fairly satisfactory state of repairs of all roads in the divisions has been certified to by the District Forest Officers after the close of the year.

(b) *Buildings.*

13. The expenditure during the year was Rs. 15,581 against Rs. 24,973 in the previous year.

Of this amount, Rs. 3,618 were spent on new works and Rs. 8,266 on repairs and maintenance against Rs. 9,536 and Rs. 15,437 respectively in the previous year. The establishment charges were Rs. 3,707 against Rs. 3,969 in the previous year.

14. The important items of new works were—

	RS.
<i>Kurnool East.</i>	
1. Construction of a stable and kitchen, with roofing of galvanizol iron, for the rest-house at Rollapenta	559
<i>Kurnool West.</i>	
2. Construction of a latrine for the Range Officer's quarters—Sivapuram Range	116
3. Construction of an inspection shed at Abbarajakunta	160
4. Conversion of the old Range office buildings at Racherla into subordinates' quarters	99
<i>Kurnool South.</i>	
5. Construction of two-roomed stables for Giddalore and Chelama range quarters	210
6. Provision of chicks, etc., to the District Forest Officer's official residence	426
<i>Cuddapah North.</i>	
7. Tiling Kothabhavi forest rest-house	350
8. Part construction of subordinates' quarters at Balayapalle	350

Cuddapah South.

	RS.
9. Acquisition of site for range quarters at Rajampet.	690
10. Completion of the rest-house with out-houses at Ankimadugu	344

15. There were 416 buildings valued at Rs. 4,25,027 on the books at the end of the year and their cost of maintenance (Rs. 8,266) was slightly under 2 per cent of the capital cost. That all the buildings have been kept in a fairly satisfactory state of repairs during the year has been certified to by the District Forest Officers.

(c) *Miscellaneous.*

16. Rupees 1,631 and Rs. 589 were spent on new works and repairs against Rs. 2,071 and Rs. 1,285 respectively in the previous year.

17. The chief items of works are—

	RS.
<i>Kurnool East.</i>	
1. Trial boring for a well at Thummalabailu (part construction)	51
<i>Kurnool South.</i>	
2. Draw well (part construction since abandoned) at Basavapuram	53
3. Trial boring for a well at Sandrapodu	12
4. Construction of a loading platform and railway siding at Diguvametta	700
<i>Kurnool West.</i>	
5. Well in the Range office compound at Sivapuram	285
<i>Cuddapah North.</i>	
6. Tube well at Chinnalettippattibhavi (part construction)	257
<i>Cuddapah South.</i>	
7. Well in the compound of the proposed range quarters at Rajampet	219

18. There were 75 wells, etc., of a capital cost of Rs. 21,299 at the close of the year.

3. PROTECTION OF FORESTS.

(a) General Protection.

19. The annual report of last year included forest offences relating to reserves under panchayats also, but they have been excluded from the present report under the orders of the Chief Conservator.

20. The total number of offences reported during the year (in regard to reserves under departmental control and unreserves) was 3,684 against 4,452 in the previous year. There was no appreciable variation in the number of cases relating to unreserves and the decrease, which pertained to reserves, is contributed by all the divisions in the circle except *Cuddapah South*. The subjoined statement shows the offences reported during the year and in the previous year:—

Cases.	Injury to forests by fire.		Unauthorized felling.		Unauthorized grazing.		Other offences.		Total.	
	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.
A. Cases taken into Court.	5	1	562	397	173	153	49	35	789	566
B. Cases compounded.	5	3	2,321	2,012	749	573	221	269	3,296	2,797
C. Cases undetected ..	190	260	165	114	9	5	3	2	357	321
Total ..	200	264	3,048	2,523	931	711	273	216	4,452	3,684

21. The marked fall under unauthorized felling and grazing has not been explained by the District Forest Officers, but it seems possible that the fall in the former case is due to the opening of a large number of small timber and fuel coupes in the neighbourhood of villages during the year, generally in all the divisions. As regards unauthorized grazing the decrease is in *Anantapur* and *Kurnool East* and *West* divisions, while *South Cuddapah* claims an increase. The fact that *Kurnool East* and *Kurnool West* are the only divisions which show a fall in the grazing revenue collections during the year, in spite of a large decrease in the number of offences under unauthorized grazing recorded by them during the year, is perhaps suggestive of the possible inadequate supervision exercised by the protective staff of these divisions, over cattle grazing in reserves.

22. Except the District Forest Officers, *Anantapur* and *Cuddapah South*, who have inquired into a few forest offences, none of the others have made any test investigation. The percentage of offences investigated by officers has not been reported in all cases. Of those reported, *Anantapur* claims 10 per cent, *Cuddapah North* 20 per cent and *Cuddapah South* 12 per cent.

23. Of the 709 cases taken to court and disposed of by the magistrates, 453 cases ended in conviction and 256 in acquittal. Of these latter, 210 cases were acquitted on payment of compounding fees, 7 were withdrawn by District Forest Officers and 39 ended in acquittal after trial which is 6 per cent of the number of cases tried.

24. The total number of cases compounded was 2,776 and the compounding fees were Rs. 42,815 or an average of Rs. 15-1-11 per case, against Rs. 13-14-9 per case in the previous year. The increase in composition fees is specially marked in *South Kurnool* and the District Forest Officer attributes it to the imposition of deterrent punishments in a few cases that required them.

25. Rewards amounting to Rs. 178 were granted during the year to subordinates and to a village magistrate for the detection of forest offences against Rs. 645 in the previous year.

(b) Protection from fire.

26. With the exception of the fuel coupes (about six square miles) in the Yerramalais of *Kurnool West* which were protected by a system of fire-lines, all other reserves in each division were grouped under two main classes:—

(1) those to be brought under the system of early-burning, and

(2) those to be dealt with under general protection.

In each of these two classes of areas, the already existing fire-lines were fire-traced and maintained.

27. Early burning, as a measure of protection, against devastating late fires, was restricted during the year to 689 square miles against 2,422 square miles in the previous year. This reduction was mainly due to the fact that work could not be done satisfactorily over very large areas in the all-too-brief time available for the operation, and the operation was therefore confined to real danger zones including all worked timber and fuel coupes where the young crop was being smothered by grass and therefore in constant danger of being killed outright by late fires. The work was done under responsible supervision and on the whole it was carried out satisfactorily, the extent of late incendiary fires in the early-burnt portions being, however, about 18 square miles or under 3 per cent of the area dealt with. The average cost of the operation was Rs. 4-2-0 per square mile against Rs. 2-13-9 in the previous year.

28. For the special protection of about six square miles, comprised in the Yerramalais (*Kurnool West*) by a system of fire-lines, the cost was Rs. 35 or Rs. 5-15-0 per square mile, but about 12 per cent of this area was burnt by incendiary fires.

29. In the rest of the areas (3,691 square miles) all the old fire-lines were maintained. There was no expenditure in three of the divisions while in the other three, there was an expenditure of Rs. 1,186. The extent burnt in the areas falling under this class was 134 square miles or under 4 per cent.

(c) *Protection against cattle.*

30. The following table shows the areas opened and closed to grazing during the year under report and in the previous year:—

	1927-28.	1928-29.
	SQ. MILES.	SQ. MILES.
Closed to all animals—		
Whole year	283	245
Part of year	18	22
Open to all animals—		
Whole year	5,543	4,119
Part of year	...	22

31. In regard to areas closed to grazing there is a decrease in the *Anantapur* and *Cuddapah South* divisions due, in the former, to the opening of two reserves in the Bukkapatnam range to grazing, and in the latter, to the opening of some of the felled timber and fuel coupes, as in both cases closure was no longer needed.

The large decrease of 1,434 square miles in the areas opened to grazing is due to the exclusion of panchayat forests from the return, in accordance with Chief Conservator's orders.

32. The number of licensed cattle fell from 356,776 cow-units in the previous year to 332,962 during the year.

The decrease was contributed chiefly by *North and South Cuddapahs* and is explained to be due to the enhancement of grazing fees during the year. There was also some decrease in *Kurnool East and South*.

33. The number of cattle impounded was 23,694 against 30,987 in the previous year. There is a decrease in all the divisions except *Kurnool South* and *Cuddapah South* and it is due to the transfer to panchayats during the year of some of the reserves which still remained under departmental control during last year in the *Anantapur* and *Cuddapah North* divisions. The increase in *Kurnool South* and *Cuddapah South* has been reflected in the increased collection of grazing fees.

34. The following statement compares the revenue and incidence during the year under report with those of the previous year:—

District.	Grazing revenue.			Incidence-acres per cow unit.	
	1927-28.	1928-29.	Difference.	1927-28.	1928-29.
	RS.	RS.	RS.	ACS.	ACS.
Anantapur	29,782	32,655	2,883	4.05	3.20
Kurnool East	32,297	31,513	684	10.55	12.75
Do. South	16,040	16,855	815	12.73	8.61
Do. West	37,458	33,682	576	7.90	8.40
Cuddapah North ..	27,883	30,712	2,829	5.90	7.5
Do. South	14,593	19,034	4,441	7.95	10
Total	* 1,67,963	1,67,701	9,738	..	..

* Fodder grass excluded.

The net increase in revenue during the year is mainly due to the enhancement of grazing fees in *Cuddapah North* and *South* and to better collections in Bukkapatnam and Madanapalle ranges (*Anantapur division*).

(d) *Protection against injuries from natural causes.*

35. There were no operations under this head except the uprootal of Lantana in Horsleykonda reserve at a cost of Rs. 353.

CHAPTER III.—SILVICULTURE.

SECTION I.—AFFORESTATION AND REGENERATION OF FORESTS.

(i) *General progress of areas under regeneration.*

36. The year was generally a bad one for seeds, except for *Anogeissus latifolia*, the regeneration of which is reported to have been fairly good in all the divisions. The annual dying back of old established seedlings of the more important timber species, such as red sanders in the two *Cuddapahs* and *Dalbergia latifolia*, *Hardwickia binata*, teak and *Terminalia tomentosa* elsewhere has, as usual, been common, due very largely to want of seasonal rains and fires. The early burning of the grass amidst which the seedlings struggle for existence has not been altogether an unmixed blessing as the seedlings die back all the same after the early burning and they could not put up a vigorous growth at the next growing season unless cut back immediately after the early-burning. But the cutting back operation over extensive areas would not be a practical proposition. Speaking generally, it may be stated that the progress of natural regeneration of the important timber species in localities where the grazing incidence is very low or altogether absent has

been fairly satisfactory except in the *two Cuddapahs* and in *Anantapur* due in both cases to late fires. The same is the case in the protected (stone-walled) *Hardwickia binata* areas in the Yerramalais of *Kurnool West*. On the other hand, in the overgrazed areas of all the divisions and particularly in *Anantapur* and *Kurnool East*, the absence of natural regeneration is very marked. But the progress of regeneration from coppice has been satisfactory in all the divisions, except in parts of *Anantapur* where the rate of growth, in addition to being usually slow, has been retarded by frequent annual fires in coupes closed to grazing.

The established sandalwood in all the divisions has been making fairly satisfactory progress, though some damage has been caused by fires in certain localities in *Anantapur* and *Cuddapah South*. The result of the sandal sowings of the year under report has not unfortunately been satisfactory in all the divisions except in parts of *Anantapur* included in the Madanapalle range.

(ii) *Establishment of reproduction under working plans or schemes.*

(a) *Mainly natural.*

37. In all areas worked under simple coppice or coppice with standards, the regeneration from coppice continued to be satisfactory in all the divisions. In some of the first-felled areas dealt with under the system of clear-felling with natural regeneration in the Sirvel Nallamalais of *Kurnool South*, such natural regeneration as existed on the area before the felling could not outgrow the rank and tall growth of grass that covered the ground after the felling. Nor could any, but teak, coppice shoots from the felled stumps, put on a vigorous growth amidst the sea of grass that has taken possession of the ground after the felling. In the latter coupes where young poles of the valuable species have been retained to form part of the new crop after the clear-fellings, the ground is comparatively better covered with regeneration, though even here the young seedlings are often unable to make headway through the rank growth of grass.

In the *two Cuddapahs*, where the red sanders forests are worked under improvement fellings, the regeneration from coppice is very satisfactory but that from seeds is wholly inadequate owing largely to continued drought and fires. Moreover many of the small poles of red sanders left as standards are not good seeders. In the Nallamalais of *Kurnool South* and *Kurnool West*, the natural regeneration from seed of *Pterocarpus Marsupium* and teak, in the coppice with standards coupes, is particularly good, but they are hampered by grass.

(b) *Mainly artificial.*

38. No systematic efforts were made in the past at restocking blanks in any of the felled areas, in any of the divisions, either in the fuel or timber working circles. Towards the close of the year under report, however, a beginning was made to dump all the refuse resulting from the fellings, both in the timber and fuel coupes, in heaps or in lines, burn the rubbish and sow seeds of valuable species, indigenous to the locality, on the resulting ash. The result of these operations will be recorded in future reports.

In *Kurnool West*, stump planting of teak at a cost of Rs. 13 was carried out over about 10 acres of blanks in coupe VIII on the Gundlabrahmeswaram plateau, but the result was a failure owing, it is believed, to the lateness of the season when the planting out was done and to the absence of adequate rain after planting.

(c) *Afforestation.*

Nil.

(iii) *Plantation and other forms of regeneration not under working plans or schemes.*

39. A list of established plantations and of localities where cultural operations were carried out in the past is given in Form 34-B.

The teak plantations in *Kurnool East* and *Kurnool West* and the red sanders plantation at Kodur (*Cuddapah South*) are thriving. The mixed plantation of casuarina, *Sissoo*, *Pongamia glabra*, etc., of which all casuarina have been cut out in the past years, in Moka (*Anantapur division*), is also getting on fairly satisfactorily, though *Dalbergia Sissoo* in it is fast dying out. The larvae of certain longicorn beetles suspected to be the cause of the death of *Dalbergia Sissoo* were identified at Dehra Dun and it was held that they could not be responsible for the death of the tree as they were not known to attack healthy trees. It is possible that climbers are the cause and for this reason systematic climber cutting is being prescribed in the working plan now under preparation. The plantations of yepi and margosa at Kupgal and Banavasi (*Anantapur division*) are practical failures as the trees could not put on any growth, except in parts of Kupgal where yepi is growing fairly satisfactorily and might be ripe for felling after about 10 or 15 years. The establishment of sandal in the past in suitable localities of which a list is given in Form 34-B has been attended with a fair amount of success, notably in the Madanapalle range (*Anantapur division*), and the established plants are thriving and the species is now spreading naturally though slowly. During the year,

systematic efforts were made to localize areas suitable for sandal in every forest guard's beat in all the divisions of the circle and to make it obligatory on all forest guards to establish each year at least 100 sandal plants over one acre as a labour of love. A large amount of work was accordingly done during the year but the result of the operations has not been recorded by most of the District Forest Officers in their annual reports.

Anantapur reports that out of 55 new propagation centres opened during the year for the establishment of sandal, as many as 10 failed owing to prolonged hot weather. In each of the remaining centres, an average of 50 established seedlings were obtained, those in Madanapalle range being far the best where, in some of the plots, as many as 200 established seedlings were obtained per acre. In addition to the establishment of these propagation centres through the unaided efforts of the beat staff, sandal seeds were dibbled in 2,200 patches in the lantana-cleared area in the Horsleykonda reserve at a cost of Rs. 9 but, due to late rains, the result was not satisfactory. A further attempt at putting out 950 transplants of sandal, raised in pots at a cost of Rs. 5, to replace some of the failures in the lantana-cleared area, resulted only in a 50 per cent success.

Cuddapah South reports that sandal seeds were dibbled in specially selected localities during the year in all the ranges and that a fair amount of success was obtained. The old established sandal elsewhere in the division are reported to be thriving.

Cuddapah North.—Forty-three one-acre propagation centres were opened for sandal, but the result of the dibbling was disappointing owing alike to the prolonged hot weather and to the lateness of the sowing. The sandalwood trees already established as a result of past efforts at Vaneswaram, Rollabodu, Kothabavi, Dasaraladoddi Kondagerlapenta, Kamativanibhavi and Kadikona-bhavi are thriving.

(iv) Tending.

40. *Anantapur*.—A sum of Rs. 157 was spent for cutting noxious growth in improvement-felled coupes of Ganganapalle and Vempalle ranges to encourage the growth of the valuable species, and Rs. 50 for tending sandalwood in the Horsleykonda reserve.

Kurnool East.—In the old emergency coupes of Dornal and Turimella ranges, seedlings of the valuable species were tended over an area of 120 acres at a cost of Rs. 44.

Kurnool West.—The teak plantation of 1905-06 was thinned during the year at a cost of Rs. 40 and the produce of the thinnings was sold for Rs. 682.

Cuddapah South and Cuddapah North.—The young red sanders top of the 1927-28 improvement coupes aggregating 1,419 acres was tended at a cost of Rs. 189 in *Cuddapah South*, while *Cuddapah North* spent Rs. 209 on the same work.

(v) General.

41. The teak at Kongamadugu, the mahogany at Kodur, Mogilipenta and Kongamamadugu, and the eucalyptus at Mogilipenta planted several years ago as an experiment and on a very small scale, are now thriving.

CHAPTER IV.—EXPLOITATION.

(a) SYSTEM OF MANAGEMENT.

(i) Major Forest Produce.

42. The total area under working plans or schemes was 2,576 square miles and the various silvicultural schemes in force were as detailed below :—

Silvicultural system.	Area in square miles.			Percentage to the total area under working plans and schemes.
	Under working plans.	Under working schemes.	Total.	
	SQ. MILES.	SQ. MILES.	SQ. MILES.	
Clear-felling with natural regeneration ..	39	..	39	1.5
Simple coppice	112	..	112	5.6
Coppice with standards	313	30	343	13.3
Improvement fellings	135	11	146	5.7
Selection fellings	413	33	446	17.7
Selection cum improvement	4	..	4	0.2
Improvement cum clear-felling	9	..	9	0.4
Miscellaneous (areas worked for grazing, minor forest produce, etc.) ..	1,375	72	1,447	56.1
Total ..	2,430	146	2,576	100.0

Steady progress is being made to bring the remaining areas of reserves under definite working plans.

43. The areas worked during the year under the different silvicultural systems are detailed below :—

Timber.—*Clear-felling with natural regeneration* under the high forest system was confined to 392 acres of the Sirvel Nallamalais in *Kurnool South*, while a system of *improvement felling* to be followed, at the end of five years, by clear-felling, after establishing, in the meanwhile, an adequate amount of regeneration both by natural and artificial means, was carried out over 221 acres in *Kurnool East*. The red sanders forests in the Ganganapalle and

Vempalli ranges of the *Anantapur* division, were, as usual, worked under *improvement fellings*, an extent of 1,091 acres in *Cuddapah North*, 2,887 acres in *Cuddapah South* and 374 acres in *Anantapur* having been dealt with in that way during the year.

The method of *selection fellings* was adopted for the *Hardwickia binata* areas in *Kurnool East*, restricting the removal to dead and dying trees over an area of about 4,000 acres. A similar system, confining the removal to mature and dead and dying timber trees in the bamboo areas of *Kurnool East* and *Kurnool South* was followed, the area gone over in the former being 106 acres and in the latter 734 acres. In *Kurnool West* an area of 102 acres was worked under *coppice with standards*. The timber working circle in the Chelama range of *Kurnool South* was worked under the same system (*coppice with standards*), an aggregate extent of 1,141 acres having been dealt with in the year for supply of fuel and timber.

In addition to the above, about 100 acres of mixed timber forest, of which teak was predominant, were thinned in *Kurnool South* which provided some small timber to meet local requirements.

To meet the demand of the slate industry at Markapur, 740 acres in *Kurnool East* and 731 acres in *Kurnool South* were worked for the supply of soft-wood under the selection system based on girth limit for selected species, mostly *Givotia rottleriformis*.

Fuel.—Under *simple coppice*, an area of 181 acres in *Kurnool East*, 86 acres in *Kurnool South* and 553 acres in *Cuddapah North* was worked over, while under *coppice with standards*, the area dealt with was 310 acres in *Kurnool West*, 185 acres in *Cuddapah North*, and 757 acres in *Cuddapah South*.

44. *Fellings not under Working plan*.—In addition to the above, coupes were located in reserves, not yet under working plan, for the supply of fuel, and small timber to the villagers bordering on reserves, in the *Anantapur*, *Kurnool South*, *Kurnool West* and *Cuddapah South* divisions, with a view chiefly to test the market before a definite working plan could be framed for these areas. Thus, 41 acres under *improvement fellings* for small timber, and 624 acres under *simple coppice* for fuel in *Anantapur* were worked. One hundred and ten acres under *selection fellings* at Isukagundam, 418 acres under *coppice with standards* and 177 acres under *simple coppice* were exploited for timber and fuel in *Kurnool South*. In *Kurnool West*, an area of about 450 acres in the Terai forests of the Nallamalais was worked for timber and fuel under the method of *coppice with standards*, while in *Cuddapah South* the area worked for timber under *coppice with standards* was 184 acres, and for fuel under *simple coppice* was 538 acres.

In addition to the above, the collection of the timber of *Canthium didymum* for the manufacture of hair combs was, for the first time, leased during the year for Rs. 4,000 in *Cuddapah South*.

The collection of timber from windfalls (result of the cyclone of November 1927) from all the accessible areas of reserves in the two *Cuddapahs* and in *Kurnool South* has also helped to increase the output of timber during the year.

45. The total output of timber was 414,000 cubic feet and of fuel 4,400,000 cubic feet from both the working plan and non-working plan areas of reserves in the Circle.

(ii) *Minor Forest Produce (including bamboos)*.

46. Bamboo coupes were, as in the previous year, leased out to contractors, in all the divisions. The collection of minor forest produce was also effected through lessees during the year in all the divisions with satisfactory results. There was practically no demand for nux vomica. It could be sold in only three ranges in *Cuddapah South* and in one range in *Anantapur* for comparatively low amounts. Tangedu bark, an important item of minor forest produce, in the reserves and unreserves of *Anantapur* was leased out for a period of two years. Similar two-year leases were sanctioned in *Kurnool East* and *Kurnool South*. Rela bark which was not sold in the previous year in *Kurnool South* was sold during the year. The long-term leases of slab quarries in *Kurnool West* continued. The right to collect 'Narmamidi' bark (*Litsea polyantha*) from the reserves of Balapalle and Chitvel ranges (*Cuddapah South*) was for the first time, leased out during the year.

Grass.—Free removal of fodder and thatch grass in head loads in all the divisions and in cart loads also in the *Cuddapah* district from reserves was continued. The proposal to prohibit free removal in cart loads from the reserves of the *Cuddapah* district was not sanctioned by the Government. A nominal fee of annas five per cart load was levied for removal in cart loads in *Anantapur* and the three *Kurnool* divisions.

Manure leaves.—One hundred and ninety-two cart loads in *North Cuddapah* and 572 cart loads in *South Cuddapah* were removed during the year at Re. 1 per cart load. Removal was allowed in the other divisions of the Circle at Rs. 2 per cart load but the demand was not appreciable.

Grazing.—This was as usual controlled by permits, a single permit being tenable for a whole range. In *Cuddapah*, the enhanced rate of annas six per cow-unit was given effect to during the year. Orders of Government have not been received on the unification of grazing fees referred to in the last report.

(b) AGENCY OF EXPLOITATION.

(i) Departmental Agency.

(1) Major Produce.

47. Departmental operations were confined practically to timber and a few fuel coupes in *Kurnool* where, however, the contract system was introduced with success after the close of the year. About half a ton of sandalwood was extracted from the Kodur Red Sanders plantation through departmental agency. Compared with the previous year, the outturn of timber during the year shows a decrease of 16,000 c.ft. and of fuel an increase of 151,000 c.ft. The decrease in the output of timber extracted through departmental agency is due in *Kurnool South* to the actual yield having fallen considerably short of the anticipated quantities in the coupes of the year, and in *Kurnool West* to the stoppage of timber fellings in the Gundlabrahmeswaram plateau, pending the preparation of a working plan. In *Kurnool East* the system of modified improvement felling to be followed at the end of five years by clear-felling, accounted for the poor outturn of timber during the year.

There was an increase, however, in the outturn of timber (29,000 c.ft.) in *Cuddapah North* due to the collection and sale of wind-fallen timber.

The increase in the outturn of fuel has been contributed chiefly by *Kurnool West*, though much of the year's outturn remained undisposed of in the coupes at the close of the year owing to transport difficulties.

(2) Minor Forest Produce.

Beyond the collection of some quantity of bamboos and thatch-grass for departmental works, and of seeds of timber species for sowing in regeneration areas, no other collection of minor forest produce was made departmentally, as the right to collect minor forest produce in all the divisions was leased to contractors.

(ii) By Purchasers.

48. All the timber and fuel coupes in the two *Cuddapahs* and *Anantapur*, and most of the timber and all the fuel coupes in *Kurnool South*, all the fuel coupes in *Kurnool East* and most of the timber cum fuel coupes in *Kurnool West* were leased out to contractors.

All the bamboo coupes and the right to collect minor forest produce in all the divisions were also similarly leased out.

(iii) Free Grantees.

49. Free grants were made in all divisions both from reserves and unreserves chiefly to rebuild houses destroyed by accidental fire.

The following statement shows the quantity and value of free grants made during the year:—

Timber.		Fuel.		Bamboos.		Grass and grazing	Other minor forest produce.	Total.
In thousands of cubic feet.	Value.	In thousands of cubic feet.	Value.	Number	Value.	Value.	Value.	Value.
28	RS. 6,802	2	RS. 45	8,014	RS. 185	RS. 71	RS. 121	RS. 7,224

* Includes cost of metal, gravel, etc., removed by local boards and for minor irrigation works.

There is a decrease under timber, as compared with last year, and this was chiefly in *Cuddapah* where large grants were made on account of damages by cyclone in the previous year.

(iv) Rights and Privileges.

50. The Chenchus in the three *Kurnools* continued to avail themselves of the concessions granted to them at the Forest Settlement, viz., free removal of timber for their huts; of minor forest produce for their own *bona fide* purposes and of free grazing in respect of their own cattle including goats. The number of cattle that actually grazed is more than that admitted at settlement, and this and other allied matters were under investigation at the close of the year. The settlers at Chelama, Diguvametta and Isukagundam continued to enjoy the privilege of free grazing in respect of their cattle under the terms of the licences issued to them for settling in Forest reserves. The grazing concessions detailed in the 1927-28 annual report in the *North* and *South Cuddapah* divisions continued to be in force during the year.

(c) SUMMARY OF OUTTURN AND SOURCES OF DIFFERENT KINDS OF FOREST PRODUCE.

51.—

Agency of exploitation.	Timber in thousands of cubic feet.		Fuel in thousands of cubic feet.		Bamboos—value.		Minor forest produce and grazing—value.	
	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.
					RS.	RS.	RS.	RS.
Government ..	104	88	204	355	2,143	880	2,047	613
Private agency ..	570	655	6,426	4,759	61,541	65,759	4,72,843	5,61,342
Free grantees ..	47	28	..	2	247	185	197	192
Rights and privilege holders.	..	..	1	..	1	75	3,632	2,697
Total ..	721	771	5,631	5,096	61,237	66,908	4,78,726	5,65,844

52. *Departmental Agency—Timber.*—The decrease was generally in all the three Kurnool divisions and particularly in *Kurnool West* where the contract system replaced the departmental extraction hitherto in force.

Fuel.—The increase is mainly in *Kurnool West* owing to the bringing in of additional areas under felling during the year to meet the steadily increasing demand for fuel.

Bamboos.—The decrease was chiefly in *Kurnool East* due to the leasing out of certain bamboo coupes which till the previous year were worked departmentally.

Minor forest produce.—The decrease is due to the replacement of departmental working by contractors.

53. *Private Agency—Timber.*—There was an increase, as compared with the previous year, of 61,000 c.ft. in the outturn of timber from reserves and 21,000 c.ft. from unreserves. The increase in reserves was contributed by the *three Kurnools* and also by *Cuddapah South* where comparatively large areas were leased out during the year, on the basis of the working plan now under preparation.

Fuel.—There was a decrease of 333,000 c.ft. relating to reserves and 254,000 c.ft. to unreserves. The decrease in the latter case was due to the abnormal increase of fuel from unreserves in 1927-28 owing to the cyclone which had uprooted hundreds of trees in unreserves in the *Cuddapah* and *Kurnool* districts. The big drop in the outturn of fuel from reserves worked through lessees has been contributed by *Kurnool South* where, on account of the prohibitive cost of transport, the lessees of several of the timber coupes of the year are reported to have left the fuel extracted by them to perish in the coupes rather than incur wasteful expenditure on placing the stuff on the market.

Bamboos.—The variation is small and does not call for comments.

Minor forest produce and grazing.—There was an increase of about Rs. 8,000 under grazing and of Rs. 80,000 under minor forest produce. The increase in grazing is contributed by the two *Cuddapahs* and *Anantapur*, due in the former to the enhancement of grazing fees during the year. The credit for the increase in minor forest produce goes to *Anantapur* where, on account of keen competition among bidders, almost record prices were obtained for the lease of *Tangedu* bark.

Rights and privileges.—No variations.

CHAPTER V.—FINANCIAL RESULTS.

55. The financial results of the year under report are compared with those of the previous year for the whole Circle in the following abstract:—

Details.	1928-29.	1927-28.
Receipts.	RS.	RS.
Revenue	9,46,905	9,02,760
Deduct refunds	2,367	2,172
Net ...	9,44,538	9,00,588
Expenditure.		
8. b. Conservancy and Works ...	88,966	1,03,037
52-A. Capital outlay	6,229	13,471
Total ...	95,195	1,16,508
8. c.i. District Establishments ...	4,21,247	5,00,820
Grand total expenditure ...	5,17,142	6,17,328
Surplus ...	+ 4,27,396	+ 2,83,260

56. During the year the gross revenue increased by Rs. 44,145 and the total expenditure decreased by Rs. 1,00,186 resulting in a surplus of Rs. 1,44,136 over that of the previous year.

The percentage of the several items of Revenue and Expenditure is noted below in a comparative form:—

Items.	1928-29	1927-28
Receipts.	PER CENT.	PER CENT.
Major produce—Forest department ...	21.2	19.5
Do. Revenue department ...	6.1	9.3
Bamboos—Forest department ...	6.7	7.3
Grass and grazing—Forest department ...	17.5	17.7
Minor produce—Forest department ...	5.8	7.4
Do. Revenue department ...	33.4	27.4
Other items—Forest department ...	9.3	11.3
Expenditure.		
8. b. Conservancy and works and 52-A. Capital outlay—		
Exploitation of forests	57.9	42.2
Upkeep and improvement of forests ...	41.5	56.9
Miscellaneous items	0.6	0.9

* Excludes Rs. 848 credited in IV Circle.

57. The important variations under 'receipts' and 'expenditure' are explained below:—

Major Produce—Forest Department.

The increase was under 'timber and fuel' by purchasers--

	RS.
Timber	+32,033
Fuel	+15,423

Timber.—All the divisions except *Anantapur* contributed to the increase as shown below:—

	RS.
<i>Kurnool East</i>	+ 1,400

Due to the replacing of the departmental fellings by the system of leases as per prescriptions of the new working plan in advance of its sanction.

	RS.
<i>Kurnool South</i>	+ 6,707

Due to the adjustment of the revenue from timber cum fuel coupes wholly to the head 'timber' unlike as in the previous year when it was apportioned between 'timber' and 'fuel'.

	RS.
<i>Kurnool West</i>	+12,682

Due to the leasing out of the coupes which were originally intended to be felled departmentally.

	RS.
<i>Cuddapah North</i>	+ 3,656

Due to the better prices fetched during sales than in the previous year.

	RS.
<i>Cuddapah South</i>	+ 8,927

Due to the leasing out of 29 coupes of 3,063 acres against 24 coupes of 2,440 acres in the previous year.

Fuel.—The increase was mainly in *Kurnool West* and *Cuddapah South* divisions as shown below:—

	RS.
<i>Kurnool West</i>	+ 1,882

Due to the leasing out of the coupes which were intended to be worked departmentally.

	RS.
<i>Cuddapah South</i>	+ 15,051

Due to the leasing out, under the provisions of a working plan now under preparation, of a larger number of coupes during the year, viz., 13 coupes of 1,295 acres against 6 coupes of 435 acres in the previous year.

Major Produce—Revenue Department.—The decrease was mainly under 'firewood and charcoal' (Rs. 25,148) and it has occurred in all the divisions. This is due to the fact that the realizations in 1927-28 were unusually high on account of the sale of a large number of wind-blown and cyclone-damaged trees.

	RS.
Bamboos—Forest Department	— 2,037

The fall was chiefly in *Kurnool West* due to the adjustment to revenue of the earnest money deposits of 1928-29 leases in 1927-28 itself.

	RS.
Minor produce—Forest Department	— 9,540

The decrease occurred wholly in *Anantapur* division (Rs. 9,717) in spite of better prices obtained for tangedu leases; this is due to the fact that the revenue was not apportioned correctly between reserves and unreserves in the previous year.

	RS.
Minor produce—Revenue Department	+ 68,886

All the divisions except *Cuddapah South* contributed to the increase as explained below:—

	RS.
<i>Anantapur</i>	+ 49,240

Due mainly to the better prices obtained for 'tangedu' leases and also partly to the more correct apportionment, during the year, of revenue between reserves and unreserves resulting in a comparatively larger revenue going to the credit of unreserves, as explained under minor produce (Forest Department).

	RS.
<i>Kurnool East</i>	+ 4,147

Due to the adjustment of the full lease amounts of tangedu bark for two years (1928-30) in 1923-29 itself.

	RS.
<i>Kurnool South</i>	+ 630

The variation is small.

	RS.
<i>Kurnool West</i>	+ 14,943

Due partly to better prices obtained in the sales of minor forest produce and also partly to larger realizations on account of tree tapping fees from unreserves.

	RS.
Cuddapah North	+ 1,126

Due to the apportionment, during the year of the revenue between reserves and unreserves unlike as in the previous year when the whole amount was credited to reserves.

	RS.
Other items—Forest Department	— 16,589

The fall was entirely under 'E-4'. Other sources (Rs. 16,766) and it was mainly in *Anantapur* division (Rs. 14,365) due to the adjustment in 1927-28 of the book-value of certain forest buildings transferred to other departments.

EXPENDITURE.

8. b. Conservancy and Works and 52-A. Capital outlay.

	RS.
Exploitation of forests	+ 7,108

This increase was brought about by an increased expenditure of Rs. 20,948 under 'Forest produce removed by private agency' due to the debiting of the pay of the surplus forest guards styled watchers to this head, and by a reduction of Rs. 13,840 under 'Government Agency' on account of the restricted expenditure on departmental fellings during the year.

	RS.
Upkeep and improvement of forests	— 27,801

This reduction was effected mostly under '8. b. Conservancy and works' (Rs. 20,559) and also to some extent under '52-A Capital outlay' (Rs. 7,242) as detailed below:—

8. b. *Conservancy and works*.—Due to the curtailment of expenditure under—

- (i) roads and bridges,
- (ii) buildings,
- (iii) fire protection and
- (iv) other works.

A considerable saving was effected under 'Early-burning' by confining the operations exclusively to real danger zones and to localities where they could be carried out effectively by the staff. Reduction of expenditure was also secured to some extent by a closer scrutiny of estimates and by permitting expenditure on a well-defined basis without any sacrifice of efficiency.

52-A. *Capital outlay*.—Due chiefly to the undertaking of a 'smaller building programme during the year, i.e., only 10 items of new works costing Rs. 3,618 were executed against 26 items costing Rs. 9,536 in the previous year.

	RS.
8. c. (i) District establishments	— 78,873

The decrease was chiefly under—

(i) Pay of officers—Voted in *Kurnool East*, *Kurnool South* and *North Cuddapah* and

(ii) Pay of establishments in all divisions due to the introduction of the beat system with one forest guard and one watcher for each beat instead of two forest guards and to the reduction in the cadre of foresters and to the debiting of the pay of surplus forest guards styled watchers to '8. b. Conservancy and works'.

58. The financial results of each division are dealt with below taking into account the 'Direction' charges apportioned to the district:—

ANANTAPUR.				1928-29.	1927-28.
				RS.	RS.
Receipts	...	...	...	3,72,724	3,50,883
Charges	...	...	...	77,699	93,362
Surplus	...	...	...	2,95,025	2,57,501

This is the only division in the circle which, as usual, has contributed largely to the surplus of revenue over expenditure for the whole circle. The increase of Rs. 21,841 in the gross revenue, during the year, was chiefly due to better prices obtained for tangedu leases. The various items which contributed to the gross receipts are detailed below:—

		Per cent.
Major produce—Forest department	...	2
Revenue department	...	10
Grazing revenue—Forest department	...	9
Minor produce—Forest department	...	2
Revenue department	...	71
Other items—Forest department	...	6

The decrease of Rs. 15,683 under charges was almost wholly under Establishments due to the reasons already stated under District Establishments for the whole circle.

KURNOOL EAST.				1928-29.	1927-28.
				RS.	RS.
Receipts	...	...	...	62,538	67,883
Charges	...	...	...	77,867	80,574
Deficit	...	...	...	15,329	18,691

The deficit is less than that of the previous year by Rs. 3,362 due to a large decrease of Rs. 8,707 under Expenditure which was due to reduction of staff.

The percentage of the several items of revenue was as follows:—

	Per cent.
Major produce—Forest department ...	15
„ Revenue department ...	1
Grazing—Forest department ...	45
Minor produce—Forest department ...	8
„ Revenue department ...	9
Bamboos—Forest department ...	6
Other items—Forest department ...	16

KURNOOL SOUTH.

	1928-29. RS.	1927-28. RS.
Receipts	1,28,188	1,24,083
Charges	85,338	1,12,630
Surplus	42,850	11,453

The surplus of Rs. 31,397 over that of the previous year was due to the reduction effected under Expenditure both under '8. b. Conservancy and works' and 8. c. (i). District Establishments. The decrease under the former head was due to the restricted expenditure under Departmental fellings and Roads and Bridges and that under the latter head was due to the reduction of staff.

The bulk of the revenue, about 44 per cent, was obtained from major produce, Forest department, and 23 per cent from bamboos (Forest department), 15 per cent from grazing, 14 per cent from the remaining items (Forest department) and only 5 per cent from Revenue department (Major produce 2 per cent and minor produce 3 per cent).

KURNOOL WEST.

	1928-29. RS.	1927-28. RS.
Receipts	1,79,234	1,75,260
Charges	98,448	1,17,191
Surplus	80,786	58,069

The net receipts of the year showed an increase of Rs. 22,717 over those of the previous year as the result of an increase of Rs. 3,974 under gross revenue and a decrease of Rs. 18,743 under expenditure which was effected both under 8. b. Conservancy

and works (Departmental fellings and Roads and Bridges) and 8. c. (i). District Establishments, for reasons already explained.

Of the gross receipts—

21 per cent was derived from grazing.	
19 „ „ „ major produce (Forest department).	
18 „ „ „ minor produce (Revenue department).	
15 „ „ „ minor produce (Forest department).	
10 „ „ „ bamboos (Forest department).	
12 „ „ „ other items (Forest department).	
5 „ „ „ minor produce (Revenue department).	

CUDDAPAH NORTH.

	1928-29. RS.	1927-28. RS.
Receipts	84,466	87,410
Charges	86,640	1,02,854
Deficit	2,174	15,444

There was a substantial improvement in the working of this division during the year as the deficit was reduced by Rs. 13,270 on account of a large reduction of Rs. 16,214 effected under charges which were mainly under Roads and Bridges, and Pay of Establishments for reasons already stated and also to some extent under 'Capital outlay—Buildings'—due to the construction of some pucca buildings in the previous year for which there was no necessity during the year.

Even the present deficit of Rs. 2,174 would have been wiped out, had it not been for the expenditure of Rs. 7,170 on account of holding the Vernacular Training School in this division.

The chief sources of revenue were from grazing (36 per cent) and major produce (35 per cent of which only 4 per cent was from unreserves) and the remaining 29 per cent was derived as follows:—

	Per cent.
Bamboos (Forest department)	6
Minor produce (Forest department)	6
„ (Revenue department)	4
Other items (Forest department)	13

CUDDAPAH SOUTH.

	1928-29. RS.	1927-28. RS.
Receipts	1,17,388	95,069
Charges	91,150	1,01,697
Difference	+ 26,238	— 9,628

The division worked at a profit unlike as in the previous years. This was the result of an increase in gross revenue and a decrease in charges. The increase in the revenue was contributed chiefly by

(i) 'Major produce'—By purchasers—
'Timber and fuel', on account of the lease of a large number of coupes, during the year, as explained already under 'Major produce—Forest department' for the whole circle, and

(ii) 'Grazing', due to the enhancement of the rate of grazing fees from three annas per cow-unit to six annas per cow-unit during the year under report.

There was a reduction, of Rs. 13,547 under charges, which was effected mainly under (i) "8. b. Conservancy and works—Roads and Bridges and Buildings; and (ii). 8. c. i. District Establishments—'Pay of establishments' for reasons already explained.

Of the total revenue, major produce brought in 60 per cent (of which only 1 per cent was from unreserves)—

Grazing	...	...	...	...	16 per cent.
Bamboos (Forest department)	...	...	...	6	"
Minor produce (Forest department)	...	...	...	5	"
" (Revenue department)	...	...	...	6	"
And other items (Forest department)	...	...	...	7	"

It will be observed from the above that all the divisions in the circle except *Kurnool East* and *Cuddapah North* have worked at a profit during the year.

59. The outstanding revenue at the close of the year was Rs. 3,45,882 of which Rs. 2,07,482 fell due after 31st March 1929, being the lease amount of coupes and minor produce leases.

60. The estimated value of timber and other produce in the sale depots at the close of the year was Rs. 920 against Rs. 14,639 at the commencement of the year.

CHAPTER VI.—RESEARCH AND EXPERIMENTS.

RESEARCH.

Nil.

EXPERIMENTS.

61. *Anantapur*.—The sample plots in Kupgal and Banavasi plantations opened in 1923 under Chief Conservator's instructions to determine whether the cutting back of the stunted *Nim* and *Hardwickia* trees and the working of the soil would improve their growth

were kept up at a cost of Rs. 1-8-0 during the year, but the result proved disappointing and the experiment has been therefore ordered after the close of the year to be given up.

Experimental sowing of tangedu was continued during the year, over a further extent of ten acres in the Gunda reserve, the seeds being sown, in June 1928, in furrows 2½ feet to 4 feet apart from each other. Germination does not appear to have started earlier than a month and the resulting seedlings were found to be 1 to 2 feet high in November 1928, the percentage of germination of the seeds and the height put on by the resulting seedlings being proportional to the amount of soil preparation carried out.

The clear-cutting (coppicing) of tangedu bushes (410 in number), in the Bandri reserve in July 1928 resulted in shoots coming up all right but their height growth was only 3 to 6 inches when inspected in October 1928.

62. *Cuddapah North*.—The sample plots in the Sancherla Fuel Series opened in the year 1921 with a view to find out the effect of weeding on the growth and development of yepi seedlings were continued to be maintained during the year but no details of measurements are contained in the district report; but it is apparent that no conclusions can be drawn yet. It is, however, significant that, in spite of more than seven years of protection of the weeded and unweeded plots by a stone wall, no increase in the quantity of natural seedlings on the area has resulted, though mother trees of yepi are present in and round the plots.

The sample plot in Jothi Improvement Series, measuring one-tenth of an acre, which was opened in the year 1922 to ascertain the annual incremental height growth of natural red sanders seedlings under weeded condition, has been ordered to be abandoned, owing to the inaccessibility of the plot and to the difficulty experienced in keeping it perpetually weeded throughout the year and year after year. It was, however, observed, during the Conservator's inspection of the plot in February 1929, that the average height of seedlings, which at the commencement of the experiment was 16 inches high, was 3 feet 3 inches high in February 1929.

Manufacture of Cutch.—It was stated in the last year's report that the Deputy Forest Utilization Officer, who has studied the manufacture of cutch, had suggested a further experiment on a very small scale in December 1928 in order to discover if the manufacture of cutch in the cold season would help the solidification and hardening of the stuff. This was carried out in December 1928 and January 1929 at a cost of Rs. 8 with the result that 68 balls of cutch weighing 37 lb. were manufactured from a few comparatively bigger trees of *Acacia sundra* of 24 inches to 36 inches in girth. The

cutch on this occasion solidified all right, but showed a tendency to flatten out in the course of drying. It was, however, of better quality but, even so, no market could be found for it. A sample of the heartwood of a freshly cut and sufficiently big tree was therefore sent to the District Forest Officer, Mangalore North, after the close of the year, to find out what the cutch would be like if it were extracted by experts in that division, so that any defect in the manufacturing process might be set right if there was nothing inherently wrong in the quality of heartwood obtainable from the *Acacia sundra* trees of *Cuddapah North*.

63. *Cuddapah South*.—The 22 sample plots opened in red sander areas (15 in 1920 and 7 in 1927), with a view to find out the girth increment of red sanders trees were continued to be maintained. Experiments were instituted in some of the red sanders forests, comprised in the *Anantapur*, *Cuddapah North* and *Cuddapah South* divisions, during the year 1927, to investigate the possibility of early-burning, without damage to the seedlings and small saplings of red sanders, wherever it is found impossible to keep out fires permanently. For this purpose, in certain plots—

(a) grass was cut away to a radius of 2 to 3 feet about two to four weeks before the ordinary early-burning and thrown in a circle round the seedlings and allowed to dry before the plot was early-burnt;

(b) grass was pulled out by the root and otherwise dealt with like (a);

(c) grass was not cut out or pulled round seedlings, but the plot was early-burnt, and

(d) same as (c) but seedlings cut back after the early-burning.

Measurements of the seedlings are being recorded twice each year, and it is too soon to draw any conclusions.

64. *Kurnool district*.—The 22 experimental and sample plots, referred to in the last year's report were maintained during the year in *Kurnool South* and *West* and the observations recorded in the plot files concerned. Most of these experiments are for determining the best method of regenerating the timber forests of the Nallamalais, and the conclusions drawn were that clear-felling and rab-sowings are the best method for regenerating the chief timber species in the locality, and weeding and climber cutting are essential during the first two or three years. Stump planting of teak one to two years old to fill up blanks in rab-sown areas gives better results than any other method, and the plants resulting from such planting do not develop any root rot.

It has been decided after the close of the year to maintain hereafter only the rab-sown plots under rigid fire-protection including

cutting back the saplings that may be damaged by any accidental fire, in addition to recording periodical measurements in all sample plots. All the other experimental plots have been ordered to be abandoned.

CHAPTER VII.—ADMINISTRATION.

65. M.R.Ry. Rao Sahib K. R. Venkataramana Ayyar Avargal was in charge of the Circle throughout the year.

66. *Changes in territorial jurisdiction*.—There was no change worth mentioning. A small area of nearly two square miles forming part of the Kothur reserve of the *North Cuddapah* division was added on to the Nellore division for administrative convenience.

67. *Tours*.—The Conservator of Forests toured in all the divisions in the Circle and spent 186 days in camp. All the District Forest offices were inspected.

The touring of all District Forest Officers except of *Anantapur* and *South Kurnool* was inadequate and this was due to changes in the personnel of the officers.

68. *Range office inspections*.—All Range offices were inspected during the year by District Forest Officers.

69. *Audits*.—All the District Forest Offices were inspected by Audit officers and the results were generally satisfactory.

70. *Recruitment to the Madras Forest College*.—None was deputed during the year. One candidate deputed to the College for the 1927-29 course has since completed his training and returned with a Higher Standard Certificate.

71. *The Vernacular Training School*.—The 1928 session of the school was as usual held in the *North Cuddapah* division from 16th January 1928 to 15th July 1928 and the usual report was submitted to the Chief Conservator after the close of the year 1927-28.

The 1929 session which opened on 16th January 1929, was also held in the same division, with Mr. S. Ramachandra Ayyar as the Senior Instructor and V. N. Parthasarathy Nayudu, Forester trained at the Madras Forest College, as the Junior Instructor. It started with 27 students but one student died in the hospital as a result of a fire accident in camp. As there are no more forest guards in this circle who are qualified for training, it has had to be decided that no school should be opened in 1930.

72. *Health of the establishment including an account of measures of sanitation and casualties*.—The health of the staff was generally satisfactory in *Anantapur*, *South Cuddapah* and *North Cuddapah*

(with the exception of the Badvel Range). The staff in the Nallamalais of the *three Kurnool* divisions and in the Badvel range of *North Cuddapah* continued to be bad and many were on leave on medical certificate. Two foresters and two guards in *Anantapur*, three guards and one range clerk in *South Kurnool* and two guards in *Kurnool West* died of malaria. No special measures of sanitation were undertaken but attention is being paid to provide a good drinking water-supply to the staff in remote localities where such supply is not available, and a beginning was made during the year of installing a tube well at Chinnalettipattibhavi in *North Cuddapah*.

CHAPTER VIII—GENERAL.

1. FORMATION AND MANAGEMENT OF PANCHAYATS.

73. All class III reserves which, till the close of the previous year, remained under departmental control, in the *Kurnool East* and *Cuddapah North* divisions, were handed over to panchayats during the year, except the Chennupalli reserve in the latter division which is the only reserve, in the whole circle, for which panchayats could not be formed.

On the other hand, the Adoni East and West reserves (class III) in the *Anantapur* division managed till 1927-28 by the Adoni Municipality, under the supervision and control of the Land Revenue Department, reverted to the Forest department, and so was the Tunukonda reserved forest in the *Cuddapah South* division. The first named reserves continued, however, to be managed by the Adoni Municipality, during the year, subject to the supervision and control of the Forest department. The Tunukonda reserve was taken over by the Forest department after the close of the year, as the panchayatdars refused to continue its management.

2. MEASURES FOR IMPROVING LOCAL SUPPLIES AND FACILITIES.

74. The existing organization for the supply of the domestic and agricultural requirements of the ryots in the matter of timber, fuel, fodder grass, manure leaves and thorns continued to work satisfactorily on the whole, though a large number of coupes for fuel and small timber could not be sold in the Sirvel and Cumbum taluks (*Kurnool South* division) in particular for want of demand. On the other hand, a number of additional felling series, for fuel and small timber, were opened, towards the close of the year under report, in the *Cuddapah South* and *Kurnool West* divisions with very satisfactory results. The ryots were, as usual, kept informed by notification in the Forest Sheets of the District Gazettes of the different descriptions of forest produce available for sale and the rates at

which they would be sold at edge of coupes. Of the sale depots referred to in the previous year's report, the one at Diguvametta alone continued to function, as the others were closed as a result of the replacement of departmental fellings by contractors.

One other special feature of the year was the regular monthly sales of softwood of *Givotia rottleriformis* from the Chelma forest depot (*Kurnool South*) for the slate industry at Markapur.

Palmyra trees were continued to be sold, as usual, in the *Kurnool West* and *Anantapur* divisions on the basis of the current felling schemes. Permits for green manure leaves were as usual issued in all the divisions, but there was not much demand. The 'Yepi' fibre extraction in four coupes in the Yerramalais (*Kurnool West*) was continued, to provide occupation to the 'Boyas'.

The supply of fuel to the Kurnool and Nandyal towns presented some difficulty towards the close of the year, owing to the impossibility of obtaining cheap transport for the large quantities of fuel lying unremoved in the Nallamalai coupes. But the situation was tided over by promptly despatching fuel by rail from the *Kurnool South* forests and by procuring carts for contractors for the transport of their fuel by road with the help of the Collector.

With the reduction in railway freight, slight as it may be, for the transport of fuel from Gazulapalli and Chelama to Kurnool, the strengthening now being made of the bridge across the Kurnool-Cuddapah canal at Jupad, and the large number of fuel felling series opened towards the close of the year in the *Kurnool West* division, it is hoped that Kurnool town will soon be able to get an adequate and cheap supply of fuel hereafter.

Water-supply.

75. Improvements to wells and 'kuntas' with a view to improve water-supply in grazing grounds continued to receive attention. The following shows the expenditure incurred on these works in the several divisions:—

	RS.
Anantapur	190
Kurnool East	491
Cuddapah North	257
Cuddapah South	88

3. TIMBER TRANSIT RULES.

76. The rules have, on the whole, worked satisfactorily; but the elasticity of the direction contained in rule 7 of the rules in regard to the registration of property marks, makes it impossible to prevent smuggling of timber, especially in the *Kurnool West* division. As

the rule now stands, the registration of property mark is not obligatory. Any private timber moved within the protected area is required to be covered only by a permit in Form II to be issued by the owner thereof, which may be printed or in manuscript, and the timber need have no property mark on it. Large volumes of timber, for trade purposes, are annually moved through protected areas to be sold at fairs and festivals, and the department is powerless to prevent smuggling. Steps are being taken to make registration of property mark obligatory.

4. JUNGLE TRIBES.

77. *Cuddapah*.—The Yanadis, of whom there are very few in the two Cuddapahs, continued to be employed, as usual, on forest works, and as forest guards and watchers. Their work and conduct have been satisfactory.

Chenchus.

78. *Kurnool*.—(i) The existing organization, for the amelioration of the Chenchus and for providing works congenial to them on which they could make an honest living, continued to work during the year, under the control of the Special Chenchu Officer (Collector), the total expenditure (net) incurred against the forest revenues of the three Kurnools being Rs. 26,832 as against Rs. 27,844 in 1927-28.

The different sources of income on which the Chenchus subsist, and the details of annual establishment employed in connexion with the amelioration work for the uplift of the Chenchus, have been recorded in the annual report for 1927-28 and they need not be repeated here. Also, as the question of the continuance or otherwise of the existing organization for the management and control of the Chenchus has come under separate consideration after the close of the year, it is unnecessary to discuss here the extent to which it has fulfilled its purpose, what its defects are and how these latter might be remedied. It may, however, be stated that there is considerable difference of opinion between the Forest Officers on the one hand, and the Special Chenchu Officer on the other, as regards the merits claimed for the present organization, and the Chief Conservator has proposed, after the close of the year, that he should discuss the matter with the Conservator, Collector and the local District Forest Officers before any decision can be reached.

(ii) *Chenchu population*.—The Chenchu population as recorded in Mr. Saunderson's report (Chief Conservator of Forests' letter No. 5, dated 26th January 1920), and that as ascertained after the close

of the year, by Mr. A. V. Sundaram, Extra Assistant Conservator, on special duty, are compared below :—

—	Adult males.			Women and children.			Total.		
	Kurnool.			Kurnool.			Kurnool.		
	West.	South.	East.	West.	South.	East.	West.	South.	East.
Mr. Saunders' report (1919) ..	512	60	644	1,363	141	1,505	1,875	201	2,239
Mr. A. V. Sundaram's report (1929) ..	534	61	588	753	123	1,576	2,001	184	2,164

In the ten years during which the present organization has been in force, there has been an increase of 34 in the total population of Chenchus in all the divisions, made up of an increase of 67 under females and children, and of a decrease of 33 in the adult males. The decrease under all heads was in *Kurnool East* which coincides with the comparatively low wages earned by the Chenchus as will be shown later, in spite of the areas under cultivation in this division being much larger than elsewhere.

(iii) *Monthly earning of the Chenchus on works directly connected with forests*.—In his report of 1919, Mr. Saunders worked out, on the basis of 305 working Chenchus, out of a total of 512 adult males then, that the average monthly earning of a working Chenchu was Rs. 4-7-0. This increased to Rs. 15 per month per working Chenchu in the same division in 1927-28, as recorded in that year's report. The corresponding monthly earnings, worked out for the same 305 working Chenchus for the year under report, have been Rs. 15-3-0. In *Kurnool East*, the average earnings of a Chenchu, on the basis of about 460 working Chenchus out of a total adult male population of 588, have been Rs. 6-8-0 during the year under report, as against Rs. 4-8-0 in 1927-28. In *Kurnool South*, the average monthly earnings during the year 1928-29 of a Chenchu, based on the entire adult male population of 61, were Rs. 41-5-0. These figures conclusively show that, so far as the activities of the Forest Department are concerned in the matter of providing adequate works for the Chenchus, there has been a steady annual increase in the facilities afforded to them of securing an honest means of living, though the educational works, which are not under the control of the Forest Department have not succeeded even to the slightest extent in keeping the Chenchus from setting fire to the forest, for his game, and for the collection of minor forest produce.

Chenchu Crime.

The Assistant Chenchu officer (an Officer of the Ranger class) continued to dispose of all offences against the Chenchus in his capacity as a Special Magistrate. The number of cases filed in his court during the year was 12, in which 13 persons were concerned against 26 cases involving 69 persons during 1927-28. The decrease is attributed by this officer to the 'lessening of criminal tendencies among Chenchus,' which is strongly questioned by the District Forest Officers who protest that the Chenchus have shown no tendency whatever to desist from setting fire to the forests, that there has been absolutely no propaganda work by the Assistant Chenchu Officer among the Chenchus; and that the Assistant Chenchu Officer's influence over the Chenchus for keeping them from mischief has been practically nil. The 12 offences committed during the year are reported by the Assistant Chenchu Officer to relate partly to offences under the Forest Act and partly to offences under section 324 of Indian Penal Code.

The average number of visits paid by the Assistant Chenchu Officer during the whole year to all the Chenchu gudems in his charge was only two, while there are seven gudems not visited by him for over one year, and two gudems not inspected by him for over two years. His inspections have been far too frequent only in respect of roadside gudems.

Works controlled by the Special Chenchu Officer.

(i) *General control.*—The total expenditure during the year on Chenchu establishment and works (agricultural, educational and industrial works, including medical relief) controlled by the Special Chenchu Officer was Rs. 26,832, of which Rs. 19,098 represented the pay and allowance (travelling allowance, including fixed and compensatory and contingencies) and the rest on educational and other matters, including midday meal for Chenchu school boys, purchase of books, supply of clothing, furniture, etc. The budget, as usual, was prepared by one of the District Forest Officers for the Special Chenchu Officer, but the latter continued to control all the expenditure. One of the three District Forest Officers, however, was authorized by the Special Chenchu Officer to pass the salary bills of the establishment (Rs. 15,731) scattered in the three forest divisions; 'pass' the expenditure, on submission of bills by the Assistant Chenchu Officer, on account of the purchase of books (Rs. 82); 'make payments' on requisition from the Assistant Chenchu Officer on account of scholarships (Rs. 765) and on presentation of bills by him for cleaning charges (Rs. 239), and feeding charges (Rs. 3,539); to 'execute petty works' (Rs. 295) sanctioned by the Special Chenchu Officer, and to 'supervise'

expenditure on contingencies under 'Medical' (Rs. 500) and on industries (Rs. 1,767); the only bills that were countersigned and passed by the Special Chenchu Officer being the travelling allowance and contingent bills of the Assistant Chenchu Officer and of his office and cost of clothing and equipment of Chenchu boys aggregating about Rs. 3,554. Having regard to the fact that none of the Chenchu establishment is under the supervision and control of the District Forest Officer, it looks as if the control exercised by the District Forest Officer over the bills presented to him by the Assistant Chenchu Officer for payment of an aggregate sum of Rs. 23,278 (Rs. 26,832 — 3,554) could have been anything but nominal.

(ii) *Agriculture.*—Neither the reports of the District Forest Officers, nor that of the Assistant Chenchu Officer contain any statement of the area brought under cultivation as a result of the continuance of the policy of the grant of loans to Chenchus for purchase of bulls for ploughing. It is gathered from the District Forest Officers' reports that there was an outstanding loan of Rs. 2,783-13-0 at the close of last year to which was added, during the year, a further loan of Rs. 360 on the recommendation of the Assistant Chenchu Officer. The cash recovery of outstandings effected through the exertions of the forest staff amounted during the year to only Rs. 951-8-0, leaving an unadjusted balance of Rs. 2,192-5-0 at the close of the year under report. That no progress was made on settling down the Chenchus to cultivation is borne out by the fact that in spite of about 338 acres of lands in the reserves of *Kurnool East* having been leased out to the Chenchus free of assessment several years ago, as much as 260 acres remained untouched at the close of the year. In this connexion the following extract from the remarks of the Special Chenchu Officer, dated 23rd July 1929, may be of special interest:—

"The statistics of Chenchu cultivation during the five years ending 1928-29 give the impression, as his diaries did till recently, that the Assistant Chenchu Officer in the course of his tours does little or no propaganda and has not achieved any substantial results, after making all due allowance for the difficulties to be overcome. The Assistant Chenchu Officer must justify his existence by more tangible results and he must establish some real influence over the Chenchus to make them do what he is supposed to make them do.

"In addition to substantial missionary work in the cause of agriculture, he must do his utmost to get colonies to settle at Gundlabrahmeswaram and Isukagundam.

"A steady measure of cultivation should be expected if the Assistant Chenchu Officer does his work properly."

(iii) *Industries*.—An amount of Rs. 1,767 was sanctioned during the year by the Collector for promoting industries in the same centres as noted in the previous year's report, viz., Pecheruvu, Indreswaram and Bairluty in the *West Division* and Chilakacherla in the *East Division* on an average of about Rs. 440 per centre. Carpentry, tape-weaving and basket making were taught in all the four schools. The Assistant Chenchu Officer commends the work of all the instructors, while the District Forest Officer, *Kurnool West*, reports that the carpenter at Bairluty is not suited to his job and the tape-weaving industry at Indreswaram had to be suspended for over three months for want of a suitable instructor who could turn out a minimum amount of work.

The Chenchus do not seem, on the whole, to have been benefited by the sort of industrial training they have so far received at the schools and none has so far practised the profession, if he has learnt it at all. This aspect of the matter will doubtless be considered when the whole question of Chenchu organization comes under review. It is, however, permissible to note below an extract from the remarks, dated 9th August 1929, of the Chief Conservator on the annual report of the Deputy Inspector of Schools on the Bairluty Chenchu school.

"The vocational training given in this school (the Chief Conservator saw it in July) is not appropriate. Before the pupils are taught to make bad chair legs, they should be in respect for, and the growing of, trees. They live in the forest and always will—hitherto they have been a menace to the forest—and they must be taught from infancy that their interests are bound up with the forest (which, by the way, pays for these attempts at Education). It would not be a difficult matter to arrange for planting and tending work to be undertaken by the children, who, it might be hoped, would thus be taught to respect trees and to protect what they have themselves created—work of this nature could easily be arranged for through the Assistant Chenchu Officer, who does not appear to be pulling his weight. If the report is read correctly he had not visited this school, of which he is Manager for nine months.

"A start may be said to have been made, but it is not on correct lines and it will perhaps be possible, in connexion with the conversation which it is hoped will take place on the subject of the continuance of the Assistant Chenchu Officer, to lay down the broad lines which should be followed in this important matter of education."

(iv) *Education*.—The nineteen schools that were in existence at the close of last year continued during the year under report. The schools are under the control of the Special Chenchu Officer (Collector of Kurnool). The Assistant Chenchu Officer and the

Chenchu Supervisor of Schools supervised the work of the schools. The Supervisor is said to have inspected each school once a quarter and toured, on an average, twenty days in a month. The Assistant Chenchu Officer reports to have visited the nineteen schools on fifty-three occasions in the calendar year 1928, out of which fourteen visits were paid to the school at Bairluty which is on a road-side; the other schools were thus visited twice during the year on an average. The schools at Garnapenta and Nagaluty were, however, not visited at all during the year.

There is a teacher for each school, and out of 19 teachers, 15 are trained and the rest untrained; two Chenchus and one Muhammadan continue to receive their teacher's training in the Government Training Schools at Kurnool. Out of the 19 teachers in service, 4 are Muhammadans, 8 Hindus, 5 Christians, 1 Sugali and 1 Christian mistress. The number of pupils on the rolls on 31st March 1928 was 282 boys and 156 girls, while the number on rolls at the close of the year was 270 boys and 167 girls. The average number on the rolls in each school during the year was 14 boys and 9 girls and the average attendance of each school was 11 boys and 7 girls.

The pupils are being taught up to IV standard. There are 5 boys studying in the Board High School with the aid of Government scholarship of the value of Rs. 175 per pupil per annum, and 2 boys of Nagaluty Gudem were admitted during the year into the same high school.

Midday meal to the Chenchu pupils in all schools was continued to be given. The expenditure on this account during the year is Rs. 3,539. It was introduced in order to stimulate better attendance of pupils at the schools but there has been no improvement in this direction so far, as will be seen from the following figures:—

		Average daily attendance.
1926-27	(Before the introduction of midday meal)	... 20
1927-28	(After the introduction of midday meal)	... 17
1928-29	(Do.)	... 18

On the other hand, the District Forest Officer, *Kurnool West*, is of the view that as soon as the midday meal is over the pupils lose all interest in their studies, and the Special Chenchu Officer (Collector) shares the same view. The Chief Conservator has remarked after visiting the school at Bairluty on 14th July 1929 as below:—

"The average attendance is stated to be 24 pupils. When the Chief Conservator saw the school, not more than a dozen or so were present and considerable number of other children of school-going age were seen (in the Gudem)."

The Assistant Chenchu Officer reports that the work and conduct of the supervisor and teachers were quite satisfactory but the District Forest Officer, *Kurnool West*, holds quite a different view, and the Collector promises to go into the question of altering the curricula and getting better work turned out by the Supervisor of Schools. In this connexion the following extract from the remarks, dated 9th August 1929, of the Chief Conservator on the annual inspection report of the Deputy Inspector of Schools on one of the Chenchu schools in the *Kurnool West* Division, may here be recorded:—

“There appears to be some reason to suppose that these schools are run on entirely wrong lines. Their theoretical object is admissible—it is a first step in reclaiming a tribe of criminal tendencies and making its members useful members of society and less of a menace to the public welfare. Insistence upon drawing, civics, mental arithmetic and some other subjects which appear to be included in the curricula seems to be unnecessary, for it should suffice if the syllabus is confined to reading, writing and very simple arithmetic. The practice in respect of the ordinary schools should not be held to apply.”

Expenditure on the following items of works was incurred in connexion with the maintenance of the schools during the year:—

	RS.	A.	P.
Feeding, cleaning charges and industries.	5,544	9	0
Purchase of books	82	3	0
Purchase of furniture	...	...	...
Construction and repairs to sheds ...	337	10	9
Cost of clothings	188	6	6
Teachers' salaries	6,552	9	0
Supervisor's salary	777	8	0
Pay of supervisor's peon	168	0	0
Total ...	13,650	14	3

The expenditure during 1927-28 was Rs. 16,448-2-11 and the decrease during the year is mainly due to the fact that fresh sets of clothing have not been supplied during the year as they were not ready.

The health of the pupils and teachers suffered now and then from malarial fever as usual and this caused dislocation of work.

MINING AND QUARRYING.

79. *Anantapur*.—There were no new leases and no removal of manganese ore during the year. Rupees 203 were collected towards the value of tree growth and Rs. 1,503 towards dead rent.

Kurnool West.—The five-year leases for quarrying slabs and stones continued to be in force.

Cuddapah South.—As in the previous year, the holder of the licence for manganese ore did not work during the year.

LIVESTOCK.

80. (a) *Elephants*.—The two elephants referred to in the last year's report continued to be attached to the *Kurnool West* division. Both of them were in indifferent health during the year. Arrangements have been made since for their inspection and treatment by the Inspector of Livestock.

(b) *Buffaloes*.—The two buffaloes in the *Kurnool South* division were sold, and the two in the *Anantapur* division remained attached as heretofore to the Horsleykonda bungalow for carrying water to the garden in the bungalow compound.

VETERINARY ESTABLISHMENT.

81.—*Nil*.

SUITS.

82.—*Nil*.

CONTROL OF UNRESERVED LANDS BY THE FOREST DEPARTMENT.

83. In the *Anantapur* division, 346 acres of assessed wastes adjoining the Baudri reserve in Hospet Range were transferred to the charge of the Forest Department for the protection and treatment of the sandalwood trees in them.

ENCLOSURE.

A BRIEF ACCOUNT OF FOREST OPERATIONS AND THEIR RESULTS IN THE SEVERAL DIVISIONS OF THE SECOND CIRCLE, BELLARY, DURING 1928-29.

ANANTAPUR.

Description and area.—The aggregate extent of reserved forests in the division in charge of the department is 575 square miles which are scattered in the four civil districts of Chittoor, Cuddapah, Anantapur and Bellary.

The increase of 8 square miles as compared with the last report is due to the transfer of Adoni East and West reserves managed by the Adoni Municipality to the control of this department. The forests are confined to isolated hills with small extensions into the plains and they consist, for the most part, of an inferior type of scrub jungle over-grazed and much hacked in the past. The only areas which support an indifferent type of timber crop—mostly poles, are those situated in the Vempalli and Ganganapalli ranges forming part of the civil district of Cuddapah. Some excellent patches of sandalwood are found in Horsleykonda and some scattered growth of the same is also to be found in a few other reserves in the division. Either for timber or for fuel this division is not important, the bulk of its revenue being from its minor forest produce (chiefly Tangedu bark). The palmyra plantation at Idupulapaya is another source of timber.

2. *Subordinate executive and protective charges.*—The division consists of five range charges and 57 beats, each of the former being in charge of a ranger and each of the latter in charge of one forest guard and one watcher. The names of ranges and number of beats in each are as below :—

Name of range.	Number of beats in the range.
Bukkapatnam	12
Hospet	9
Ganganapalle	8
Vempalli	11
Madanapalle	17
Total	57

3. *Cost of administration.*—The cost of administration (pay, travelling allowance and contingencies) was Rs. 56,612. Establishment alone has cost)—

	RS.
(a) District Forest Officer	7,200
(b) Rangers	7,957
(c) Subordinate staff	19,006
(d) Clerical staff	8,590
Total	42,753

4. *Cost under other important heads.*—There are no works of any outstanding importance in the division except the special tending of young sandalwood and eradication of lantana over a fairly large area at a cost of Rs. 352-10-0.

Dibbling of sandal in 53 acres in all, in suitable localities, with a view to establish centres of propagation for the natural spread of the species into adjoining areas of reserves was also another work of importance on which a small amount of Rs. 28-10-0 was spent, most of the work having been carried out free of cost by beat subordinates. In 10 acres the operation was a failure. The other works carried out during the year were of a recurring nature such as demarcation of annual fuel and timber coupes, maintenance of existing roads and buildings, early-burning and repairs to tanks and wells in grazing grounds for affording water facilities to grazing animals.

5. *Income from main sources.*—The bulk of the gross revenue (69.70 per cent) is from Tangedu bark of which a very large portion is rightly creditable to unreserves and even grazing only forms 8.77 per cent of the gross revenue. There seems to be hardly any scope for development of revenue from timber but in the matter of fuel including small timber, such as hutting materials, there appear to be some possibilities which are being tried, by opening additional coupes.

The introduction of sandal in suitable localities is likely, ultimately, to increase enormously the value of some of the reserves in the division.

Details of revenue under various items are given below :—

	RS.
(a) Sandalwood	122.
(b) Timber	4,223 from reserves. 30,872 from unreserves.
(c) Fuel	3,563 from reserves. 7,798 from unreserves.
(d) Bamboos	170.
(e) Grazing	32,834.
(f) Minor produce	7,977 from reserves. 2,63,718 from unreserves.
(g) Miscellaneous	About 5,000 from reserves. 16,945 from unreserves.
Total	3,73,222

6. *Chief works done in the division.*—Except the tending of sandalwood and eradication of lantana in Horsleykonda and the dibbling of sandalwood to establish propagation centres in all reserves, no other work of importance was carried out during the year. In the matter of supply of small timber including palmyra trees an aggregate extent of 1,027 acres was gone over for the extraction through lessees of a quantity of 14,000 cubic feet of timber. As regards fuel, a quantity of 668 tons of it from an area of 756 acres was placed on the market during the year.

KURNOOL EAST.

Description and area.—The total area of reserves in the division is 886 square miles and it forms the easternmost, and outlying portions of the Nallamalais hills which have been recklessly cut over in the past. All

the outer slopes are practically devoid of any tree growth worth mentioning in them, except for some stunted and gnarled growth of *Yepi*, few and far between. A large part of the interior of the hills which support an irregular, mixed, open deciduous forests of varying density, is economically unworkable except for minor forest produce and bamboos. The most important species composing the crop in the workable portions are *Terminalia tomentosa*, *Pterocarpus Marsupium* and an occasional teak and rosewood. This type of forest is confined to localities with an average annual rainfall of about 40 inches, the rainfall elsewhere in the less well-wooded portions being only about 20 inches. Bamboos occur throughout the area of 40-inch rainfall.

2. *Subordinate executive and protective charges.*—The division is divided into five ranges, each in charge of a ranger with a total number of 37 protective beats looked after by 37 guards and 37 watchers. For the execution of works and for charges of certain sections, there is a staff of sixteen foresters. The names of ranges and number of beats in each are shown below :—

Name of range.	Number of beats.
Turimella	10
Markapur	7
Yerrakoudapalem	6
Ganjivaripalli	5
Dornal	9
Total ...	37

3. *Cost of administration.*—The total expenditure for the division under 'B. Conservancy and works' and 'C. Establishment' during 1928-29 was Rs. 70,316, of which Rs. 54,967 was on establishment which is 78 per cent of the total expenditure.

4. *Cost under other important heads.*—The important works of the division on which expenditure was incurred consisted of the departmental felling of timber, under Timber-improvement-*cum*-clear-felling system, and selection system, and collection of dead wood. The collection of minor forest produce and extraction of bamboos were undertaken departmentally till the lessees were put in possession of the leased areas. Most of this work was for providing labour for Chenchus. The amount spent on the above operations carried out through departmental agency was Rs. 2,888.

The Chenchu Industrial School at Chilakacherla in this division was run at a cost of Rs. 640 and it was also an item of work on which a large amount of money was spent during the year for which accounts are maintained by the Special Chenchu Officer.

The maintenance of roads and buildings and fire protection operations and miscellaneous other works and petty items of expenditure have cost Rs. 6,754. On the construction of new roads, buildings and wells a total amount of Rs. 767 was spent during the year.

5. *Income from main sources.*—The main sources of revenue and the percentage they form of the gross revenue of 1928-29 are noted below :—

	RS.	
Timber	9,157	(Rs. 553 from unreserves), 14 per cent.
Firewood and charcoal	1,162	(Rs. 344 from unreserves), 2 per cent.
Bamboo	4,034	6 per cent.
Grazing	29,238	47 per cent.
Minor forest produce.	11,116	(Rs. 5,895 from unreserves) 18 per cent.
Miscellaneous	8,000	13 per cent.
Total ...	62,707	

6. *The chief work done in the division* was to provide Chenchus, who are scattered all over the division in 23 Chenchu Gudems, with an aggregate population of 1,762 Chenchus—consisting of 489 men, 459 women and 814 children, with a congenial occupation by extracting timber, bamboos and other minor forest produce. The agency of exploitation is being gradually changed, from departmental into a system of leases to contractors. Seventeen thousand cubic feet of small timber and 825 tons of fuel were extracted for the market. The works provided for were in places where the demand justified them under the prescriptions of the working plan sanctioned during the year.

The ten Chenchu schools continued to work during the year 1928-29 and the amount spent on them on account of pay of schoolmasters, and of midday meal to the pupils was Rs. 5,212.

The pupils were taught carpentry and basket work in the school at Chilakacherla as usual.

The cultivation by the Chenchus of lands let out to them in the reserves, free of assessment, has made no progress in spite of advances being made for the purchase of plough-cattle.

KURNOOL SOUTH.

Description and area.—The area of reserves under departmental control in the division is 634 square miles, of which the Nallamalais and its foot-hills cover about 532 square miles and the Velligondas, 102 square miles.

The forest consists of a deciduous irregular mixed type, the principal species composing the crop being Teak, *Terminalia tomentosa*, *Pterocarpus Marsupium*, *Dalbergia latifolia*, *Anogeissus latifolia* and *Hardwickia binata*.

Most of the accessible portions have been heavily cut over in the past, and the foot-hills for the most part consist at present of only trees fit for fuel for which they are being worked.

There are some portions of the plateaus and inner valleys which contain a better type of forest where timber trees of comparatively large dimensions are found, while elsewhere, on the outer slopes, the pole forests lend themselves to remunerative working.

Bamboos are found almost throughout the forest and they constitute one of the chief sources of revenue.

The division as a whole is well served by roads and railway.

2. *Subordinate executive and protective staff.*—The division consists of four ranges each in charge of rangers, and 37 beats (protective units) each in charge of a forest guard and a watcher. For assisting in the protection of reserves and in the supervision and execution of works in them, there are seventeen foresters, some of whom are in charge of important sections (group of beats), and others in charge of special forest works.

The names of ranges and the number of beats in each are given below:—

Name of range.	Number of beats.
Chelama	9
Gundlakamma	6
Giddalore	12
Sirvel	10
Total ...	37

3. *Cost of administration.*—The cost of administration (establishment charges including contingencies) has been Rs. 65,090 and it forms 82 per cent of the total expenditure (Rs. 79,234) in the division during the year.

4. *Cost under other important heads.*—The total expenditure incurred during the year under 'B. Conservancy and works' including '52-A. Capital' has been Rs. 14,238, of which Rs. 1,502 was spent on the construction of new roads, buildings and wells. Of the remaining expenditure, Rs. 2,093 represented cost of departmental timber operations which constitute the most important work of the division. The annual maintenance of roads, buildings, and wells involved an aggregate expenditure of Rs. 3,649 while fire protection operations have claimed Rs. 457.

The silvicultural experiments connected with finding out the best way of regenerating the hill forests of the Nallamalais, etc., have cost during the year, Rs. 521.

5. *Income from main sources.*—The chief item of revenue was from timber and fuel which together have contributed 45 per cent of the gross receipts of the year. Bamboos coming next have given 23 per cent of the gross revenue, while grazing was responsible for 14 per cent; minor forest produce is practically a negligible source of revenue.

	Rs.	
Timber	47,620	(Rs. 1,627 relates to unreserves.)
Fuel	10,961	(Rs. 1,404 do.)
Bamboo	29,466	
Grazing	18,732	
Minor produce	8,119	(Rs. 3,629 relates to unreserves.)
Miscellaneous	13,633	
Total	1,28,531	

6. *Chief works done in the division.*—By far the most important works in the division relate to the departmental extraction of big timber and to the leasing of the timber-cum-fuel, fuel and bamboo coupes of the year.

During the year a quantity of 25,000 cubic feet of comparatively big timber was extracted departmentally for sale, while a quantity of 123,000 cubic feet of small timber was extracted through forest lessees. As regards fuel, all fellings were mostly through lessees and an aggregate quantity of about 2,475 tons of fuel was placed on the market.

KURNOOL WEST.

Description and area.—The area of reserves under departmental control in the division is 856 square miles of which the Yerramalais form 300 square miles and the rest of the area is included in the western portions of the Nallamalais including their foot-hills.

The Yerramalais support a comparatively inferior type of a very much open deciduous mixed forest in which *Yepi* (*Hardwickia binata*) predominates in most parts, sometimes occupying pure patches—while teak, *Anogeissus*, and *Terminalia tomentosa* affect special localities. But, in nearly every case, the trees are stunted and malformed and nowhere are they fit for any timber, as even *Yepi* is only fit for fuel at present. The rainfall in this region is scanty and the soil generally of little depth.

The Nallamalai portion of the division, on the other hand, though also of a deciduous irregular mixed type of forest, has better soil and greater rainfall and the composition and condition of the forest are therefore better than those of the Yerramalais. But even here, areas fit for growing big timber are confined to special localities such as those in some of the inner valleys, and plateaus where remunerative timber felling is unfortunately not yet possible. The 'Terai' portions, however, contain areas where economic working of small timber and fuel is possible and it is here that the bulk of the *Chenebus* are established through whose agency the departmental works are being carried out.

Bamboos are abundant generally throughout the Nallamalais and they offer a steady source of revenue.

2. *Subordinate executive and protective charges.*—The division consists of seven ranges, two in the Yerramalais, and five in the Nallamalais, with 38 protective units (beats) on the whole. The names of ranges and the number of beats in each are as below:—

Name of range.	Number of beats.
Kurnool	9
Dhone	7
Nandyal	4
Gundlabrahmeswaram	5
Bairlaty	5
Sivaparam	6
Pecheruvu	2
Total	38

3. *Cost of administration.*—The cost of administration during the year (Establishment including contingencies) has been Rs. 63,592. This comes to 75 per cent of the total expenditure (Rs. 87,932) of the division.

4. *Cost under other important heads.*—Hitherto the most important works in the division related to the departmental timber and fuel fellings in the terai portions and the Gundlabrahmeswaram plateau of the Nallamalais, both for the purpose of economic working of the forests and also for affording a steady source of employment to the chenchus of whom there is a large number depending on the forest department for help, but in the year 1927-28, departmental fellings were mostly given up in favour of felling by contractors through the agency of Chenchus. This resulted in a large saving of expenditure under timber and fuel operations. The maintenance of the Chenchu industrial schools has, however, been continued.

On the annual maintenance of roads, buildings and other works, an aggregate expenditure of Rs. 2,635 was incurred, while sowing and planting and maintenance of boundaries cost Rs. 576. The maintenance of two elephants for baggage purposes has cost Rs. 1,616 to the department. Fire protection involved an expenditure of Rs. 948, while the construction of new roads, building wells and improvement of water sources has resulted in an expenditure of Rs. 1,323.

5. *Income from main sources.*—The chief item of revenue was from small timber and fuel to an extent of 25 per cent of the gross revenue; minor produce has given 19 per cent while grazing gave 26 per cent. Bamboos are responsible only for 13 per cent of the gross revenue.

Details of revenue under each head are as below :—

	RS.
Timber	30,034 (Rs. 5,918 from unreserve).
Fuel	13,723 (Rs. 3,490 from unreserve).
Bamboos	17,236
Minor forest produce ...	60,610 (Rs. 32,790 from unreserve).
Grazing	36,015
Miscellaneous	21,670
Total	1,79,288

6. *Chief works done in the division.*—The chief works of the division consisted during the year of

(i) timber and fuel fellings in the terai portions of the Nallamalais carried out departmentally,

(ii) timber and fuel fellings elsewhere; bamboo fellings and minor forest produce collection throughout the division through the agency of lessees from well-defined extraction units and

(iii) the running of the Chenchu industrial schools.

The quantity of timber extracted during the year was 71,000 cubic feet of which 18,000 cubic feet were extracted through departmental agency. As regards fuel an aggregate quantity of about 6,800 tons was felled of which about 3,000 tons were through departmental agency.

7. *Revision of working plans.*—Mr. H. E. Brown joined the division early in January 1929 as Assistant Working Plan Officer and took up the preparation of the Nallamalais working plan under the orders of the Conservator

Pending the definite constitution of the different felling series for timber and fuel, coupes for 1928-29 were demarcated and sold to the fullest extent possible.

The revision of the Yerramalais working plan was nearing completion at the close of the year.

CUDDAPAH NORTH.

Description and area.—This forest division, which has 790 square miles of reserved forests in it managed by the department, covers the eastern slopes of the extreme south end of the Nallamalais, and also the Lankamalais, the Palakonda and the Veligonda Ranges with their foot-hills. The Veligondas on the east which form an unbroken chain, except where the Pennaru river cuts through them, separate this division from Nellore. The forests comprised in these hills are all deciduous, irregular and open, varying considerably in the condition and the density of the growing stock. The foot-hills and outer slopes are fuel forests. The inner slopes and plateaus contain a degraded type of pole forests in which red sanders predominates, mixed with *Pterocarpus Marsupium* and *Anogeissus latifolia*, which are the chief timber species of the district; in parts of the district *Hardwickia binata* occurs, often in pure patches, but it does not grow to any large dimensions.

Of the area shown in the last report, two square miles were transferred to the First Circle for administrative convenience.

2. *Subordinate executive and protective charges.*—The forest division is divided into five ranges each in charge of a forest ranger, and each range is split up into a number of beats, as noted below, each in charge of a forest guard and a watcher :—

Name of range.	Number of beats.
Sidhout	6
Badvel	8
Porumamilla	10
Vonipenta	12
Vontimitta	10
Total	46

3. *Cost of administration.*—In addition to the normal staff of the division, a staff of two instructors was employed for running the annual session of the Vernacular Training School, for forest guards, attached to this division and the cost of all establishment, including contingencies, was Rs. 64,206. Establishment alone has cost—

	RS.
(a) District Forest Officer	11,163
(b) Rangers	10,584
(c) Subordinate staff	21,526
(d) Clerical staff	10,369
(e) Vernacular Training School	7,071
Total	60,713

4. *Cost under other important heads.*—The total expenditure incurred during the year on account of all the ordinary and capital works, debitable to "B. Conservancy and works and 52-A. Capital" was Rs. 14,916. In view of the fact that all the annual operations connected with the extraction of timber and other forest produce are carried out through contractors to whom the right to collect and dispose of the annual yield from well-defined areas is leased, no expenditure was incurred on the exploitation of forest produce during the year. The only expenditure on departmental operations was in felling the indicator areas in coupes to be leased out. A sum of Rs. 8 was spent on the experimental manufacture of cutch on a small scale to find out if it would pay to work it on a larger scale.

Among the other works of importance, the following may be mentioned:—

	RS.
Tiling the rest-house at Kothabhavi	349
Part construction of subordinates' quarters at Balaya-palle	350
Part construction of a tube well at Chennellettibatihavi.	257

All other works carried out in the year were of a recurring nature, such as the maintenance of the existing roads and buildings, cultural operations and fire protection, etc.

As regards the manufacture of cutch, the result so far has not been encouraging. A sample of the local wood has been sent to the District Forest Officer, North Mangalore, for trial there and the result is awaited.

5. *Income from main sources.*—The main source of income was from small timber and fuel which together contributed about 36 per cent of the gross revenue, and from grazing which contributed about 35 per cent during the year. Details of revenue from various items are given below:—

	RS.
Timber	17,998 (Rs. 1,439 relates to unreserves).
Fuel	12,030 (Rs. 2,237 relates to unreserves).
Bamboos	5,303
Minor forest produce	8,322 (Rs. 3,700 relates to unreserves).
Grazing	30,499
Miscellaneous, including confiscations, rent of buildings, etc. ...	10,361
Total	84,513

The rate of grazing fee was enhanced during the year from three to six annas a cow-unit.

6. *Chief works done in the division.*—During the year, 59,000 cubic feet of small timber and about 6,717 tons of fuel from about 1,810 acres were extracted through the agency of contractors. All bamboo coupes of the year were also similarly leased.

7. A working plan for the whole division was prepared and sanctioned during the year.

CUDDAPAH SOUTH.

Description and area.—The area of reserved forests in the division, in charge of the department, is 689 square miles, made up of the whole of the Seshachellam hills on the west, all the Veligondas South of the Pennernu, with their foot-hills on the east, and a portion of the Palakondas in between. The forests throughout are of the dry deciduous, irregular and open type, red sanders being the principal species in all the outer slopes and plateaus up to about 2,000 feet elevation. The foot-hills consist for the most part of fuel forests, while localities above the 2,000 feet level contain varying abundance of a stunted growth of *Shorea Tumbuggaia*, *Shorea Talura* and *Eugenia alternifolia* not fit for timber.

Though this division is the chief home of red sanders, which is a very valuable timber tree, trees of this species above 30 inches girth are few and far between and, even among the smaller trees, sound poles do not generally exist over large areas.

The red sanders plantation at Kodur, however, is the only locality where some big red sanders have been successfully grown by the department.

The other timber species common to the division are:—

- (1) *Anogeissus latifolia*,
- (2) *Chloroxylum swietenia*,
- (3) *Terminalia tomentosa*,
- (4) *Hardwickia binata*, and
- (5) *Pterocarpus Marsupium*,

but none of these grow to any large size before getting hollow and unsound.

2. *Subordinate executive and protective charges.*—The division consists of the following range-charges, each under a ranger. The number of protective-units (beats) is as below:—

Name of range.	Number of beats.
Cuddapah	7
Rajampet	10
Kodur	8
Balapalle	9
Chitvel	8
Sanipaya	10
Total	52

3. *Cost of administration.*—The cost of administration (establishment charges including contingencies) for the year 1928-29 was Rs. 63,391.

4. *Cost under other important heads.*—There were no special works of importance over which large amounts were spent. The following are the few items of works undertaken during the year:—

- | | |
|---|-----|
| | RS. |
| (1) Completion of the rest house at Ankimadugu with out-houses in Cuddapah range. | 344 |
| (2) Sinking of a well in the compound of the proposed range quarters at Rajampet. | 219 |

An amount of Rs. 690 was spent on the acquisition of site for the construction of range quarters at Rajampet.

The rest are all works of a recurring nature such as repairs to buildings and roads, fire protection and other works of minor importance. The aggregate expenditure under 8 (b) Conservancy and works and 52-A Capital was Rs. 18,666 as against Rs. 18,456 spent in the previous year.

5. *Income from main sources.*—The main sources of income were leases of timber and fuel coupes under sanctioned working plans, leases of bamboos and minor forest produce, grazing and penning of cattle in the reserves, and compounding fees collected in forest offences.

An amount of Rs. 848 was realized by the sale of sandalwood, extracted from Kodur red sanders plantation in Balapalle Range, which was sent to Vellore, for sale by the District Forest Officer, Vellore. The total revenue realized from all sources was Rs. 1,18,149 as against Rs. 95,053 in the previous year. Details of revenue under the various heads are given below :—

	Rs.
(a) Sandalwood	848
(b) Timber	36,977 (Rs. 697 relates to unreserves).
(c) Fuel	33,298 (Rs. 787 relates to unreserves).
(d) Bamboos	7,150
(e) Grazing	18,785
(f) Minor forest produce (Rs. 6,499 relates to unreserves).	12,733
(g) Miscellaneous	8,358
Total	1,18,149

Timber and fuel formed the chief items of revenue and they contributed 59 per cent.

The striking feature of the year's financial results is that the district which has been working at a very heavy deficit for the past several years, showed a marked profit during 1928-29 giving a surplus revenue of Rs. 36,092 against a deficit of Rs. 13,069 during the five years ending with 1927-28. It is expected that this surplus will be maintained in all future years.

6. *The chief works done in the division.*—The works carried out during the year were of a routine and recurring nature. The extraction of both major and minor produce was carried out, as usual, through the agency of lessees, under departmental supervision. About 81,600 cubic feet of small timber and 25,000 tons of fuel from an area of 4,360 acres were placed on the market during 1928-29, as against 45,000 cubic feet of small timber and 23,500 tons of fuel from an area of 2,875 acres during 1927-28. Grazing and penning were allowed, as usual, on permits issued at fixed rates—the grazing fees for local cattle having been increased from 3 annas per cow-unit to 6 annas per cow-unit during the year, in accordance with Government Order No. 64, Development, dated 17th January 1927.

One important feature in working the forests of the division, was the attempt made in preparing a single working plan for all the reserves in the division, which was nearing completion at the close of the year.

SUMMARY OF PROGRESS DURING THE FIVE YEARS 1924-25 TO 1928-29.

Administration.—The following officers held charge of the Circle during the period under review :—

	From	To
Mr. T. Clear ...	1st April 1924 ...	27th September 1924.
Mr. C. C. Wilson.	28th September 1924.	18th November 1925.
Mr. T. A. White-head.	19th November 1925.	31st March 1926.
Mr. F. R. Madan.	1st April 1926 ...	6th January 1928.
M.R.Ry. Rao Sahib K. R. Venkata-ramana Ayyar.	7th January 1928.	31st March 1929.

2. *Changes in the administrative charges.*—The more intensive forest management that became possible, as a result of the completion of the reclassification of forests and the transfer of all minor (ryots') forests to the control of the Land Revenue Department for management by panchayats, was followed, during the quinquennium by a readjustment, with effect from 1st May 1925, of the territorial charges which were reduced from six to five, with a separate Conservator to be in charge of working plans. As a consequence of this arrangement, the three Cuddapahs and Chittoor divisions were transferred from the III to this (II) Circle. Subsequently, however, the latter division was transferred to the IV Circle except the forests comprised in the Madanapalle taluk. The Guntur division was transferred to the I Circle. The Bellary and the Cuddapah West divisions were abolished, the former being merged in the Anantapur division and the forests of the latter being distributed among the remaining two Cuddapahs and the Anantapur division. The net result of all these changes was that the II Circle had in it four major and two minor divisional charges, and thirty-two forest ranges at the close of the quinquennium.

The forest divisions at the end of the quinquennium were—

Anantapur (minor).	Kurnool West (major).
Kurnool East (minor).	Cuddapah North (major).
Kurnool South (major).	Cuddapah South (major).

3. *Changes in the executive and protective staff.*—The following ranges were abolished :—

Rachakonda range in *Kurnool East*, Gooty, Tadpatri, Madakasira, Kadirri and Bellary ranges in *Anantapur*, and Oak range in *Kurnool South*.

A considerable reduction in the number of foresters and forest guards was also made as a result of the handing over of ryots' forests to panchayats.

4. *Changes in area.*—The area of reserves at the commencement and close of the quinquennium was as below:—

	At commencement of the quinquennium. SQ. MILES.	At the end of the quinquennium. SQ. MILES.
Reserved forests ...	6,477	5,838
Reserved lands ...	3	...
	6,480	5,838

The 5,838 square miles of reserved forests shown above consist of 4,830 square miles under the control of the Forest Department, and the rest (1,458 square miles of ryots' forests) under the Land Revenue Department. The latter include, however, six square miles not yet handed over, as panchayats could not so far be formed for them.

5. *Forest settlement.*—There was no area pending settlement at the end of the quinquennium.

6. *Demarcation.*—The total length of artificially demarcated boundaries at the close of the period was 4,323 miles, against 6,694 miles at the commencement. The decrease was chiefly due to the exclusion of ryots' forests from the departmental return.

Twenty-three miles of new demarcation were done during the period.

7. *Surveys.*—No work was done either by the Survey of India or by the Madras Survey Party.

8. *Working plans.*—The quinquennium under report marks a definite stage in the activities of the department towards the solution of some of the sylvicultural problems connected with the regeneration of a few of the more important timber species in the Nallamalais of the Kurnool district. An officer was placed on research work in the Kurnool district and as a result of the experiments carried out by him, the preparation of a working plan for the Nallamalais of the *Kurnool West* division was taken in hand after the close of the quinquennium. Several other working plans and schemes were also prepared and sanctioned during this period, the chief of which being those for the forests comprised in the *Cuddapah North*, *Kurnool East* and the major part of *Kurnool South* divisions. Similar working plans were nearing completion at the close of the period in the *Anantapur* and *Cuddapah South* divisions, the plans in all these cases being prepared by the District Forest Officers themselves in addition to their duties.

The aggregate area under working plans and schemes at the commencement of the quinquennium, in respect only of reserves now comprised in the Circle, was 496 square miles and the corresponding area at the close of the quinquennium was 2,430 square miles.

The introduction of the method of concentrated regeneration of sandalwood in suitable localities in all the divisions was also an additional feature during the period under review.

9. *Communications and buildings.*—The average annual expenditure on communications, buildings and other works amounted to nearly Rs. 41,000, which is slightly in excess of the average of the previous quinquennium. Forty-four miles of new roads and paths were constructed at a cost of Rs. 14,555; Rs. 32,674 were spent on new buildings and Rs. 8,281 on wells, etc.

10. *Forest offences.*—No comparison is possible in view of the administrative changes and the exclusion of figures relating to forest offences in 'panchayat' reserves from the annual returns. The average number of forest offences during the past two years, however, was 4,000 per annum and it may be said that offences have not been on the increase.

11. *Fire protection.*—The system of early-burning referred to in the last quinquennium was continued during the period under report with, more or less, satisfactory results, the operation being confined strictly to real danger zones and to the comparatively more valuable forests, special regard being, at the same time, paid to the staff available and to the amount of responsible supervision that could be exercised in each division for the execution of the work within the limited time available for real early-burning. The average annual cost during the previous quinquennium was Rs. 14,000, as against Rs. 7,000 during the period under report. The expenditure in 1928-29 was, however, only about Rs. 4,000, as much of the work was done exclusively by the staff. In 1928-29, 689 square miles were dealt with under early-burning, at an average cost of Rs. 4-2-0 per square mile. A small area of 6 square miles was dealt with under special protection by a system of fire lines, at a cost of Rs. 5-15-0 per square mile. In the rest of the area of 3,691 square miles comprised in the Circle, all the old fire lines were maintained at a cost of Rs. 1,186.

12. *Protection from cattle.*—Owing to several changes in administrative and divisional charges, no comparison is possible of the position during the period under report, with the previous quinquennium. Areas primarily intended for grazing have been handed over to panchayats. The area opened to grazing at the end of the period was 4,119 square miles, out of 4,386 square miles, and it forms 94 per cent of the total area. The number of cattle, licensed to graze during the period, expressed in cow-units was 332,962 which works out to about 8 acres per cow-unit on an average for the whole Circle.

The block system of grazing was abolished during the period, and it was replaced by a range-wide system which enabled cattle to graze in all the reserves of a range on a single permit.

The rate of grazing fee remained the same as in the last quinquennium, except in the *Cuddapah district* where it was enhanced from three annas to six annas a cow-unit from 1928-29. Even so, there are varying rates in different divisions, i.e., three annas, six annas and eight annas a cow-unit. On the subject of the unification of grazing fees in all the divisions, a special report was submitted during the quinquennium on which orders of Government were awaited at the close of the period.

The Committee appointed to enquire into the forest grievances in the Kurnool district concluded its enquiry and orders of Government were passed on the several questions discussed in the report of that body.

13. *Yield and outturn.*—No true comparison with the previous quinquennium is possible, due to changes in the administrative and divisional charges, and to the transfer of the ryots' forests to panchayats. It may, however, be observed that the chief feature during the period under report was the replacement of departmental agency by contractors in the working of timber, fuel, bamboo and minor forest produce areas with, at the same time, adequate provision for supply of fuel, and small timber for agricultural

implements, to ryots at cheap rates at edge of coupes. The proposal which was, at one time, made for large scale timber operations in the Nallamalais, under modern methods, with mechanical appliances, etc., was thrown out, after investigation, as unsuitable and uneconomical and, instead, special steps were taken for increasing the annual output of timber, fuel and bamboos by bringing in all the economically workable areas under fellings, in the usual way, through lessees, on the basis of the working plans framed for the purpose in the *Kurnool South* and *East* divisions, with gratifying results.

The following statement shows the yield of timber and other produce during each of the past three years from the reconstituted six divisions now in the Circle, after nearly all changes in the area had been completed at the close of 1925-26 :—

Year.	Timber in thousands of cubic feet.	Fuel in thousands of cubic feet.	Bamboos in value.	Minor forest produce in value.
			RS.	RS.
1926-27	770	4,075	73,751	3,19,736
1927-28	721	5,631	64,237	3,15,120
1928-29	771	5,096	66,908	3,93,862

14. *Financial results.*—While no true comparison is possible of the financial results of the period under review with those of the previous quinquennium, some idea may be gathered of the progress during the period under report, in regard to the financial position of the Circle as at present constituted as compared with that of the same forest divisions in 1923-24 (the last year of the previous quinquennium), in spite of the latter year and also the years 1924-25 and 1925-26 including the revenue and expenditure on account of the ryots' forests which have, from the beginning of 1926-27, been practically all transferred to the panchayats :—

Year.	Revenue.	Expenditure.	Surplus plus or deficit minus.	Remarks.
	RS.	RS.	RS.	
1923-24 ..	7,98,334	7,93,290	+ 5,044	} Excludes Madanapalle range figures included in the Circle from 1926-27.
1924-25 ..	7,96,450	7,68,126	+ 28,324	
1925-26 ..	9,20,607	7,46,287	+ 1,74,320	
1926-27 ..	9,00,706	6,87,489	+ 2,13,217	
1927-28 ..	9,00,588	6,17,328	+ 2,83,260	
1928-29 ..	9,45,386	5,17,142	+ 4,28,244	

The above figures show that what was a surplus of only Rs. 5,044 during the year prior to the period under report, has been steadily increasing every year until, at the close of the period under review, it has reached a record. The special feature of this period is that one of the deficit divisions (*Cuddapah South*) was converted into a surplus one during 1928-29, while the annual deficits in *Cuddapah North* and *Kurnool East* were considerably reduced during 1928-29, the remaining divisions having had generally a steadily increasing surplus until the maximum had been reached in 1928-29.

15. *Hill tribes.*—The ameliorative works connected with the uplift of the Chenchus in the Kurnool district were continued during the period under review, at the expense of the Forest Department, the average annual expenditure incurred being Rs. 25,834 during the last three years for which the expenditure had been recorded separately.

The monthly earnings of the Chenchus had increased considerably during this period, on account of the steadily increasing occupation provided by the department for all the able-bodied, in the shape of timber, fuel and bamboo felling work. But they continued to be apathetic to agricultural pursuits and the progress in this direction was practically nil. In the matter of education, the curriculum of studies, it is feared, has not perhaps been on right lines and this and other connected matters have come under separate investigation after the close of the period under review.

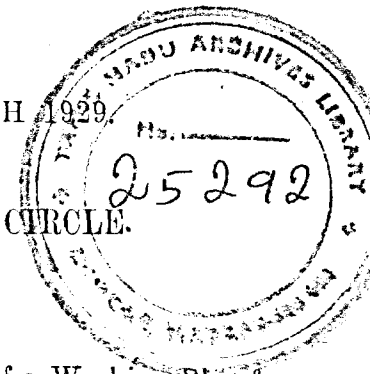
K. R. VENKATARAMANA AYYAR,
Acting Conservator of Forests, II Circle.

BELLARY,
6th September 1929.

ANNUAL ADMINISTRATION REPORT OF THE FOREST DEPARTMENT

FOR THE
YEAR ENDING 31st MARCH 1929.

THIRD (WORKING PLANS) CIRCLE.



INTRODUCTION.

In the course of the year the preparation of a Working Plan for the sandal bearing forests of North Coimbatore division was taken up and work of stock-mapping and enumeration is in progress.

The special regeneration experiments started in the Kannikatti forests of the Tinnevely district were continued by the Assistant Working Plans Officer, Tinnevely.

2. Preparation of tables of yield of scented sandalwood (according to girths of standing trees) along with the necessary graphs were prepared for four ranges of Vellore division by Mr. C. R. Ranganathan, Deputy Conservator of Forests, who was on special duty from 12th March 1928 to 6th April 1928. Similar work regarding the other sandal areas, where proper accounts of the complete stem and root yield from individual trees are maintained, will be attended to on receipt of the necessary information from the Conservator of Forests, IV Circle, with whom the subject is under correspondence.

3. The preparation of volume tables for certain deciduous species, referred to in the last report, is under progress and is being attended to.

Volume tables for *Terminalia paniculata* based on 900 trees felled in Nilambur division have been compiled to-date.

4. The final proofs of the Madras Forest Pocket Book were sent to the Press after the close of the year and the book is expected to be issued shortly.

5. For silvicultural research the progress already made has been maintained and the special feature is the attention paid to the problem of successfully growing a second rotation teak crop in Nilambur.

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Extensive experiments regarding the regeneration of certain areas with the evergreen species, are being conducted in the Dhoni and Silent Valleys (Palghat division).

6. The Working Plans Conservator (Mr. Minchin) and the Forest Research Officer (Mr. Littlewood) were deputed to attend the Silvicultural Conference held at Dehra Dun from the 18th March 1929. The Conservator read a paper "Regeneration of evergreen forests" and which is published at pages 51 to 56 of Part II of the Notes and Papers to be read at the Conference.

CHAPTER I.—DETAILS OF WORK UNDERTAKEN IN CONNEXION WITH THE PREPARATION AND REVISION OF WORKING PLANS.

Working Plan for the deciduous forests of Wynad division.

7. This Plan was completed within the year and sanctioned by the Chief Conservator of Forests in his Proceedings No. 127 of 1929, dated 8th April 1929.

Revision of the Working Plan for the Sal forests of Ganjam division.

8. The work has made considerable progress and stock-mapping for a large area has been finished by the Working Plans Officer with the help of his rangers and foresters. It is expected that this Working Plan will be completed by about December 1929.

Revision of Mount Stuart Working Plan.

9. Three parties were employed under the Working Plans Officer and completed 7,290 acres during 1928-29, bringing the total area cruised up to 11,182 acres. Progress was slow owing to the limited staff available and due to heavy incidence of sickness during the months of January to March. The area remaining to be completed is about 11,300 acres, and arrangements have just been made to increase the staff employed for this Working Plan area and hence the progress henceforth will be more rapid.

Working Plan for forests of South Mangalore.

10. A reconnaissance report was drawn up by the Working Plans Officer and it was forwarded to the Chief Conservator of Forests and his general orders regarding the manner of future working were obtained.

The following is a brief resume of progress of field work carried out in 1928-29 in Mangalore South:—

Approximately 27,500 acres were stock-mapped, according to silvicultural types in Sampaji (part), Thodikan, Bantemale, Aranthakallu, Balpa, Yenekal and Mujur reserves and detailed compartment descriptions were prepared.

In addition 6,900 acres in Bhagimale reserve was roughly stock-mapped for Mesua areas and Bhagimale reserve (7,000 acres) were reconnoitered for Hopea, Poon, Mesua, and Artocarpus.

Enumerations over 160 acres in Sampaji reserve were also completed.

Working Plan for the Dhoni, Silent and Attapadi Valley reserves of Palghat division.

11. Assistant Working Plans Officer Mr. T. V. Venkateswara Ayyar was posted for this duty from the beginning of January 1929, and up-till March was engaged in laying out felling series, selecting areas suitable for teak planting, etc., in Chenat Nair reserve with a view to revise the rough scheme drawn up by Assistant Conservator Mr. Lasrado.

Working Plan for the Nallamalai forests, West Kurnool division.

12. The Assistant Working Plans Officer (Mr. H. E. Brown) joined the division on 7th January 1929 and till March 1929 was engaged in reconnoitering the forests in the Bairlutty, Gundlabrahmeswaram and Nandyal ranges. He was able to complete stock-mapping of about 2,000 acres of the Velgode and Nandyal reserves.

CHAPTER II.—SILVICULTURAL RESEARCH AND EXPERIMENTS.

13. Mr. Littlewood was Forest Research Officer throughout the year. It has been decided that his report is, in future, to be printed as a bulletin. The following account therefore merely outlines the work done by him and refers to any final or intermediate results obtained.

I. EXPERIMENTAL SILVICULTURE.

(i) General.

14. (a) *Teak*. (*Tectona grandis*) *Second rotation teak areas*.—The difficulty of establishing a satisfactory second rotation teak crop on clear felled plantation areas at Nilambur has been referred to in the reports of former years. The beneficial effect of soil aeration by

ploughing has been noted previously. An experiment on a very small scale conducted in the year under review, where soil aeration on such an area was very thoroughly achieved by two forkings, the latter one at the close of the monsoon, confirms the conclusion drawn before. It confirms also, in a somewhat striking manner, the effect (noted in the report for 1926-27) which a thorough soil aeration has in prolonging the growing season. The Forest Research Officer suggests that this is likely to be the solution of the problem of raising second rotation teak crops. On clear felled plantation areas the soil, already somewhat exposed and impoverished, cannot be given the chemical and physical benefits of a good burn, as there is little waste material for burning. It is thought that a thorough aeration of the soil, by whatever method proves cheapest on a large scale, will largely counteract this disadvantage.

Cover crops.—Plots at Nilambur were devoted to studying the question of introducing a soil improver in second rotation teak crops. Boga (*Tephrosia candida*) and *Centrosema pubescens* were introduced with the teak. It was thought that these might serve the double purpose of soil-improver and weed-suppressor. *Centrosema* failed to establish itself, but boga grew well. As a weed-suppressor however it was not a success. It was more trouble and expense to grow it, and latter to control its growth, than to carry out ordinary weeding and soil aeration. Whether it can be used successfully as a soil-improver in teak plantations remains to be seen. It is now realized that in Travancore it is introduced in the plantation's second year, and is regarded as a soil-improver pure and simple. Further experiments on these lines are being undertaken by the District Forest Officer.

Teak grown from stumps.—Some alarm was occasioned by cases of unsoundness found in young teak, raised from stumps, which were examined by the Forest Research Officer at Nilambur. Further investigation in Palghat, Kurnool and the Nilgiris does not give conclusive results, but appears to indicate that, in the drier districts at all events, there is probably little to be feared, provided the work is properly done. It is in the drier districts that the use of stumps (with their more rapid early growth) possesses the greatest attractions. The matter will be pursued further.

15. (b) *Rosewood (Dalbergia latifolia)*.—In Bolampatti Plot No. 45 (Palghat district) rosewood raised in 1925 by sowing on bunds with field crop cultivation between continues to do exceedingly well, in spite of some browsing. An experiment on similar lines has been started at Nilambur. Both here and at Mount Stuart (by Mr. Laurie) it has been found that young rosewood must have its head

kept free, but the side shade of coppice and weed growth appears to have a beneficial effect. As might be expected soil aeration was found to benefit, to a very marked degree, the growth of young rosewood.

16. (c) *Vengai (Pterocarpus Marsupium)*.—Experiments at Mount Stuart (by Mr. Laurie) confirm observations previously made that this species is very tolerant of weed growth, and appears to continue vigorous and healthy even when completely smothered by weeds. In Mettupalaiyam Range a similar observation was made by the Forest Research Officer.

17. (d) *Aerocarpus fraxinifolius*.—Both sowings and plantings at Nilambur have failed, confirming experience in Palghat noted in last year's report. Stump planting in Palghat gave indifferent results.

But at Neelikal in the Silent Valley (Palghat) dibbling of seed in openings caused by light selection fellings shows promise, though it is too early to draw conclusions.

18. (e) *Improvement of coppice coupes*.—It seems almost certain that poor fuel forest, typical of the hotter and drier districts must tend to deteriorate under a system of simple coppice fellings. In most of such areas regeneration, other than from the coppiced stools, is conspicuously absent. A very large area is treated in this way throughout Madras. The problem of improving coppice coupes by the introduction of fresh stock of suitable species is therefore a pressing one. In many districts attempts have been made in this direction in the past without producing any very notable results. The matter has now been taken up by the Forest Research Officer who has opened plots in the fuel areas of Mettupalaiyam Range.

19. (f) *Stocking gaps caused by Selection fellings*.—At Mount Stuart in deciduous forest Mr. Laurie succeeded in stocking gaps caused by the removal of trees in selection fellings with seedlings of useful species. Unfortunately the surrounding bamboos have flowered, so the effect of side shade on the development of the seedlings cannot be studied.

Attempts to regenerate similar "funnels" in evergreen forest in the Silent Valley and at Kannikatti in Tinnevely district have also been made, with encouraging results—but it is much too early to draw conclusions.

(ii) *Natural Regeneration.*

20. The Forest Research Officer continued to observe the evergreen forest natural regeneration plots at Sappal (Palghat).

In Karian Shola (South Coimbatore) plots were opened to ascertain how to deal with the dense mass of *Strobilanthes* which comes in and swamps all natural regeneration as soon as an opening is made in the canopy.

In Ganjam the Working Plans Officer (Mr. M. Kesavanunni Nayar) continued his experiment in the Rambha Ravine area, the object of which is to find out how to obtain natural regeneration of Sal (*Shorea robusta*) in ravine areas where Sal regeneration is absent or deficient. A bad seed year interfered with this as an experiment in *natural* regeneration; but by broadcasting selected seed results were obtained which may be regarded as encouraging.

(iii) *Seeds.*

24. Five new species were added to the list of weights of seeds.

Germination tests were made with seed of *Acrocarpus fraxinifolius*, of Sandal, and of *Mesua ferrea*. Seed of the first named species was found almost entirely infertile after storing for one year. Seed of *Mesua* remained fertile for only about 6 weeks after collection.

At Nilambur experiments with teak seeds of different origin were undertaken. Soaked and unsoaked seed from:—

- (1) Mount Stuart (natural forest)
- (2) Nilambur (natural forest)
- (3) Selected trees in Nilambur plantations, and
- (4) Unselected trees in Nilambur plantations

were sown in varying kinds of nursery bed (all 4 kinds in each kind of bed). Except in No. 4 (above) seeds were from the best class of seed-bearer to be found. Results indicated that, except with Mount Stuart seed soaked seed gave the best results in quicker and more even germination. Soaked natural forest seed did better than any others, but unsoaked plantation selected tree seed did better than unsoaked natural forest seed. There was little to choose between soaked plantation seed from selected and from unselected trees. The sunk type of nursery bed gave the best results.

But in subsequent growth (after planting out) the seedlings of all classes evened up and there was little to choose.

(iv) *Nursery work.*

27. Large scale nursery experiments with 10 deciduous and 8 evergreen species were initiated at Dhoni (Palghat). The Nilambur experimental nursery was maintained.

Reference is made above (under "Seeds") to a nursery experiment with teak seeds of different origin.

Evergreen nursery experiments were also conducted at Kannikatti (Tinnevely) by the Assistant Working Plans officer.

It was proved that a nursery for *Mesua ferrea* must be placed in the open. (Neelikal and Karian Shola.)

(v) *Artificial regeneration.*

23. Reference has been made above ("General") to a number of experiments in artificial regeneration.

In addition may be noted experiments in "notching out" germinating sandal seed (North Salem, by the District Forest Officer), with Red Sanders (*Pterocarpus santalinus*) by the District Forest Officer, Chittoor.

The plots previously in existence were observed and enumerated. No striking results are recorded.

(vi) *Reclamation and Afforestation.*

Nil.

(vii) *Thinnings.*

Nil.

(viii) *Mixtures.*

Nil.

(ix) *Underplanting.*

24. The Nilambur experiments undertaken with a view to ascertain a method of introducing an underwood under the teak in the plantations were continued. Detailed notes are recorded in the Forest Research Officer's report. The results achieved are not impressive and it cannot be claimed that our knowledge of the subject has advanced appreciably. A point which appears to be established is that fair sized seedlings (in the case of *Mesua*, and probably with most species) are to be preferred for underplanting as they do not suffer so much from "drip" as smaller seedlings.

(x) *Silvicultural system.*

Nil.

(xi) *Miscellaneous.*

25. An experiment at Nilambur with stumps of *Iloepa parviflora*, *Artocarpus hirsuta*, *Dalbergia latifolia*, *Lagerstroemia lanceolata* and *Mangifera indica* from plants varying from 1 to 3 years old tends to show more successful results from stumps from the older plants. Stumps of *Artocarpus hirsuta* did well—a point of special interest, as so far attempts to raise this species by other methods have met with very little success.

II. WORKING PLANS AND STATISTICS.

(i) *Working Plans.*

26. Working Plans are dealt with elsewhere in this report.

(ii) *Yield tables.*

Nil.

(iii) *Volume tables and Form factors.*

27. A provisional volume table for *Terminalia paniculata* in Nilambur District was prepared by Mr. Pearce, Logging Engineer, based on measurement of 900 trees.

Figures for the preparation of volume tables for a number of species are accumulating in the Forest Research Officer's office and it is expected that provisional tables can shortly be prepared.

(iv) *Bark measurements.*

Nil.

CHAPTER III—ADMINISTRATION.

28. Mr. A. Wimbush held charge of the circle up to 3rd August 1928 and afterwards Mr. A. A. F. Minchin up to the end of the year.

29. The following officers were attached to the circle as Working Plans Officers, officers on special duty and Assistant Working Plans Officers :—

Name of officer.	Period.
<i>Working Plans Officers.</i>	
Mr. R. S. Browne	Up to 6th April 1928.
Mr. J. Coode	Up to 13th December 1928.
Mr. M. V. Laurie	} Throughout the year.
Mr. M. Kesavanunni Nayar	
Mr. P. W. Davis	
Mr. C. R. Ranganathan	From 6th April 1928 to the end of the year.
<i>Officers on special duty.</i>	
Mr. C. R. Ranganathan	Up to 6th April 1928.
<i>Assistant Working Plans Officers.</i>	
Mr. M. H. Krishnaswami Ayyar	Up to 1st June 1928.
Mr. B. S. Kesava Vittal	Throughout the year.
Mr. T. V. Venkateswara Ayyar ..	From 3rd January 1929 to the end of the year.
Mr. H. E. Brown	From 7th January 1929 to the end of the year.

30. Mr. A. M. C. Littlewood held charge of the office of the local Silviculturist throughout the year.

TOURS.

31. The Conservator visited all the localities where works were in progress.

He also toured in the Nallamalais with the Conservator, II Circle, in the North Coimbatore Division with the Conservator, V Circle, and in the Silent and Attapadi Valleys and the Sandalwood Kumri areas in Coorg with the Chief Conservator of Forests.

HEALTH.

32. The health of the establishment during the year was on the whole satisfactory.

APPENDIX

SUMMARY OF PROGRESS DURING THE FOUR YEARS,
1924-25 TO 1928-29.

ADMINISTRATION AND CONTROL.

The old III (territorial) Circle with headquarters at Madras as constituted in February 1921, was abolished on 1st May 1925 and the present III (Working Plans) Circle with headquarters at Ootacamund, was constituted from the same date in accordance with G.O. Mis. No. 1008, Development, dated 14th July 1925. Soon after the formation of this Circle, the Forest Research Officer who since the creation of the post in 1919 was attached first to the V Circle up till 1924 and then to the VI Circle, was transferred to the control of the Working Plans Conservator.

Hence this report covers the period of last four years beginning with May 1925, though the review of the Research branch is for full five years.

The following officers were in charge of the Circle since its formation :—

Year.	Officer.	Period.
1925-28	Mr. A. Wimbush	From 1st May 1925 to 3rd August 1928.
1928-29	Mr. A. A. F. Minchin	From 4th August 1928 to 31st March 1929.

STAFF.

The sanctioned staff of the new circle was—

One Conservator of Forests.

Five Working Plans Officers

Three Assistant Working Plans Officers (belonging to Provincial Service) and ten Rangers.

In addition the following clerical staff for Direction office and for Working Plans Officers was sanctioned :—

One head clerk.

Three clerks (one post since abolished as a retrenchment measure from 1st March 1928),

One draftsman, and

One typist.

Five clerks (one for each of the five Working Plans Officers).

During the first two years of the existence of this Circle, little progress could be made in the preparation and revision of Working Plans, mainly due to shortage of suitable men for posting as Working Plans Officers, nor could the full sanctioned cadre of Rangers be filled up at once for lack of men available for transfer from other circles.

The following list shows the progress made by the Circle up till March 1929, in the matter of preparation of new plans or of revising existing ones in the whole Presidency :—

NEW WORKING PLANS.

Year of sanction.	Name of Working Plan.	Area covered by the Working Plan. ACRES.
1926-27	Punachi forests of South Coimbatore division	2,162
1926-27	Bolampatty Valley of Palghat division	25,518
1928-29	Working Plan for the deciduous forests of Wynad division	100,336
REVISION OF EXISTING WORKING PLANS.		
1926-27	Revised Working Plan for Beypore tope	42.55
1926-27	Revised Working Plan for the Walayar forests of Palghat division	9,600
1927-28	Revised Working Plan for the Mudumalai forests of the Nilgiri division	65,905
1928-29	Revised Working Plan for the Nilambur Valley forests	81,031

WORKING SCHEMES.

Revised scheme for working Blocks II and III of the Snowden Working Circle of the Nilgiri Division.

Brief scheme for the conversion of Bingham and Brooklands, Hunt Coverts to Eucalypt Hardwoods.

Experimental scheme for certain timber areas in the Vannathiparai forests of the Cumbum Valley of Madura district.

The following Working Plans are now under preparation.—

Working Plan for Mount Stuart forests of South Coimbatore division.

Working Plan for the Sal forests of Goomsur in Ganjam.

Working Plan for the forests of North Coimbatore division.

Working Plan for the forests of South Mangalore division.

Working Plan for the Nallamalais of Kurnool.

Working Plan for the Chenai Nair, Silent Valley, etc., forests of Palghat division.

In addition, in the first year, one Working Plans Officer and an Assistant Working Plans Officer were employed for a greater part of the year in continuing to supervise the cruising work carried on by the Logging Branch as they were employed on that work prior to their transfer to this circle. These officers also plotted maps and tabulated data from statistics collected by cruising parties in four localities in the Mount Stuart, North Mangalore, Nilambur and Palghat divisions.

The control records of all Working Plans at present in force in the Presidency, are annually scrutinized by the Working Plans Conservator.

GENERAL.

The preparation of a Forest Pocket Book for the Madras Presidency was taken up and completed by the Working Plans Conservator. The Chief Forest Engineer and certain Conservators assisted with matters relating to Forest Engineering and to various timber species. The book is now in the Press and printed copies are expected in the near future.

The work of preparation of Volume Tables for certain deciduous species has been taken up and is being attended to by the Forest Research Officer.

The special work of 'weight-outturn tables' for sandalwood was commenced in 1928 under the orders of the Chief Conservator, and up-to-date such tables with the necessary graphs have been completed for four ranges of Vellore division.

The office of the Logging Engineer was transferred from Madras to Ootacamund in 1928; in order that closer co-operation between the Working Plans Conservator and the Logging Engineer might be maintained.

About the close of the quinquennium the Conservator of Forests (Mr. Minchin) and the Forest Research Officer (Mr. A. M. C. Littlewood) were deputed to attend the Silvicultural Conference held at Dehra Dun. The former availed of the opportunity and read a paper on "Regeneration of Evergreen Forests" (which is published in Part II of the Notes and Papers to be read at the Silvicultural Conference).

Steady progress relating to the more urgent research problems of the Presidency has been maintained and is dealt with in the review prepared by the Madras Forest Research Officer, for the Quinquennium ending March 1929 and which is herewith enclosed.

F. R. MADAN,
Acting Conservator, III (Working Plans) Circle.

OOTACAMUND,
28th August 1929.

QUINQUENNIAL REVIEW OF FOREST RESEARCH IN MADRAS FOR THE PERIOD ENDING 1928-29.

I. GENERAL.

The Research Office which was transferred to Ootacamund in April 1924 continued to be located there. At the end of the previous quinquennium it was under the control of the Conservator of Forests, VI Circle, but in 1925 it was transferred under the control of the Conservator of Forests, III (Working Plans) Circle.

2. Mr. J. M. Sweet was the Provincial Silviculturist till March 1925, when Mr. J. D. Connolly took over. The latter went on long leave at the end of March 1928, since which time Mr. A. M. C. Littlewood has held charge.

II. RESEARCH.

3. Research work in Madras has so far been almost exclusively confined to the West Coast districts.

4. A study of the more important species of the evergreen, semi-evergreen and deciduous forests constituted the chief duty of the Silviculturist during the period under review. The work was carried out almost entirely by the maintenance of experimental plots both for studying natural regeneration and for the purpose of artificially raising crops and watching their development under varying conditions.

5. A good deal of nursery work was also undertaken in both the ranges of the Nilambur division and in the drier forests on the west of Coimbatore.

6. The results of those experiments have been recorded in the annual reports issued by the Research Officer and it is unnecessary here to give more than a very brief idea of the more important of them.

7. The necessity for underplanting the teak plantations in Nilambur has perhaps been the chief problem tackled and among a large number of species tried with varying degrees of success the following are the more important:—

- (a) *Hopea parviflora*,
- (b) *Artocarpus hirsuta* and *integrifolia*,
- (c) *Sweitenia macrophylla*,
- (d) *Hydnocarpus Wightiana*,
- (e) *Mesua ferrea*,
- (f) *Vateria indica*,
- (g) *Filicium decipiens*,
- (h) *Hardwickia pinnata*, and
- (i) *Carrallia integerrima*.

It will of course be many years before final results are established.

8. Improvement of second rotation teak in Nilambur has also been an important problem and experiments connected therewith have resulted in a certain measure of success. The growing of second rotation teak in conjunction with field crops was tried and proved impossible under conditions obtaining at Nilambur.

9. Attempts at improvement of poor coppice forest in dry areas were started as also a study of the regeneration of *Dalbergia latifolia*, *Pterocarpus Marsupium* and *Azadirachta indica* in conjunction with field crops.

10. Apart from the question of growing evergreens under teak at Nilambur some of the more important of them, viz., *Mesua ferrea*, *Calophyllum tomentosum* and *Artocarpus fraxinifolius* have been under study in their habitats both in connexion with natural regeneration and artificially raised crops.

11. Generally, much has been learnt about the silviculture and the silvicultural treatment, in the lower age classes, of many species.

III. STATISTICAL INFORMATION.

12. A large number of sample plots opened originally by the Research Institute, Dehra Dun, or by District Forest Officers, were brought under the control of the Provincial Silviculturist and maintained by him. In addition, several were formed by him in second rotation teak and in the hardwood *Eucalyptis* on the Nilgiris.

A party from Dehra Dun came to Nilambur in the winter of 1927 and gave the local establishment practical demonstration in respect of the formation and measurement of sample plots by the Standard method.

IV. LEDGER FILES.

13. Three hundred and seven specific and 38 miscellaneous ledger files on the model of those in use in the Research Institute, Dehra Dun, were maintained and kept up-to-date.

V. ESTABLISHMENT.

14. The clerical establishment remained at the end of the quinquennium as it was at the beginning: the executive establishment which, five years ago, consisted of 2 Rangers, 1 Forester and 2 Forest Guards had been reduced by the end of the quinquennium to 2 Rangers and 1 Forest Guard. It having been found impossible to carry on with so attenuated a staff, an increase was recently asked for and sanctioned.

FOREST RESEARCH OFFICE,
18th August 1929.

A. C. LITTLEWOOD,
Forest Research Officer.

ANNUAL ADMINISTRATION REPORT OF THE FOREST DEPARTMENT

FOR THE
YEAR ENDING 31st MARCH 1929

FOURTH CIRCLE

CHAPTER I.—CONSTITUTION OF STATE FORESTS.

1. ALTERATION IN AREA.

Reserved forests and reserved lands.—Three thousand two hundred and eighty-one acres were disforested, of which 2,415 acres represent the area of coffee estates on the Shevaroy's which were disreserved and transferred to the control of the Revenue Department. 626·06 acres is the area in Vanavasi Panchayat Forest in *South Salem* disreserved for the Mettur Project. The balance consists of small items in *Vellore* and *Central Salem*. 801 acres were added by resurvey and correct computation in *South Salem* and 13·55 acres of reserved land were notified as reserved forest in *Central Salem*.

The net area at the close of the year was 3,356 square miles.

Forty-eight square miles of departmental forests were transferred to the control of panchayats during the year.

2. FOREST SETTLEMENT.

2. An area of 13·55 acres in Varanjaram reserved land in *Central Salem* was notified under section 16 of the Forest Act with effect from 28th March 1929.

3. DEMARCATION.

3. Permanent demarcation of Aiyur extension reserved forest and Hudaidurgam reserved forest in *North Salem* was carried out during the year to a distance of 24 miles 3 furlongs at a cost of Rs. 323. Rupees 18 was spent in *Chittoor* to cut a new line in Karapet reserve 29 chains long to separate the area handed over to panchayats, and to demarcate Venkatagirikota road passing through Nayakaneri extension reserved forest and Paddanayakdrug reserved forest. The existing boundary lines of reserves were maintained

by the protective staff. *Chittoor*.—Rs. 36-4-0 was spent in replacing a broken boundary stone in Panapakkam reserved forest and in demarcating a portion of Nayakaneri reserved forest by means of a cut line 12 feet broad for a length of $3\frac{1}{2}$ miles, and Rs. 75-1-6 for whitewashing cairns in all the ranges of the division. *Vellore*.—Rs. 32 was spent on reclearing the top boundary lines of Inner Javadis, Andiappanur and Mambakkam reserves in Alangayam range over a length of 15 miles and on replacing a broken stone slab in Mulakad reserve. In *North Salem*, Rs. 153 was spent in repairing cairns and clearing lines. In *Central Salem*, line clearing was done for 329.60 miles at a cost of Rs. 746-12-0. Rs. 32-4-0 was spent in clearing the boundaries of Aranah and Thirthagiri reserved lands, the total length being 16 miles and one furlong. In the same division Rs. 1,060-2-0 was spent on clearing coupe and strip lines and Rs. 133-12-0 on planting coupe corner stones in the coupes already worked.

4. FOREST SURVEYS.

(a) There was no survey by the Survey of India.

(b) Party No. III of the Madras Survey took up the resurvey of Omalur, Atur, Salem, Namakkal, Rasipur and Tiruchengode revenue taluks, and incidentally surveyed the boundaries of reserved forests adjoining patta holdings. In the Trichinopoly district, the resurvey plan of Musiri taluk showing the reserved forests is reported to have been supplied and the plan for Perambalur taluk is said to be still under preparation. This contains part of the Pachamalai reserves under departmental control. The survey of Bailnad, Adukkam-Puducumbai and Perumalmalai reserved lands sanctioned in G.O. No. 1382, Development, dated 21st August 1928, was taken up by the same Survey Party in March 1929.

(c) The survey of coupes was as usual carried out departmentally.

(d) Reference maps were maintained in all the divisions.

CHAPTER II.—MANAGEMENT OF STATE FORESTS.

1. REGULATION OF MANAGEMENT.

Preparation and control of regular working plans.

5. (a) *Preparation*.—The consolidated working plan for the *Chittoor* division referred to in the previous year's report was sanctioned by the Chief Conservator in his Proceedings No. 312, Press, dated 30th August 1928. In *North Salem*, a tentative scheme for working sandal in Dharmapuri range was prepared by the District Forest Officer and sanctioned by the Conservator. An Extra Assistant Conservator has since been posted for the preparation of a consolidated working plan for the whole division for fuel,

bamboos, timber and grazing and for the revision of the Hosur sandalwood working plan. In *Central Salem*, the preparation of a consolidated working plan for the whole division was entrusted at the close of the year to an Extra Assistant Conservator specially posted for the purpose and the plan has since been completed. The preparation of a consolidated working plan for the whole division in *South Salem* is similarly being attended to by an Extra Assistant Conservator posted specially to that work.

(b) *Control*.—The prescriptions of the sanctioned working plans and schemes were generally adhered to in all the divisions. As mentioned in the previous year's report, the extraction of sandalwood is confined to dead trees only.

2. COMMUNICATIONS AND BUILDINGS.

(a) *Roads and Bridges.*

6. The cost of new works and repairs during the year was Rs. 6,543 and Rs. 13,115 against Rs. 5,124 and Rs. 10,428 respectively in the previous year. The principal new works undertaken during the year were—

Chittoor.—Forming a road from Bbakarapet to Talakona temple.

Vellore.—Completion of Jamnamarathur-Barghur cart track and completing the plateau section of the Amerdi-Nadanur road (Latham's road).

North Salem.—(1) Construction of an Irish bridge over the Deverbetta-Gopasandiram road.

(2) Construction of a culvert at the entrance of the rest-house compound at Denkanikota.

South Salem.—Construction of an approach road connecting the Naducombai rest-house with the Local Fund road from Kalappanayakanpatti.

(b) *Buildings.*

7. The expenditure on new buildings and the maintenance of the existing ones (including the pay of watchers) during the year was Rs. 6,519 and Rs. 12,376 against Rs. 24,379 and Rs. 13,415 in the previous year. The principal new buildings constructed during the year under report were—

Vellore.—Improvements to the Range Officer's quarters at Alangayam by providing kitchen and stables.

North Salem.—Part construction of a new Range office for Denkanikota West range, (2) construction of a motor garage at Deverbetta, and (3) completion of an inspection shed at Gerhatti.

Central Salem.—Conversion of a stable attached to the rest-house at Harur into a motor garage, (2) providing lintels to Sanniyasimalai inspection shed, and (3) compensation paid for acquisition of land at Modur.

South Salem.—Completion of a rest-house with outhouses at Naducombai, clearing the compound and site of the rest-house, and demarcating with F.D. stones, and (2) part construction of a Range office building at Namakkal.

(c) *Miscellaneous.*

8. The cost of new works and repairs during the year was Rs. 3,564 and Rs. 534 against Rs. 807 and Rs. 662 respectively in the previous year. The chief items of new works undertaken were—

Chittoor.—Sinking a trial well shaft for subordinates' quarters at Nagapatla, and (2) construction of a well in the compound of the Range officer's quarters at Mamandur.

Vellore.—Deepening of old wells and construction of new wells, and digging of trial shafts at various localities in hill villages.

Deepening of wells in the compounds of Range offices and rest-houses was carried out in *North* and *Central Salem* where necessary. In *South Salem*, the parapet wall of the well in the District Forest officer's bungalow was repaired at a cost of Rs. 268.

3. PROTECTION OF FORESTS.

(a) *General Protection.*

9. The following statement shows the offences registered during the year as compared with the previous year.

Offences relating to reserves dealt with by Forest Officers.

	1928-29. Number.	1927-28. Number.	
Injury to forests by fire ...	236	373	Decrease.
Unauthorized fellings ...	3,850	3,877	Do.
Unauthorized grazing ...	1,136	1,137	Do.
Other offences ...	236	160	Increase.
Total ...	5,458	5,547	

The decrease in the number of fires was principally contributed by *Central Salem* and is reported to be due to the hot weather not being so unfavourable. It was also due to the fact that in *Chittoor* special care was taken to see that early burning was properly done and in good time.

The increase under 'Other offences' is notable in *South Salem* and is reported to be due to Ponakad cultivation in the Trichinopoly Pachamalais being started by the Malayalees. The action taken was effective.

10. *Sandalwood cases.*—Seven sandalwood cases were detected in *Central Salem* during the year. Six out of the seven cases ended in conviction. They related to illicit possession or removal of sandalwood. In *South Salem*, four important sandalwood smuggling cases were detected, and seven accused who were the chief smugglers were prosecuted. All the accused were sentenced to rigorous imprisonment, ranging from two to six months excepting one accused who was fined Rs. 60. The accused appealed against these sentences, but the appellate court upheld the decision of the lower court with the exception of one instance where the sentence on the accused was reduced from six months to one month imprisonment by the Subdivisional Magistrate, Namakkal.

The Chief Commercial Superintendent, South Indian Railway, Trichinopoly, greatly helped in bringing to light cases of breach of Sandalwood Transit Rules for sandalwood transported by railways.

Nine cases were charged under the Sandalwood Transit Rules and compounded for an aggregate amount of Rs. 420. The compounding fees were paid in all except two cases which were sent up to court after the close of the year.

The villagers bordering the western slopes of the Kollimalais in the taluks of Namakkal and Rasipur harbour smugglers of sandalwood. Veppadi, Palkad and Kallapatti of Perambalur taluk on the east side of the Pachamalais and Gangavalle and other villages bordering the Belur reserve also harbour men of this profession. The co-operation of the police and the public is enlisted under the reward system.

Offences relating to unreserves dealt by Revenue officials.

11. These exclude offences relating to reserves under panchayat management :—

	1928-29. Number.	1927-28. Number.	
Injury to forests by fire ...	4	3	Increase.
Unauthorized fellings ...	4,673	2,657	„
Unauthorized grazing ...	336	268	„
Other offences ...	130	89	„
Total ...	5,143	3,017	

No convincing reason has been furnished by the Revenue officials for the marked variations. The large increase under unauthorized fellings may be due to increased vigilance.

12. Cases relating to reserves brought to trial.—

Year.	Number.	Convictions.	Acquittals.	Percentage of failure.
1927-28	1,287	1,125	162	12.59
1928-29	723	470	253	35.00

The increase in the number of acquittals was mainly in *Chittoor* division. It is explained that in 199 out of 200 cases taken to court, the accused paid compounding fees in court.

13. Cases relating to unreserves brought to trial.—

Year.	Number.	Convictions.	Acquittals.	Percentage of failure.
1927-28	258	177	81	31.39
1928-29	298	245	53	17.78

14. The percentage of offences personally enquired into by the District Forest Officers and their rangers is given below :—

Division.	District Forest Officers.	Range Officers.
	PERCENTAGE.	PERCENTAGE.
Chittoor	Nil.	7
Vellore	Do.	8
Salem North	Do.	9
Salem Central	0.26	5
Salem South	Nil.	13

The amount of compounding fees realized during the year was Rs. 44,625 against Rs. 42,604 during the previous year.

The instructions issued in G.O. No. 990, Revenue, dated 13th June 1910, were generally followed in fixing the compounding fees.

Patrol system.

15. The patrol system which was in force for about six months in the previous year in the *Central Salem* division was discontinued during the year under report. Special gangs were occasionally organized under the supervision of the range officers and inspections were made without previous warning which to some extent checked illicit removals. A new coupe in the Kapputhu reserve was opened during the year to provide work for habitual smugglers. The strengthening of the staff in the Toppur section which has been systematically plundered in the past is reported to have had beneficial results. In *South Salem*, a special party was organized in each range during the manure leaf season, and at the commencement

of the grazing year, to prevent illicit removals of manure leaf and illicit grazing. A special patrol party worked in *Namakkal* range to guard against sandalwood thefts.

In the other divisions the system was not in vogue.

Rewards.

16. In *Vellore* division, a reward of Rs. 69-8-0 was paid to certain forest subordinates of *Tiruvannamalai* range for the detection of important goat browsing cases. In *Central Salem*, a reward of Rs. 50 was paid to a Police Sub-Inspector, and the District Superintendent of Police, South Arcot, was requested to record a good conduct entry in his service book. Rupees 5 was also sanctioned for payment to a police constable for the help rendered by him in a sandalwood case. In *South Salem*, rewards aggregating Rs. 515 were disbursed during the year to Railway officials, police officials, Village officers, forest guards and private informants for their aid in the detection of important sandalwood cases. Rupees 85 of the above amount were paid to the railway goods staff at *Trichinopoly* and *Karur* stations for reporting promptly cases of sandalwood consignments despatched into the scheduled areas without a way permit, the property involved being valued at Rs. 1,050; and good conduct entries were made by the Chief Commercial Superintendent in their service rolls.

(b) Protection from fire.

17. The total area attempted to be protected from fire during the calendar year 1928 was 2,860 square miles of which 2,772 square miles were successfully protected at a cost of Rs. 4,540.

Special protection.—The area under special protection was 1,087 square miles as compared with 1,140 square miles in the previous year. An area of 1,064 square miles was successfully fire protected during the year against 1,074 square miles in the previous year, the percentage of failure being 2.12 against 5.76, a very satisfying decrease.

General protection.—The area under general protection was 1,773 square miles against 1,737 square miles in the previous year, the percentage of failure being 3.67 against 2.81 in the previous year. The area burnt was 65 square miles against 49 square miles in the previous year. The increase was in *North Salem* and is attributed to unusually dry weather and also to spreading of fires from frontier lines.

Early burning.—The operation was carried out in all the ranges of *Chittoor* division during January and February 1929. The system was not followed in the other divisions, which are considered to be unsuited to it.

(c) Protection from cattle.

18. The total area closed to grazing was 213 square miles, out of 2,875 square miles of reserved forests and reserved lands. Eight square miles of reserved forests were closed to grazing for part of the year in the *Chittoor* division. The area opened to grazing to all animals except goats was 2,654 square miles. The number of cattle impounded during the year was 12,592 against 14,807 in the previous year. The decrease was in all the divisions except *Central Salem*.

(d) Protection against injuries from natural causes.

19. *Lantana*.—*North Salem*.—Clearing of *Lantana* was done in all the sandalwood coupes in connexion with the process of enumeration and extraction. A sum of Rs. 408 was spent on the clearing of *Lantana* with Spike operations and sandal sowing in *Jowlagiri* reserve and in the eastern boundary of *Sameri* reserve.

South Salem.—The growth of *Lantana* along the boundary line of certain reserves was cleared by the Malayalees under the fire reward system.

Creepers cutting.—This was done in all sandalwood areas prescribed for the year and also on other timber trees in the *Chittoor* and *Vellore* divisions.

Spike.—This is dealt with under Research and Experiments.

Bison continued their usual damage, to young sandal trees in all sandalwood areas and especially in special tending areas in the *Javadis* in the *Vellore* division, and in *Kottapatti*, *Chitteri* and *Dombakkal* reserve, *Central Salem* division. The latter division also reports damage to tender coppice shoots by deer in *Anandavadi* fuel coupes and damage to *Veppam* and *Thurinji* trees by *Loranthus*.

CHAPTER III:—SILVICULTURE.

SECTION 1.—FORMATION AND REGENERATION OF FORESTS.

(i) General progress of areas under regeneration.

20. *Chittoor*.—Natural regeneration of sandal was fairly good except in *Gudiyattam* range, but that of red sanders was not particularly good except in *Chamala* range and *Muduvapalle* tope. Natural regeneration from seed of *Acacia Sundra*, *Albizzia amara*, *Hardwickia binata*, *Azadirachta indica*, *Chloroxylon Swietenia*, *Cassia auriculata* and *Strychnos Nux-vomica* was fairly good in *Chandragiri* range. In *Chamala* range natural reproduction of red sanders, *Canthium didymum* and *Pleurostylia Wightii* was fairly good and that of *Acacia Sundra* fair.

Vellore.—Natural regeneration of sandal was fair on the *Javadis* owing to heavy rains from August 1928 to January 1929 but owing to exceptionally hot weather that followed, all seedlings died. In the *Yelagiris*, natural reproduction of *Chloroxylon Swietenia*, *Albizzia amara* and *Acacia Sundra* was fairly satisfactory. The regeneration of *Dendrocalamus strictus* and *Bambusa arundinacea* was satisfactory.

North Salem.—Natural regeneration of sandal was fair in parts of *Anchetti*, *Denkanikota* West and East ranges. It was good all over the *Dharmapuri* range, but proved a failure in *Krishnagiri* range. The regeneration of *Dendrocalamus strictus* in the *Tholuvabetta* valley was quite good. Natural reproduction of *Hardwickia binata* and *Chloroxylon Swietenia* was fair in *Anchetti* range, also that of *Schleichera trijuga*, *Hardwickia binata*, *Melia indica* and *Albizzia Lebbek* in *Dharmapuri* range; in *Krishnagiri* range the regeneration of all species was distinctly poor.

Central Salem.—Natural reproduction of *Acha* was reported to be good in the *Cauvery* Range and that of sandal was fairly good throughout the division.

South Salem.—A large number of healthy root suckers have come up in the sandal area of *T. Kanapadi*, *V. Kanapadi* and *Karuppankaduthittu* series of the *Trichinopoly* *Pachamalais*. Natural reproduction of sandal by seed is good throughout the division especially in *Belur*, *Pariyasholai*, *Vanjarai* and *Vengamudi* reserves.

Natural reproduction of *Dalbergia latifolia*, *Shorea Talura*, *Pterocarpus marsupium* and *Anogeissus latifolia* was good on the *Bodamalai* ridge. Reproduction of *Chloroxylon Swietenia* is profuse in *Tirumanur* and the *Bodamalai* lower slopes especially in the valleys. In the *Namakkal-Kollimalais*, natural reproduction of *Toon* is disappointing but that of *Dalbergia latifolia* and *Anogeissus latifolia* is fair.

(ii) Establishment of reproduction under working plans or schemes (with 34-A).

(a) Mainly natural.

21. Areas covered by the working plan were worked under the coppice system. Reproduction from coppice shoots has been fair but the condition of some of the worked coupes in *Chittoor* division gives rise to anxiety as subsequent growth is very slow. In the fuel series in *South Salem* reproduction of the following species was reported good :—*Acacia planifrons*, *Albizzia amara*, *Canthium didymum*, *Albizzia Lebbek* and *Chloroxylon Swietenia*.

(b) Mainly artificial.

22. *Vellore*.—Regeneration by dibbling sandal seeds in blank areas in sandal coupes and in special tending areas proved a failure. Red sanders seedlings raised from nursery beds and planted in pits in the Thaniyar rest-house compound in Polur range are kept watered and are doing well.

North Salem.—Regeneration operations prescribed in the working plan were suspended, but sowings in plots were carried out by the subordinates free of charge. In Krishnagiri range, seeds of *Albizia Lebbek*, *Melia indica* and *Eugenia Jambolanx* were sown by the fuel coupe contractors in all felled areas.

The results are not encouraging.

Central Salem.—Sandal propagation centres were started in one acre plots free of cost by the beat subordinates but the operation proved a failure.

South Salem.—Seeds of indigenous junglewood tree species sown in the felled coupes of fuel series proved a failure. Sandal seeds were sown in Namakkal, Rasipur and Thuraiyur ranges but the results were on the whole disappointing.

(c) Afforestation.

23. Nil.

(iii) *Plantation and other forms of regeneration not under working plans or schemes (with Form 34-B).*

24. *Chittoor*.—506.18 acres of old plantations have been brought under the revised working plan sanctioned during the year under report.

Vellore.—No fresh areas were taken up but blanks in those compartments where previous plantings were unsuccessful were replanted.

Central Salem.—The blank areas of 1926 and 1927 of the Sanniyasimalai plantation on the Shevaroy hill were repitted during the year and basketted seedlings of *Acacia decurrens* were put out. Artificial regeneration was carried on in the Kurumbapatti Palmyra tope and the undergrowth in 25 acres of coupe II was cleared during the year for dibbling of palmyra seeds in the area. A fairly extensive natural regeneration was revealed after clearing the undergrowth.

(iv) Tending.

25. General tending was done in all sandal coupes of the year and in the fuel coupes of *North Salem* division except in the unreserve portions included in the coupes. The tending consisted of freeing the crowns of sandal by cutting creepers and overhanging branches of other trees interfering with them. The operation is reported

to have considerably improved, the condition of sandalwood in *Central Salem* and *South Salem* divisions. In addition to tending of Sandal, climbers on other valuable timber species were cut in *Chittoor* division.

(v) General.

26. Nil.

SECTION 2.—TENDING OF THE GROWING STOCK.

27. Tending operations were carried out in *Vellore* division in special tending areas but even here regeneration of sandal has been unsatisfactory. Creeper cutting was done in sandal areas outside the Javadis, and in the Chillimalai special tending area of the Mulakad reserved forest (outside the sandalwood working circle) at a cost of Rs. 62-1-0.

Improvement fellings in timber areas at Kilpet coupe III in *Vellore* division were carried out departmentally. Improvement fellings in coupe II of Kottur timber coupe were given on contract under departmental supervision.

CHAPTER IV.—EXPLOITATION.

(a) SYSTEM OF MANAGEMENT.

28. The total area under working plans and schemes during the year was 2,566 square miles, and the various silvicultural systems in force are detailed below :—

	Area in square miles.	Percentage to the total area under working plan.
Selection method	314	12.24
Simple coppice	712	27.75
Coppice with standards	39	1.52
Method of improvement fellings	691	26.93
Unworked or worked with no system	810	31.56
Total area under working plans	2,566	100.00

(b) EXPLOITATION BY DEPARTMENTAL AGENCY.

29. The chief species marketed departmentally was sandalwood. A quantity of 263 tons and 7 quarters was sold in public auction at Tiruppattur against 418½ tons in the previous year and 59 tons 27 quarters at Vellore against 53½ tons in the previous year.

The total amount realized at both the depots was Rs. 4,78,368 against Rs. 6,35,330 in the previous year. The average price realised was Rs. 1,492 per ton at Tiruppattur and Rs. 1,446 at Vellore against Rs. 1,337 and 1,418 respectively in the previous

year. The decrease in the total quantity in both the depots was 149 tons 46 quarters and it was due to less quantity of wood received from *North Salem* than last year as a consequence of extracting only dead trees instead of dead and diseased trees.

Timber.—One thousand eight hundred and seventy-three cubic feet of timber were extracted in *Chittoor*. Of this quantity, 1,853 cubic feet of timber were sold and the remainder was utilized for departmental works. In *Vellore*, improvement fellings were carried out departmentally in one coupe and 1,377 cubic feet of timber were extracted. The demand for small timber was generally poor. There being no demand for the materials obtained in previous year's felling, 233 cubic feet of small timber were written off during the year, 48 cubic feet represented wastage in conversion, 90 cubic feet were used for building purposes, 210 cubic feet were sold and the balance 796 cubic feet were mainly intended for building purposes during 1929-30. One other coupe was worked by contract agency. In *North Salem*, 2,056 cubic feet of timber of different species were extracted during the year. Of this quantity, 464 cubic feet of *Hardwickia binata* trees were felled from the reserves of Dharmapuri range for testing the market, 47 cubic feet of *Hardwickia binata* was sold for Rs. 94. About 640 cubic feet of miscellaneous species being rejected, pieces were sold for Rs. 34. About 768 cubic feet of timber were used for departmental works. In *Central Salem*, 6 Vanni logs (24 cubic feet) were extracted departmentally from Atur Ghat and its extension for supply to the Industrial Engineer, Madras, at a cost of Rs. 36. Thirty-eight cubic feet of timber was extracted departmentally and utilised for buildings. The value of the timber so utilised was about Rs. 8-5-0 at 4 annas per cubic foot. In *South Salem*, the operation of the previous year of converting into planks and scantlings *Cedrela Toona* and *Chickrassia tabularis* proved a failure as the materials warped and split. They had to be disposed of at very low prices. Two trees were girdled and converted into 171 cubic feet of cart materials of which 156 cubic feet was sold for Rs. 206, 354 cubic feet of old materials (planks and scantlings) were disposed of for Rs. 340, the total revenue under timber operation being Rs. 546. Besides the 510 cubic feet of timber sold to the public, 66 cubic feet were utilized for departmental building works and 66 cubic feet were the wastage in conversion.

Fuel.—Indicator areas were felled in order to ascertain the average outturn of fuel coupes.

Chittoor.—Fifteen thousand four hundred and ninety cubic feet of fuel was obtained of which 5,044 cubic feet was sold, 1,026 cubic feet being the produce obtained in working indicator areas was

handed over to contractors and 432 cubic feet of fuel was written off. The balance was pending disposal.

Vellore.—Forty-nine thousand and nine cubic feet of fuel was obtained from indicator areas of which 46, 866 cubic feet remained to be sold at the end of the year.

North Salem.—Nine hundred and sixty three cubic feet of fuel was collected by the students of the Vernacular Training School by marking indicator areas, and sold for Rs. 30. Three hundred and twenty cubic feet was collected free of cost for burning bricks for departmental works.

Central Salem.—The outturn was 26,000 cubic feet which was removed by the coupe contractors concerned.

South Salem.—The stock of fuel at the close of the previous year was 13,766 cubic feet and a further quantity of 13,450 cubic feet was cut during the year. The total quantity of 32,216 cubic feet has since been sold.

Bamboos.—Fifty-seven bamboos in *Chittoor* and 342 bamboos in *South Salem* were used for departmental building works.

Minor Forest produce.—In *Vellore* 355 quarters of Divi Divi pods and 71 quarters of other kinds of seeds were collected departmentally. Twenty-five quarters of seeds, mostly sandalwood, were supplied to other districts and 133 quarters were sown departmentally.

Seeds of timber species including sandalwood were collected in all divisions for cultural operations and for supply to other divisions.

(c) EXPLOITATION BY PURCHASERS.

30. Except in the cases referred to in the previous paragraphs, fuel and bamboo coupes and minor forest produce farms were as usual sold to contractors. In *Central Salem*, 18,970 cubic feet of Jalari (*shorea talura*), *Terminalia tomentosa*, etc., trees from Pannikaradu and Kottapatti reserved forests were enumerated, marked and sold for Rs. 1,709. The total outturn from all classes of forests by all agencies is compared with similar details of last year in the following statement:—

Year.	Timber in thousands of cubic feet.	Fuel in thousands of cubic feet.	Bamboos.	Gross value of minor forest produce including grass and grazing.
1927-28	555	1,270	Rs. 1,12,589	Rs. 3,23,310
1928-29	660	1,977	1,21,714	3,70,508

The outturn shows increase under all the items.

Timber.—This year the increase in yield (*vide Form No. 35*) is solely from unreserves; this was due to larger number of darkhast

lands assigned as a consequence of which the number of trees removed from unreserves was greater than that of the previous year.

Fuel.—The increase in outturn (*vide Form No. 35*) was in reserves only. This was due to the fact that (1) the coupes sold during the year in *Chittoor* division were better stocked and certain coupes of that division which had previously been worked under the system of 'Coppice with standards' were worked as 'Simple coppice' which contributed to the large yield, and (2) better prices were realized for coupes in *North Salem* division.

Bamboos.—The outturn is mainly from reserves and the increase in revenue is largely in *Vellore* division. This was due to keen and perhaps rather unhealthy competition during the sale of the year 1928-29, and two more kists having been collected during the year as against three kists only in the previous year.

Grazing.—The increase is in all the divisions for the following main reasons :—

Chittoor.—Due to the seasonal rains.

Vellore and Central Salem.—Due to better supervision.

North Salem.—Due to influx of foreign cattle in Anchetti range.

South Salem.—Due to the popularity of the single permit system for whole ranges, and to the dearth of fodder in villages on account of the adverse season.

Minor forest produce.—The increase was in all the divisions for the following reasons :—

Chittoor and North Salem.—Due to the good crop of tamarind and better prices obtained for other kinds of minor produce also.

Central Salem.—Due to the three year lease of barks.

South Salem.—Due to the three year lease of Avaram and Konnai barks and to better prizes obtained for other kinds of minor produce.

31. *Grazing.*—Of the total area of reserved forests and reserved lands 92.31 per cent was opened to grazing against 92.69 per cent in the previous year. The incidence of grazing in the several districts of the Circle is given below :—

District.	Area in acres.	Cow-unit.	Number of acres per cow-unit.
Chittoor	286,080	59,779	4.79
Vellore	419,200	124,487	3.36
North Salem	359,580	71,175	5.05
Central Salem	454,400	134,137	3.39
South Salem	179,200	46,615	3.84
Total ..	1,698,560	436,193	3.89

There was an increase in the number of cattle grazed during the year as compared with the previous year in all the divisions of the Circle. The explanation given for the increase in grazing revenue holds good here also. The number of acres per cow-unit available during the year was 3.89 against 4.28 in the previous year.

(d) EXPLOITATION BY RIGHT AND PRIVILEGE HOLDERS.

32. In *Vellore*, as in the previous year, the system of grazing cattle by the Malayalees at 3 annas per cow-unit and the distribution of separate rewards to them for successful protection of reserves against fire continued. In *Central Salem*, the grazing of cattle of the Malayalees on the Chitteris and Salem-Kalroyans on an initial deposit of 2 annas per cow-unit and the distribution of rewards to hill tribes for the successful protection of reserved forests continued to work satisfactorily. The number of cattle allowed was 5,564 in Chitteris and 5,045 in the Salem-Kalroyans respectively.

Proposals for revising the assessment for the Salem-Kalroyans based on the 1926-27 census of cattle submitted to the Chief Conservator are pending sanction. The assessment for the Chitteris was also revised on the basis of the cattle census of 1927-28 and proposals sent up to the Chief Conservator for sanction are pending final orders. In *South Salem* the concession of free grazing at the time of forest settlement in the Gundur, Ariyur shola reserves in Namakkal range, Palamalai and Kanapadi extension in Turaiyur range was not availed of by the Malayalees as these people are not inclined to take the responsibility of protection of reserves. They prefer purchasing permits for *bona fide* cattle and for foreign cattle from the plains left in their charge by plainsmen for breeding purposes.

The hill village scheme for the Bodamalai reserve submitted to the Chief Conservator to admit of grazing on an initial deposit of 3 annas per cow-unit is pending sanction.

(e) EXPLOITATION BY FREE GRANTEES.

33. A statement showing details of free grants is appended :—

	Timber in thousands of cubic feet.	Value.	Fuel.		Bamboos value.	Grazing value.	Other minor forest produce value.	Total.
			In thousands of cubic feet.	Value.				
Right-holders	..	Rs. ..	..	Rs. ..	Rs. ..	..	Rs. ..	Rs. ..
Free grantees	38	7,763	..	..	1,970	..	513	10,246

Chittoor.—Four thousand and thirty-two cubic feet of timber, 23,355 bamboos, 146 palmyra trees and 8,500 palmyra leaves were granted free for reconstruction of houses burnt by fire. Thirty-three thousand seven hundred and sixty cubic feet of metal and gravel were removed by the Public Works Department and local fund contractors for Government and Local Fund works. *Vellore.*—Free grants were made mainly from unreserves. In one case, 14 palmyra trees were allowed to be removed from the reserves. Two hundred and forty cubic feet of third-class timber and 16 head-loads of bamboos were allowed to the Malayalis for domestic purposes under the forest village system. Details of free grants made from unreserves are given below :—

Number of cases	...	...	...	...	32
Number of grantees	...	...	...	...	425
Number of palmyra trees	...	...	...	...	906
Timber, cubic feet	...	...	...	...	91
Palmyra leaves, number	...	...	...	...	236,100

Including removals from reserves, the aggregate value of produce removed by free grantees amounted to Rs. 3,696 as against Rs. 2,638 of the previous year. *North Salem.*—A small quantity of timber, 200 bamboos, 200 palmyra leaves, and 60 cart-loads of thatch grass worth Rs. 111 was granted free to rebuild houses destroyed by fire. *Central Salem.*—Fifteen thousand three hundred and eighty-six cubic feet of timber and 520 head-loads of bamboos worth Rs. 2,559 removed free from unreserves to rebuild houses destroyed by fire. *South Salem.*—Seven thousand cubic feet of timber, 22,072 bamboos worth Rs. 3,312 were removed from reserves and unreserves to rebuild houses destroyed by fire. The Fire Relief Committee afforded facilities by providing funds to destitute people for the cutting and transport of bamboos from reserves to the villages burnt.

CHAPTER V.—FINANCIAL RESULTS.

34. The following statement shows the financial position of the year under report compared with that of the previous year :—

					1928-29.	1927-28.
					RS.	RS.
Revenue	...	...	...	...	12,89,534*	14,12,177
Refunds	...	...	...	...	12,666	23,450
Net					12,76,868	13,88,727

* The revenue excludes Rs. 2,018 relating to other circles as explained at the foot note of Form No. 39.

EXPENDITURE.

			RS.	RS.
52-A. Capital	...	...	18,054	30,963
B. Conservancy and works	...	...	1,10,591	1,06,316
C. Establishments	...	...	4,35,629*	4,35,484
Total expenditure			5,64,274	5,72,763
Surplus			7,12,594	8,15,964

The surplus as well as the revenue and expenditure were less during the year than they were in the previous year.

35. The various contributions to the gross receipt of Rs. 12,91,582 are detailed below :—

			Per cent.
Major produce, Forest Department	...	...	42.79
Major produce, Revenue Department	...	...	9.11
Bamboos, Forest Department	...	...	10.92
Bamboos, Revenue Department	...	...	...
Grazing, Forest Department	...	...	15.91
Minor forest produce, Forest Department	...	...	6.07
Minor forest produce, Revenue Department	...	...	7.12
Miscellaneous items	...	...	8.08
Total			100.00

36. Of the expenditure under "B. Conservancy and Works" and "52-A. Capital" 26.36 per cent relates to exploitation, 71.43 to improvement and upkeep of forests and 2.21 to miscellaneous items.

37. The important variations are explained below :—

RECEIPTS.

(i) By Government Agency.

Sandalwood.—This is the chief item. The revenue for the Circle during the year was Rs. 4,82,432 against Rs. 6,94,944 in the previous year. The decrease is due to less revenue obtained in *North Salem* division as extraction was confined to dead trees only. Further the yield was comparatively poor as all the big trees had been extracted during the previous years on account of spike. The

* Rupees 3,90,428 given in last year's report is a mistake for Rs. 4,35,484.

quantity sold and the revenue realized during the year as compared with those of the previous year are given below district-wise :—

Divisions.	1927-28.		1928-29.	
	Quantity in tons.	Revenue.	Quantity in tons.	Revenue.
Chittoor	1	Rs. 1,551	1½	Rs. 1,598
Nellore	101	1,39,274	110	1,62,040
North Salem	368½	4,92,953	170	2,51,998
Central Salem	15½	26,169	20	28,078
South Salem	26½	34,987	18	18,718
Other circles	1½	2,200	1½	2,048
Total	518	6,97,144	315½	4,84,480

Timber.—The revenue was Rs. 5,023 against Rs. 4,834 in the previous year. The increase was in *Chittoor* division and it was due to extraction and sale of a greater quantity of red sanders during the year than in the previous year.

Firewood and charcoal.—The revenue was Rs. 895 against Rs. 1,120 in the previous year. The decrease was in *Central Salem* division and it was due to the fact that fuel obtained from indicator areas was handed over to lessees along with the coupes sold.

(ii) *Purchasers—Forest Department.*

38. **Timber.**—Rupees 2,190 was realized during the year against Rs. 4,663 in the previous year. The decrease was due to want of demand for timber coupes in *Vellore* and *Central Salem* divisions.

Firewood and charcoal.—The revenue realized was Rs. 59,344 against Rs. 64,955 in the previous year. The decrease was in *South Salem* division and was due to coupes being sold in the previous year before being handed over to panchayat management.

Bamboos.—Rupees 1,41,004 was realized during the year against Rs. 1,11,731 in the previous year. The increase was mainly in *Vellore* division and was due to the collection of 5 kists during the year, being the first year of the 3-year bamboo lease in Polur, Anthavasal and Tiruvannamalai ranges, as against 3 kists in the previous year.

Grazing and fodder grass.—The revenue realized was Rs. 2,05,460 against Rs. 1,92,950 in the previous year. The increase was in all divisions and it was due partly to seasonal rains, partly to the abolition of the class II forest village system in Tiruvannamalai range, partly to the revised assessments current for three years fixed for the Javadi Grazing Blocks under the Hill Forest Village System, and also in *North Salem* to large herds of foreign cattle being sent to graze in Anchetti range.

Minor forest produce.—Rupees 77,842 was realized during the year against Rs. 59,514 in the previous year. The increase was in all divisions. There was a good tamarind crop in *North Salem*, and the sale of barks on a 3-year lease in *Central* and *South Salem* had a beneficial effect on revenue realised.

By purchasers—Revenue Department.

39. **Timber.**—Rupees 85,579 was realized in the year against Rs. 68,832 in the previous year. The increase was in the three *Salem* divisions, due to greater extent of lands assigned on darkhast during the year than in the previous year.

Firewood and charcoal.—Rupees 32,275 was realized in the year against Rs. 32,103 in the previous year. The difference is small.

Bamboos.—Rupees 6 only was realized during the year against Rs. 342 in the previous year. This is a fluctuating item.

Minor forest produce.—Rupees 91,910 was realized in the year against Rs. 88,391 in the previous year. The increase was due to favourable prices realized for leases in unreserves.

40. **Fines and forfeitures.**—Rupees 4,924 was realised during the year against Rs. 3,220 in the previous year. The increase was in *Vellore* and *North Salem* divisions and was mainly due to collection of heavy fines from contractors.

41. **Other sources.**—Rupees 93,598 was realized during the year against Rs. 77,967 in the previous year. The increase was mainly in *Vellore*, due partly to larger receipts from compounding fees and partly to the adjustment of the amount of about Rs. 4,900 received from the District Board, North Arcot, for improvement of water facilities in the Javadis, in *Central Salem* to higher prices realized for shell leases in the unreserves of South Arcot district and in *South Salem* to (1) recovery of rent of District Forest Office from the Public Works Department, (2) collection of arrear rent and value of the Shevvapet depot on assignment and (3) sale of certain unwanted buildings.

42. **Refunds.**—The actuals during the year were Rs. 12,666 against Rs. 23,450 in the previous year. The decrease was mainly in *Vellore* and *South Salem*, due to less amount of grazing fees refunded under the Forest Village system in *Vellore*, and to refund of lease amount of Vanavasi fuel coupe handed over to Panchayat management in *South Salem*.

EXPENDITURE.

B. Conservancy and Works.

43. The important variations are explained below :—

Sandalwood.—The expenditure was Rs. 32,315 against Rs. 35,905 in the previous year. The decrease was in *North Salem*

division, due to restriction of extraction to dead sandalwood trees only, and in *South Salem* division to there being no extraction of patta sandalwood trees as in the previous year.

44. *II. Forest produce removed by private agency.*—Rupees 36,490 was spent during the year against Rs. 31,764 in the previous year. The increase was in three *Salem* divisions, due in *North Salem* to payment of commission to permit issuing officers for issue of grazing permits as against the issue of permits by foresters in the previous year for which no commission was paid, in *Central Salem* to debit to this head the expenditure for the cutting of indicator areas, and in *South Salem* to the employment of an additional number of watchers consequent on the reduction in the Forest Guards' cadre.

45. *Works.*—Rupees 26,024 was spent against Rs. 24,130 in the previous year. The increase was in *Vellore* and *South Salem* divisions, due in *Vellore* to increased expenditure on repairs to roads, and in *South Salem* to repairs to bridle paths in the Thuraiyur Pachamalais which had been neglected in previous years for want of funds.

46. *IV. Conservancy and regeneration.*—The expenditure was Rs. 12,057 against Rs. 10,792 in the previous year. The increase was in all the divisions except *Chittoor*, due in *Vellore* division to increased expenditure on fire protection operations, in *North Salem* to the expenditure on lac operations being debited to 'Regeneration', in *Central Salem* to the clearing of top lines done in Kurumbapatti and the Hill reserves of the old Kallakurichi range, in *South Salem* division to intensive tending operations of sandalwood, to fire protection operations, and to clearing footpaths.

47. *V. Miscellaneous.*—The expenditure was Rs. 1,767 against Rs. 846 in the previous year. The increase was in *North* and *South Salem* divisions, due in *North Salem* to increased expenditure on spike operations, and in *South Salem* to increase rewards paid to informants and public officers.

52-A. Capital.

48. *Purchase of stores, tools and plant.*—The expenditure during the year was Rs. 738 against Rs. 279 in the previous year. The increase was in *Central Salem* division and it was due to the purchase of three new Avery Beam scales.

49. *Communications and buildings.*—The expenditure during the year was Rs. 16,644 against Rs. 30,684 in the previous year. The decrease was in all the divisions except *South Salem*, and it was due mainly to the purchase of the District Forest office building at *Chittoor* in 1927-28 and to the greater number of new buildings constructed that year in other divisions.

50. *Organisation, improvement and extension of forests.*—The expenditure during the year was Rs. 672 against 'nil' in the previous year. The sum was spent for permanent demarcation of Hudaidurgam reserved forest and Aiyur extension reserved forest and for construction of wells in *Vellore* and *North Salem* divisions.

51. *8-c. Establishment—Pay of Officer—Non-Voted.—Plus* Rs. 13,227 due to a greater number of imperial officers in the circle than in the previous year.

Pay of Officers—Voted.—Minus Rupees 8,213, due to an Extra Assistant Conservator being in charge of each of the *Chittoor* and *North Salem* divisions for part of 1927-28.

Pay of Establishments—Voted.—Minus Rs. 17,920, due to retrenchment and the consequent reduction in the establishment of Foresters and Forest Guards and to fewer Forest Guards being deputed to the Vernacular Training School during the year.

52. *Allowances.*—*Minus* Rs. 1,661, due to the retrenchment in the Foresters' cadre and to the cutting out of travelling allowance for short touring.

53. *Contract contingencie—Minus* Rs. 755, due to strict economy exercised.

Non-contract contingencies—Rent.—Plus Rs. 8,328, due to the adjustment of difference between standard and actual rents due on residential quarters.

Supplies and Services—General—Apparatus and materials.—Minus Rs. 949, due to less amount spent for purchase of medicines.

54. *8-c. ii. Research—Charges payable to Government departments and others.*—Rupees 9,241 was spent during the year against Rs. 1,558 in the previous year. The increase was due to the reimbursement of cost of experiments carried out by the Indian Institute of Science and payment of pay and retiring allowances to the Institute staff.

The variations under other heads are small and call for no remarks.

CHAPTER VI.—RESEARCH AND EXPERIMENTS.

55. In *Chittoor* division the four sample plots intended to record the growth of red sanders under various conditions were maintained. The last measurements were recorded in February 1928.

The experiments to find out the effects of early burning on red sanders regeneration were continued.

In *Vellore* division experiments to ascertain whether sandal is an obligatory root parasite were continued. No final conclusions have yet been reached.

Measurements of height and girth of sandal in sample plots were recorded.

The experiments in the bamboo plots at Komettiyeri were continued and notes of observations were sent to the Research Officer, Ootacamund.

In *North Salem* experiments in lac cultivation were continued. It is now established that lac can be grown successfully on *Shorea Talura* in this division. *Dolichandrone falcata* and *Atylosia mollis* also appear to be good hosts. Wild lac has been found on *Shorea Talura*, *Acacia pennata* and *Ficus retusa*. The disposal of brood lac has not been an easy matter, and it will not pay to grow lac on a large scale until a good market has been assured. Meanwhile further areas in *North Salem* and other divisions will be taken up in order to see what species and what localities are most suitable.

56. *Spike disease of Sandal*.—Spike has spread rapidly in the Yelagiris in *Vellore* division and 4,886 spiked trees were counted during 1928-29. In *North Salem* fresh attacks are reported in the Guttiroyan reserved forest of Dharmapuri range, and in Denkanikota reserved forest, the disease has spread considerably towards the north and east. Though only 60 trees were attacked in February 1927 over 1,000 trees are now diseased.

No spike in sandal is reported from *Central Salem* but spike in *Zizyphus* was common in Harur range.

In *South Salem* spike has spread in Valappur Nad of the Namakkal Kollimalais. Many of the dead stems are found to have bore holes within three feet of ground level, but the insects have not yet been identified.

In the Turaiyur Pachamalais there has been no recrudescence of spike in the spiked area treated in 1925-26, and the root suckers reported last year are still healthy and vigorous.

57. In *North Salem* field observations and experiments in connexion with spike investigation were continued during the year. The results are recorded in the proceedings of periodical conferences held at the Indian Institute of Science, Bangalore. Spike can now be communicated from one plant to another in the laboratory with comparative certainty by means of patch grafting, but in the field it is not so easy to establish infection although fusion takes place in a large percentage of the grafts. The manurial experiments are still in the initial stage. Experiments to test the effect of applications of Atlas solution are being conducted on a larger scale than was done last year.

Experiments in sandal regeneration are being conducted in the same division in consultation with the Research Officer. So far the results seem to indicate that sowing under light shade gives a better percentage of germination but that the percentage of survivals is greater under heavy shade than under light shade.

CHAPTER VII.—ADMINISTRATION.

58. Mr. T. Clear held charge of the circle throughout the year. The proposals for the bifurcation of the *Vellore* division which were submitted to Government, were still in abeyance at the close of the year in view of the question of the reorganization of the entire department now under consideration. For the same reason the question of lightening the work of the *Central Salem* division by regrouping and redistribution of some of the reserves among other divisions remained unsettled.

59. *Tours*.—The Conservator toured in all the divisions of the circle and spent one hundred and eighty-five days in camp.

The District Forest Officers, *Chittoor*, *Vellore*, *North and South Salem* did more than the prescribed minimum of touring during the year. In *Central Salem* the period fell short by three days. This was due to the fact that Mr. Woodhouse Adolphus was permitted to restrict his touring to half the prescribed period during the time he was engaged on the preparation of a new consolidated working plan.

60. *Inspections*.—The Conservator inspected all the District Forest offices in the circle. The forests of *Vellore* and *North Salem* were inspected and inspection notes written.

The District Forest Officers inspected all the Range offices in their divisions.

61. In the permit defalcation case referred to in the last year's administration report, the Range clerk, Odugathur, was convicted and sentenced to undergo rigorous imprisonment for three months. In the case of the other subordinates, as the Police reported that no case was made out they were reinstated, the period of suspension being treated as leave to which they were eligible.

62. *Sandalwood depots*.—The two sale depots at *Vellore* and *Tiruppattur* were inspected by the District Forest Officer and the result of inspection was satisfactory. The forest depots in *North*, *Central* and *South Salem* divisions were also inspected by the respective District Forest Officers.

63. *Audit*.—The accounts of the District Forest offices, *Chittoor*, *Vellore* and *South Salem* were audited by the Accountant-General's staff and the results were reported satisfactory. The inspections of *North* and *Central Salem* offices were taken up after the close of the year.

64. *Vernacular Training School*.—The school was held in *North Salem* at Denkanikota from 1st April 1928 to 30th September 1928 with M.R.Ry. P. Mathuramuthu Pillai as senior Instructor and Supernumerary Ranger P. K. Subanarayana Ayyar as junior Instructor. Thirty students were trained; fifteen came from Kollegal division of the Fifth Circle and the balance from the three Salem divisions of this Circle; seven passed in the first class and twenty-three in the second class. All were trained in lac cultivation. The conduct and discipline of the students were satisfactory. Three Forest Guards from *Chittoor* were deputed to the school held at North Cuddapah; one of them did not join for which disciplinary action was taken against him; one of the two students who joined the school died as a result of an accident.

65. *Health of establishment and sanitation*.—The health of the establishment was bad in Mamandur range in *Chittoor* division, the Javadis and the Thenmalais in *Vellore* division, in the Chitteris and Atur-Kalroyans in *Central Salem* division and in the Kollimalais and Pachamalais in *South Salem* division; elsewhere it was normal.

66. For the improvement of water facilities on the Javadis, the District Board, North Arcot, generously contributed Rs. 4,900. With this amount 22 wells were deepened or repaired and trial shafts were sunk. The Malaiyalis greatly appreciate this benefit conferred on them.

No special measures of sanitation were undertaken in other divisions.

67. *Casualties*.—In *Chittoor*, two clerks, one of whom was the Accountant, and a punkah puller of the District Forest office, and one Forest Guard died of malaria. In *Vellore*, one watcher died of malaria. In *North Salem* one Ranger (Mr. R. E. Lemos) died of chronic asthma. In *Central Salem*, the head clerk of the District Forest office died, one Forester died after an operation, and one range peon died of malaria.

CHAPTER VIII.—GENERAL.

1. FORMATION OF AND MANAGEMENT BY PANCHAYATS. (TO INCLUDE FOREST VILLAGE SYSTEM.)

68. *Formation and management of panchayats*.—In *Vellore* division, four reserves aggregating 23,524.71 acres, viz., Kavuthi, Kannamadai, Radapuram and Tippakadu reserves of Tiruvannamalai range which were transferred from 'Red' to 'Yellow' during the previous year were handed over to panchayats during the year. In the *Central Salem* division, a special enumeration of all sandal trees in the Nagaramalai reserve under panchayat management was made by Mr. N. S. Ghate, Assistant Conservator

of Forests, the total number of measurable trees being 9,214. This made a strong case for resuming the reserve under class I, and a revision of the classification was accordingly ordered in G.O. Mis. No. 73, dated 10th January 1929. The reserve was handed over to the Forest department after the close of the year.

69. *Forest village system (Class II panchayat)*.—The administration of certain 'Red' reserves of Tiruvannamalai range by class II panchayats was given up under the Chief Conservator's orders. Proposals to introduce the system in *Central Salem* division were dropped as the reserves were found not suited for the purpose.

2. MEASURES FOR IMPROVING LOCAL SUPPLIES AND FACILITIES FOR OBTAINING FOREST PRODUCE, WATER-SUPPLY, FUEL, MANURE LEAVES, ETC.

70. (a) *Improvement of water-supply in State forests—Boring operations*.—

Nil.

71. (ii) *Improvement of water-supply in grazing grounds*.—In *Chittoor*, the villagers of Synagunta and Kottamitta were permitted to graze their cattle in Mordana reserve of Palmaner range and to water them in the Govinda Nathi Ar as there was water scarcity in the Synagunta reserve. Rupees 237 in *Chittoor*, Rs. 204 in *Vellore*, Rs. 50 in *North Salem* and Rs. 50 in *Central Salem* were spent on repairing or deepening water sources in grazing grounds. In *South Salem*, no necessity was felt for any special improvement of water sources. If this work can be extended it may be possible to return to the block system of grazing, which will be greatly to the benefit of the forests.

72. (b) *The supply of forest produce to meet the wants of the public*.—The wants of townspeople and factories were generally met by coupe contractors. In Tiruvannamalai town a co-operative labour union met the town supply from coupes leased out to the union.

73. (c) *Supply of manure leaves*.—The question of supply of green manure from reserves under departmental control is awaiting orders of Government on the proposals submitted for ultimate closure of the reserves, the agriculturists being educated in the matter of growing their own green manure crops from patta fields through demonstration by the Agricultural department. As the progress in this respect is very slow and as land-owners do not evince any interest in growing green manure crops in patta fields, the agitation for green manure from reserves is great in *South Salem* and *Central Salem* divisions. Working forests for leaf manure is opposed to all sylvicultural principles but something has to be done pending more complete education of agriculturists. Accordingly in *South Salem* manure leaf series were sold on the coupe

system to contractors who supplied the local demand on payment. The demand in *Central Salem* is at present met from unreserves and mitta forests, and Daincha is grown to some extent in private holdings, but illicit removal of green leaf manure is still practised on a large scale especially in manure reserved forest. In *Chittoor* nine manure leaf felling series, each series divided into three annual coupes, were opened under the provisions of the revised working plan and one coupe in each series is sold annually. It is hoped that this provision may soon be cancelled when the people become more enlightened. In *Vellore* the requirements were met to some extent from leased fuel coupes. It is reported that the supply is nothing like enough to meet the demand and that illicit removals from reserved forests are resorted to by the ryots especially in Odugathur and Polur ranges. In *North Salem* the villagers get their requirements from unreserves and their own patta holdings. The solution of this problem is a pressing matter in the interests of the forests.

74. (d) *Removal of thatch and fodder grass by the public.*—In *Vellore* division free removal of thatch grass was permitted as usual or all the reserves including fuel coupes closed to grazing.

3. TIMBER AND SANDALWOOD TRANSIT RULES.

75. (i) *Timber Transit Rules.*—These are in force only in *Chittoor* division where they are working satisfactorily.

(ii) *Sandalwood Transit Rules.*—The rules referred to in the last year's report remain in force. Proposals for revising the existing schedule of routes and checking stations with a view to effect better control over transport are under consideration.

4. JUNGLE TRIBES.

76. The Malayalee Hill village system continued in force in the hill villages on the Javadis and the Kalroyans in the *Vellore* division and in the Chitteris in the *Central Salem* division. The introduction of the system in the Salem Kalroyans of the Attur range and in the Bodamalais in the *South Salem* division is under consideration. The extension of the scheme to the Pachamalais and Kollimalais also has been suggested and so far the cattle census in each Malayalee village has been recorded.

As usual refunds of grazing fees for satisfactory protection of sandalwood areas and maintenance of reserve boundary lines, and special rewards for successful fire protection of the reserves covered by the Hill Village Grazing Scheme, were distributed during the year in open durbars specially convened for the purpose by the District Forest Officers. Deserving men from jungle tribes

continue to be employed as watchers, forest guards and foresters. The elementary schools at Komettiyeri and Veerappanur on the Javadis continue to work well. The opening of an itinerant dispensary at Komettiyeri is under consideration. A school under co-operative management was opened on the Kollimalais and proposals were received after the close of the year from the Registrar of Co-operative Societies to extend the system to other parts and the forest department has been requested to partake in the supervision.

5. MINING AND QUARRYING.

77. *Mining.*—In *Vellore* division a licence to prospect for pyrites for a period of one year from 2nd March 1928 in respect of an extent of two square miles in Periamalai reserve of Polur taluk was granted to Mr. H. A. Golwynne, Madras. A similar licence for one year from 5th November 1928 in respect of an extent of 1,060 acres on the same reserve adjoining the extent originally granted was also granted to him. In *Central Salem* Mr. S. K. Ramachandar was granted a mining lease for magnesite in Kurumbapatti reserve for a term of thirty years.

78. *Quarrying—Chittoor.*—A stone quarry in Ambur drug reserved forest was leased out for Rs. 352. Permission was granted for quarrying elsewhere on payment of seigniorage rates. *Vellore.*—Local Fund contractors were as normal allowed free removal of road metal from reserved forests for public works. Banavaram quarry was leased. Avarampoliem quarry had already been leased for three years from 1923–29. *Central Salem.*—Rupees 96–2–0 was collected from the District Board for 38,446 cubic feet of metal quarried during the year. *South Salem.*—Ordinary building stones were sold on lease in quarries in the reserves and unreserves. Royalty was charged for other departmental works irrespective of the agency of collection both for reserves and unreserves.

6. LIVESTOCK.

79. *Elephants.*—Nil.

80. *Other animals.*—One bull was maintained by the department for watering the plants in the Whiteside's garden reserved forest and the forest rest-house compound at Palmaner.

7. CIVIL SUITS.

81. *Chittoor.*—The result of the appeal preferred by the Zamindar of Baugarupoliem is not yet known. *Central Salem.*—A notice of suit was filed by Mr. K. V. Krishnaswami Ayyar on behalf of Arunagiri Chettiyar of Talapalaiyam, Bhavani taluk, claiming damages to the extent of Rs. 20,000 consequent on the District Forest Officer's refusal to register his

property mark on the ground that the party was suspected of illegal practices of substituting and introducing other sandal trees bearing counterfeit hammer mark. The property mark of Arunagiri Chettiyar was subsequently registered after which the suit was dropped. *South Salem.*—The bees'-wax case referred to in the last year's report was decreed against Government to pay to the plaintiff the value of the wax under suit, together with costs and interest. The bundles of wax—the suit property—which were kept in the double-lock room of the Salem Huzur Treasury were taken over after the close of the suit and despatched to the medical stores depot.

82. *Enclosures within the Arasadi Arivithi reserved forest, Musiri Pachamalai reserve, Tenbarunad village.*—The suit filed by Mr. Ramachandra Ayyar of Arumbavur referred to in the last year's report, claiming an extent of 26.75 acres within the reserved forest, alleging to have been purchased from the legal inheritant of Parathammal under the cover of a sale deed executed in the 8th September 1921 was pending in the Court of the District Judge, Trichinopoly, in O.S. No. 4 of 1923. Another suit was filed within the same vicinity by Natti Periamuthu Machi Reddi of Arumbavur, Perambalur taluk, in O.S. No. 141 of 1928 of the District Judge, Trichinopoly, contending that paimash No. 1368 and three other numbers in Thenbarunad village are his private property within the reserved forest, by virtue of a sale deed dated 9th December 1917 and praying for possession and annual profits or in the alternative for a decree of Rs. 1,000 as the value of the suit property.

8. CONTROL OF UNRESERVED LANDS BY THE FOREST DEPARTMENT.

83. *Vellore.*—The Land Revenue Administration of the Javadi hill villages of Tiruppattur taluk has now been under the control of this department for the last eleven years and its continuance for another year up to 31st August 1929, was sanctioned in G.O. No. 276, Development, dated 14th February 1929, and communicated in Chief Conservator's Proceedings Mis. No. 133, dated 16th April 1929. Proposals have already been submitted to extend the Land Revenue Administration throughout the Javadis and the Yelagiris of this division. *South Salem.*—The unreserves of the Pachamalais and Kollimalais remained under the partial control of the Forest department in the matter of protecting the existing growth from destruction by 'ponakading.' The department continued to have control over the sandalwood and minor produce in the plateau unreserves.

84. Several of the old Ponakad areas on the Kollimalais and Pachamalais have been held under sivayi-jama and by a general

order, all such cases were held 'objectionable.' This led to agitation among the Malayalees. After due investigation, the Collector of Salem passed orders classifying such lands as 'objectionable' and 'unobjectionable'; on the basis of this order, the revenue subordinates can admit of petitions for Ponakad cultivations only in respect of the lands classed 'unobjectionable.'

A similar detailed report on the origin and condition of the Trichinopoly Pachamalais has been sent up to the Collector of Trichinopoly for a joint investigation with the Revenue and Forest Officers regarding lands on the Pachamalais available for Ponakad cultivation, on the same lines as dealt with by the Collector of Salem. The Collector of Trichinopoly is taking actions on the proposals submitted.

85. The relations between the Forest and Revenue departments continued to be friendly.

ENCLOSURE

AN ACCOUNT OF THE OPERATIONS AND RESULTS IN EACH FOREST DISTRICT OF THE FOURTH CIRCLE DURING 1928-29.

CHITTOOR DIVISION.

Description.—This division covers portions of the civil districts of Chittoor and North Arcot. It consists of Palmaner range, which is a continuation of the Mysore plateau, and Chandragiri, Chamala, Mamandur and Gudiyattam ranges which cover the western slopes and spurs of the Eastern Ghats. The elevation of the division varies from 500 to 3,794 feet above sea level. The forests are of the dry deciduous type for the most part, but in parts of the Mamandur and Chamala valleys, timber of valuable species occurs. Sandal is also found but of inconsiderable size.

Area.—The aggregate area of the reserved forests in the division is 786 square miles, of which 577 square miles are under the control of the Forest department and 209 square miles under the control of pauchayats.

How the Forest division is split up into subordinate administrative charges—

	Ranges.						Number of beats.
1. Chandragiri	...	...	...	...	...	...	8
2. Chamala	...	...	...	...	...	...	8
3. Mamandur	...	...	...	...	...	...	8
4. Palmaner	...	...	...	...	...	...	13
5. Gudiyattam	...	...	...	...	...	...	15
							—
						Total	52
							—

Cost of administration—

	RS.
District Forest Officer	9,919
Range officers	10,601
Subordinate staff	32,727
Clerical staff	8,793
Total	62,040

Cost under other important heads—

	RS.
Exploitation	1,166
Improvement and upkeep of forests	18,602
Miscellaneous	17
Total	19,785

Income from main sources—

	RS.
Sandalwood	1,598
Timber	11,174
Fuel	8,319
Bamboos	14,353
Grazing	24,643
Minor forest produce	21,624
Miscellaneous, including drift and waif wood	8,936
Total	90,647

The chief work done in the division—

Supply of fuel and control of grazing.

Establishment of sandal propagation centres with a view to the introduction of sandal in a systematic manner.

A limited amount of timber, red sanders and species of shorea, is marketed from Talakona and Chamala valleys of Chamala range.

The financial results of the year are analysed below :—

	RS.
Total revenue	90,647
Total expenditure	84,520
Net profit	6,127

VELLORE DIVISION.

Description—The division comprises the whole of the Javadi hills of the Eastern Ghats with their outliers, roughly 50 miles long and 30 miles broad, with an elevation rising to about 3,200 feet. To the south, lie the Kalroyans forming, as it were, a barrier between the North and South Arcot districts and the fringe of these also is administered from Vellore. The

territorial jurisdiction of the division extends over the major portion of South Arcot and Chingleput districts in which, however, reserved forests have been handed over to Revenue Panchayat management. The hill forests are mostly deciduous, with stretches of evergreen belts at higher elevations. The forests are notable for sandal and bamboos, especially bamboos which are famous throughout Southern India with small timber and fuel species in the foot hills.

Area.—The aggregate area of the reserved forests in the division is 1,116 square miles, of which 706 square miles are under the control of the Forest department and 412 square miles under the control of the Revenue Department. An area of 37 square miles was transferred to the control of the Revenue Department during the year under review.

How the Forest division is split up into subordinate administrative charges.—

Ranges.	Beats.	Sandal-wood series.	Total.
1. Tirupattur	9	4	13
2. Alangayam	8	1	9
3. Chengam	4	3	7
4. Tiruvannamalai	7	...	7
5. Polar	7	3	10
6. Santhavasal	9	3	12
7. Odugathur	29	...	29
Total	73	14	87

Cost of administration—

	RS.
District Forest Officer and his assistants	25,391
Range officers	21,481
Subordinate staff	41,632
Clerical staff	15,761
Total	1,07,265

Cost under other important heads—

	RS.
Exploitation	10,030
Improvement and upkeep of forests	25,622
Miscellaneous	109
Total	35,761

Income from main sources—

	RS.
Sandalwood	1,82,040
Timber	26,752
Fuel	42,718
Bamboos	97,404
Grazing	51,818
Minor forest produce	59,790
Miscellaneous, including drift and waifwood	37,220
Total	4,97,742

The Chief work done in the division.—Marketing of sandalwood, fuel, bamboos and minor forest produce. Land Revenue Administration is a feature in the Tirupattur-Javadi where the Forest department assumes to a limited extent the functions of the Revenue Department to the satisfaction of all concerned. A start has been made in the enumeration of patta sandalwood trees on the hills.

The financial results of the year are analyzed below :—

	RS.
Total revenue	4,97,742
Total expenditure	1,50,075
Net profit	3,47,667

NORTH SALEM DIVISION.

Description.—Part of the division covers a portion of the Mysore plateau which contains large areas of sandalwood forests. The lower areas towards Salem (the 'Talaghat') do not contain so much sandalwood, but such timber species as *Hardwickia binata*, *Terminalia Arjuna* and *Anogeissus latifolia*, etc., grow in profusion.

Area.—The aggregate area of the division is 578 square miles, of which 568 square miles are under the control of the Forest department and 10 square miles under the control of the Revenue Department.

How the Forest division is split up into subordinate administrative charges.—

Ranges.	Beats.	Sandal-wood series.	Total.
1. Denkanikota East	5	5	10
2. Denkanikota West	7	2	9
3. Anchetti	8	2	10
4. Dharmapuri	8	2	10
5. Krishnagiri	6	...	6
Total	34	11	45

Besides the above, there is a Ranger on spike investigation work and another on patta sandalwood duty.

Cost of Administration—

	RS.
District Forest Officer	11,507
Range officers	17,182
Subordinate staff	29,681
Clerical staff	11,734
Total	70,104

Cost under other important heads—

	RS.
Exploitation	17,764
Improvement and upkeep of forests	25,337*
Miscellaneous	988
Total	44,089

Income from main sources—

	RS.
Sandalwood	2,51,998
Timber	10,808
Fuel	3,766
Bamboos	3,825
Grazing	34,955
Minor forest produce	24,749
Miscellaneous, including drift and waifwood	8,602
Total	3,38,703

The chief work done in the division.—The extraction of sandalwood, the supply of small timber, bamboos and fuel to the local population are the chief works done in the division. Investigation under the supervision of the Indian Institute of Science, Bangalore, is being undertaken with a view to discover the cause of sandal 'spike' disease. Lac introduced by the Utilization Branch as an experimental measure is likely to afford an additional source of revenue.

The financial results of the year are analyzed below :—

	RS.
Revenue	3,38,703
Total expenditure	1,18,401
Net profit	2,20,302

CENTRAL SALEM DIVISION.

Description.—The Forest division covers the Shevaroy hills in the centre and the Kalroyan hills in the north and north-east, part of the latter being known as the Chitteris. The Shevaroy hills attain an elevation of over 5,000 feet, while the Kalroyan hills average 2,000—3,000 feet. The Chitteris are a tangled mass of plateau and ravines with peaks rising to nearly 4,000 feet in height. The southern and western parts of the division consist of small hillocks and undulating ground where *Hardwickia binata* and fuel species are found. The higher elevation contains small timber, bamboos and sandal in fair quantities. About 2,000 acres of the Shevaroy hills have been leased to planters for coffee cultivation.

Area.—The aggregate area of the reserved forests of the division is 964.61 square miles, of which 732.61 square miles are under the control of the Forest department and 232 square miles under the control of the Revenue Department. An area of about 3½ square miles was disreserved during the year.

* Includes Rs. 9,241 incurred on spike investigation operations.

How the Forest division is split up into subordinate administrative charges—

	Ranges.						Beats.
1. Atur	...	...	...	...	...	...	20
2. Harur	...	...	...	...	...	...	19
3. Shevaroy's South	...	...	...	...	...	...	10
4. Shevaroy's North	...	...	...	...	...	...	7
5. Cauvery	...	...	...	...	...	...	10
							66

Cost of Administration—

							RS.
District Forest Officer	...	...	...	...	...	...	10,417
Range officers	...	...	...	...	...	...	13,286
Subordinate staff	...	...	...	...	...	...	30,492
Clerical staff	...	...	...	...	...	...	11,076
Total	...	...	...	...	...	...	65,271

Cost under other important heads—

							RS.
Exploitation	...	...	...	...	...	...	3,088
Improvement and upkeep of forests	...	...	...	...	...	...	17,134
Miscellaneous	...	...	...	...	...	...	82
Total	...	...	...	...	...	...	20,304

Income from main sources—

							RS
Sandalwood	...	...	...	...	...	...	28,078
Timber	...	...	...	...	...	...	20,231
Fuel	...	...	...	...	...	...	29,046
Bamboos	...	...	...	...	...	...	20,935
Grazing	...	...	...	...	...	...	69,694
Minor forest produce	...	...	...	...	...	...	26,200
Miscellaneous, including drift and waifwood	...	...	...	...	...	...	28,564
Total	...	...	...	...	...	...	2,21,848

The chief work done in the division.—Timber trees in Harur and Shevaroy's ranges were sold standing to contractors in order to test the market. For the rest the work is mainly control of grazing and supply of fuel to Salem town. A limited quantity of sandalwood is extracted.

The financial results of the year are analyzed below :—

							RS.
Total revenue	...	...	...	...	...	...	2,21,848
Total expenditure	...	...	...	...	...	...	90,051
Net profit	...	...	...	...	...	...	3,11,797

SOUTH SALEM DIVISION.

Description.—The South Salem Forest division comprises the Bodamalais and the Kollimalais of the Salem district and the Pachamalais of the Salem and Trichinopoly districts, isolated hill ranges reaching in some places an elevation of 4,000 feet. The valleys and the higher slopes contain semi evergreen forests. The plateaux were originally mainly evergreen species, but most of them have been denuded by shifting cultivation, only small remnants of the original sholas being left. Sandalwood is common in the plateaux and along streams and slopes up to about 2,500 feet. The present stock is mostly immature. 'Spike' disease on the Pachamalais of Trichinopoly district has almost been arrested; it is now prevalent on the eastern side of the Kollimalai plateau. The lower slopes of all these ranges are fuel forests, greatly denuded by manure leaf cutting.

Area.—The aggregate area of the reserved forests in the division is 411 square miles, of which 255 square miles are under the control of the Forest department and 156 square miles under the control of the Revenue Department.

How the Forest division is split up into subordinate administrative charges—

	Ranges.						Beats.
1. Rasipur	...	...	...	...	...	...	9
2. Namakkal	...	...	...	...	...	...	9
3. Thammampatti	...	...	...	...	...	...	12
4. Turaiyur	...	...	...	...	...	...	12
Total	...	...	...	...	...	...	42

Cost of Administration—

							RS.
District Forest Officer	...	...	...	...	...	...	8,648
Range officers	...	...	...	...	...	...	12,217
Subordinate staff	...	...	...	...	...	...	21,196
Clerical staff	...	...	...	...	...	...	11,046
Total	...	...	...	...	...	...	53,107

Cost under other important heads—

							RS.
Exploitation	...	...	...	...	...	...	1,858
Improvement and upkeep of forests	...	...	...	...	...	...	15,480
Miscellaneous	...	...	...	...	...	...	571
Total	...	...	...	...	...	...	17,909

Income from main sources—

	RS.
Sandalwood	18,718
Timber	23,827
Fuel	8,665
Bamboos	5,410
Grazing	24,350
Minor forest produce	37,846
Miscellaneous, including drift and waifwood	21,755
Total	1,40,571

The chief work done in the division.—Control of grazing and supply of fuel and leaf manure.

Toon trees were extracted in the Namakkal Kollimalais for cart materials in order to test the market. The Ponakading in the plateau unreserves of the Pachamalais and Kollimalais of Salem district under the control of the Forest department was investigated by the Collector of Salem and classified into objectionable and unobjectionable.

The financial results of the year are analyzed below :—

	RS.
Total revenue	1,40,571
Total expenditure	74,381
Net profit	66,190

SUMMARY OF PROGRESS DURING THE FIVE YEARS 1924-25 to 1928-29.

The chief features of the quinquennium were—

1. The reconstitution of the Fourth Circle into five divisions from eight. During this rearrangement, Chittoor was attached to the Fourth Circle and Chingleput was abolished.

2. The transfer of headquarters of *North Salem* to Hosur cattle farm and that of *South Salem* division to Salem.

3. Reclassification of forest reserves and the consequent transfer of Ryots forests to the Land Revenue Department resulting in a change in the territorial jurisdiction of forest divisions as follows :—

(1) A reduction in the number of ranges from 34 to 26 due to the abolition or transfer of ranges to other circles.

(2) The transfer of Tanjore forests to the Fifth Circle.

(3) The merging of *East Salem* division excluding the portion handed over to Panchayat management into *Central Salem* division.

(4) The reconstitution of the three *Vellores* into one *Vellore* division.

4. The decision in favour of Government of the appeal against Section 4 Notification in respect of Arana and Thirthagiri reserved lands.

5. The investigation into the cause of 'spike' disease in sandal by the Indian Institute of Science, Bangalore, on a contract for three years from 1st October 1927.

2. ADMINISTRATION AND CONTROL.

The present *Central Salem* and the *Vellore* divisions as reconstituted being found too heavy, the question of regrouping and distributing the reserved forests among other divisions was considered. Proposals were sent up to Government for bifurcation of the *Vellore* division. These have been kept in abeyance pending decision on the larger question of reorganization of the Forest department.

The following officers were in charge of the Fourth Circle during the period under review :—

(1) Mr. H. A. Latham—1st April 1924 to 23rd November 1924.

(2) Mr. T. Clear—24th November 1924 to 24th May 1926.

(3) M.R.Ry. Rao Sahib K. R. Venkataramana Ayyar—25th May 1926 to 27th November 1927.

(4) Mr. T. Clear—28th November 1927 to 31st March 1929.

3. ORGANIZATION.

The reorganization of the protective staff resulting in reduction in the number of foresters and forest guards was given effect and beats were reconstituted on the basis of one forest guard and one watcher for each beat.

4. CHANGES IN AREA.

The area under the control of the department was increased from 2,754 square miles to 2,876 square miles as detailed below :—

	At the commencement of the period. SQ. MLS.	At the close of the period. SQ. MLS.
Reserved forests	2,703	2,839
Reserved lands	51	37
Total	2,754	2,876

The net increase was chiefly due to the addition of *North Vellore* as reconstituted to include part of Chingleput, and of Chittoor to this circle and partly to the areas of reserved lands having been constituted as reserved forests in *East* (now included in *Central Salem*), *North* and *South Salem* divisions.

5. FOREST SETTLEMENT.

Forty-six (46) square miles were settled during the period.

6. DEMARCATION.

The total length of artificially marked boundaries at the end of the quinquennium was 4,917 miles. During the period under review 166 miles of boundaries were permanently demarcated.

7. FOREST SURVEYS.

During the period the Madras Survey surveyed the outer boundaries of reserved forests in Atur and Salem taluks including the survey of coffee

estates on the Shevaroy, and the survey of boundaries in Omalur, Rasipur and Namakkal taluks is in progress.

At the close of the period the survey of Bailnad reserved land was also taken up by the survey party.

8. WORKING PLANS.

During the period under review consolidated working plans for the workable areas in *Chittoor* and *Vellore* (old *South* and *West Vellore* divisions) were completed for an aggregate area of 1,423 square miles. At the close of the quinquennium, the preparation of the consolidated working plan for the *Central Salem* division covering an area of 508 square miles was taken up and this has since been completed.

An area of 337 square miles is still to be brought under working plan.

9. COMMUNICATIONS AND BUILDINGS (INCLUDING OTHER WORKS).

The average annual expenditure during the quinquennium was Rs. 50,171 against Rs. 85,620 of the previous period. The decrease is due to the fact that large expenditure was incurred by the Forest Engineer on the Javadi roads in the previous period (Rs. 62,656).

10. FOREST OFFENCES.

The average annual number of offences reported during the period under review was 10,637 as compared with 8,550 of the previous quinquennium. The increase is due to the addition of *North Vellore* division as reconstituted to include part of *Chingleput* district, and of *Chittoor* to this circle.

11. FIRE PROTECTION.

The average area under special fire protection amounted to 1,171 square miles, the average failure being 2.64 per cent as compared with 1,090 square miles and 2.29 per cent respectively of the previous quinquennium.

12. PROTECTION FROM CATTLE.

The whole forest is closed to goats. The average area annually closed to all animals was 285 square miles and that open to grazing 3,288 square miles.

13. YIELD AND OUTTURN.

The following shows the average annual outturn for the two periods:—

	Timber and fuel in thousands of cubic feet.	Bamboos.	Minor produce.
	Rs.	Rs.	
1919-20 to 1923-24 ...	1,694	1,46,885	1,03,846
1924-25 to 1928-29 ...	2,688	1,19,817	4,00,159

There has been an increase under timber by 58.67 per cent. due to the redistribution of divisions and increased assignment of darkhast lands and under minor forest produce by 285.34 per cent. The variation is apparently due to exclusion by mistake of the outturn under grass and grazing from the total outturn 'minor produce'.

The decrease under bamboos, which amounts to 18.43 per cent, is due to gregarious flowering of bamboos and to unhealthy competition in the previous quinquennium and to collection of 1924-25 kist in 1923-24.

14. FINANCIAL RESULTS.

The average annual financial results for the two periods are—

	Revenue.	Expenditure.	Surplus.
	RS.	RS.	RS.
1919-20 to 1923-24 ...	10,35,462	5,72,484	4,62,978
1924-25 to 1928-29 ...	13,99,148	6,42,023	7,57,125

The increase in the net revenue was chiefly due to extraction of sandalwood in a large scale on account of Spike in *North Salem* division, and to the addition of *Chittoor*, and *North Vellore* as reconstituted to include part of *Chingleput* division, to this Circle.

15. FOREST EDUCATION.

The results during the quinquennium are shown in the statement below:—

Period of sessions.	Total number trained.	Award of certificates.		
		With Honours.	Higher standard.	Lower standard.
Period ending June 1925	1	1	..	..
Do. 1926	1	1	..	..
Do. 1927	..	..	..	..
Do. 1928	2	..	2	..
Do. 1929	2*	..	1	..

* One died.

The Vernacular Training School for training foresters and forest guards was opened annually as usual. The results are summarized below:—

Period.	Total trained.	Award of certificates.		
		First class.	Second class.	Third class.
February to July 1925	28	8	20	..
Do. 1926	30	14	16	..
Do. 1927	30	8	22	..
Do. 1928	30*	7	23	..
Do. 1929	..	..	..	..

* Includes fifteen students from Kollegal division of V Circle.

SALEM,
13th September 1929.

T. CLEAR,
Conservator of Forests, IV Circle.

ANNUAL ADMINISTRATION REPORT OF THE FOREST DEPARTMENT

FOR THE
YEAR ENDING 31st MARCH 1929.

FIFTH CIRCLE.

CHAPTER I.—CONSTITUTION OF STATE FORESTS

1. ALTERATION IN AREA.

Reserved forests.—The total area of reserved forests at the beginning of the year was 3,338 square miles and at the end 3,321. The decrease was mainly due to the disafforestation of reserves in Cumbam range of Madura amounting to 10,817·50 acres as per details noted below :—

	ACS.	
Punnaimuthukaradu	87	Being a low-lying undulating ground with low thorny shrubs and without any tree growth was considered not worth while retaining as a reserved forest and disafforested.
Surilipatty Karadu	28·00	} Disafforested and granted to Mr. Mead for plantation.
Kuttinachiar do.	1,266·50	
Vannathiparai do.	9,436·00	

An area of 0·78 acre of reserved forest consisting of the sites occupied by the buildings at Attakatti, taken over by the Ropeway Company, was disreserved with effect from 1st August 1928. There is a difference of 31·64 acres in Satyamangalam, Bhavani and Mettupalayam ranges of North Coimbatore. This is due to adoption of correct figures as notified. There is also a difference of 1·52 acres in Madura (Ayalur range) due to the recomputation of the reserved forest areas by the Director of Survey. The addition of 6·24 acres in South Coimbatore during the year is due to the adoption of the correct area disafforested from the Anamalai reserved forest under notification No. 329, dated 8th November 1924.

The survey of the Honnametti estate has been completed by the Officer in charge of No. III Party, Salem, but the survey has not been validated under the Act. The survey officer has intimated that the final notification will be published by the end of July 1929, provided no petition disputing the correctness of the survey is pending then. On receipt of further information from the survey officer, necessary notification will be submitted for the disreservation. Until then the estate will continue to be held on lease by Mr. R. C. Morris.

2. *Reserved lands.*—Nil.

3. *Forest settlement.*—Nil.

DEMARICATION.

4. The following are the new works undertaken during the year:—

	RS.	A.	P.
Demarcation of enclosures in Kollegal for the first time 14 miles	777	9	0
Completion of the demarcation of the boundary between North Coimbatore and Palghat division, 5 miles	111	0	0
Clearing the boundary between the North Coimbatore and the Nilgiri division, 5 miles ...	301	0	0
Clearing the boundary between the North Coimbatore and Kollegal divisions, 1 mile	70	0	0

The reclearing of the existing boundaries was as usual done by the subordinates free of cost in all divisions except South Coimbatore.

South Coimbatore.—A sum of Rs. 42-8-0 was spent for clearing the eastern boundary of the Punachi Working Circle, and erecting small cairns of rough stone, with stacks in the centre over a distance of 11½ furlongs. In Pollachi range a sum of Rs. 14-8-0 was spent in re-erecting 58 fallen boundary pillars on the outer boundaries of Tunacadavu and Anamalai reserves.

Madura.—Ten miles and four furlongs of Karumalai reserve, Natham range, was permanently demarcated with stone pillars and cairns at a cost of Rs. 1,099.

A sum of Rs. 50 was spent in *Tinnevelly* on clearing the common boundary between the Kattalamalai estate and reserved forest in Kannikatty range.

FOREST SURVEYS.

(a) *By the Survey of India Party.*

5. Nil.

(b) *Local Surveys.*

6. The survey of coupes and regeneration areas was as usual done by the subordinates.

7. Reference maps were maintained in all districts and posted to end of March 1929.

CHAPTER II.—MANAGEMENT OF FORESTS.

1. REGULATION OF MANAGEMENT.

Preparation and control of working plans.

(a) *Preparation.*

8. No new working plans were sanctioned during the year.

The working scheme for the Kollegal division completed by the District Forest Officer was tentatively approved.

The preparation of a new working plan in North Coimbatore division is underway by the working plans staff.

A revised working plan for the Mount Stuart forests is under preparation by Mr. M. V. Laurie under the Working Plans Conservator.

A scheme for opening a fuel series consisting of 30 coupes in the Nallar valley of the Anamalai reserve in the Udamalpet and Pollachi ranges of South Coimbatore division was prepared by the District Forest Officer and was sanctioned tentatively for a period of three years.

The prescriptions of the tentative working plan of 1923 in the Tinnevelly division were carried out. Steps are being taken to revise the working plan as early as possible.

(b) *Control.*

9. The prescription of the existing working plans and schemes were generally followed except in the following cases:—

North Coimbatore.—Felling in eight working circles were behind hand, due to lack of demand. For the same reason coupe 21 of Senkaradu was not sold during the year. Improvement fellings in Kallar and Jaccaneri working circles were not undertaken, as the operations were found unnecessary.

South Coimbatore.—Slight deviations from the working plan for Mount Stuart Working circle were reported to the Chief Conservator and his approval obtained. Coupe XLI of the above was worked during the year, and the area regenerated was 150 acres. All fuel and bamboo coupes were sold standing, except one fuel coupe for want of good offer, and this was worked departmentally.

Madura.—Felling was not carried out in three felling series, wherein re-arrangement of series for working was under correspondence, and one Karandamalai timber felling series in Ayalur range was closed.

Tinnevelly.—Two strips of Puliyangudi coupe XXI and one strip of Karuppaswamikoil coupe VI and Vasudevanallur coupe V were worked departmentally. The remaining strips in the above were sold.

The three coupes in Scrivilliputhur range, not sold in 1928, were sold during this year.

2. COMMUNICATIONS AND BRIDGES.

(a) Roads and Bridges.

10. The expenditure on new works amounted to Rs. 6,452 and on repairs Rs. 51,325 against Rs. 5,146 and Rs. 71,022 in the previous year. The chief works were:—

Kollegal.—Construction of bridle path, 1 mile 6 furlongs.

North Coimbatore.—The cost of land acquired for the Dayanur-Tholampalayam road constructed last year was paid.

South Coimbatore.—Construction of a fair weather road in Tunacadavu range, 7 furlongs.

Madura.—Extension of Sirumalai-Anjukulipatti road, 4 miles 2 furlongs.

Tinnevelly.—A cart-track 5 furlongs 17 yards, a new road 4 furlongs, and one bridle-path $2\frac{3}{4}$ furlongs. A bridle-path was traced to a distance of 8 miles 2 furlongs and another was widened to 11 feet for a distance of ten furlongs.

11. Five hundred and twenty-five miles and two furlongs of roads and bridle-paths were maintained during the year. The road from Cowdalli to Chengadi, 13 miles long, was thoroughly repaired and made fit for motor traffic. One hundred and ten miles of road was maintained in Madura from combined funds of the local fund and this department. A sum of Rs. 4,846-4-0 was contributed by the several district boards for repairs to roads, and this sum was credited to revenue. A sum of Rs. 1,099-11-0 paid by the

District Board, Coimbatore, for repairs to Tamarakarai-Girgagandi road, and Ajjipuram-Girgagandi road, and Rs. 2,000 for the Amaramapalayam-Sethumadai road were received after the close of the year.

Contribution from the Tinnevelly Taluk Board for repairs to five falls road is yet due.

(b) Buildings.

12. Expenditure on new works was Rs. 11,313, and the important works carried out were:—

Kollegal.—Construction of subordinates' lines at Gopinatham. Construction of subordinates' lines at Ullurthanda.

Construction of a Range clerk's quarters at Thattakarai (incomplete work).

North Coimbatore.—Subordinate lines at Thekkampatti.

South Coimbatore.—The construction of the waterfall buildings was completed. A new raingauge was set up at Gundrow.

Madura.—Improvements to the subordinate lines at Vembadi. Improvements to the depot clerk's quarters at Gundan shola.

Conversion of subordinate lines at Green hut into an inspection shed.

Construction of a compound wall round Surlipatti depot.

Tinnevelly.—Construction of Forester's quarters at Pudupatti, and the construction of a portion of the compound wall of Range Officer's quarters and office at Kadayanallur.

13. Rupees 12,623 was spent on repairs to buildings during the year.

(c) Miscellaneous.

14. *Kollegal.*—The well attached to the Range Officer's quarters at Cowdalli, and that in the rest-house compound were deepened at a cost of Rs. 13 and Rs. 54-10-0 respectively.

North Coimbatore.—The wells in the Range Officer's quarters at Satyamangalam, at Kadambur and in the Range Office compound at Andiyur were deepened at a cost of Rs. 157.

Tinnevelly.—A new well at Ambasamudram for the use of the Kannikatty Range quarters was constructed at a cost of Rs. 288.

The expenditure on repairs, viz., Rs. 916 was chiefly in silt clearing and deepening wells.

3. PROTECTION OF FORESTS.

(a) General protection.

15. The following statement compares the total number of forest offences during the year under report with those of the previous year :—

Reserves and unreserves.

Cases.	Fires.		Felling.		Grazing.		Other offences.		Total.	
	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.
A. Taken into Court ..	14	7	1,930	1,404	286	226	55	53	2,285	1,690
B. Compounded ..	8	38	2,294	2,233	520	448	174	190	2,996	2,909
C. Undetected ..	180	179	33	17	3	1	1	2	217	199
Total ..	202	224	4,257	3,654	809	675	230	245	5,498	4,798

The figures show slight increase under fires and other offences and decrease under felling and grazing.

The increase under the two heads is very slight, and the decrease is reported to be due to the villagers getting their requirements from agricultural implement coupes, and the handing over of ryots forest to panchayats.

16. *Cases old and new dealt with during the year.*—Of the 2,615 cases taken into court including the old ones, 1,089 ended in conviction, 971 in acquittal leaving a balance of 555 cases pending with the magistrates. Of the 971 cases acquitted, 772 related to cases in which compounding fees were paid in court. One hundred and seventeen cases had to be withdrawn in Madura, as the subordinates who charged the cases were either not in the service, or the accused could not be identified. Rupees 41,750-11-0 was realized as compounding fees against Rs. 34,177 in the previous year. Punishments awarded by magistrates were generally adequate in all districts.

17. In all the districts the range officers enquired into a small percentage of the offences, and the following District Forest Officers held enquiries themselves as noted below :—

	Cases.	
Kollegal ..	...	3
North Coimbatore ..	...	3
Madura ..	...	2
Tinnevely ..	...	1

18. *Rewards.*—Rupees 50 was disbursed as rewards to subordinates : Kollegal Rs. 10 ; North Coimbatore Rs. 25 ; and Madura Rs. 15.

19. *Patrol.*—The special patrol system was not in force in any of the districts. The usual notice warning the public against setting fire to the reserved forests was published in the District Gazettes. Five thousand and eight hundred acres in Tinnevely where fire had occurred were closed to grazing until further orders. Grazing fees were not enhanced.

(b) Protection from fire (calendar year 1928).

20. *Special protection.*—The area attempted to be specially protected during the year was 225,952 acres against 372,180 acres in the previous year, and the cost of protection was Rs. 3,458 against Rs. 4,585 in the previous year. The total area burnt was 1,509 acres against 3,610 in the previous year, the percentage of successful protection being 99.33 against 99.03 in the previous year.

21. *Kollegal.*—No areas were specially protected during the year. Early burning was done in the sandal areas, the grass between the outer edges of the sandal blocks was early burnt at a cost of Rs. 556-6-0. The result of the operation is reported to be satisfactory, as no fires occurred in the sandal areas. The Kollegal-Mysore frontier boundary was cleared to a width of 30 feet on the Kollegal side over a length of 22 miles, and the forests adjoining it were burnt early, at a cost of Rs. 220.

North Coimbatore.—Early burning was done in 5 square miles of Minchigully valley at a cost of Rs. 45. Patches in the Hassanur hills were burnt at a cost of Rs. 19. Hassanur-Bailur road sides were burnt for a distance of 15 miles at a cost of Rs. 44.

South Coimbatore.—Besides the early burning of grass around sholas on the grass hills, the regeneration areas, and timber depots, and also the Punachi timber working circle were fire protected at a cost of Rs. 236-4-0. There were no fires in Punachi range during the year.

Madura—Pine plantations.—The fire protection of the plantations was carried out as in previous years, and was generally satisfactory. Fire tracing of 50-foot lines was done in portions of frontier line to a length of 6 miles.

Amphill downs.—Fire protection was done on the same lines as last year for the protection of the sholas. There was only one fire during the year over an area of 10 acres.

Tinnevely.—The system of early burning was discontinued this year in all ranges, a system of protection by fire patrols is under investigation.

22. *General protection.*—The area under this heading was 1,809,234 acres against 1,682,090 acres in the previous year, and the area burnt was 54,649 acres against 45,486 acres in the previous year. The number and origin of fires are compared in Appendix A.

A sum of Rs. 9 was spent in South Coimbatore for putting out fires.

23. The average cost per square mile of special protection and general protection was Rs. 9-14-0 and Re. 0-11-0, respectively, per square mile attempted.

(c) *Protection against cattle.*

24. Two thousand four hundred and seventeen square miles were open to grazing of all animals except goats against 2,408 square miles in the previous year. Three square miles in Coimbatore North, and two in Tinnevely were kept open for part of the year. One hundred and ninety-nine square miles were open to grazing of all animals except browsers, sheep and goats, throughout the year, and nine for part of the year.

The Minchigully valley (2.82 square miles) in the Satyamangalam range of North Coimbatore was thrown open to the grazing of cattle of Kottadai and Osatti from the 15th August to 30th September 1928 on account of the prevalence of severe rinderpest in Hassanur and Ekkathur plateau.

25. The grazing incidence was :

					Acres per cow unit.	
					1928-29	1927-28.
Kollegal	...	...	...	...	6.1	6.6
Coimbatore, North	...	...	...	...	6.56	6.2
Do. South	...	...	...	...	10.07	9.5
Madura	...	...	...	...	8.0	8.0
Tinnevely	...	...	...	...	2.52	5.4

Grazing permits were issued in South Coimbatore for three elephants at Rs. 10 each. The number of cattle impounded was 10,854 against 13,289 in the previous year and 14,956 the average of three years ending with 1927-28.

(d) *Protection against injuries due to natural causes.*

26. Due to prolonged hot weather the regeneration in South Coimbatore was poor. Teak plantations continued to be attacked by defoliators, though less severely than usual.

27. *Weeds and climbers.*—In Kollegal, creeper cutting on sandal trees in the sandalwood working circles, was done over an area of 8,938 acres at a cost of Rs. 337-12-0.

North Coimbatore.—Creeper on trees in the Mettupalayam range were cut by subordinates during patrol.

South Coimbatore.—Weeding was done in fuel coupes already worked over at a cost of Rs. 377-15-0. Weeding and climber cutting were also done around young teak plants in the Punachi working circle.

Madura.—Creeper cutting in seven fuel coupes over an area of 459 acres was done at a cost of Rs. 550.

Tinnevely.—Weeding and climber cutting were done by the beat subordinates free of cost generally. Rupees 537 was spent on climber cutting in three ranges.

28. *Prickly-pear, Lantana and Strobilanthus.*—Strobilanthus is uprooted by contractors in working their fuel coupes in Tinnevely, being one of the conditions of the coupe agreements.

29. *Damage by animals—Kollegal.*—Elephants continue to roam in the forest and do considerable damage to the forest growth. Four solitary tuskers were proscribed and shot. Sambur and deer caused damage to young sandal seedlings.

North Coimbatore.—Elephants continue to damage the Manar sandal area in Mettupalayam range.

South Coimbatore.—Tender leaves of rosewood and vengai were browsed by sambur and deer, and the teak plantations were defoliated though not so severely as last year. Wild elephants continued to cause damage to teak plants and partially wrecked the 1926 Regeneration Area.

Tinnevely.—Sambur caused damage to a few teak coppice shoots. Elephants migrate to the Alagarcoil valley and cause damage to the sandal, teak and usil trees in Srivilliputtur range.

Madura.—The damage by elephants continued.

30. *Damages by rain and floods.*—Nil.

CHAPTER III.—SILVICULTURE.

SECTION 1.—FORMATION AND REGENERATION.

(i) *General progress of areas under regeneration.*

31. *Kollegal.*—Operations to spread sandal, in portions of Doddasampagai, Madeswaramalai and Chikkailur reserves are being conducted.

Coppice growth in the fuel and agricultural implement coupes, is slow.

North Coimbatore.—Spike still occurs at Hassanur, Kottadai, Gairmalam and Yekkatur of Satyamangalam Range and to a limited extent near Talamalai in Talamalai range; but Gundri and Makampalayam are reported to be free.

Sandalwood reproduction was good and was free from spike in Palamalai and South Bargur reserves of Bhavani range but it is reported that several trees in South Bargur reserve, were found to have been attacked during the last few months. There is good natural regeneration of sandal, in small bushes in the hill plateau of Satyamangalam range. Natural reproduction of sandal in Mettupalayam range is very satisfactory. Reproduction of teak and vengai in South Bargur hills from seed is fair, and that of vengai, vellanagai porasu, unjai and veppam in Talamalai is satisfactory, but although the regeneration of selavagai, rosewood and vengai is good in Karaipalayam forests, most of the seedlings die on account of fire.

South Coimbatore.—Natural regeneration of the more important deciduous species in Tunacadavu range was poor, due to the very bad south-west monsoon, and the north-east monsoon being equally bad, many of the surviving young plants died out, during the hot weather. In Punachi range, the regeneration of valuable species was not satisfactory, due to scanty rains and unusually hot weather.

Natural reproduction from seed in Pollachi range is reported to be fair in the interior portions. Remarkable growth of *nim* is reported in the north-east corner of Kottur fuel coupe, and coppice reproduction is reported to be satisfactory in Ayerangal and Kottur fuel coupes, but to be rather poor in Gudaravalli and Pothamadai coupes, due to suppression by weeds and bushes. Natural reproduction in Udampalpet range is reported to be unsatisfactory, owing to unfavourable season, and spread of lantana and other obnoxious growth. The growth of coppice shoots in the worked over coupes is fairly satisfactory.

Madura.—Natural regeneration of *delbergia latifolia*, *albizzia lebbek* and *odoratissima*, is fair, in the Vannathiparai Sethuvaikal valley of Cumbum range, but they do not make much headway due to the thick canopy overhead.

Vengai and shorea talura natural seedlings are to be found on slopes and plateaux.

Regeneration of teak, vengai and rosewood is fair in Sirur-malai-Anjukulipatti south and Waguthumalai in Sholavandan Range. Sandal regeneration in Cumbam range is restricted to the northern half of Kombai block and natural germination by root suckers and seed is good.

In the felled fuel coupes, the growth from coppice is satisfactory.

Tinnevely.—Sandal is spreading in some quantity in Srivilliputtur and Kuttalam ranges. Artificially introduced sandal plots (1923) in Kannikatty and Kodamadi have not yet started to reproduce—but a number of these plants have survived.

(ii) *Establishment of reproduction under working plan or scheme.*

(a) *Mainly natural.*

32. *North Coimbatore.*—Coppice reproduction in the felled fuel coupes in all ranges is good.

Madura.—Under the Vannathiparai scheme natural regeneration of rosewood is good and that of *adina* fair.

Tinnevely.—Reproduction from coppice in the felled coupes is good except where *Stobilanthus* is abundant. Reproduction from seed bearers in fuel coupes is poor.

Albizzia amara is abundant in Srivilliputtur range. *Dalbargia tamarindifolia* reproduces itself well in the clear-felled coupes of Vallanad reserve.

(b) *Mainly artificial.*

33. *South Coimbatore—Tunacadavu range.*—An area of 150 acres was selected for regeneration during 1929. This was clear-felled, burnt and partly dibbled with teak at a cost of Rs. 3,973-9-0. A further sum of Rs. 161 was spent after the close of the year in completing the dibbling. The whole work was carried out in good time, taking special care in the selection of seeds for dibbling, and in not dibbling seeds too deep.

In the regeneration area of 1928 the operation of raising teak and rosewood in conjunction with hill paddy undertaken last year, was a failure, due to the very bad monsoon. There was no continuous rain soon after germination to enable the seedlings to establish themselves, and the little rain we had was badly distributed being generally followed by a period of drought so that replacements invariably died.

Punachi range.—An area of 25 acres in periodic block I was cleared of all thickets of Lantana, and evergreen shrubs were burnt at a cost of Rs. 89. Clearing and burning Lantana thickets in the periodic block I of 1926-27 was also done at a cost of Rs. 13. Due to continued hot weather, the casualties in the 1926-27 plots were many, and only very few seedlings survived at the close of the year. In the 1928 plot also, only very few seedlings were found here and there, and they were kept clear of weeds.

The proposal to burn Lantana thickets in about 130 acres of compartments IV and VI could not be carried out for want of sufficient dead material, and on account of the greenness of the Lantana as a result of rains in March and April.

Madura.—Artificial regeneration was carried out in the Vannathiparai forests of Cumbum valley, under different treatments, and these have been dealt with in detail in Chapter VI.

Tinnevely.—The following seeds were sown by the subordinates free of cost in Srivilliputhur range and results are noted below :—

Name of reserve.	Teak.	Tamarind.	Result.
Ayyanarkoil reserve ..	12 measures.	3 measures.	41 Teak and 6 Tamarind seedlings exist.
Coupe XXV Pudupatti ..	3 ..	1 of Nellikottai.	2 Nellikottai seedlings exist.
Coupe XXXI of Valaikulam ..	20 ..	..	Nil.
Coupe XIII of Rangarkovil ..	8 ..	..	Nil.
Coupe XXV Ayyanarkovil Athithondur.	25 ..	..	Nil.

(c) Afforestation.

34. *South Coimbatore.*—During the year no rosewood trees were root-wounded either in the periodic plot or in compartment II of Punachi range.

Tinnevely.—A scheme of two years planting for the Kudiraimoliteri reserve with experimental sowing of *Acacia Planifrons* and *Dalbergia Tamarindifolia* with the object of fixing the shifting sands was sanctioned in Chief Conservator's Proceedings Mis. No. 258, dated 25th July 1928. The 5-acre plots and Semmarikulam compartment No. 7, and Kachinavilai compartment No. 2, were sown with *Dalbergia Tamarindifolia* and *Acacia Planifrons* in October 1928.

The latter was found to be more promising than the former. The blank areas of compartment Nos. 2, 3 and 5 of an area of 289 acres in Nazareth series, were sown with 125,715 palmyra nuts at a cost of Rs. 387-14-0, and the result of inspection in March 1929, showed that 80 per cent had germinated.

(iii) *Plantations and other forms of regeneration not under working plan or scheme.*

35. *Madura.*—The plantations already formed were maintained during the year.

Tinnevely.—The evergreen regeneration areas near Kannikatty and Kodamadi are doing well.

Areas brought under regeneration during this year are—

(1) a small teak plantation of $3\frac{1}{2}$ acres at a cost of Rs. 93 in continuation of the Kariar plantations ;

(2) another teak plantation of $9\frac{1}{2}$ acres at Mundanthorai at a cost of Rs. 182 ; and

(3) Dibbling of teak seeds in an open area of 12 acres in coupe No. XXVIII Padarnalai series at a cost of Rs. 41-15-0.

36. *Other forms of regeneration not under working plan or scheme.*—*Kollegal.*—The dibbling of sandal at an elevation of 2,500 feet to 4,000 feet on stream banks containing perennial pools and under good tree growth in small patches $10' \times 10'$ was carried out. The result was not very satisfactory.

North Coimbatore.—Sandal seeds were dibbled under bushes in all the beats of Talamalai range, and 433 seedlings are reported to have come up in five beats ; six nurseries were opened along the Bejjalethipallam, and seeds were sown in October, but there has been no germination so far.

Small patches of nursery were opened in all the hill beats of Satyamangalam range by beat subordinates without cost, and the results are encouraging in Hassanur, Geddesal, Yekkathur, Dimbum, Kakarai and Gundri.

Madura.—Sandal seeds were sown departmentally in some of the reserves during the year, and the survivals reported in each range is noted below :—

Kodaikanal range	...	...	...	...	203
Cumbum range	...	...	...	...	615
Sholavandan range	...	...	...	...	61
Ayalur range	...	...	...	...	31
Natham range	...	...	...	...	12
					922

Tinnevely.—Sandal seeds were sown on 0.90 acre in Valliyur reserve, but germination was poor. Only 55 seedlings are reported to have survived at the close of the year. Dibbling of *Dalbergia Tamarindifolia* and *Acacia Planifrons* was done in Srivaikuntam range.

(iv) *Tending.*

North Coimbatore.—Tending of sandal trees in Jaccanari, and Constantia reserves was done in an area of $59\frac{1}{2}$ acres at a cost of

Rs. 160-4-0. Creeper cutting and tending of young sandal growth was done in South Bargur reserve in an area of 310 acres at a cost of Rs. 199-14-0.

South Coimbatore.—The prescribed weedings in the regeneration areas of Tunacadavu range were carried out as usual. Tending operations in Punachi range were confined to compartment XX and a sum of Rs. 68-8-0 was spent. Creeper cutting was done in compartments II and V at a cost of Rs. 69-8-0. Weeding, climber cutting and cutting back damaged teak plants were done at a cost of Rs. 10 in compartments 14 (b), (c) and (d).

Madura.—Tending of sandal trees was done at a cost of Rs. 48 in Kodaikanal and Cumbum ranges.

(v) *General.*

37. *Kollegal.*—Steps are being taken to introduce *Santalum Album*, throughout the reserves, wherever conditions are favourable.

Teak seeds dibbled did not germinate for want of rain.

Chloroxylon Swietenia and *Hardwickia binata*, are reported to continue to coppice well, but the rate of growth is slow.

North Coimbatore.—Enumeration of sandal trees in Bhavani range was taken up.

Madura.—Creeper cutting on standards and other useful trees, was carried out by subordinates free of cost.

Section 2—Tending of the growing stock.—Climber cutting for the benefit of sandal trees over an area of 8,938 acres at a cost of Rs. 337-12-0 was done in Kollegal. Trees interfering with the growth of sandalwood were lopped by subordinates. In North Coimbatore sandal trees along the Abrahalla in Satyamangalam range were tended at a cost of Rs. 69-4-0 for a distance of ten miles six furlongs to a width of two chains. All the dead bamboos were also removed from the area.

In *Madura*, creeper cutting was done in Ayalur, Nattam, and Sholavandan ranges at a cost of Rs. 550 in six coupes.

The result of the operation is reported to be unsuccessful as more vigorous shoots grow up again.

In *Tinnevely*, a portion of the 1924 Kariar teak plantations of Kannikatty range, submerged during the floods and damaged thereby, was cut back, after burning the area, of about $8\frac{1}{2}$ acres. The cost incurred was Rs. 22-8-0.

CHAPTER IV.—EXPLOITATION.

SYSTEM OF MANAGEMENT.

(a) *Major produce.*

38. The area under working plans including the temporary schemes was 1,454 square miles and the various silvicultural systems in force are noted below :—

	Area in square miles.	Percentage to the total area under working plan.
Selection method	325	22
Simple coppice	702	48
Coppice with standards	136	10
Unworked or other felling	291	20
	1,454	100

In *Tinnevely*, dead sandalwood and that damaged by elephants was collected as in previous years and sent to Tirupattur for sale. The quantity sent was 65 qrs.

In *North Coimbatore*, extraction of sandalwood was confined to dead trees. Fuel coupes were worked under the simple coppice system, but tamarind and sandal were not cut.

Silvicultural restrictions were removed in the case of bamboos which have flowered, and are dead or dying. The forests in Kodaikanal, Sholavandan, Ayyalur and Natham ranges were worked under the simple coppice system as usual.

(b) *Minor forest produce.*

39. *Kollegal.*—Bamboo coupes were leased as usual to contractors, except in Kollegal range where for want of contractors, two bamboo coupes of the year were worked under the controlled permit system. Removal of dead bamboos on permits were also allowed. All minor produce including honey and wax was sold in public auction. There was no bid for the right to collect stone and tree moss in Bargur range in two successive auctions.

North Coimbatore.—All bamboo coupes were leased to contractors, with the exception of an area in the Nilgiri eastern slopes reserve for which permits were issued departmentally. As the Periyakulam bamboo coupes did not fetch a proper price at the auction, permits were issued departmentally. Minor forest produce was leased as usual. There was no demand for Vembadam bark, and stone and tree moss. Elephant tusks were sent to the Deputy Forest Utilization Officer.

South Coimbatore.—Bamboos were leased as usual in all ranges except Punachi. The minor forest produce used to be leased to the Anamalai Planters Association for a fixed sum of Rs. 280, and this has been in vogue for many years. During this year the area which was usually leased out to the planters was reduced, the fixed annual lease amount remaining the same. The remaining area was leased out for a sum of Rs. 300 for a period of four months and nine days from 22nd February 1929 to 30th June 1929.

Madura.—Bamboo coupes, the right to collect minor produce, avaram, myrabolam and kaya leaves were sold. Nux vomica was sold separately.

Tinnevely.—Minor forest produce was leased out as usual.

40. *Grazing.*—This was as usual controlled by permits. Block system was abolished except in a range in North Coimbatore. Fodder grass was removed on permits in the three divisions of Coimbatore.

AGENCY OF EXPLOITATION.

(i) By Departmental Agency.

41. *Major produce.*—Timber and sandalwood continued to be extracted departmentally. In South Coimbatore timber from the forests of the Mount Stuart Working Circle was extracted departmentally and sent to Pollachi depot for sale. Some of the timber which could not be profitably sold in the round at the depot was sawn into sizes according to demand at the saw mill at Topslip and then sent to Pollachi depot. Selected timber from Punachi Working Circle which was felled departmentally was sent to Pollachi. The balance was dragged to the Aliar roadside depots and some of it was sold there to contractors and estate managers. The conversion of spokes and felloes from the top ends of trees, was undertaken; those pertaining to Tunacadavu range were all sent to Pollachi, while those of Punachi were partly sent to Pollachi, and the balance sold at the roadside depot itself. Brake poles supplied to cartmen were felled departmentally. In Tinnevely two strips in Puliyangudi coupe XXI and one strip in Karuppasamikoil and Vasudevanallur coupes VI and V, respectively, were worked departmentally.

42. *Minor produce.*—In North Coimbatore the collection was limited to bamboos and thatch grass required for departmental work.

In South Coimbatore ivory is the chief item, and the tusks collected are sent to the Forest Utilization Officer for sale.

(ii) By Purchasers.

43. Fuel coupes in all the districts except Kollegal and three coupes in Tinnevely were sold standing. In Kollegal due to paucity of contractors, fuel coupes could not be sold standing, and they were worked, along with the agricultural implement coupes under the regulated permit system.

In North Coimbatore a small area in the Ennamangalam reserve was worked under the regulated permit system for supply of twigs to Shanars for manufacture of jaggery.

One coupe in the Udamalpet range of South Coimbatore could not be sold for want of proper bids at the sale and this was felled departmentally and the right to remove the brushwood in the coupe was sold to a contractor for a sum of Rs. 327-8-0.

44. *Minor forest produce.*—Bamboo coupes in all the districts except in Kollegal range and two coupes and another small area in the Nilgiri eastern slopes of North Coimbatore and the collection of minor forest produce except elephant tusks were in the hands of contractors. The coupe in the Kollegal range, and the two coupes and the small area in the Nilgiri eastern slopes were worked under the regulated permit system.

45. *By right and privilege holders.*—The quantity and estimated value of the different kinds of produce removed by right and privilege holders and free grantees is shown in the following statement:—

	Timber in thou- sands of cubic feet.	Value.	Fuel in thou- sands of cubic feet.	Value.	Bamboos in value.	Grazing value.	Other minor produce in value.	Total.
		RS.			RS.	RS.	RS.	RS.
Right and privilege holders	..	..	..	..	..	1,257	612	1,869
Free grantees	11.5 and 590 pal- myras.	2,892	..	..	8	..	15	2,915

Cattle up to 30 in number belonging to a temple in block II of South Coimbatore were allowed to graze free. The Pulayars of Thalinj in South Coimbatore were allowed to cultivate 33 acres according to rights acceded at settlement. The right to graze free in the Amphthil downs reserve in Kodaikanal range was continued and the number of cattle admitted was 4,587.

46. *By free grantees.*—The free grants in North Coimbatore, South Coimbatore and Tinnevely were chiefly for rebuilding houses destroyed by fire.

47. *Outturn and sources of forest produce.*—The attached statement shows the total outturn of major and minor produce from all classes of forests by all agencies during the year as compared with that of the previous year.

Agency of exploitation.	Timber and sandalwood in thousands of cubic feet.		Fuel in thousands of cubic feet.		Bamboos in value.		Minor produce including grazing in value.	
	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.
By Government agency	154	208	116	409	7	4	1,342	612
By purchasers	468	422	3,491	2,879	42,498	39,795	2,54,258	2,87,164
By right and privilege holders ..	..	..	..	..	..	..	3,577	1,854
By free grantees ..	12	17	..	..	108	8	22	423
Total ..	634	648	3,607	3,288	42,613	39,807	2,59,199	2,70,053

48. *By Government Agency—Timber.*—The increase is largely in South Coimbatore, and is due to the felling of a large quantity of timber in coupe 41 and part of coupe 50 of the Mount Stuart Working Circle and also in regeneration area of 1929 for the purpose of feeding the saw mill at Topslip, besides sending selected logs to Pollachi depot. In Kollegal larger quantity of sandalwood was extracted and sent to Satyamangalam. In Tinnevely the outturn from the Kannikatti experimental plot accounted also for the increase.

Fuel.—The increase is due to the following causes:—

Kollegal.—Due to the sum realized from rejected top ends and branches in agricultural implement coupes and also due to the greater demand on account of favourable season for silk industry.

North Coimbatore.—Due to larger outturn from indicator areas.

South Coimbatore.—Due to felling of Kamanuthu fuel coupe No. IX departmentally for want of proper bid in auction and also to the sale of fuel stacks obtained from the indicator plots of Udamalpet range and from the fellings on the sides of Sethumadai-Adivaram Road.

Tinnevely.—Due to the departmental working of strips 1 and 2 in Puliangudi and strip 1 in Karuppasamikoil and Vasudevanallur felling series.

Minor produce.—The decrease under this head was due to a smaller quantity of ivory collected and sold.

49. *By purchasers—Timber and fuel.*—The decrease is chiefly due to receipt from unreserved lands, which is an uncertain source

of revenue depending on the area containing tree growth granted on darkhast.

Bamboos.—The decrease is due to the fact that Attani bamboo coupes I, II and V and the bamboo block above the upper boundary of the present Hulikal block were sold for Rs. 8,510 for two years ending 31st March 1929, out of which Rs. 7,410 was collected during 1927-28 in North Coimbatore. This has been partly compensated by the better prices obtained for the bamboo coupes in Bargur Range of Kollegal and also in Madura and Tinnevely owing to keen competition.

Grazing and minor produce.—The increase is chiefly due to better prices obtained for Konnai and Somai barks, and gallnuts in Kollegal. The minor forest produce of Kollegal and Ramapuram Ranges was sold for two years (1st July 1927 to 30th June 1929). There was greater demand for gallnuts and there was competition for one lot of minor produce in North Coimbatore.

Better prices were obtained for gallnuts and minor produce in South Coimbatore also. Against these, there was a small decrease in Tinnevely due to want of proper bids, and sale of fewer manure leaf tickets.

50. *Free grants.*—The grants were made for rebuilding of houses destroyed by fire.

CHAPTER V.—FINANCIAL RESULTS.

51. The following statement shows the financial position of the year under report compared with that of the previous year:—

	1927-28.	1928-29.
	RS.	RS.
Revenue	10,07,636	10,85,371
Plus	16,269	..
Deduct—Refunds minus	1,411	9,070
Total	10,22,494	10,76,301
Expenditure.		
(b) Conservancy and works, including 52-A. Capital outlay ...	1,63,961	2,03,880
(c) Establishments	3,99,825	3,55,840
	5,63,786	5,59,720

* Includes Rs. 5,446 relating to VI Circle and excludes Rs. 1,656 relating to Tinnevely realized in the IV Circle. The net revenue is therefore Rs. 10,02,429.

† Excludes Rs. 6,162 relating to 52/C-II Regeneration and Rs. 3,192 relating to investments in Government commercial concern.

‡ Excludes Rs. 6,523 relating to 52/C-II Regeneration and Rs. 6,373 by recoveries of investments in Government commercial concern.

Of the gross receipts, 66 per cent was derived from the major produce, 8 per cent from the minor produce, 13 per cent each from grass and grazing and miscellaneous items. Of the expenditure, 16 per cent was incurred on exploitation, 25 per cent on upkeep and improvement, and 59 per cent on miscellaneous items.

RECEIPTS.

52. The increase was mainly due to—

(1) greater quantity of sandalwood extracted in Kollegal and transported to Satyamangalam and better prices realized at the auction;

(2) under 'Minor produce' the increase is mostly in North Coimbatore;

(3) under 'Rent of buildings' there has been a small increase. There has been an increase of about Rs. 30,229 under 'Recoveries of indirect charges'; and

(4) the revenue realized by the sale of Valparai sleepers has been included in the South Coimbatore division for the first time.

EXPENDITURE.

53. 8. (b) *Conservancy and works and 52-A. Capital outlay.*—The increase was mainly under the following heads:—

Timber.—Due to exploitation expenses by the Assistant Working Plans Officer in Kannikatty experimental plot and to the greater quantity of sandalwood extracted in Kollegal.

Timber removed by purchasers and consumers.—Due to increase in the number of watchers sanctioned and employed.

Roads and bridges.—Due to increased expenditure on the roads in Kollegal to make them fit for motor traffic, and thereby to enable the District Forest Officer to inspect sandalwood operations efficiently.

Roads and bridges—Works in progress.—Due to completion of incomplete works of 1927-28.

Roads and bridges—New works.—Due to metalling of one mile in Hasanur-Bailur road in North Coimbatore and further extension of Sirumalai-Anjukulipatti road in Madura.

Buildings—Works in progress.—Due to completion of incomplete works of 1927-28.

Buildings—New works.—Due to improvements to three buildings in Kodaikanal and construction of compound wall to Surlipatti depot in Cumbum range of Madura.

54. (c) *Establishment.*—There has been a decrease due to reduction of foresters and forest guards.

The revenue outstanding at the end of the year was Rs. 1,89,812-12-1 of which Rs. 2,770-1-5 fell due within the year. Rupees 16,221-6-0 represents value of deficits on sandalwood requiring sanction to write off. The estimated value of timber and other produce at sale depots at the end of the year was Rs. 32,290 against Rs. 37,397 at its commencement.

The financial results of each district are dealt with below taking into account the direction charges apportioned to the divisions.

All the divisions worked at a profit.

KOLLEGAL.

	1928-29.	1927-28.
	RS.	RS.
Receipts	2,04,169	1,26,809
Charges	93,526	81,660
Surplus	1,10,643	45,149

Receipts.—There has been an increase of about Rs. 79,000 in the receipts from all items except timber, in which there is a decrease of about Rs. 1,200. The increase is due to larger quantity of sandalwood extracted and transported to Satyamangalam. There have also been increases, under bamboos and minor produce due to the better prices obtained owing to keen competition, and under miscellaneous due to increased contribution realized from the District Board. The grazing revenue is also steadily increasing.

Charges.—The increase is due to larger quantity of sandalwood extracted, but this has been partly compensated by decrease under 'Establishment' due to reduction of foresters and guards.

NORTH COIMBATORE.

	1928-29.	1927-28.
	RS.	RS.
Receipts	3,79,361	3,69,661
Charges	1,18,059	1,17,211
Surplus	2,61,302	2,52,450

Receipts.—There has been an increase under fuel, due to better prices obtained for fuel coupes. The decrease under 'Sandalwood' is due to disposal of less quantity. In 1927-28 revenue was realized by sale of reserve stock of sandalwood: hence the decrease. There was a decrease under 'Bamboos and grazing' also. The latter is due to the transfer of certain reserves to panchayats. There was increase under 'Minor forest produce' and other sources also.

Charges.—There was increase under 'Sandalwood' due to extraction of a larger quantity, under 'Timber' due to employment of additional watchers, under 'Roads' due to metalling of one mile of Hasanur-Bailur road and maintenance of minor roads and under 'Supplies and services' due to refund of grazing fees to Odanthorai panchayats for three years. This has been compensated by the decrease under establishment due to reduction of foresters and forest guards.

SOUTH COIMBATORE.

	1928-29.	1927-28.
	RS.	RS.
Receipts	1,15,475	1,15,687
Charges	1,22,518	1,42,214
Deficit	7,043	26,527

N.B.—The figures for 1927-28 now given includes adjustments made by the Accountant-General in April 1929 and hence differs from that given last year.

Figures for the commercial concern and the Forest Utilization Officer's sales and from Valparai project are not included in the above. The audit report has not yet been received.

Including these, the position is—

	1928-29.	1927-28.
	RS.	RS.
Receipts	3,76,704	4,32,639
Charges	2,86,196	4,03,939
Surplus	90,508	28,700

Receipts.—The decrease in the revenue is due to the fact that the sale of sawn timber in Pollachi depot and of timber in London Market was dull.

Charges.—There was increase * under 'Works' due to carting of more timber to Pollachi, and that under 'Establishment' to the payment of pay and travelling allowance to two Assistant Conservators of Forests and higher grade rangers posted to the division.

MADURA.

	1928-29.	1927-28.
	RS.	RS.
Receipts	2,03,985	2,19,948
Charges	1,27,245	1,43,323
Surplus	81,740	76,625

* The actual expenditure during the year is Rs. 2,65,704 (2,86,196 — 20,492, the loss on the Mount Stuart Commercial concern for 1927-28) as against Rs. 2,48,761 (4,03,939 — 1,55,178, the loss on Mount Stuart Commercial concern for 1926-27). Thus, there is an increase in expenditure during the year under report of Rs. 16,943.

Receipts.—The decrease is due to the postponement of extraction of timber in Cumbum range, till the completion of the enumeration of trees in Surliar plateau, and fall under timber and fuel in the unreserved lands.

Charges.—The increase is under 52-A. Capital outlay, due to further extension of Sirumalai-Anjukulipatti Road and improvements done to three buildings in Kodaikanal, and construction of compound wall to Surlipatti depot in Cumbum Range.

The decrease under establishment is due to a junior officer being in charge of the division for about seven months and reduction under foresters and guards.

TINNEVELLY.

	1928-29.	1927-28.
	RS.	RS.
Receipts	1,54,953	1,71,063
Charges	1,02,971	1,01,353
Surplus	51,982	69,710

Receipts.—The decrease in revenue is due to low amounts fetched at the coupe sales for want of proper bids.

Charges.—The increase under conservancy and works is due to the exploitation expenses incurred by the Assistant Working Plans Officer in Kannikatti experimental plot, and the pay of the increased number of watchers entertained during the year.

The decrease under establishment is due to the transfer of an officer on higher pay, the abolition of a clerk's post in the District Forest office, and reduction in the number of foresters and forest guards.

TANJORE.

	1928-29.	1927-28.
	RS.	RS.
Receipts	12,032	15,530
Charges	1,771	1,479
Surplus	10,261	14,051

The fall in revenue was due to there being no offer for some of the items of minor forest produce.

CHAPTER VI.—RESEARCH AND EXPERIMENTS.

55. *Kollegal.*—The *Acacia dealbata* poles raised in 1921 near Bellaji (5,000 feet elevation) are thriving. *Acacia dealbata* and *Acacia decurrens* seeds were sown in beds near Bellaji. The seedlings are doing well.

Sandal was dibbled in almost all the beats as usual. The result is reported to be a failure due to the complete failure of the South-west monsoon.

Seeds were sown, again in favourable places during North-east monsoon, and the results are reported to be satisfactory.

The experiment of sowing teak seeds near Araipalayam was a complete failure due to the failure of the South-west monsoon.

North Coimbatore—Satyamangalam Range.—In Karapalayam a plot of five acres was selected for experiment. In half of this area, rosewood, vengai and selavagai were reserved, felling and burning the rest of the growth. The Sholagas were permitted to raise cereal crops in the area, and in return were made to dibble seeds of rosewood, selavagai and vengai 6 feet apart, and to dig trenches round rosewood trees. The results are reported to be satisfactory.

In the other plot, seeds of the above species were dibbled where bamboos and other growth had been felled and burnt. The results are not encouraging.

Sandal seeds were dibbled in baskets at Geddazal at a cost of Rs. 33-11-0 with a view to transplanting them. The operation was stopped, as results did not justify the expenditure.

A small piece of sandalwood weighing 120 tolas, which exhibited signs of rot inside was sent to the Research Officer, Dehra Dun. The result of the examination has not been received yet.

South Coimbatore—Tunacadavu Range.—The Adina plants in the natural regeneration experimental plot below the Mount Stuart bungalow are doing well.

The experiment of raising teak and rosewood, in conjunction with hill paddy undertaken last year, was a failure, due to the very bad monsoon, but about 30 per cent of the teak has survived. The area will be restocked this year, the weed growth in this area is less than elsewhere due to the suppression of weeds while the paddy was on the ground.

Punachi Range.—Measurements were taken in the one acre sample plot in the Punachi working circle of *Pterocarpus Marsupium* maintained to find out, the height growth, and the percentage of survivals, when tended and left untended. The result is as follows:—

	Seedlings present.	Average height in inches.
Southern portion tended...	733	12
Northern portion untended	918	12.2

Seven sholas in Konalar side are protected from fire to find out whether the sholas extend when they are rigidly fire protected,

The lantana and evergreen thickets are burnt as usual annually in periodic block 1 to encourage natural regeneration of valuable species.

Udamalpet Range—Mayuthu sandal plot near Kombu Rest-house.—All the saplings are healthy, and they vary from 4 to 20 feet in height. As these are in a well protected area no danger is apprehended.

The seedlings in Esalmanthorai Rest-house and Chinnaserai are doing well. The saplings in the small experimental plot in Nallar valley close to the common boundary between Udamalpet and Pollachi ranges are healthy and vary from 4 to 8 feet in height.

Madura.—In the experimental plots at Vannathiparai, the operation prescribed in the working scheme was continued, the object being to produce natural regeneration helped by artificial regeneration, by sowing teak, rosewood, *Albizia lebbek*, *Odoratisma* and *Pterocarpus Marsupium*.

Seeds were sown at stakes 6' x 6' in May 1928, and seedlings were weeded when necessary in two plots, Plot No. I, 1.9 acres and Plot No. II, 0.73 acre. The result of the enumeration in April 1929 is given below:—

Species.	Natural regeneration.		Artificial regeneration.		Failures at stakes.		Remarks.
	Plot No. I.	Plot No. II.	Plot No. I.	Plot No. II.	Plot No. I.	Plot No. II.	
Rosewood ..	497	92	175	42	594	112	Plot No. I. 95 rows of stakes natural regeneration very good.
Albizia, Odoratisma and lebbek ..	511	145	227	93	230	112	Artificial regeneration.
Adina ..	578	24	..	..	..	..	Only 24 per cent survivals.
Melia ..	170	28	..	..	..	..	Plot II. Artificial regeneration.
Vengai ..	..	..	25	13	432	112	Survivals 28 per cent. Comparatively natural regeneration is good.
Teak ..	..	..	58	25	278	112	

All trees except Adina and rosewood were cut and removed with the object of producing natural regeneration in

	ACS.
Plot No. III	1.5
" IV	0.2
" V	1.5
" VI	2.52

The result of the enumeration of seedlings made in April 1929 is given below :—

	Rose-wood.	Albizzia, Odoratisima and lebbuck.	Adira.	Melia.	Ste-phegyna.	Steroc-perum.
Plot No. III	1,047	115	22	38	..	..
" IV	99	163	12	..	..	..
" V	168	298	276	63	251	189
" VI	This plot was badly run over with weeds and consequently natural regeneration was poor.					

Coupe I, extent 5 acres, was clearfelled, burnt and sown with seeds of the same species. Seeds were sown 6 feet apart at stakes in June 1928.

The coupe has been subdivided into sub-blocks roughly, and enumeration was made at the end of March 1929.

Sub-block numbers.	Species.	Number of stakes.	Survivals.	Other species
I	Rosewood	543	230	6 vagai.
II	Teak	1,311	782	Rosewood 6, vagai 28.
III	Vengai	397	125	Vagai 25, teak 5.
IV	Vagai	414	231	Rosewood 15, teak 3.
V	Rosewood	758	282	Teak 17.
VI	Vengai	310	75	Rosewood 19, vagai 16.
VII	Vagai	389	218	Rosewood 25, teak 1.
VIII	Rosewood	818	256	Teak 26, vagai 103.
IX	Mixed	1,166	273	Teak 88, vagai 58, vengai 12.
X	Vengai	288	97	Rosewood 43, vengai 18.
	Total	6,383	3,107	

Percentage of survivals works out to 48.64. The copice growth of rosewood and advanced growth of natural seedlings is good.

Hopea dibbled near Kumili in June 1927 has failed. Seventy-two Aini which were dibbled at the same time have survived.

Tinnevelly.—In February 1928, an experimental plot of 67 acres was opened in the Mesua Zone along Martin's hut bridle-path, and 283 trees were marked for felling on the selection method. Some of these selected trees were subsequently discarded to reduce the intensity of the felling. The object of the experiment is to ascertain how these evergreen areas can best be regenerated and what market exists for the various species at Ambasamudram sale depot. One hundred and fifty-three trees were actually felled, of which 9 were rejected as unsound and 131 were converted. Heavy rain prevented the conversion of the remaining 13 trees.

The cost of extraction per cubic foot was Rs. 1-1-0 which included, in addition to felling, conversion and transport charges, compensation to sawyers, commission, cost of sheds, and cost of conversion of 1 mile 4 furlongs of Martin's hut bridle path into a cart-track. The prices obtained at the sales were Rs. 1,399-15-0 for 156 broad gauge sleepers, Rs. 898 for 280 metre gauge sleepers and Rs. 6,696-4-0 for other units.

The net profit was Rs. 440. The experiment is incomplete.

Silvicultural and regeneration experiments at Kannikatty by the Assistant Working Plans Officer.—Experimental coupe 67 acres. Cutting of climbers and thorny growth was done over the whole coupe at a cost of Rs. 58-8-0.

Natural regeneration experiments.—Three plots of 1 acre each were opened in the coupe in March to study the effect of gradually opening the canopy over the advance growth and young regeneration. More plots will be opened as necessity arises.

Nursery experiments.—Two nurseries were opened, one in the unworked evergreen forests and the other in a portion of clear-felled evergreen forest, in order to see the best method of regenerating various evergreen species. The experiments are still in progress.

CHAPTER VII.—ADMINISTRATION.

56. Mr. T. A. Whitehead held charge of the Circle throughout the year.

Changes in the territorial jurisdiction—Tinnevelly.—Srivaikuntam Range was newly formed in November 1928 from Nauguneri Range, which was split up into two ranges—vide Chief Conservator's Ref. No. 8309/27-B-2, dated 22nd August 1928, based on G.O. Mis. No. 1333, Development, dated 11th August 1928.

57. *Health of the establishment.*—Continued to be good in Tinnevelly except at Kannikatty, where the cold, isolation and leaches are trying, fair in Madura, and not good in North Coimbatore and Kollegal. In South Coimbatore, health of the establishment improved, as a result of the sanitary measures taken, though there is malaria in the hot season. Several subordinates in Kollegal and North Coimbatore had to be granted leave on medical grounds. The casualties during the year were, one forest guard and one bungalow watcher in Kollegal, one forest guard in North Coimbatore and one Forester in Tinnevelly, who all died of the effects of malarial fever.

58. *Sanitation—South Coimbatore.*—A sum of Rs. 1,139 was spent for draining the swampy areas in Tunacadavu Range, and

clearing and burning the growth round Topslip as an anti-malarial measure. No special anti-malarial measures were undertaken in Punachi Range in view of the shifting of the range headquarters from Attakatty to Waterfall.

59. *Tours.*—The Mount Stuart Forests were inspected by the Chief Conservator of Forests and the Chief Forest Engineer at the beginning of July 1928, and the first week of November 1928, and by the Hon'ble Mr. T. E. Moir, Finance Member, during the 1st week of November 1928. The Conservator toured in all the divisions of the circle, spending more than six months in camp. All the District Forest Officers toured for more than the prescribed minimum, except the District Forest Officer, Kollegal, who was in camp for 176 days. The short touring was due to the fact that the District Forest Officer was obliged to stay at headquarters for certain periods in connexion with a departmental enquiry.

60. *Inspection of District Forest and Range Offices.*—The Conservator inspected all the District Forest Offices in the circle during the year, and the result of these inspections was on the whole satisfactory, although there is room for improvement all round. The clerk, who was reported to be absconding in Madura, has since been traced, tried under section 409 of the Indian Penal Code and sentenced to one year's rigorous imprisonment on each count. The matter is still under investigation, and final report is awaited from the District Forest Officer. As regards the unremitted amount of Rs. 100 of earnest-money deposit, the matter has been enquired into, money refunded to the party, and the subordinate responsible for the carelessness punished. The District Forest Officers inspected all the ranges in their districts, and the results are reported to be generally satisfactory, although here too in several ranges there is room for improvement.

61. *District Forest Officers' Accounts—Inspection.*—Audit staff of the Accountant-General's office inspected the accounts of all the divisions, and the result was reported to be satisfactory.

The accounts of the Mount Stuart commercial concern were audited by the staff of the Assistant Director of Commercial Audit after the close of each quarter.

62. *Madras Forest College*—One III Grade Forester was deputed for training in the Madras Forest College during the year for 1928—30 course.

63. *Vernacular Training School.*—Of the 15 Forest Guards of Kollegal deputed to the Vernacular Training School held at Denkanikotta, North Salem division, for the 1928-29 sessions, 4 obtained first-class certificates, and the remaining 11 second-class certificates

CHAPTER VIII.—GENERAL.

(1) FORMATION AND MANAGEMENT OF PANCHAYATS.

64. Odanthorai reserve in North Coimbatore 6,066.90 acres, was handed over to the panchayats during the year.

The working of the grazing panchayats under the forest village system in Mettupalaiyam Range having been found unsatisfactory, proposals were submitted to abolish this system.

The third-class forests in the Dharapuram taluk of South Coimbatore are under the control of the Revenue Department as also in Madura.

About 500 acres of land on the south-western corner of Kodiakkadu reserve in Tanjore have been set apart for the communal use of the villagers. Panchayat system is not working in this district.

(2) MEASURES FOR IMPROVING LOCAL SUPPLIES AND FACILITIES.

65. Except in two reserves in Tinnevely no leaf manure was removed in other divisions, the demand for the same being limited and met from patta lands and unreserves. The issue of tickets in Nanguneri and Srivilliputtur Ranges of Tinnevely to the public for removal of manure leaves continued during the year; but the revenue under this head fell to Rs. 1,977 against Rs. 4,453 in last year. This is reported to be probably due to 1,500 acres in Srivilliputtur and 150 in Nanguneri Ranges having been sown with green leaf manure crops by the ryots.

Mr. Morris of Honnametti estate was permitted to remove dry leaves in the Bellaji sholas, on payment of one anna per head-load. The revenue realized during the year was Rs. 230.

Supply of fuel and agricultural implements—Kollegal.—The fuel coupes, as usual, were worked on the controlled permit system, there being no bids in the auction sales held. The removals are effected under the supervision of the beat subordinates who look to the proper coppicing of the trees felled. The tentative working scheme approved was followed.

North Coimbatore.—The requirements of the villagers are met from the unreserves and coupes leased to contractors.

South Coimbatore.—The spokes and felloes converted from the top-ends of trees felled in the compartment of Mount Stuart and Punachi Working Circles were offered to the public for sale. Brake poles were cut and sold departmentally on the Anamalai Ghat road for the use of cartmen. Three hundred and twenty-seven plough shafts, 33 ploughs and five yokes were removed by the ryots from a special coupe, opened for the purpose in Udamalpet Range.

Grazing was prohibited in felled areas, for five years in Pollachi Range and seven years in Udamalpet Range after felling. The concessions granted as a result of the Forest Committees' Conference in 1922, in the matter of grazing, penning, etc., were continued during the year.

Madura.—The demands of the villagers were met, as usual, by the coupe contractors, in accordance with the terms of agreements.

Tinnevely.—Permits are being issued by the Revenue department for the removal of *Acacia arabica* from unreserved lands for making agricultural implements on payment of prescribed seigniorage fees. There was no shortage of fuel.

Tanjore.—There has been no complaint from the public about the price of fuel fixed by contractors.

(3) IMPROVEMENT OF WATER-SUPPLY IN GRAZING GROUND.

66. *North Coimbatore.*—Two tanks in Guthialathur reserve were repaired at a cost of Rs. 365.

Madura.—Rupees 78 was spent in improving a tank and two springs in the reserves in Ayyalur range. The work in two cases is incomplete, and in the other, there was water, and it was much used by the ryots and cattle.

Timber transit rules.—The rules are reported to have worked satisfactorily. There were 4 cases of breach of these rules in Kollegal, and 6 in Madura.

Sandalwood transit rules.—A revision of the Sandalwood transit rules is under consideration. The registration of property mark of Khazi Syed Yusuf Sahib Bahadur for 1929-30 was refused, and the result of the appeal by the party is reported to be awaited.

67. *Jungle tribes.*—The jungle tribes are employed as usual. A proposal for the amelioration of the condition of these people in North Coimbatore is under consideration.

68. *Mining and quarrying.*—There were no alterations in the rules.

69. *Cultivation in reserved forests—Kollegal.*—The survey and disreservation of the Honnametti estate for assignment on ryotwari patta has not been completed. Hence the estate continued to be held on lease by Mr. R. C. Morris.

South Coimbatore.—There are two mulcer settlements, one at Sircarpathi 2 miles from Sethumadai and the other at Avarakodipallam about 6 miles from Paruthiyur.

The mulcers at Sircarpathi are allowed to cultivate 39.05 acres of arable land on condition that they supply labour to Pollachi and Tunacadavu Ranges when called on to do so. These are of assistance to the department in putting out fires. The mulcers at the

other settlement are reported to have abandoned the settlement, and migrated for work in Punachi range.

70. *Livestock.*—(i) *Elephants—South Coimbatore.*—There were 25 elephants at the commencement of the year, and six were captured during the year; of these three died, three were handed over to the Raja of Kollengode and four sold during the year; the balance at the close of the year was 21. The estimated value of these elephants is Rs. 62,100.

(ii) *Other animals.*—Nil.

71. *Veterinary Assistant.*—The livestock was in charge of an Assistant Veterinary Inspector, and was inspected by the Inspector of Livestock twice—one in April 1928 and again in October 1928. The health of the elephants continued to be fairly satisfactory.

72. *Civil suits.*—*North Coimbatore.*—A suit filed by the panchayat of Odanthorai against the Government for failure to hand over to them, the trees felled in the boundary of the block to cover the cost of demarcation, was compromised on payment of Rs. 370 in full settlement of all their claims against the Government.

South Coimbatore.—Three civil suits were filed against certain advances during the previous year. A sum of Rs. 17-8-0 was recovered against an outstanding of Rs. 358-8-0. As the defaulters were either paupers or could not be found anywhere the balance of Rs. 341 has been written off as irrecoverable.

Madura.—The second appeal referred to in the previous year's report is reported to be still pending in the High Court.

Tinnevely.—The civil suit pending last year in the District Munsif's Court, Srivaikuntam, against revenue lessees and Government in respect of damage caused to produce of certain lessees, was dismissed with costs: so far as the Government was concerned as a defendant, the matter is *sub judice* on appeal in the Sub-Court at Tuticorin.

A civil suit is reported to be pending in the District Munsif's Court, Ambasamudram, against a sawyer to whom advance was made by the Assistant Working Plans Officer, and three more such suits have to be filed.

73. *Control of unreserved land by the Forest department.*—The department has no control over the unreserved lands in the circle except over the sandalwood working circles in Kollegal and North Coimbatore, and also an area of 866.8 acres of unreserved lands included in the Bargur working circle and exploited for bamboos, along with the Tamarakarai bamboo working circle.

ENCLOSURE

REPORT ON EACH FOREST DISTRICT, 1928-29.

KOLLEGAL.

Description.—The forest division covers the hills and plateaux of the Kollegal and Bhavani taluks of the Coimbatore district. The forests are of a poor, open deciduous type with an undergrowth of thorns, but support a very valuable stock of sandalwood at elevations between 2,000 and 4,000 feet.

On the west the Biligirirangan mountain and on the north and east the Cauvery form the natural boundaries of the division. To the south lies the North Coimbatore forest division.

There is good grazing available throughout the division.

Area.—Nine hundred and forty-seven square miles.

How the forest district is split up into subordinate administrative charges.—The whole division is divided into three ranges consisting of 49 beats.

Names of ranges with headquarters.

	Ranges.					Headquarters.
Kollegal	...	...	...	...	...	Kollegal.
Ramapuram	...	...	...	...	...	Cowdalli.
Bargur	...	...	...	...	...	Thattakarai.

Cost of administration.

	Rs.
Pay of officers	6,864
Rangers	5,532
Subordinate staff	17,686
Clerical staff	7,191
Allowances	9,197
Contingencies—Other charges	3,851
Total	50,321

Cost under other important heads.

8. b. Conservancy and works—

	Rs.
(i) Sandalwood	6,272
Grass and other minor produce	...
(ii) Timber and other produce	10,589
(iii) Renewals and replacement of stores	78
Communications and buildings—	
Roads and bridges	10,153
Buildings	1,420
Other works	5
(iv) Fire protection	776
Other works	338
(v) Miscellaneous	185
Total	29,816

52—A. Capital.

	Rs.
(iii) Purchase of stores	147
(v) Roads and bridges—	
Works in progress	...
New works	397
Buildings—	
Works in progress	...
New works	2,272
Other works—New works	68
(vi) Demarcation	777
Total	3,661

Income from main sources—

	Rs.
VIII. (a) Sandalwood	1,23,067
Timber	2
VIII. (b) Timber	3,625
Firewood	4,249
Bamboos	7,050
Grazing, etc.	49,778
Minor produce	6,885
Miscellaneous including driftwood, etc.	9,806
Total	2,04,462
<i>Deduct—Refunds</i>	300
	2,04,162

Chief works done.—Introduction of sandalwood in suitable places and sandalwood extraction are the main operations in the district.

In order to facilitate extraction of forest produce mainly sandalwood, and inspection of forests, three ghat roads in the district are repaired annually—

The Kollegal-Hannur-Tamarakarai Road.

The Kollegal-Lokkanhalli-Bailur Road.

The Cowdali-Chengadi-Ponnachi Road.

Fire protection of reserves, climber cutting, stock-mapping and enumeration of sandalwood trees, demarcation, improvement of water-sources, coupes for the supply of firewood and small timber are other important works undertaken.

COIMBATORE NORTH.

Description.—The division comprises the hills and plateaux of the Gobichettipalayam, Bhavani and Avanashi taluks of the Coimbatore district forming a continuous block from the Nilgiris and the Mysore territory on the west to the Cauvery on the east. To the north lies the Kollegal division. The forests are generally open and deciduous, but support a very valuable stock of sandalwood at elevations between 2,000 and 4,000 feet. Teak and Rosewood are found in the Minchigully valley.

There is good grazing available throughout the division.

Area.—Eight hundred and seventy-two square miles, of which 42 square miles are under the management of village panchayats.

How the forest district is split up into subordinate administrative charges.—The division consists of four ranges with 54 beats—

Ranges.	Headquarter.
Satyamangalam	Satyamangalam.
Talamalai	Do.
Bhavani	Andiyur.
Mettupalaiyam	Mettupalaiyam.

Cost of administration—

	Rs.
Pay of officers	11,722
Rangers	8,813
Subordinate staff	18,703
Clerical staff	7,645
Menials	1,612
Allowances	11,370
Contingencies	3,460
Total	63,325

Cost under other important heads—

8. b. Conservancy and works—

(i) Forest produce removed by Government agency—

	Rs.
Timber	392
Firewood and charcoal	370
Sandalwood	13,773
Other minor produce	92

(ii) Timber and other produce removed by consumers and purchasers 10,416

(iii) Renewals and replacement of stores 179

Communications and buildings—

Roads and bridges	8,604
Buildings	3,435
Other works	38

(iv) Maintenance of boundary 301

Regeneration	97
Fire protection	1,366
Other works	953

(v) Miscellaneous 2,144

Total ... 42,160

52—A. Capital

	RS.
(iii) Purchase of stores, tools and plant	551
(v) Communications and buildings—	
Roads and bridges—	
Works in progress	79
New works	...
Buildings—	
Works in progress	...
New works	1,315
Other works—	
Works in progress	...
New works	157
(vi) Demarcation	111
Total	2,213

Income from main sources.

	RS.
VIII. (a) Sandalwood	2,37,120
Timber	2,806
Firewood	797
Other minor produce	2
VIII. (b) Timber	2,615
Firewood	24,067
Bamboos	22,760
Grazing	43,094
Minor produce	31,587
Miscellaneous including driftwood, etc.	17,518
Total	3,82,276
Deduct—Refunds	2,922
Total	3,79,354

Chief works done.—Introduction of sandalwood in suitable places, extraction of sandalwood, supply of firewood, agricultural implements, small timber and bamboos to the neighbouring towns and villages are the important operations in the district.

The following ghat roads are maintained by the department :—

Hassanur-Bailur road.

Gairmalam road.

Bargur ghat road.

Dimbam-Talamalai road.

Fire protection of reserves, stock-mapping and enumeration of sandalwood trees, climber cutting, demarcation, improvement of water-sources are other important works undertaken.

SOUTH COIMBATORE.

Description.—The forest division covers the Anamalais and their foot hills. The central portion in the higher elevations consisted originally of tropical evergreen forest. Vast areas of this have now been allotted to planters. To the west is the magnificent Mount Stuart timber forest most of which is deciduous. To the east the quality of the forest deteriorates, as the rainfall decreases. Along the northern outer slopes and foot hills are fuel and pole forests.

Area.—Three hundred and ninety-one square miles. Of this 5 square miles are ryots' forests under the control of the village panchayats.

How the forest district is split up into subordinate administrative charges.—The division is divided into four ranges. Of these Tunacadavu and Punachi ranges have no beats, and the other two ranges are split up into 17 beats

Ranges.	Headquarters.
Tunacadavu range	Topslip.
Pollachi	Anamalai.
Punachi	Waterfall.
Udamalpet	Udamalpet.

Cost of administration.—As Tunacadavu range is commercialized, the charges for the year 1928-29 are not known as audited figures for the last quarter have not yet been adjusted by the Accountant-General in his accounts.

Last year's figures are --

Tunacadavu range.

	RS.
Pay of officers	4,795
Rangers	9,804
Subordinate staff	
Clerical staff	
Allowances	3,117
Contingencies and other charges	1,434
Total	19,150

The cost for the non-commercialized ranges is as follows :—

1928-29.

	RS.
Pay of officers	15,381
Rangers	6,511
Subordinate staff	8,180
Clerical staff	7,577
Menials	1,308
Allowances	9,212
Contingencies and other charges	3,623
Total	51,792

Cost under other heads.

8. b. Conservancy and works—

	RS.
(i) Forest produce removed by Government agency --	
Timber	6,457
Firewood and charcoal	1,845
Grass and other minor produce	...
(ii) Timber and other produce removed from the forest by purchasers and consumers	2,662
(iii) Maintenance and renewals—	
Feed and keep of cattle	6,369
Renewals and replacements of stores, tools and plant	368
Communications and buildings—	
Roads and bridges	803
Buildings	1,485
Other works	38
(iv) Conservancy and regeneration—	
Maintenance of boundary	57
Regeneration	532
Fire protection	320
Other works	410
(v) Miscellaneous	— 16
Total	21,330

52—A. Capital outlay—

b. Conservancy and works—

	RS.
(iii) Rent of leased and part-owned forests	1,250
(iv) Livestock, stores, tools and plant—	
Purchase of livestock	4,367
Feed and keep of livestock	813
Purchase of stores, tools and plant	91
(v) Works—	
Roads and bridges ... { Works in progress	...
... { New works	15,250
Buildings ... { Works in progress	4,819
... { New works	9
Other works ... { Works in progress	...
... { New works	...
(vi) Organization, improvements and extension of forests—	
Sowing and planting	5,740
Fire protection	240
Other works	72
(vii) Miscellaneous—	
Supplies and services—Miscellaneous	492
Total	33,143

Income from main sources—

	RS.
Timber	1,426
Firewood	8,254
Bamboos	16
Other minor produce	37
Sandalwood	...

Forest department—

Timber	3,332
Firewood	12,621
Other minor produce	10,402
Bamboos	5,823
Grazing	5,161
Other sources, including driftwood, etc.	19,112
Recoveries of indirect charges from commercial concerns	47,233
Profit from Government commercial concerns	...
Recoveries of investment in commercial undertakings	2,048

Total ... 1,15,495

Deduct—Refunds ... 27

Revenue from Tunacadavu range is excluded. It will be reported later. Last year's figures are—

	RS.
Timber	2,05,808
Profit in carriage	15,145
Rents	668 (half of this is creditable to regeneration.)
Interest	65
Miscellaneous	758
Total	2,23,654

Chief works done are:—Extraction of timber from Punachi and Mount Stuart Working Circles, elephant capture, and regeneration of forests exploited.

Besides the above, the following were also carried out:—

Carting of timber to Pollachi for sale, cutting and conversion of spokes and felloes.

Anti-malarial measures to keep forest stations from malaria.

Repairs to roads and buildings and fire protection of reserves.

MADURA.

Description.—With the exception of the Palnis and the Cumbum Valley, isolated fuel reserves lie scattered throughout the district. Forty square miles of reserve forest in the taluks of Kulittalai and Trichinopoly are also included in this division. In the lower slopes of the Palni Hills cardamom cultivation by the villagers is permitted on long leases.

Area.—Six hundred and eighty-four square miles. Of this 37 square miles are ryots forests. The decrease as from last year is due to disreservation.

How the forest district is split up into subordinate and administrative charges.—The whole district is divided into six ranges with 87 beats—

Ranges.	Headquarters.
Cumbum	Cumbum.
Kodaikanal	Kodaikanal.
Ayyalur	Ayyalur.
Sholavandan	Andipatti.
Palni	Palni.
Natham	Natham.

Cost of administration—

	RS.
Pay of officers	11,296
Rangers	10,351
Subordinate staff	28,079
Clerical staff	8,041
Menials	1,610
Allowances	15,660
Contingencies and other charges	3,707
Total	78,744

Cost under other important heads—

8-b. Conservancy and Works—

(i) Timber	552
Firewood and charcoal	1,031
(ii) Timber and other produce removed from the forest by consumers and purchasers	12,859
(iii) Renewals of stores	105
Communications and buildings—	
Roads and bridges	11,458
Buildings	3,396
Other works	213
Maintenance of boundaries	25
(iv) Regeneration	159
Fire protection	2,178
Other works	100
(v) Miscellaneous	273
Total	32,299

52-A. Capital—

(iii) Purchase of stores...	...	...	...	...	Rs. 236
(v) Communications and buildings—					
Roads and bridges—					
Works in progress	...	...	...	...	2,050
New works	...	...	...	...	354
Buildings—					
Works in progress	...	...	...	...	...
New works	...	...	...	...	1,296
Other works—					
Works in progress	...	...	...	...	...
New works	...	...	...	...	...
(vi) Demarcation	...	...	...	...	1,099
Sowing and planting	...	...	...	...	373
Other works	...	...	...	...	1,066
Total	...	...	...	...	6,474

Income from main sources—

VIII. Forests—

Timber	...	...	...	...	...	4,587
Firewood	...	...	...	...	...	2,401
Bamboos	...	...	...	...	...	1

Forest department—

Timber	...	...	...	...	...	16,185
Firewood	...	...	...	...	...	81,238
Bamboos	...	...	...	...	...	3,295
Grazing	...	...	...	...	...	28,508
Other minor produce	...	...	...	...	...	51,816
Miscellaneous including driftwood...	...	...	...	...	...	24,832

Total ... 2,12,863

Deduct—Refunds ... 3,886

Chief works done are :—Supply of fuel to the public, maintenance of long lines of communications belonging to the District Board as well as Forest departments. Experimental work is in progress at Vannathiparai. The pine plantations on the Palni hills are fire protected. Extension of cart tracks to tap fuel areas and enumeration of trees in the Cumbum valley were also done.

TINNEVELLY DIVISION.

Description.—A broad belt of evergreen forest clothes the ghats on the western border of the district, in the taluks of Nanguneri, Ambasamudram and Tenkasi. A portion of the forests also lies in the Srivilliputtur taluk of the Ramnad district. Owing to the value of these evergreens in protecting the head waters of the rivers and streams, they have been very lightly

worked in the past. An experiment is now being tried in the evergreen forests at Kannikatti, Ambasamudram taluk—to see what it will cost to place timber of evergreen species on the market, and regenerate the area worked over, satisfactorily. At the foot of the ghats is a belt of deciduous forests.

Area.—Four hundred and seventeen square miles, of which 11 are ryots' forests.

How the forest district is split up into subordinate administrative charges.—The whole division is divided into six ranges with 49 beats.

Ranges.	Headquarters.
Kodamadi	Ambasamudram.
Kannikatti	Do.
Kuttalam	Kadayanallur.
Srivilliputtur	Srivilliputtur.
Nanguneri	Sivanaperi.
Srivaikuntam	Srivaikuntam.

Cost of administration—

	Rs.
Pay of officers	11,150
Rangers	9,812
Subordinate staff	17,586
Clerical staff	9,591
Menials	1,508
Allowances	9,293
Contingencies and other charges	2,997
Total	61,937

Cost under other important heads—

8-b. Conservancy and Works—

(i) Timber	8,740
Firewood and charcoal	3,980
Sandalwood	114
(ii) Timber and other produce removed from forests by consumers and purchasers	6,355
(iii) Renewals and replacements of stores	293

Communications—

Roads and bridges	4,804
Buildings	1,433
Other works	98
Maintenance of boundaries	59
(iv) Regeneration	431
Fire protection	...
Other works	607
(v) Miscellaneous	135

Total ... 27,040

52-A. Capital—

	RS.
(iii) Purchase of stores	57
(v) Communications and buildings—	
Roads and bridges—	
Works in progress	191
New works	955
Buildings—	
Works in progress	745
New works	1,610
Other works—	
Works in progress	...
New works	288
(vi) Sowing and planting	420
Total	4,266

Income from main sources—

VIII. Forests—

Timber	7,075
Firewood	8,312
Other minor produce	...

Forest department—

Timber	447
Firewood and charcoal	86,298
Bamboos	849
Grazing	8,740
Minor produce	30,454
Miscellaneous including driftwood	13,199

Total ... 1,55,374
Deduct—Refunds ... 428

*Chief works done are :—*Extraction and supply of firewood to the public. Sandalwood in Srivilliputtur range is extracted and sent to the IV Circle for sale.

Experiments are being conducted in the evergreen forests.

The following are other items of work done :—

- Construction of cart tracks to tap fuel areas.
- Construction of quarters, etc., for subordinates.
- Fire protection of reserves.
- Regeneration.

In the Srivaikuntam taluk, palmyras are being planted in Kudiramoliteri reserve, to fix the shifting sands, and to form a valuable crop for the future.

SUMMARY OF PROGRESS MADE IN FOREST ADMINISTRATION DURING THE QUINQUENNium ENDING 1928-29.

In G.O. No. 91, Revenue (Special), dated 18th July 1921, it was ordered that the Forest Administration report should be compiled since 1920-21 for the official year ending 31st March instead of for the fasli year ending 30th June.

2. *Administration.*—The following officers held charge of this circle during the period under review :—

	From	To
Mr. H. F. A. Wood ...	20th December 1920	12th October 1924.
„ A. Wimbush ...	13th October 1924	19th May 1925.
„ D. T. Barry ...	20th May 1925	10th March 1927.
„ T. A. Whitehead ...	11th March 1927	to date.

3. *Changes in the controlling charges.*—The management of the Kaliavur reserve 158.07 acres in Tinnevely was transferred to the Public Works Department during 1925-26 and the Executive Engineer was invested with the powers of a forest officer under clause (d) of section 59 of the Madras Forest Act.

38.64 acres of sandalwood Reserved Forest Block III in the Nilgiris district (VI Circle) was transferred to the North Coimbatore district (V Circle) from 15th February 1927. Consequent on the abolition of the Vayyampatti Range of the South Salem district (IV Circle) 19 reserves to the extent of 40.45 sq. miles were transferred to Madura in the year 1926-27.

During the same year, the reserve forests in the Tanjore district were transferred from the IV Circle to the V Circle.

In October 1924, the Tinnevely Range of the Tinnevely district was amalgamated with the Nanguneri Range. By 1928 the range was found to be rather unwieldy owing to the planting up of the Kudiramoliteri Reserve Forest and a bifurcation was considered necessary. The Nanguneri Range was bifurcated and the new Srivaikuntam Range was formed in November 1928.

4. *Organisation.*—The strength of the executive establishment was reduced in 1927 as shown below :—

	Number as originally sanctioned.	Number as reduced.
Foresters	106	70
Forest Guards	431	300

5. *Changes in area.*—The area of reserve forests and lands under the control of the Forest department at the commencement of the quinquennium in the divisions now comprising this circle was 3,251 sq. miles, and the area at the close was 3,330 sq. miles. The increase is due to the adoption of the survey of India map area for the Guthiyalathur Reserve in North Coimbatore and the addition of the Vayyampatti Range and the forests in Tanjore district from the IV Circle to this circle. The increase has been lessened by disafforestation of Vaipar and Virasampatti reserves and a portion of Teri Reserve in Tinnevely, estates and house-sites in Anamalais of South Coimbatore, and for grant of land to Mr. Mead in Madura.

6. *Forest Settlement.*—The following statement shows details as to forest settlement:—

In hand at the commencement of the quinquennium period.	Newly taken in hand during the period.	Total.	Finally settled during the period.	Balance.	Remarks.
SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.	..	..
356	343	699	699	..	..

7. *Demarcation.*—The total length of artificially marked boundaries at the close of 1928-29 was 2,815 miles as compared with 2,881 miles at the commencement of the quinquennium. The decrease is due to disafforestation of reserves in Madura, Tinnevely and South Coimbatore. The length of boundaries still to be demarcated at the close of the period was 379 miles.

8. *Forest surveys.*—There were no surveys made by the Survey of India party during the quinquennium.

9. *Working plans.*—The total area under sanctioned working plans and schemes at the close of the quinquennium was 2,243 sq. miles against 1,433 at its commencement. The increase is due to the temporary working scheme sanctioned for Kollagal district, and also to the addition of the Tanjore, and Vayyampatti ranges from the IV Circle to this circle. The preparation of a new working plan in North Coimbatore division is underway by the working plan staff.

A revised working plan for the Mount Stuart Forests is under preparation by Mr. M. V. Laurie under the Working Plans Conservator.

Area for which working plans have still to be prepared is 342 sq. miles and that for which working plans are not required at present is 733 sq. miles.

10. *Communications, buildings and other works.*—The expenditure during the quinquennium is given below:—

	RS.
1924-25	26,730
1925-26	60,682
1926-27	56,657
1927-28	97,825
1928-29	83,142
Total	3,25,036

The average expenditure per annum amounted to Rs. 65,007, against Rs. 92,372 during the previous quinquennium.

The increase during 1927-28 was due to the completion of the Topslip-Anapadi road, and that in 1928-29 due to the improvements and repairs to the Amarampalaiyam-Anapadi road. The road from Amarampalaiyam to Sethumadai was transferred to this department from the District Board.

11. *Forest offences.*—The average annual number of forest offences during the quinquennium under review was 5,127, against 4,249, in the last quinquennium.

12. *Fire protection.*—During the period under review, the average annual area under systematic protection was 516 sq. miles against 427. The percentage of failure was 2.23 per cent against 4.6 per cent in the last quinquennium.

13. *Protection from cattle.*—The whole forest area is closed to goats. The average area annually opened to grazing of all animals except goats was 2,468 sq. miles and area open to all animals except sheep and goats 241 sq. miles as against 2,321 sq. miles and 218 sq. miles in the last quinquennium. The percentage comes to 74.1 and 7.2 per cent respectively of the total area against 71 and 7 per cent in the last quinquennium.

The average number of animals permitted to graze in the quinquennium under review was 260,446 against 254,088 in the last quinquennium.

14. *Yield and outturn.*—The total outturn of the forests during the quinquennium under review is as shown below:—

	In thousands of c.ft.
Timber	2,677
Fuel	15,858
Total	18,535

15. *Financial results.*—The revenue, expenditure and the surplus are given below:—

Years.	Gross revenue.	Expenditure.	Surplus.	Remarks.
	RS.	RS.	RS.	
1924-25	11,69,954	7,09,023	4,60,925	
1925-26	9,65,898	5,38,382	4,27,516	
1926-27	9,08,583	5,31,838	3,76,745	
1927-28	10,07,636	5,63,785	4,43,851	
1928-29	10,85,371	5,59,720	5,25,651	
Total	51,37,448	29,02,755	22,34,693	

The gross revenue for the period under review was Rs. 51,37,448 and the expenditure Rs. 29,02,755 leaving a surplus of Rs. 22,34,693 against Rs. 58,37,154 under revenue, Rs. 35,16,502 under expenditure and Rs. 23,20,652 under surplus, during the last quinquennium.

16. *Forest education.*—During the period under review, there were no sessions of the Vernacular Training School held in any of the divisions of the circle. In 1927-28, fifteen forest guards were deputed for training to Salem, and out of the fifteen, all came out successful 4 obtaining first-class and 11 second-class certificates. One student sent to the Madras Forest College came out with honours in 1924-25, two with higher standard certificates in 1926-27 and one with higher standard certificate in 1928-29. One student is undergoing training now.

COIMBATORE,
6th September 1929.

T. A. WHITEHEAD,
Conservator of Forests, V Circle.

ANNUAL ADMINISTRATION REPORT OF THE FOREST DEPARTMENT

FOR THE
YEAR ENDING 31st MARCH 1929.

SIXTH CIRCLE.

CHAPTER I.—CONSTITUTION OF STATE FORESTS.

1. ALTERATION IN AREA.

(i) *Reserved forests.*

The total area of reserved forests at the beginning of the year was 1,847 square miles and at the end 1,839 square miles. The decrease was almost wholly due to areas disafforested in the Nilgiris where 4,195 acres were assigned mostly for cultivation of tea or coffee in accordance with G.O. Mis. No. 64, dated 12th January 1927. The largest individual instance of disafforestation was in Kundah and Addition Reserve where 1,105 acres were given for planting of *Acacia decurrens*.

(ii) *Reserved lands.*

There was no alteration and the area continued to be the same, viz., 106 square miles.

2. FOREST SETTLEMENT.

No progress was made in the settlement of the five blocks (three in South Mangalore and two in the Nilgiris) referred to in form No. 26 for the following reasons.

South Mangalore division.—The settlement of the three blocks of (i) Karindala, (ii) Kinnanur and (iii) Eleri notified under section 4 in October 1926 is pending the theodolite survey of the villages and especially the survey of boundaries between warg and sircar kumries. Survey of the villages concerned was taken up during the year and the work is proceeding, but it is reported by the Settlement Officer that this will not be completed before March 1930. Consequently the Forest Settlement work is likely to be taken up only about the end of 1930.

The Nilgiris.—The notification of Mudumalai Kumabarakolli Block under section 16 is pending with Government. Addition No. II of Madanad reserve was notified under section 16 after the close of the year.

3. DEMARCATION.

Eleven miles of reserve boundaries were demarcated by clearing line and erecting cairns in Wynaad division. Three miles of boundary of reserves, or of portions of reserves, disafforested during the year were demarcated with cairns in the Nilgiris division. The work of clearing of boundaries and of repairing cairns was, as usual, attempted to be carried out by subordinates free of cost, but where the work was beyond the capacity of the establishment, small sums (amounting in all to Rs. 1,469) were sanctioned.

4. FOREST SURVEYS.

The Madras Survey Party continued its operations in South Mangalore division and another party was working in the Nilambur division also.

There was no survey by Survey of India Party.

The surveys of coupes, regeneration areas, plantations, etc., were as usual undertaken departmentally.

The reference maps were maintained.

CHAPTER II.—MANAGEMENT OF STATE FORESTS.

1. REGULATION OF MANAGEMENT.

Preparation and control of working plans.

Work by the Working Plans Branch.—Revised working plans for the deciduous forests of Wynaad and for the whole of the Nilambur Valley Forests were completed during the year, but the latter only was sanctioned before March 1929 and the one for Wynaad received Chief Conservator's sanction just after the close of the year.

Mr. Davis, Working Plans Officer, Mangalore, after a preliminary inspection and stock mapping of some of the reserves of South Mangalore division submitted his reconnaissance report and on which Chief Conservator's orders have been issued.

The following schemes and working plans were prepared by the circle (i.e., not by the Working Plans Branch).—A preliminary scheme (mainly dealing with regeneration and tending in the exploited areas) for Chenat Nair reserve was drawn up by Assistant Conservator Mr. Lasrado and will be followed till a regular working plan, now under preparation, is ready.

Mr. Dyson's revised working plan for the Nilgiri plantations was brought into effect from the commencement of the year, though it could not be submitted to the Chief Conservator of Forests in time to obtain his final sanction within the year.

In North Mangalore, some field work was carried out to obtain data for revising the fuel and catechu schemes of Coondapoor range and for expanding Hopea regeneration in suitable localities.

The prescriptions of the existing working plans and schemes were generally followed and for the few unavoidable deviations proper sanctions were obtained.

2. COMMUNICATIONS AND BUILDINGS.

Roads and bridges.—The total expenditure on 'new works' was Rs. 9,088 against Rs. 13,102 in the previous year and the expenditure on repairs amounted to Rs. 14,291 against Rs. 18,534 in the previous year.

The decrease under 'new works' was chiefly in Mangalore South and Palghat where in the previous year a larger scale road and bridle-path programme had to be carried out. The decrease under 'repairs' was chiefly in Palghat and was due to the fact that only about Rs. 1,000, were required for repairs to the Dhoni-Olavakot and Sappal roads against over Rs. 5,000 spent in the previous year.

The important new works costing over Rs. 1,000 each, executed during the year were—

South Mangalore division.

	RS.
1. Completion of the Aletti Reserve Extraction road including crossing across the Paiswani river—10½ miles in all (Rs. 5,020 were spent in 1927-28)	4,663
<i>Wynaad.</i>	
2. Improvements to part of Boothakal-Bavali road.	1,216
<i>Palghat.</i>	
3. Metalling Walayar-Nadupathi road—4½ furlongs.	1,125

Six hundred and eighteen miles of roads, bridle-paths and inspection paths were maintained at a cost of Rs. 14,291.

Buildings.—The total expenditure incurred on new works was Rs. 17,26- against Rs. 27,305 in the previous year, the amount spent on repairs being Rs. 11,055 against Rs. 8,591 in the previous year.

The decrease is accounted for by Wynaad where during 1927-28 we purchased from the Public Works Department, at a cost of Rs. 10,000, Revenue Divisional Officer's quarters at Manantoddu.

for the use of the Extra Assistant Conservator stationed there. The increase under 'repairs' was chiefly in Wynaad, Nilambur and Palghat due to more expenditure required for repairs according to necessity.

Important new works were—

	rs.
<i>North Mangalore division.</i>	
1. Range clerk's quarters at Shankernaraina ...	1,001
2. A shed to accommodate two forest guards at Andar	1,283
<i>South Mangalore division.</i>	
3. Ranger's rest-house at Baradka	1,850
4. Ranger's rest-house at Sankadakatte	1,222
<i>Wynaad.</i>	
5. Part construction of rest-house at Padri ...	1,438
<i>Nilambur.</i>	
6. Part construction of Extra Assistant Conservator's quarters at Nilambur	4,567

Other works.—The expenditure on new works amounted to Rs. 1,120 against Rs. 1,708 in the previous year. The main items under this head are construction of new wells near subordinates quarters or for forest rest-houses, and hence expenditure must vary according to necessity.

3. PROTECTION OF FORESTS.

(a) General Protection.

The following statement compares the total number of forest offences during the year under report with that of the previous year:—

Cases.	Fires.		Felling.		Grazing.		Other offences.		Total.	
	1927-1928.	1928-1929.	1927-1928.	1928-1929.	1927-1928.	1928-1929.	1927-1928.	1928-1929.	1927-1928.	1928-1929.
A. Taken into Court ..	73	32	96	159	23	43	13	33	208	268
B. Compounded ..	300	117	882	918	269	282	110	107	1,561	1,424
C. Undetected ..	71	92	4	8	..	..	..	..	75	100
Total ..	444	242	982	1,085	295	325	123	140	1,844	1,792
In Reserves ..	91	115	586	706	285	325	99	119	1,071	1,265
In Unreserves ..	353	127	396	379	..	..	24	21	773	527

Compared with the previous year, there was a slight decrease in the total number of offences by about 2.82 per cent. There was however an increase under 'Reserves' by 18 per cent and decrease under 'Unreserves' by about 32 per cent.

Under 'reserves' the increase was under all heads. The increase under 'Injury to forests by fire' was chiefly in South Mangalore and Palghat divisions and is reported by the District Forest Officers to be due to prolonged hot weather in the former division and accidental fires in the latter division. The increase under 'Felling' was in South Mangalore and the Nilgiris may be due to the better detection by subordinates. The increase under 'grazing' and 'other offences' was mainly contributed by the Nilgiris and is accounted for by surprise detection carried out by a party of guards specially deputed to patrol the areas in and around Ootacamund town and in the Wenlock downs. Under 'unreserves' there was a very large drop under 'Fires' in South Mangalore division and the Tahsildar considers that the main cause must be the deterrent punishment meted out to Kumri cultivators (all fire offences in unreserves of South Kanara relate to burning of forests and waste lands for shifting cultivation mainly by the very backward class of Maratis). Kumri cultivators shift their ground rapidly and when suitable Government lands are not available they go to Patta Kumries and this also may partly account for reduction of such offences in Government unreserves. The decrease under other items is small and calls for no remarks.

The percentages of cases detected in reserves and enquired into by Range officers and District Forest Officers are as follows. (As mere percentages do not give a fair comparison the total number of cases concerned are also entered in the last column.)

	By District Forest Officer. PER CENT.	By Range officer. PER CENT.	Total cases. NO.
North Mangalore division ...	...	10	135
South Mangalore	2	22	285
Wynaad division	...	27	11
Nilambur division	20	12	35
The Nilgiris	1	10	598
Palghat	1	17	201

The offences not enquired into, are generally reported to be of such a simple nature as not to need personal enquiry. But the District Forest Officers could have done more and it is hoped they will attend to this in future.

Of the 136 cases prosecuted in courts, 59 ended in conviction and 77 in acquittal. Of the cases acquitted, 56 were settled by payment of compounding fees in courts. Hence the total percentage of successful prosecution was about 85.

The amount of compounding fees realized was Rs. 16,024 against Rs. 15,537 in the previous year. The average compounding fees realized were Rs. 11-4-0 per case and Rs. 6-4-0 per person.

Rewards.—A reward of Rs. 18 was paid to six forest subordinates in the Palghat division for detection of offences in Narasuram reserve—a place notorious for illicit felling. A reward of Rs. 25 was paid to forest subordinates in the Nilgiris for detection of an illicit shooting case in Teppakuchi reserve.

A reward of Rs. 15 was paid by the District Superintendent of Police to a forest guard in Mangalore South who rendered valuable service in a police case.

(b) *Protection from fire.*

Special protection.

The period dealt with is the calendar year 1928.

Early burning—North Mangalore.—The operations were confined to the ghaut forests and the result is reported to be good. The area early-burnt was however much reduced under orders of the Conservator who considered that more was done in previous years than was necessary.

Wynaad.—Only the forests of Kannothe range were protected under this system and there were no fires.

The Nilgiris.—The early burning, on only one side, from certain existing lines mostly roads and outer boundaries was tried as prescribed by the working plan for the Mudumalai range, but the result not being satisfactory, the old system of burning lines and engaging patrols was adopted. No early burning was done in Sigur range.

The old system of protection by cleared lines and patrols prevailed in other parts of the circle, and in some places this was combined with a modified form of early burning, consisting in burning fairly wide strips (about 100 yards) on either sides of roads, paths, and such other, what may be called 'danger zones'.

The area specially protected decreased from 1,172 square miles to 1,103. The decrease was in North Mangalore and was due to not resorting to early burning in Coondapoor range for the reason noted above, and as the figure entered in the 1927 Form 31 for that division was incorrect.

The area successfully protected during the year was 99.4 per cent against 99.6 in the previous year, the area burnt being 3,825 acres against 2,981 acres in the previous year.

The average cost of special protection was Rs. 12-7-0 per square mile against Rs. 12-10-0 in the previous year.

The cost of early burning was Rs. 9-5-0 per square mile in North Mangalore division. The lowest rate, for protection under

the old method, was in Palghat division and it amounted to Rs. 13-9-0 per square mile and the highest was Rs. 25-7-0 per square mile in North Mangalore division.

General Protection.—The area under general protection was 454,350 acres, the area burnt over being 6,977 acres.

(c) *Protection against Cattle.*

The area closed to grazing increased from 333 to 336 square miles due to closure of the recently felled coupes and areas under regeneration. In Nilambur the entire forest area is supposed to be closed to grazing but the cattle from adjoining villages continued, as usual, to damage the young plantations and are difficult to be kept out.

The area closed to grazing of all animals was 336 square miles and which amounted to 17 per cent of the total area of reserved forests and lands. The area open to grazing of all animals except goats was 69 per cent and that open to all animals except browsers (sheep and goat) was 14 per cent.

The number of animals licensed to graze on payment was 123,392 against 117,997 in the previous year. The increase was chiefly in South Mangalore and the Nilgiris divisions. In South Mangalore it was due to a larger number of cattle brought to the Kulgunda cattle fair. In the Nilgiris it was due to a larger importation of slaughter cattle to Ootacamund through the Sigur reserve, as the disease among cattle in that locality subsided during the year.

The incidence of grazing as reckoned by District Forest Officers was—

	Acres per cow unit.	
	1928-29.	1927-28.
North Mangalore division ...	9.9	9.8
South Mangalore division ...	5.9	6.2
Wynaad division ...	18.0	12.0
Palghat division ...	6.6	6.3

It is not possible to work out the incidence in the Nilgiris for the reasons stated in the report of 1926-27.

The number of cattle impounded increased very slightly from 2,208 to 2,271.

(d) *Protection against injuries from natural causes.*

Weeds and climbers.—In North Mangalore division climbers were cut in the timber coupes, and creepers injuring Hopea plants in sown areas were removed during tending operations.

Lantana.—In South Mangalore division, the uprootal of lantana was carried out in Muliyar reserve fuel coupes and cutting of climbers, weeds, etc., was done in all the regeneration areas as a

preventive measure against injury. In Wynaad lantana was uprooted in plantations and around buildings. Burning of lantana in a test area was also carried out. Loranthus on teak trees in plantations was cut.

Insects.—In South Mangalore division an insect damaging Hopea seedlings in Mundaje Kap reserve was sent to the Forest Entomologist at Dehra Dun, and it was identified as *Xyleborus morstathi* Haged known as a borer of coffee seedlings and twigs. The remedy suggested by the Entomologist to combat this attack, is frequent inspections and the destruction of the attacked seedlings by burning or burying. Another insect which appears to do a lot of tunnelling in the boles of over-mature Hopea parviflora trees was also sent to the Forest Entomologist. As he could not yet definitely identify the insect, further investigation is being carried out by him and a piece of log containing these borers has been sent to Dehra Dun.

Damage by *Teak defoliators* in Nilambur was comparatively light. Unusual rains in November and December appears to have reduced the activities of the caterpillars. The work of mapping defoliated areas by a special duty forester and reporting observations to the Forest Entomologist was continued throughout the year.

It is worth recording, that defoliators are reported by the Forest Research Officer to have left alone teak seedlings in a one-year old experimental Research Plot in Nilambur, where the plants scarcely ceased growing throughout the hot weather and dropped but few leaves, on account of excellent soil aeration carried out twice (early in September and at end of October 1928): Whereas defoliation was going on in the surrounding areas.

In the Nilgiris, spike in sandalwood trees in Sigur, Kalhatti and Bokkapuram reserves was noticed for the first time, though from the extent to which it has already spread it is presumed that it has been going on for some time, though not noticed and reported.

Damage by animals.—In South Mangalore division the injury by wild animals continued to some extent. In Wynaad, the bison, sambhur, and elephants continued to do some damage to young plantations, and a promising young teak area in Begur range was almost wholly destroyed by pigs which took to digging up the plants for their roots. In Nilambur the damage by wild elephants is reported to be severe in parts of the young plantations of the Amarampalam range. In Palghat, the visits of wild elephants were a source of damage and cultural operations were rendered difficult thereby in Bolampatty and Walayar reserves. One unfortunate forest guard who was returning from Bolampatty tuckle area, along with some four other subordinates, was killed by a rogue elephant in January 1929.

CHAPTER III.—SILVICULTURE.

I. AFFORESTATION AND REGENERATION OF FORESTS.

(i) *General progress of areas under regeneration.*

North Mangalore.—The Hopea parviflora, etc., areas regenerated in previous years in Someshwar, Jatkanmale and Halesomeshwar reserves continue to be promising. Regeneration by coppice in fuel and catechu coupes is fair.

South Mangalore.—Much lighter tending than in previous years was done in the areas regenerated with Hopea between 1920 and 1927 in Parappa, Perkala and Padnur. All the regenerated areas are in a satisfactory condition.

An attempt was made in both Mangalore divisions, to find out if at least in earlier sown areas we can do away without such works being carried out annually. But result shows that the time has not yet come to stop freeing seedlings and as this costs very little should be continued to be done for some time longer according to actual requirements.

Wynaad.—Natural reproduction was generally poor, the undergrowth of the grass and weeds being very heavy in deciduous forests. Regeneration in evergreen sholas is reported to be satisfactory.

Nilambur.—The new teak plantations of the Plantation Working Circle (i.e. second rotation crops) are indifferently stocked, and the growth is generally below the average, though there are restricted areas of excellent growth. In the Conversion Working Circle, the new clearing in the Amarampalam range is quite well stocked, and the growth is generally good, while that in the Nilambur range is of poorer growth, though it is also fairly stocked. The 1927 Ponam plantations are poor to fair in stocking and development.

The Nilgiris.—Eucalyptus globulus coppice on the plateau continues to be eminently satisfactory. Eucalyptus eugenoides, planted in Coonoor and Ootacamund ranges last year, though not so hardy as Bluegum, is also doing well.

Palghat.—The areas regenerated in the previous years were tended and the development of coppice and young regeneration is satisfactory.

(ii) *Establishment of reproduction under working plans or schemes.*

Form 34-A.

Mainly natural.

Wynaad.—In felled coupes, teak of all ages was found to coppice better than any other species. Mathi and Rosewood coppiced well at the start, but their further development is reported to be poor.

Nilambur.—In an area of 17 acres in compartments 83 and 88 of Edacode (teak plantation of 1851) which contained a good natural underwood of *Hopea parviflora*, the entire overwood of teak was removed, leaving the *Hopea* underwood to form the future crop.

Natural mixed pole crops and regeneration of valuable species were thinned, cleaned and tended both in the miscellaneous felling series of the Plantation Working Circle, and in subsidiary coupe I of the Conversion Working Circle. The areas so treated amounted to 27 acres and 69 acres respectively.

Mainly artificial.

North Mangalore.—As prescribed by the scheme, catechu sowings were continued—but on a smaller scale—and the work done with cost and results is as follows:—

Series.	Area sown.	Cost.	Percentage of survivals at end of 1929 hot weather.
		RS.	PER CENT.
Coupe III, Baindur ...	13	86	34
Coupe III, Wandse ...	36	211	91
	40	229	96

All the three areas were fenced and were weeded once; the first in August and the other two in September 1928. The area sown in Baindur series was too open and rocky and hence results were poor. Seeds were sown in June in prepared patches 12' × 12' apart.

Casualties (amounting to 47 per cent) were replaced over 75 acres of catechu coupe II of Baindur series (1926 coupe) and the area was weeded in November and December 1928 at a cost of Rs. 165. But the percentage of success at end of May 1929 was only 65. The area being a recently worked fuel coupe, the seedlings get a poor chance to develop and it has now been decided not to attempt further catechu sowings in such areas, as the luxuriant growth of coppice gives too much shade to suit the light requirements of catechu.

Palghat—Pole Working Circle—Coupe II in Varalapadi Block II—Out of 125 acres clear-felled in the previous year, only about 67 acres, where natural reproduction and coppice regrowth of good species were not sufficient, were planted with one year old teak stumps early in June 1928, the espacement adopted being 9' × 9'. The remaining area contains good coppice growth of teak and other valuable species and hence was not planted. The growth over both planted and coppiced areas is very good. The total expenditure on 67 acres planted with stumps was Rs. 936 or Rs. 13-15-0 per acre. The remaining area not artificially regenerated, viz., 58 acres was ended at a cost of Rs. 128 or Rs. 2-3-0 per acre.

Bolampatti range.—Ponam Working Circle—Compartment 16, Coupe III.—An area of 25 acres felled in the previous year was given on *tuckle* to the Irulars who cleared and burnt the area by end of April 1928 and prepared bunds 12 feet apart. Subsequently the subordinates notched germinating teak seeds taken from dumps over 112 of these bunds and over the remaining 139 Neem, *Albizia lebbek* and *Odoratissima*, *Terminalia tomentosa*, and *Gmelia arborea* seeds were sown. The approximate area sown with teak may be about 17 and with all other species about 8 acres (as lengths of bunds vary area is not in proportion to their numbers). The Irulars weeded the bunds in July and August 1928 and again in January 1929. The total expenditure on regeneration was Rs. 112 or Rs. 4-8-0 per acre. Owing to a very prolonged break in the monsoons (between middle of June up to 17th October there was only about one week's rain), results of sowings were poor, Neem having done best of all.

The Nilgiris.—In Ootacamund range about 11 acres were planted up with bluegum in areas which originally contained *Acacia* or *Frenela* and the cost incurred was Rs. 176 or Rs. 16 per acre. The seedlings are doing well. The change of species was affected as it pays best to have bluegum plantations for fuel.

In compartment 3 of Brooklands, an area of 5 acres was planted in July 1928 with eucalyptus eugenoides seedlings at a cost of Rs. 211 or Rs. 42 per acre. The weather was rather unfavourable but the plants are doing well.

In Coonoor range, 10.50 acres of Springfield, which originally contained *Acacia*, were planted with eucalyptus eugenoides at a cost of Rs. 286 or Rs. 27 per acre. The plants are thriving. The cost is lower than in Ootacamund range as smaller sized pits were made and as less shading was required in the Coonoor range.

Sandal sowings.—Twenty-five acres in Burliar reserve were dibbled with sandal at a cost of Rs. 95. The success varies from 10 to 12 per cent.

In Sigur range, an area of 25 acres, where germination failed last year, was resown with sandal seeds at a cost of Rs. 84 but with no better results. Even the plants raised in a nursery as a germination test and planted out in the area died owing to lack of timely rains.

Sandal seeds put out on one acre plot to the north of Teppakadu toll-gate in Mudumalai range at a cost of Rs. 3 did not germinate. Two hundred seedlings from the nursery at Lower Kargudi were transplanted in the area, but only 86 survived at end of the year.

In the Mudumalai range, teak was regenerated under the tuckle system (the field crop being ragi) in an area of 12½ acres in compartment 4 of Cheenakolli. The work was done departmentally. Similar work done in 10 acres in 1927-28 was a failure but that taken up during the year under report yielded 63 pallas of ragi valued at Rs. 665. In 1927-28 area the survivals of teak plants at end of the first year were only 50 per cent, but after restocking in 1928-29 the percentage had increased to 80. Whereas in 1928-29 area survivals amounted to 78 per cent at end of first year.

Nilambur—Nilambur range—Plantation Working Circle.—Edacode compartments 77, 83 and 88, Moolathamanna compartment 20 (part), Ramallur compartments 26 and 27 (part) in all, 39·8 acres were regenerated during the year, 37·8 acres by planting teak seedlings 6'×6' and 2 acres by sowing teak seeds in pits 6'×6'. The sowing was done in June, and planting between the 12th June and 3rd July. Casualties in the planted area were replaced in July-August with teak, in most places, and with Karimarudu (*Terminalia tomentosa*) in portions of compartment 77 where the teak originally planted did not come up owing to the swampy nature of the locality. Three weedings were carried out. The first, in August, consisted merely in cutting back the weeds, the second, in September-October, consisted of removing weeds and digging the soil with forked mamutties 2' on either side of the plant rows. The third, in November, consisted of removing weeds with mamutties 2' around plants below 3' in height and mulching the plants. The cost of formation was Rs. 2,043-10-10 or Rs. 51-6-0 per acre, out of which a sum of Rs. 457-12-3 was spent in 1927-28.

The stocking is very variable, from about 90 per cent in the best bits to about 20 per cent in the worst, and on the average it is poor. In a few small areas the growth is extremely good, and testifies to the value of digging the soil just after the monsoon. With such notable exceptions, the average growth is poor. Obviously heavy casualties attended the original planting, and much of the replacement of casualties was done too late to give the plants a proper start and hence the general poor result in spite of subsequent soil aeration.

Moolathamanna compartment	...	20
Ramallur	"	...
Elenjeri	"	...
Edacode	"	...
		28, 29, 38, 39, 40
		61, 70, 82, 86, 87

in all 160·1 acres were attempted to be regenerated with teak under the Ponam system (Tuckle) in 1927. But the areas were so poorly stocked as to require almost complete re-formation and hence were again regenerated during the year, mostly with one year old

teak stumps. Planting was commenced by the middle of June, and owing to the scarcity of labour, and the large area to be dealt with, was completed only by the middle of August. Here also three weedings were carried out, more or less on lines described above.

Best results are obtained only if one succeeds in establishing teak in the very first year. But due to unorganized Ponam work, this advantage was lost in first year of formation. For this reason and also partly as planting could not be completed in proper time, the results on the whole were poor.

The expenditure incurred on the work was Rs. 4,577-15-5, of which a sum of Rs. 1,878-5-6 was spent in 1927-28 and the balance during 1928-29 (i.e., in all about Rs. 28-8-0 per acre).

Five acres in compartment 87 of Edacode where Ayini (*Artocarpus hirsuta*) regenerated in 1927, had mostly failed, were replanted with Ayini seedlings 6'×6' in July at a cost of Rs. 47-9-0. Most of the plants disappeared chiefly due to heavy browsing.

Five acres in compartments 17, 18, 19, 23 of Moolathamanna 1925, where teak had failed, were regenerated with Karimarudu (*Terminalia tomentosa*) by dibbling seeds at stakes. The plants were freed in October and again in February 1929. The expenditure incurred was Rs. 16-5-3.

In accordance with the provisions of the revised working plan, Hopea was underplanted in portions where shade conditions were considered suitable in the following areas:—

Panangode	compartment...	130 m, 136 m.
		137 m, 138 m.
Walluvasseri	"	...
		149 m, 152 m.
Old Amarampalam	"	...
		233 m, 235 m.

The planting was done at an espacement of 9' × 9' in August with plants from the 1926 nursery. Ten thousand five hundred ten Hopea seedlings were planted in all (or roughly an area of 20 acres) at a cost of Rs. 108.

Conversion Working Circle—Periodic block I—Nilambur range.—53·8 acres of natural forest in Erambadam, clearfelled in 1927-28 were cleared and burnt. But owing to interruption of rains, the burning had to be delayed, and was not satisfactory. An area of 9 acres where the burning was satisfactory, was planted with teak seedlings 6' × 6' in the second week of July. The area was weeded and casualties replaced in July-August 1928. The heavy weed growth was cut and the plants aerated in September-October. A further weeding consisting of cutting weed growth was carried out in February 1929. The stocking is fair, but the growth, on the whole, is poor—mainly on account of late planting.

The total expenditure incurred on the area was Rs. 1,592-1-7 out of which a sum of Rs. 741-1-6 was incurred in 1927-28. The proportionate cost of the area actually regenerated during the year was Rs. 622-15-6 or Rs. 69-3-6 per acre.

Amarampalam range.—84.8 acres of natural forests in Munda-cadava (New Amarampalam reserve forest) clearfelled in 1927-28 were cleared and burnt and regenerated during the year. 42.1 acres were dibbled with teak at stakes 6' apart, 39.6 acres were planted with teak seedlings 6' × 6' and the balance 3.1 acres were dibbled with Karimarudu (*Terminalia tomentosa*) at stakes 6' apart. Dibbling was done between the 23rd April and 19th May, while planting was done between the 9th June and 4th July 1928.

Casualties were replaced in the planted area in July, and in the dibbled area in June, July and August. The teak dibbled area was weeded 2' around the plants in June and again in September. (The latter weeding was accompanied with soil digging.) The planted area was weeded in July, and weeded and aerated by digging with forked mamutties in September–November. The area regenerated with Karimarudu (*Terminalia tomentosa*) was weeded in July and December. The whole area is quite well stocked, and the growth, generally speaking, is good, more especially in the planted area which had the advantage of soil digging in four feet strips, two feet on either side of the plant rows.

The total expenditure incurred on regeneration of the area was Rs. 5,153 or Rs. 60-12-0 per acre.

Afforestation—Nil.

(iii) *Plantation and other forms of regeneration not under working plans or schemes—Form No. 34-B.*

North Mangalore.—In the 1927 regeneration area of 500 acres in Someshwar reserve, casualties were replaced in June and July 1928 with nursery and natural seedlings at a cost of Rs. 235 or Rs. 7-3 per acre. Percentage of success at end of 1929 hot weather was 89.

Eight and a half acres in Madibare reserve (Timber coupe II) where the percentage of survivals of 1927 sowings of *Xylia* was only 20 in May 1928 were resown with the same species and the plants weeded in September and October 1928 at a cost of Rs. 10. At end of May 1929, the survivals were 82 per cent. An adjoining area of two acres in the same coupe was sown with *Xylia* during the year at a cost of Rs. 6 and the percentage of success at end of May 1929 was 89.

South Mangalore.—The area of 21 acres in Compartment 9 of Parappa reserved forest, sown with *Melia dubia* and *Ayini* (*Artocarpus hirsuta*) in 1926-27, was a thorough failure except for the

few *Ayini* seedlings over half an acre. Hence the area was clearfelled during the year and burnt preparatory to regeneration with Teak and *Acrocarpus*. The amount spent was Rs. 138.

Wynaad.—There was taken up for regeneration 86 acres in Boothakkal in Begur range and 77.5 acres in Chikkanji in Chedleth range.

In Begur range, planting was done with one year teak stumps in crowbar holes, 6' × 6' and one foot deep and the work was completed by the middle of June 1923. The monsoon was light and was ideal for planting. The plantation promised to be good. There was some damage to the seedlings from pigs, which pulled out stumps, and chewed and threw them away. This was done when the plantation was weeded and the plants made conspicuous. Further weeding was therefore stopped and 40,500 failures were replaced in July 1928 on 63 acres. Subsequently weeding was done.

Result of enumeration in January 1929 was as follows :—

In untucked area, 56 acres ...	12,056 plants survived.
South of stream (tucked area) 16½ acres ...	4,749 do.
North of stream (all tucked area) 15½ acres ...	10,623 do.
	27,428 or
	26.3 per cent success.

In Chedleth range, out of the 77.50 acres planted, 38 acres (western half) were planted with teak stumps from the transplanted beds in the nursery and 38½ acres (eastern half) was planted with stumps obtained from the old seed beds, i.e., seedlings not transplanted from their original beds of sowing. One acre was utilized for planting stumps early in April before the monsoons burst. The planting was done in crowbar holes and was completed by the commencement of July 1928. In August 1928, grass weeding was carried out and in September–October, soil wounding and weeding in patches was done. From enumerations, it has been found that 80 per cent of the plants have survived.

The cost of regeneration, including felling and burning of miscellaneous species, and cost of seedlings was Rs. 4,366 for 86 acres in Begur range and Rs. 4,524 for 77.5 acres in Chedleth range. This works out to about Rs. 51 per acre in Begur range and Rs. 58 per acre in Chedleth range. The increase in Chedleth range is due to more imported labour employed there than in Begur range.

Palghat.—Planting of teak was carried out on the following areas in Chenat Nair reserve, to find out whether the soil and other conditions were suitable for teak, and results were quite satisfactory especially in plots 2 and 3:—

	ACRES.
(1) Dhoni over	4
(2) Elival over	21
(3) Sappal over	5

In the blanks formed by selection felling in the evergreen forests of Silent Valley in Coupe I (a), 3,000 patches were sown with seeds of *Acrocarpus fraxinifolius* and in 400 patches *Ayini* (*Artocarpus hirsuta*) seeds were put in. The sowings were carried out between April and August 1928. During March 1929, a large quantity of *Acrocarpus* seeds was collected and 5,323 additional patches were dibbled. A few blanks were also planted up with one year old natural *Mesua* seedlings. The expenditure on the operation was only Rs. 76.

Careful records are kept to show the progress of germination and the success achieved so far is quite good. Observations show that for *Acrocarpus* seeds, percentage of germination at first appears to be low, but the seeds keep on germinating very slowly and some sprouted even four months after sowing. This was especially noticed in three beds in rather an exposed locality near the Neelikal serambi, where tests were made to find out the fertility of *Acrocarpus* seeds.

(iv) (a) *Tending of areas under regeneration.*

North Mangalore.—Tending, weeding, clearing low shade were carried out over 2,995 acres regenerated (mostly with *Hopea*) between 1920 and 1927 in Someshwar, Jatkattmale, Halesomeshwar and Baidur reserves, and the cost per acre was As. 8-9. This includes cost of replacing casualties in recently sown areas of 1927.

South Mangalore.—Tendings (very light compared to what used to be done hitherto) were carried out in the areas previously regenerated with *Hopea* in Parappa, Jalsur East, Porkala, Padnur and Mundaji Kap reserves. The area gone over was about 2,278 acres and the cost incurred was Rs. 652 or As. 4-6 per acre. This included an area of 189 acres in compartments I to V of Parappa which were originally abandoned as failures, but which were resown in 1927. In these patches casualties also were replaced. In addition, 23 acres in Parappa and 55 in Nerankimale sown with deciduous species were also tended at a cost of Rs. 75.

Wynaad.—The teak plantations of 1926 and 1927 in Chedleth and Begur ranges were tended and the casualties replaced and the *Hopea* plantations of 1923, 1924 and 1925 in Kannothe range were

also similarly dealt with. The total area gone over amounted to 756 acres. (The expenditure incurred has not been reported by the District Forest Officer.)

Tending of areas under regeneration in Plantation and Conversion Working Circles.

Nilambur.—Weeding, pruning, cutting back damaged plants and climbers, and clearing bamboo growth interfering with teak were carried out wherever necessary and in addition blanks in 1926 Old Amarampalam and Mundacadava plantations were dibbled with *Karimaruda* (*Terminalia tomentosa*). The area gone over in the Plantation Working Circle was 164 acres and the cost incurred was Rs. 194 or Rs. 1-2-11 per acre and that in the Conversion Working Circle was 510 acres costing Rs. 1,659 or Rs. 3-4-0 per acre.

The Nilgiris.—The *Eucalyptus* plantations in Ootacamund and Coonoor ranges were weeded and the casualties replaced at a cost of Rs. 313.

Palghat.—Weeding and climber cutting were done in the artificially regenerated area in Chenat Nair and weeding only in the teak plantations of the Walayar Pole Working Circle and Bolampatty Ponam Working Circle.

Cleaning and climber cutting were done in the Pole Working Circle in an area of 181 acres at a cost of Rs. 217. An area of 162 acres of the fuel coupes was cleaned and the cost incurred was Rs. 320. Climber cutting was done in 94 acres of the fuel coupes for Rs. 89. The Vernacular Training School did the work of cleaning and cutting in 112 acres and the subordinates did similar work over about 1,238 acres free of cost. The Vernacular Training School also cleaned 16 acres of the Singapatty fuel coupe.

(iv) (b) *Tending of growing stock.*

South Mangalore.—One hundred and forty-seven acres of natural *Hopea* regeneration area in Jalsur East were tended at a cost of Rs. 30. The advanced growth of *Hopea* in Kidu over 19 acres was tended at a cost of Rs. 25. Only climbers and creepers were cut in an area of 1,030 acres in coupes I and II of Nalkur, as tending given for the area in the previous year was intensive.

In Mandekole reserve the growth round ten acres of natural *Hopea* seedlings was cleared, creepers were cut and interfering trees were girdled at a cost of Rs. 15.

The fuel coupes of Mulliar, Narimogar, Narinkemale and Kalanjimale reserves were tended and lantana was also uprooted in all except Nerankimale, where this pest is not found. The total area dealt with was 462 acres and the amount spent, Rs. 442.

Nilambur.—Five hundred and twenty-four acres of teak plantations were thinned at a cost of Rs. 2,495 or Rs. 4-12-0 per acre. Climber and bamboo cutting and removal of loranthus and other parasites injuring teak were carried out over 844 acres at a cost of Rs. 789 or 15 annas per acre.

Natural tree seedlings were freed of weeds and climbers in Panangode 1886 and 1887 and Karimpoya 1900 teak plantations at a cost of Rs. 123.

The Nilgiris.—In coupe III of Coonoor sandal felling series tending was done over an area of 67 acres at a cost of Rs. 100. Sandal trees in coupe III of the Sigur felling series were also tended at a cost of Rs. 100, the area gone over being 216 acres.

(v) *General*.—Underplanting, improvement fellings, etc.

Nilambur.—Formation and tending of underwoods in teak plantations—*Hopea*.—*Karimpoya* 1919 B: 32.4 acres.—Casualties were replaced in July-August with 6,950 *Hopea* plants from the 1926 nursery. The *Hopea* plants were freed and aerated in November and in March. There were 5,231 plants alive at the end of March 1929, or a success of 50 per cent.

The expenditure incurred was Rs. 129-15-6.

Karimpoya 1906 (compartments 286 and 289).—Area: 53 acres.—The casualties of *Hopea* were replaced by dibbling Mahogany seeds in June and planting Mahogany natural seedlings in July. The plants were weeded in August and again in November. The survivals in November were:

Hopea	...	...	...	...	...	4,030
Mahogany	...	...	...	...	...	9,078
Hardwickia	...	...	...	...	...	349
Total	...	...	...	...	...	13,457

or nearly 85 per cent. Nothing further is proposed to be done in this area.

The expenditure incurred on the year's work was Rs. 153-12-0.

Panangode 1887 (Compartments 139 to 144).—Area: 65.1 acres.—Casualties over 25.3 acres (compartments 140 and 141) were replaced by dibbling Mahogany seeds in April, and planting natural seedlings of Mahogany in July. Casualties in the balance area were replaced in July with *Hopea* plants from the 1926 nursery.

The expenditure incurred was Rs. 46-11-0.

Old Amarampalam 1868 (Compartment 225).—Area 5.3 acres.—The casualties were replaced in August with *Hopea* plants from the 1926 nursery at a cost of Rs. 10-6-6.

Mahogany.—*Panangode* 1886 (Compartment 134).—Area: 10.1 acres.—Casualties were replaced by dibbling Mahogany seeds in April and planting natural seedlings in August. The expenditure incurred was Rs. 12-4-6.

Nellikutha 1871 (Compartment 247).—Area: 10.1 acres.—Casualties were replaced by dibbling Mahogany seeds in June, and planting natural seedlings in August. The expenditure was Rs. 9-8-0.

Karimpoya 1905 (Compartment 294).—Area: 12 acres.—Casualties were replaced by dibbling Mahogany seeds in June and planting natural seedlings in the first week of August. The plants were freed in August and November. At the end of November there were 2,434 plants alive or success of 68 per cent. The expenditure incurred was Rs. 34-7-6.

Macaranga Roxburghii and *Vitex negundo*.—Two hundred and twelve natural seedlings of *Macaranga roxburghii* were planted 9' × 9' in an area of bad grass in compartment 132 of Panangode 1863 in August. Of these 157 were found surviving in January 1929.

In the same compartment cuttings of *Vitex negundo* were planted in the first week of September at an espacement of 12' × 12'. The cuttings all struck roots, but mostly died, as the work was done much too late.

The object of introducing these species is to kill out coarse grass in the area and to provide material for a good burn when the area is clearfelled and regenerated. The expenditure incurred on the work was Rs. 2-14-0.

Cuttings of *Vitex negundo* were also planted at the same espacement in the following areas of the second rotation where teak had failed, with a view to reclaim the areas for regeneration in the near future:—

				ACRES.
Arevakode 1922, compartment 12	...	...	...	1.9
Do.	do.	13	...	1.1
Do.	do.	14	...	1.8
Ellonjeri 1919	do.	37	...	1.0
Total	...	...	...	5.8

The work was done too late and the results are negligible. The expenditure incurred was Rs. 5-12-0.

Tephrosia candida (Boga).—Seeds were sown in furrows 6' apart in two acres of compartment 33 Ellenjeri 1846 B in May. The germination was good, but the seedlings died as the shade was too heavy.

Seeds were sown in 0.9 acre in compartment 5 of Aravallikava 1917, in furrows 4' apart. The sowing here was done in June. Very few seedlings came up. One hundred and nineteen were found to be surviving in November, when the area was gone over and the surviving seedlings freed of weed growth. The expenditure incurred was Rs. 12-12-6 of which Rs. 6-12-0 was spent in 1927-28.

Wynaad.—The nine acres of Ayini underplanted in 1901 teak plantation in Begur range was tended at a cost of Rs. 20.

Improvement fellings.—To assist the established Hopea regeneration in Someshwar timber coupe III were carried out over 65 acres at a cost of Rs. 130 or Rs. 2 per acre.

In *Wynaad*, 812 acres of natural forest in Sultan's Battery range were gone over and all teak trees which were overmature or badly growing and which would not develop into useful timber were felled after reserving a suitable number of teak standards. The marketable timber was sold and the stumps coppiced.

In coupe I of the New Amarampalam reserve in *Nilambur* division, poles of valuable species were cut in an area of 388 acres. Climbers on all standing trees were also removed. The expenditure on the work was Rs. 129.

In *Nilgiris*, Improvement-Selection fellings were carried out over whole of compartment 15 (area 1,568 acres) of Mudamalai range according to the prescription of the new working plan, the trees felled having been marked by Assistant Conservator Mr. Lasrado.

CHAPTER IV.—EXPLOITATION.

The sale depots at Beypore, Nanjangod and Kasaragod continued to be in charge of the Forest Utilization Officer.

Since the termination of the agency of Messrs. Howard Bros. Co., London, the overseas timber trade is now being carried on through Messrs. Peirce, Leslie & Co., Calicut who are now the shipping and sales agents for the department. During the year under report 4,900 cubic feet of selected logs of Mathi (*Terminalia tomentosa*) and Rosewood were made over to the Company from *Wynaad* and the *Nilgiris* for sale abroad. Of this quantity, 1,019 cubic feet were sold during the year by Messrs. Peirce, Leslie & Co. and the amount realized was Rs. 6,017. This sum is the net realizations excluding cost of delivery of logs from forest to Calicut

(which cost varies from Rs. 1-10-6 to 2 per cubic foot). The logs were sold in London, Havre and Antwerp and it is interesting to note that 57.44 cubic feet of Laurel logs (*Terminalia tomentosa*) sold in London realized Rs. 1,750 or Rs. 30-11-5 per cubic foot. In addition the previous agents (Messrs. Howards) sold during 1928-29 874 cubic feet and realized Rs. 2,300.

The Saw Mills at Beypore, Parappa and Chedleth continued to work during the year, the intake being 86,090, 82,618 and 41,084 cubic feet respectively. These mills are under the control of the Chief Forest Engineer and the marketing of the sawn timber is effected by the Forest Utilization Officer. The number of sleepers supplied to the railways was considerably larger than in the previous year, when only 5,144 broad gauges and 2,640 metre gauges were supplied, whereas for 1928-29 the numbers actually passed and taken over by the railways were as follows:—

				Placed in	
				I class.	II class.
Broad gauges	...	...	...	17,667	719
Metre gauges	...	...	...	6,065	200

The following statement shows the particulars of the sleepers supplied from the several divisions of this circle.

Thus, by now every district of this circle (except the *Nilgiris* where there is no scope) are supplying sleepers, Palghat division having started these operations for the first time in the Evergreen Forests of the Silent Valley. In spite of the remoteness and inaccessibility of the locality (every sleeper has to be dragged down over 3,000' of very steep rough country and over a lead of about 4 or 5 miles), we have made a handsome profit on these operations without in the least deviating from strict silvicultural safeguards.

Xylia gives the highest percentage * of rejections and this is due to the timber splitting after conversion. Besides, the *Xylia* trees available in Mangalore South are of poor quality and often show signs of damage by fires which are believed to have been very frequent in years before Reserves were constituted, and when *Kumri* cultivation (*taungya*) was in full swing.

* The percentages of rejections by species for the whole circle were as follows:—

	Per cent.
Meana	2.3
Hopea	7.6
Xylia	11.2

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Name of division.	Size of sleepers.	Hopea.			Xylia.		
		Number of sleepers presented.	Number of sleepers passed.		Number of sleepers presented.	Number of sleepers passed.	
			As I class.	As II class.		As I class.	As II class.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mangalore North ..	Broad gauge.	1,757	1,734	13	..	..	..
	Metre gauge.	711	697	5	..	..	..
Mangalore South ..	Broad gauge.	3,912	3,315	150	1,032	729	90
	Metre gauge.	1,187	1,005	44	1,307	1,088	39
Wynaad	Broad gauge.	..	..	..	..	..	..
	Metre gauge.	..	..	..	..	..	..
Nilambur	Broad gauge.	..	..	..	2,329	2,090	48
	Metre gauge.	..	..	..	904	848	14
Palghat	Broad gauge.	..	..	..	..	..	..
	Metre gauge.	..	..	..	..	..	..
Total ..	Broad gauge.	5,669	5,079	163	3,361	2,819	138
	Metre gauge.	1,898	1,702	49	2,211	1,936	53

Name of division.	Mcena.			Total for all species.			
	Number of sleep- ers presented.	Number of sleepers passed		Number of sleep- ers presented.	Number of sleepers passed		Percentage of rejections.
		As I class.	As II class.		As I class.	As II class.	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Mangalore North ..	..	..	..	1,757	1,734	13	0.7
	..	..	..	711	697	5	1.3
Mangalore South ..	..	..	..	4,944	4,074	210	12.7
	..	..	..	2,194	2,093	83	12.7
Wynaad	2,924	2,688	94	2,924	2,688	94	4.8
	1,498	1,404	58	1,498	1,404	58	2.4
Nilambur	..	..	..	2,329	2,090	48	8.2
	..	..	..	904	848	14	4.6
Palghat	7,526	7,101	324	7,526	7,101	324	1.4
	1,088	1,023	40	1,088	1,023	40	2.3
Total ..	10,450	9,789	418	19,840	17,607	719	5.5
	2,586	2,427	98	6,695	6,065	200	6.4

(a) SYSTEM OF MANAGEMENT.

(i) Major Forest Produce.

The different silvicultural systems in force are described below :—

Clearfelling.—The following areas, after extraction of all saleable timber, were clearfelled for regeneration with teak.

	ACS.
Wynaad	152
Nilambur	233 (of which 77 acres were mature teak plantation).
Nilgiris	15

In addition, 33.80 acres of Acacias and Frenilla plantations in the Nilgiris were clearfelled with the object of conversion of crop and replanted with Eucalyptus pillularis and globulus.

Thirty-five acres in Compartment 5 of Parappa Reserve in Mangalore South (an old teak plantation underplanted with Hopea in 1917) were clearfelled by cutting down all teak trees, in the interest of the understorey of Hopea which is to form the crop of the next rotation.

Selection fellings (including subsidiary fellings).—Under this system are included all fellings carried out primarily with the object of exploiting timber. The fellings consisted of removing trees of saleable species of exploitable girth limits (approximately determined and which varied according to locality and types of forests) and of trees which were not worth keeping any longer. Such fellings were carried out both in deciduous and evergreen types of forest and especially when dealing with the latter type, rigid silvicultural safeguards were observed in the interest of regeneration.

The areas thus gone over were—

	In deciduous forest.	In evergreen forest.
	ACS.	ACS.
Mangalore North	458	243
Mangalore South	453	321
Nilambur	515	..
Wynaad	812	..
Palghat	..	485

* The area for Wynaad is not known, but approximately about 1,000 acres are said to have been gone over, mature 7 feet girth and over-mature Mesua trees felled by selection.

N.B.—In the three coupes worked in Mangalore North, the division of forests into deciduous and evergreens is not very sharp, as the growth is often very mixed up. About 25 per cent of the yield of timber is of evergreen species and it is not more merely because many evergreen species are not saleable.

Improvement fellings.—Compartment 15, area 1,563 acres, of Mudumalai in Nilgiris was gone over mainly with the idea of improving the existing stand. Yield of saleable species obtained was 35,680 cubic feet, but bulk of this timber is of very poor quality.

Thinnings.—Thinnings were carried out in Nilambur division over 525 acres of teak plantation and in some volume increment

sample plots maintained by Dehra Dun and the yield of timber and poles realized amounted to 85,531 and 7,033 cubic feet respectively, or a total of 92,564 cubic feet.

In Nilgiris 6.87 acres of *Eucalyptus pillularis* plantation at Snowdon were thinned and 13,000 stacked cubic feet of fuel was obtained.

Simple coppice.—This system is adopted for working fuel coupes of North and South Mangalore and in the Nilgiris and Palghat, the area gone over being 1,266 acres.

Coppice with standards.—3.50 acres in Coupe I, Muthinad in the Nilgiri division, were felled under this system, the object being to grow a few magnificent *Eucalyptus globulus* trees over the coppice, mainly to watch their future development. The yield was 33,120 stacked cubic feet of fuel.

Unregulated fellings.—These were confined to the extraction of sandalwood in North and South Mangalore and the Nilgiris divisions, the outturn being 1 ton in North Mangalore, 2½ tons in South Mangalore and 7 tons in the Nilgiris, and of which 4 tons in the Nilgiris were obtained from spiked dead trees.

(ii) *Minor forest produce (including bamboos).*

Miscellaneous items of produce.—The right to collect these was leased out to contractors, except in the Mudumalai Range of the Nilgiris where departmental collection of minor forest produce continued. In Nilambur bamboos on a large scale were collected departmentally for floating timber to Beypore.

Fodder grass.—In Palghat division, the Military Department harvested 65 tons of grass from Walayar and Chenat Nair Reserved Forests.

Grazing.—This was as usual controlled by the issue of permits, the revenue realized being Rs. 31,491.

(b) AGENCY OF EXPLOITATION.

(i) *Departmental Agency.*

Timber and sandalwood continued to be extracted departmentally throughout the circle, with the one exception of Mukkada teak plantation (6½ acres) in Mangalore South which was sold standing by tender and for which Rs. 16,250 were realized.

Excepting teak, all other available species of woods which are accepted by the railways were, as far as possible, converted into sleepers, as this method of exploitation is found to be the most paying. Thus the entire output of *Mesua*, the bulk of *Hopea* and a good portion of *Xylia* in Silent Valley of Palghat, in Wynaad,

South Kanara and Nilambur, was converted in the coupes into sleepers (19,840 Broad Gauge's and 6,695 Meter Gauge's) and delivered at Mangalore, Kasaragod, Tellicherry, Nilambur and Melatur Railway stations. In all about 170,000 cubic feet of logs of the above mentioned three species were sawn into sleepers.

The rest of the timber exploited was transported to sale depots (important depots being Beypore, Mysore, Nanjangode, Mangalore and Kasaragod) mostly in shape of logs, though some sawn scantlings mostly obtained from remnants of *Hopea* and *Xylia* logs sawn primarily for sleepers, were also marketed at these depots. The only important exception was in Silent Valley of Palghat which locality being inaccessible to carts, all non-sleeper species (*Dichopsis elliptica*, Poon and some *Arocarpus* and *Hopea glabra*) had to be converted at stump into kolmarams and chattams (sawn cart-shafts for which principal demand comes from the East Coast and the Ceded Districts) and thence transported to Olavakot depot for sale.

Of the timber converted by the districts as logs, the following quantities were supplied in 1928-29 to the saw mills run by the Forest Department:—

Division.	Situation of saw mill.	Quantity supplied to saw mills.	Depots at which Mill sawn timber was transported for sale.
		C. FT.	
Mangalore, South.	Parappa ...	88,927	Kasaragod.
Wynaad ...	{ Chedleth ... { (Chikkenji)	34,283	Nanjangode.
Nilambur...	Beypore ...	86,520	Beypore.

In addition, two private saw mills purchased the following quantities of logs from the department:—

Kasaragod Sri Lakshmi Mills ...	36,676 c.ft. of non-teak from Mangalore (North division).
Nilambur (Mr. L. S. Krishnan's) Mill ...	3,917 c.ft. of teak from Nilambur division.

The Nilambur mill contracted to purchase 38,665 cubic feet of teak logs, but as it was not able to pay the sale amount, the contract had to be cancelled in May 1929 and so it actually took only 3,917 cubic feet though voidah was extended twice.

The only other important departmental activity worth noting is the supply from the Wynaad and Mudumalai Forests (Nilgiris) of about 5,000 cubic feet of specially selected *Terminalia tomentosa*

and Rosewood logs to Messrs. Pierce, Leslie & Co., at Calicut, for shipment to European markets.

Sandalwood.—As usual the stock of sandal of the North and South Mangalore divisions was sold at Mangalore, while of sandalwood obtained from the Nilgiris, the Segur Range sandal was disposed of locally and that obtained in Coonoor Range was sold at Satyamangalam depot.

Fuel.—Top ends of timber were as usual converted into fuel departmentally and sold in North Mangalore. In the Nilgiris, the departmental felling and sale of the fuel in situ continued with the exception of one compartment in Governor Shola Reserve which coupe was leased for felling.

Bamboos.—The only departmental collection of bamboos, on an extensive scale, was in Nilambur where they were wanted for floating timber.

Minor Forest Produce.—Departmental collection of the produce in the Mudumalai Range of the Nilgiris continued. In the Wynaad 6,320 canes were collected departmentally to meet a demand from Messrs. Wrenn, Bennet & Co.

Elephant tusks collected were disposed of through the Forest Utilization Officer.

(ii) *By purchasers.*

Major produce.

Timber.—This was mostly confined to removal of dead and wind-fallen trees.

In South Mangalore the teak plantation of Mukkada (about 6½ acres) was sold to a contractor for Rs. 16,250 the total stand being estimated at 18,000 cubic feet. The refuse of timber in Parappa coupes was as usual sold to the public at Rs. 6 per cart load for teak and rosewood and at Re. 1 for other species. The revenue realized from this source was Rs. 841.

Nilambur.—The top ends of trees clearfelled in the natural forests were allowed to be worked by contractors for spokes and felloes and other small saleable materials. Some trees in the natural forest adjoining the teak plantations in the old Amarampalam Reserve of the Nilambur Range which were hampering the development of teak trees had been girdled in 1926. These were allowed to be felled and removed by a contractor. The total quantity of timber removed by purchasers was 11,334 cubic feet and the revenue realized was Rs. 2,123.

Fuel coupes.—Fuel coupes were sold standing in North and South Mangalore and in Palghat. In the Nilgiris only one fuel coupe was sold standing. There is no scope for selling any fuel in the Wynaad and Nilambur. The Badagas were allowed the usual privilege of removal of dry fuel from Reserves on permits at Re. 1 per house.

In the South Mangalore four fuel coupes, due for felling in the year, could not be sold for want of demand owing to depression in the tile trade at Mangalore still continuing.

Minor forest produce.

Bamboo coupes in South Mangalore, Wynaad and Palghat were leased out to contractors. Permits were also issued in all divisions except Palghat and Nilambur, to meet local requirements.

In the Nilgiris, three bamboo coupes due for felling as per sanctioned scheme, were not sold as two were ordered to be rested having been overworked in the previous rotation and as there was no bid for the remaining coupe owing to objections raised by the bidders to the observance of the usual conditions. Other minor forest produce was leased out as usual.

(iii) & (iv) *By right holders and free grantees.*

	Timber in thousands of cubic feet.	Value.	Fuel in thousands of cubic feet.	Value.	Bamboos.		Grazing value.	Other minor forest produce, value.	Total value.
					Number.	Value.			
Free grantees ..	4	Rs. 580	1	Rs. 68	2,025	Rs. 21	Rs. 949	Rs. 1,838	Rs. 3,456
Right-holders ..	12	5,517	..	..	..	..	..	..	5,517
Total ..	16	6,097	1	68	2,025	21	949	1,838	8,973

Outturn and sources of forest produce.

	Timber in thousands of cubic feet.		Fuel in thousands of cubic feet.		Bamboos value.		Grazing and minor forest produce.	
	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.	1927-28.	1928-29.
By Government agency.	713	942	547	511	Rs. 5,444	Rs. 8,917	Rs. 1,965	Rs. 2,144
By purchasers ..	133	161	1,562	1,266	18,564	26,129	71,164	81,029
By free grantees ..	1	4	1	1	12	21	1,812	2,787
By right-holders ..	16	12	..	..	..	..	..	..
Total ..	863	1,119	2,110	1,778	27,020	35,067	74,941	85,960

Timber.

By Government Agency.—The output in the year exceeded that of the previous year by 229,000 cubic feet. There was an increase of 133,000 cubic feet in Nilambur due to larger areas clearfelled and thinned and subsidiary fellings of *Xylia* undertaken as prescribed by the new Working Plan, South Mangalore, contributed to an increase of 81,000 cubic feet. This is mostly due to expansion of timber operations to provide for adequate supply to the Parappa Saw Mill (including advance fellings amounting to 37,089 cubic feet for 1929-30 supply to the Mill, in time before carting stops in rains) and also as one new series—Aletti West—was opened according to a sanctioned scheme and a trial coupe at Sampaji was worked for finding out yield, etc., for that locality. The selection fellings in Silent Valley (Palghat) started for the first time for sleeper operations, accounted for an increase of 41,000 cubic feet. In Wynaad the increase was by 12,000 cubic feet and this was due to a larger yield in the Sultans Battery Range and to Mathi and Venteak of Begur Range allotted for the previous year having been felled in the year under report. The increase in the abovesaid four divisions was partly set off by a decrease of 32,000 cubic feet in the Nilgiris, due to timber fellings being restricted to such logs as would pay the cost of exploitation and of 6,000 cubic feet in North Mangalore where the decrease was due to advance fellings in Udipi Range having been undertaken in the previous year.

Purchasers.

Reserves + 29,000 cubic feet.

Unreserves — 1,000 cubic feet.

Reserves.—The outturn shown under this chiefly represents removal of timber by fuel coupe contractors and hence figures are as a rule not accurate. Bulk of the increase (about 18,000 cubic feet) was in South Mangalore due to felling of Mukkada teak plantation. Nilambur shows an increase of 7,000 cubic feet and which is said to be due to the innovation of selling top ends and refuse of timber coupes for conversion into spokes and felloes.

Right holders — 4,000 cubic feet.

This is a varying item, based on removals from kumki lands (in South Kanara).

Fuel.

Government Agency—Reserves.—The decrease as compared with the outturn of the previous year for the whole circle amount to 36,000 cubic feet or only 6.5 per cent. The decrease was chiefly in the Nilgiris where the fellings were curtailed according to the prescriptions of the Revised Working Plan.

By purchasers.—Reserves—187,000 cubic feet or 14 per cent.

Unreserves—107,000 cubic feet or 40 per cent.

Reserves.—There was a decrease of 101,000 cubic feet in North Mangalore due to less areas of fuel coupes worked. In South Mangalore also there was a decrease of 13,000 cubic feet due to the smaller area worked and to the poor outturn. In the Nilgiris, a smaller quantity of dead wood was sold to planters. The decrease in Palghat was 68,000 cubic feet; this is based on the contractors' figures which are not accurate.

Unreserves.—In North and South Mangalore divisions the decrease of 29,000 and 13,000 cubic feet, respectively, are ascribed to less extent of lands assigned on darkhast. In Wynaad, the amount due for fuel in unreserves having been collected in the previous year in advance, no outturn is shown for 1928-29. There was decrease in the Nilgiris by 22,000 cubic feet and the District Forest Officer explains that it is not possible to arrive at the correct figures under this head. Palghat showed an increase of 6,000 cubic feet and the yield was fixed by conversion of the money realized.

Bamboos.

Government agency (+Rs. 473).—The increase was in Nilambur where 50,941 bamboos were collected against 37,817 in the previous year.

By purchasers (+Rs. 7,565).—High prices realized for two bamboo blocks sold in Palghat account for the entire increase.

Grazing.—The number of cattle admitted to graze on payment rose from 117,997 during 1927-28 to 123,392 in the year under report. The increase has been explained in Chapter II.

Minor forest produce (including grazing value).

Government agency.—+179 calls for no remarks.

By purchasers (+Rs. 9,865).—The increase was in South Mangalore, Wynaad, Nilambur and the Nilgiris. There was an all-round increase in the amounts realized at minor forest produce sales. In Nilambur the lease amount realized on canes in the New Amarampalam reserve was an addition to the year's revenue. The improvements carried out in the Beypore coconut tope, resulted in an increase of the lease amount by about Rs. 1,000.

By Free grant-es (+Rs. 975).—The increase was in the Nilgiris due to more quantity of road metal quarried by local bodies free of charge.

CHAPTER V.—FINANCIAL RESULTS.

In previous years, transactions relating to Nilambur division (which is a commercialised concern) could not be taken into account for this chapter owing to the actuals for the complete year not being received in time from the Audit Department. But this year special arrangements having been made to obtain all figures from the Accountant-General in time, all transactions relating to this division also have been included in the accounts of the year under report. The transactions pertaining to the Circle, taken independently of the revenue and expenditure transactions dealt with on behalf of Mangalore South and Wynaad divisions by Forest Utilization Officer and Forest Engineer, show a surplus of Rs. 65,090 against a deficit of Rs. 46,162 during the previous year as shown below :—

	1917-28.	1928-29.
	RS.	RS.
Revenue	7,73,610 [†]	9,67,800 [†]
Refunds	2,972	1,279
	<u>7,70,638</u>	<u>9,66,521</u>
<i>Expenditure.</i>		
8 (b) Conservancy and works	3,06,769	3,90,366
52-A Do. do.	87,454*	71,760
52-A-C (ii) Regeneration	28,196 [†]	28,289
52-A (d) Investments on Government Commercial undertakings	342	487
Establishments and contingencies	3,94,039	4,10,529
	<u>8,16,800</u>	<u>9,01,431</u>
	RS.	
Deficit	46,162	
Surplus	65,090	

2. The Forest Engineer is in charge of Parappa and Chedleth Saw Mills which are supplied with timber from Mangalore South and Wynaad divisions. The marketing of timber sawn at these mills (and also of some logs and sleepers supplied by the districts) is done at Kasaragod and Nanjangode Depots and which are controlled by the Forest Utilization Officer on behalf of the divisions concerned.

3. The figures of expenditure incurred and the revenue realized by Forest Engineer and Forest Utilization Officer are not however

* Includes adjustments made by the Accountant-General for the Nilambur division after the last Administration Report was compiled.

† Includes Rs. 1,326 credited in V Circle.

directly incorporated in the accounts of this Circle and hence are not included in figures furnished above. But to get a correct idea of profits made by the Circle during the year, the Forest Utilization Officer's and Forest Engineer's transactions, as far as these relate to timber supplied by divisions of this Circle, must be considered and these figures are as follows :—

	1927-28.	1928-29.
	RS.	RS.
<i>Revenue.</i>		
Kasaragod Depot	8,011	68,360
Nanjangode Depot	69,355	1,58,306
Miscellaneous—Revenue	...	591
Total	<u>77,366</u>	<u>2,27,257</u>
<i>Expenditure.</i>		
Kasaragod Depot	16,534	13,135
Nanjangode Depot	15,637	9,714
Parappa Saw Mill	18,646	24,286
Chedleth Saw Mill	22,813	29,070
Total	<u>73,630</u>	<u>76,205</u>
Overheads for all Depots and Mills	<u>31,047</u>	<u>24,027</u>

4. As overheads represent merely the apportioning of pay of the officers concerned with the Mills and Depots, these figures are not really an item of direct expenditure, although it may be necessary to charge such items when preparing audit notes to show profit and loss of each commercial concern.

5. Thus the total figures of revenue and expenditure (excluding overheads) for the Circle from all sources for the two years are as follows :—

	Revenue.	Expenditure.	Deficit or surplus.
	RS.	RS.	RS.
1927-28.			
Circle actuals	7,70,638	8,16,800	— 46,162
Other agencies	77,366	73,630	3,736
Total	<u>8,48,004</u>	<u>8,90,430</u>	<u>— 42,426</u>
1928-29.			
Circle actuals	9,66,521	9,01,431	65,090
Other agencies	2,27,257	76,205	1,51,052
Total	<u>11,93,778</u>	<u>9,77,636</u>	<u>2,16,142</u>

6. It has however to be pointed out that the same system is not adopted by the Accountant-General and the Auditors in the annual adjustment of profits and recovery of indirect charges on account of the Nilambur commercial concern as can be seen from details furnished below for the last two years.

	1927-28.	1928-29.
	RS.	RS.
Profit from Government commercial concerns	1,32,838	2,17,670
Recoveries of indirect charges from the commercial concerns	21,827	1,06,228
Total	1,54,665	3,23,898

7. The amount adjusted as profit for 1927-28 was the actual profit made by the concern in the previous year (1926-27), whereas in showing profit for 1928-29 the same system has not been followed by the Audit Department and it is made up as follows:—

	RS.
Actual profit made by the concern in 1927-28 ...	1,67,670
Portion of profit made by the concern in 1928-29 ...	50,000
Total	2,17,670

8. The only drawback of this lack of system of adjustments, is the difficulty experienced in correctly comparing results of the two years in question.

9. The financial position of each division of the Circle based on the *actuals shown in the accounts* for 1928-29 is furnished in the sub-joined statement.

Division.	Revenue.		Expenditure.				Surplus or deficit.
	Division.	Forest Utilization Officer.	Total.	Division including proportion for Inspector of Live Stock.	Forest Utilization Officer.	Forest Engineer.	Total
	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Mangalore, North	1,00,655	2	1,00,657	97,470	13,135	24,286	97,470
Do, South	80,191	68,360	1,48,551	1,54,328	9,714	29,070	1,91,719
Wynaad	1,80,367	1,58,206	3,38,573	2,59,760	..	..	2,98,514
The Nilgiris	1,15,181	16	1,15,197	1,26,735	..	..	1,36,736
Palghat ..	1,06,165	573	1,06,738	1,26,230	..	..	1,26,230
Nilambur	3,84,283	..	3,84,283	76,557	..	..	76,557
Direction	679	..	679	50,350	..	..	50,350
Total ..	9,66,521	2,27,257	11,93,778	9,01,431	22,849	53,356	9,77,636
							+ 2,16,142

10. *Nilambur*.—As to how the net surplus for 1928-29 for Nilambur amounting to Rs. 3,07,726 was arrived at, needs some explanation. Only the exploitation unit of this division is a *recognized commercial concern* and hence for this portion all expenditure is paid off from revenue and only the net profit of the concern is credited to District Accounts. In addition, certain sums are paid by this commercial concern by adjustments to General Forest Administration of the division. This latter unit is not a commercialised concern and hence for it both the Revenue and Expenditure charges are exhibited in our accounts.

The actual figures were as follows :—

	..	Net surplus.	Remarks.
	RS.	RS.	
EXPLOITATION UNIT.			
Profits of 1927-28 credited to 1928-29 accounts	..	1,67,670	} Vide para-graphs 6 and 7 above.
Part do. 1928-29 do.	..	..	
(total being Rs. 1,28,788)	..	50,000	
REGENERATION AND GENERAL ADMINISTRATION.			
Revenue—			
(1) Recovered by adjustments from the commercial concern	1,06,228		
(2) Revenue realized by district direct (mainly from plantations, thinnings, rents of buildings, etc).	60,385		
	1,66,613		
Expenditure	78,557	90,056	
Total ..	..	3,07,726	

The audited figures furnished by the Assistant Director of Commercial Audit show a net profit of Rs. 1,28,788 made by the concern during 1928-29 against Rs. 1,67,670 during the previous year. The results of the two years are compared below :—

	1927-28.	1928-29.
	RS.	RS.
Profit on Forest trading	2,857	10,916
„ hand-sawn sleeper trading ...	...	5,568
„ log trading, Beypore ...	1,62,648	73,707
„ sawn timber trading, Beypore ...	39,351	36,604
„ Olavakkot (i.e., for timber supplied to this mill from Nilambur) ...	9,268	17,981

	RS.	RS.
Interest received	119	1,047
Other receipts	2,921	419
Total ...	2,17,194	1,46,242
Deduct interest on capital and other miscellaneous charges ...	49,524	17,454
Net profit ...	1,67,670	1,28,788 and

of which only Rs. 50,000 have been credited to 1928-29 accounts and rest will appear in 1929-30 accounts.

Only 153,329 cubic feet of timber in logs were sold at the Beypore depot during 1928-29 at an average rate of Rs. 1-5-2 per cubic foot against 2,36,346 cubic feet in 1927-28 at Rs. 1-8-1 per cubic foot. As the detailed audit report for 1928-29 has not yet been received, it is not possible to account for the decrease in quantity and the rates during 1928-29 and which have so considerably reduced the profit for the year.

The selling rates and the costs of production for 1928-29 are noted below :—

(a) *For Logs.*

	Cost of production at Beypore sale depot per cubic foot including overheads.	Sale rate per cubic foot at Beypore.	Quantities sold.
Logs.	RS. A. P.	RS. A. P.	C. FT.
Nilambur Range—			
Plantation teak	0 8 10 97	2 5 6	39,922
Miscellaneous species from natural forests	0 8 7 08	1 0 9	* 65,963
Amarampalam Range—			
Miscellaneous species from natural forests	0 11 4 32	.. ..	† ..
Teak thinnings	0 12 7 61	† 0 13 7	47,444
Total ..	..	..	153,329

* Includes 1,854 cubic feet of teak from natural forests sold at Rs. 2 per cubic foot.

† Selling rate is only for poles and measurables.

N.B.—Cost of production includes not only every kind of actual charges, but also all indirect charges, e.g., establishment (even including Conservator's and Chief Conservator's share), leave and pension contribution, interest, audit fees, working plan, etc.

(b) For Sawn Timber.

	Cost of production per cubic foot including overheads.	Sale rate per cubic foot.	Quantities sold.	Remarks.
Handsawn sleepers. (Xylia)—	RS. A. P.	RS. A. P.	C. FT.	
Nilambur Range	1 1 10.8	2 7 3	7,974	Quantity sold through the agent and expenditure figure includes his commission.
Amarampalam Range	1 3 6.2			
Beypore Millsawn timber	2 8 4.9	2 15 1	30,960	
Do.	2 3 7.9	4 11 0	10,089	
Rejects and other sales	2 3 7.9	1 1 5	4,652	Work orders.
Olavakkot Mill sawn timber (obtained from logs supplied from Nilambur)	2 4 1.10	5 4 8	3,120	By Forest Utilization Officer.
.. ..	2 4 1.10	2 14 9	1,236	By Forest Engineer.
.. ..	2 9 4.1	3 4 1	9,891	Sold through the Agent.

N.B.—All figures are for Beypore depot except for last item.

The audited figures do not give specieswise details of timber sawn at the mills, but it was mostly teak. The total quantities sawn were 86,090 and 25,259 cubic feet at Beypore and Olavakkot Mills respectively.

Details for the costs of production are furnished below :—

(a) For logs.

	Nilambur Range.		Amarampalam Range.	
	Plantation teak.	Miscellaneous species (natural forests).	Teak thinnings.	Miscellaneous species.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1. Felling, conversion, dragging, carting, etc., up to riverside depots.	0 3 6.65	0 1 2.47	0 6 7.16	0 5 3.87*
2. Overheads and other miscellaneous charges.	0 2 0.63	0 2 0.63	0 2 0.63	0 2 0.63
3. Floating charges to Beypore.	0 3 3.69	0 5 3.96	0 3 11.82	0 3 11.82
Total cost of logs at Beypore per cubic foot.	0 8 10.97	0 8 7.06	0 12 7.61	0 11 4.32

* As audit notes are not yet received it is not possible to comment on differences in cost.
N.B.—Item 2.—“Overheads and other miscellaneous charges”—include share of Range and Divisional Establishment (Re. 0-1-1.6), share of Conservator, Chief Conservator, Working Plan and Inspector of Livestock; interest, audit fees, rents, roads and buildings share, etc., charges.

Sawn timber.

Beypore Saw Mill.

(86,090 cubic feet of logs yielded 45,281 cubic feet of sawn timber, i.e., net yield 52.6 per cent.)

	RS.	A.	P.
Cost of timber to yield one cubic foot of sawn material	1	0	6.62
Handling expenses	0	0	5.03
Direct sawing charges	0	9	1.29
Depreciation	0	1	6.59
Overheads	0	3	2.37
Expenses of sale—			
Binding, etc., conveyance to Feroke	0	1	3.00
Proportion of depot expenses	0	1	8.00
Proportion of Forest Utilization Officer's overheads	0	1	11.00
Total cost per cubic foot for sales other than through the Agent	2	3	7.90
Add for commission paid on sales to Agent	0	4	9.00
Total cost per cubic foot for sale to the Agent.	2	8	4.90

Olavakkot Saw Mill.

(For logs supplied from Nilambur.)

(25,259 cubic feet of logs gave 15,364 cubic feet of sawn timber, i.e., net yield 60.8 per cent.)

	RS.	A.	P.
Cost of timber to yield one cubic foot of sawn outturn	0	14	3.75
Railway freight to Olavakkot including loading and unloading charges	0	5	5.01
Mill running expenses saw mill salaries	0	1	11.73
Mill running including wages and petty expenses	0	4	9.82
Depreciation	0	1	4.48
Chief Forest Engineer's supervision charges.	0	1	7.44
Interest on capital	0	1	9.87
Binding	0	0	11.00
Depot expenses	0	1	6.00
Forest Utilization Officer's overheads	0	2	4.00
Total cost per cubic foot for timber sold otherwise than through the Agent	2	4	1.10
Add for commission paid on sales to the Agent	0	5	3.00
Total cost per cubic foot for supply to the Agent	2	9	4.10

11. *Wynaad division*.—The accounts of only the Chedleth Saw Mill and the Nanjangode sale depot (controlled by the Forest Engineer and the Forest Utilization Officer) are maintained under the commercial accounting system. But as all the transactions connected with the division are taken together and an annual commercial audit is conducted, this division is dealt with here under commercial concerns.

The profits on the working of the division during 1928-29 amounted to Rs. 92,602 against Rs. 16,086 for the previous year. The chief items relating to these are shown below :—

(a) *Profits.*

	1927-28.	1928-29
	RS.	RS.
<i>Export trade—</i>		
(i) On sales through Messrs. Pierce Leslie and Company	...	3,172
(ii) On sales through Messrs. Howard Brothers and Company	...	752
(iii) Log Trading Account	67,918	1,40,494
(iv) General Forest Administration	2,161	...
Remittances by Messrs. Howard Brothers and Company on previous years' sales	1,331	500
Miscellaneous receipts	...	84
Total ...	71,410	1,45,002

(b) *Losses to be deducted.*

(1) Loss on Sawn Timber Trading Account	46,925	28,541
(2) Loss on handsawing operations in Sultan's Battery Range	...	916
(3) Loss on General Forest Administration Account	...	22,943
(4) Loss on Howard's consignments	5,958	...
(5) Loss due to death of a working elephant	2,411	...
Total ...	55,324	52,400
Net profit ...	16,086	92,602

N.B.—So far only audited figures have been communicated and unless audit notes are received it is not possible to make any useful comments on variations.

The costs of production and the selling rates per cubic foot during 1928-29 are shown in the statement below :—

	Cost of production per cubic foot including overheads.								Selling rates per cubic foot and the quantity sold.				
	In the forest.		At Mysore.		At Nanjangode.		At Tellicherry.		In the forest.				
									Rate.	Quantity.			
Logs of—	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	C. FT.
Begur range ..	0	8	8-24	1	1	11-98	..	..	..	0	4	9-86	20,068
Chedleth range.	0	8	6-91	..	1	4	3-21	..	..	0	6	0	3,274
Sultan's Battery	0	8	8-30	..	0	15	2-44	..	..	1	6	6	14,552
range.													
Kannoth ..	0	4	0-45	..	..	..	..	..	..	0	6	7	74
Sawn timber ..	..	..	..	..	(g) 4	8	6-17	2	4	9-55	..	..	..

..	Selling rates per cubic feet and the quantity sold— cont.											
	Mysore.		Nanjangode.		Tellicherry.							
	Rate.	Quantity.	Rate.	Quantity.	Rate.	Quantity.						
Logs of—	RS.	A.	P.	C. FT.	RS.	A.	P.	C. FT.	RS.	A.	P.	C. FT.
Begur range ..	2	6	10	33,156	..	..	..	..	..	..	..	..
	(a) 3	0	2	5,939								
Chedleth range.	..	..	..	..	2	13	2	} 40,713	..	..	..	..
Sultan's Battery range.	..	..	..	..	2	13	2		..	..	..	..
Kannoth ..	..	..	..	..	(b) 3	5	6	8,092	(c) 2	13	0	9,084
Sawn timber ..	..	..	..	..	(e) 1	7	3	208	(d) 1	15	7	2,111
					(f) 2	15	7	599				

(a) By Forest Utilization Officer.

(b) Teak to the Agent.

(c) B. G. Sleeper.

(d) M. G. Sleeper.

(e) Miscellaneous to the Agent.

(f) Miscellaneous other sales.

(g) Excludes depot expenses and Forest Utilization Officer's overheads.

Details for costs of production are as follows :—

(a) *For Logs*

	Begur.	Chedleth.	Sultan's Battery.	Kannoth.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Felling and Conversion ..	0 1 5-93	0 1 3-90	0 1 5-29	0 0 9
Dragging	0 1 4-58	0 1 4-83	0 1 4-88	0 0 10-38
Divisional over heads ..	0 5 10-13	0 5 10-13	0 5 10-13	0 2 5-07
Total ..	0 8 8-94	0 8 6-91	0 8 8-30	0 4 0-45

* Of this the share of the District and Range Establishment .. 0 4 1.

SAWN TIMBER.

(b) *Ohedleth Saw Mill.*

(41,084 c.ft. of logs converted into 15,249 c.ft. of sawn timber, i.e., net yield 37.12 per cent.

	RS.	A.	P.
Cost of timber to yield 1 c. ft. of sawn outturn.	1	9	8.60
Direct sawing charges	1	2	11.80
Depreciation	0	6	4.88
Overheads	0	9	8.59*
Total cost per c.ft. of sawn timber at the mill.	3	12	9.87

Do Do. at Nanjangod Depot. 4 8 6.17†

* Details of Overheads.

	RS.	A.	P.
Chief Forest Engineer	0	0	7.55
Forest Engineer and Central Stores ..	0	6	4.92
Audit fee, interest, etc.	0	2	8.12
Total ..	0	9	8.59

† Excludes depot expenses and Forest Utilization Officer's overheads as these figures have not been supplied by Auditors.

12. *South Mangalore division.*—The special agencies concerned with this division are the Forest Engineer in charge of the Saw mill at Parappa and the Forest Utilization Officer in charge of the Kasargode Depot. The accounts of only these two are brought under the commercial system. In order to obtain a correct financial result for the whole division, the figures obtained from the Assistant Director of Commercial Audit have been combined with the Divisional transactions and the totals are as follows:—

	1927-28.		1928-29.	
	Receipts.	Expenditure.	Receipts.	Expenditure.
	RS.	RS.	RS.	RS.
As per District Accounts ..	80,708	1,26,940*	80,191	1,54,328*
Parappa Saw Mill	..	27,297	..	26,624
Kasargode depot	38,668†	18,819	99,405†	30,556
Total ..	1,19,376	1,73,056	1,79,596	2,11,508
	Deficit.	Deficit.		
	RS.	RS.		
	53,680	31,912		

* Includes the cost of production of timber supplied to the mill, and which amounted to 61,683 and 82,618 C. ft. in 1927-28 and 1928-29, respectively.

† Represents sales as per account rendered by the Assistant Director of Commercial Audit; but full amounts were not realized during the years.

The main cause of the deficit for Mangalore South in 1928-29 was that whilst large scale fellings (including advance fellings

towards following years supply) were undertaken to supply sufficient timber to the Parappa Saw Mill, yet sales of sawn timber were poor and at the end of the year 34,806 c.ft. of mill-sawn timber valued at Rs. 66,867 remained unsold.

The average selling rate at the Kasargode Depot during 1928-29 and the cost of production are shown below:

	Cost of production per c. ft.	Average rate of sale per c. ft.	Quantity sold.	Net profit per c. ft.
	RS. A. P.	RS. A. P.	C. FT.	RS. A. P.
Logs	0 9 3.32	0 14 6.00	8,559	0 5 2.68
Sawn Material	2 5 3.04	2 6 2.7	41,488	0 0 11.66

Particulars for the cost of production are as under:—

Logs.

	RS.	A.	P.
Felling and conversion	0	0	7.02
Dragging	0	1	7.00
Carting or rafting to Kasargode ..	0	4	0
Divisional Overheads	* 0	1	11.1
Depot expenses	0	0	7
Forest Utilization Officer's overheads ..	0	0	7
Total ...	0	9	3.32

	RS.	A.	P.
* District Forest Officer	0	0	9.3
Range Establishment	0	0	4.9
Other items	0	0	8.9
Total ..	0	1	11.1

SAWN TIMBER.

Parappa Saw Mill.

(82,618 c. ft. of logs converted into 38,592 c. ft. of sawn timber, i.e. net yield 46.7 per cent).

	RS.	A.	P.
Cost of timber at the Saw Mill required to produce 1 c. ft. of sawn material.	0	12	3.80
Direct sawing charges	0	5	6.59
Depreciation	0	1	10.59
Overheads	* 0	2	7.72
Interest on Capital	0	0	11.56
Carting sawn timber from Parappa to Kasargode.	0	6	3.08
Depot expenses	0	1	8.90
Carting of sawn timber to Railway Station and load in trucks.	0	0	6.00

* See page 242.

			RS.	A.	P.
Forest Utilization Officer's overheads	...	...	0	1	5.30
Commission to agent	...	...	0	3	11.50
Total	...	...	2	5	3.04

			RS.	A.	P.
* Forest Engineer and Central Stores	..	..	0	2	2.72
Chief Forest Engineer	..	..	0	0	3.00
Audit fee, leave and pension..	..	..	0	0	2.00
Total	..	..	0	2	7.72

4,314 B.G. and 2,176 M.G. Sleepers relating to the division were passed during the year against 1,622 B.G. and 1,067 M.G. Sleepers in the previous year.

13. The Nilgiris.—Rs. 21,539.

This Division, consisting largely of protective forests, is generally worked at a loss.

14. Palghat.—Rs. 20,492.

The apparent deficit was due to—

(a) Charging to this division the entire cost amounting to Rs. 8,822 of running the Circle Vernacular Training School, as it was located in this Division.

(b) To a large outlay on sleeper operations newly started during the year in the Silent Valley; the revenue for sleepers produced (amounting to Rs. 46,000) will as usual be credited by the Railways only in the following year. But for this system of deferred payments, the division would have shown a handsome surplus.

15. Direction.—Rs. 49,671.

The expenditure of Rs. 50,350 includes a sum of Rs. 1,927 being the proportion of pay and travelling allowance of the Inspector of livestock and his establishment which ought to be really debited to other circles, as this officer looks after livestock of the whole Presidency.

16. Taking the Circle figures alone for the year there was an increase in Revenue by Rs. 1,95,883 and in expenditure by Rs. 84,631 as compared with the actuals of the previous year.

The following are the principal variations as compared with the figures for 1927-28.

17. Revenue.

VIII (a). Timber and other produce removed by Government Agency.

	RS.
Sandalwood	— 8,182

The decrease was due to less quantity extracted in North Mangalore owing to the stock of sandal trees in the unreserves and

kumkies having been almost exhausted. In the Nilgiris, only about 7 tons of sandalwood were sold during the year against 11 in the previous year.

	RS.
Timber	— 9,077

Based merely on the revenue directly credited to Circle accounts, there was a decrease under timber in 1928-29 amounting to Rs. 9,077. But it is not possible to draw any effective comparison for two years between revenue based on Circle figures alone. Because a good deal of the timber exploited by the divisions is supplied to the Saw Mills and finally disposed off by the Forest Utilization Officer and revenue for which is credited to his accounts. Hence unless all accounts of the Circle, Forest Utilization Officer and Forest Engineer are taken together, it is impossible to give actual differences for two years, as for 1927-28 all these accounts were not dealt with together.

	RS.
Firewood and Charcoal	— 7,406

Practically the entire decrease was accounted for by the Nilgiris and was due to less quantity of firewood extracted for sale in Ootacamund and Coonoor Ranges in accordance with the prescriptions of the revised working plan.

VIII (b). Timber and other forest produce removed by consumers and purchasers.

	RS.
Forest department	19,529

The sale of the standing crop of the Mukkada teak plantation in South Mangalore (for Rs. 16,100), the high prices realized for bamboo blocks in Palghat and the favourable rates obtained as the minor forest produce sales in general, contribute to the increased revenue. There was a decrease of Rs. 6,839 in North Mangalore due to less number of fuel coupes sold owing to lack of demand.

	RS.
VIII (d) Profits from Government Commercial concerns	84,832
VIII (g) Recoveries of indirect charges from Government Commercial undertakings	84,401

The above two items relate to Nilambur and depend on the adjustments effected by the Accountant-General, as has been explained above in paragraph 6.

	RS.
VIII (e) Miscellaneous	+ 26,894

The increase in revenue was chiefly due to—

(1) A larger amount of revenue realized by sale of elephants, viz., Rs. 27,250 against Rs. 22,000 in the previous year.

(2) Recovery of rent on buildings of the Nilambur division used by the Exploitation Unit (Nilambur Commercial concern) for two years 1927-28 and 1928-29 and recovery of half the rent actually collected by the exploitation unit from the occupants of the residential buildings. These items contributed an increase of Rs. 14,941.

18. Expenditure.

Ordinary + 83,597

The important variations were under 'timber' (+Rs. 89,918), 'firewood and charcoal' (-Rs. 3,919), 'feed and keep of cattle' (+Rs. 3,654), 'roads and bridges' (-Rs. 4,132) and 'regeneration' (-Rs. 3,001).

The increase under 'timber' was largely accounted for by starting for the first time of large scale sleeper operations in the Silent Valley in Palghat and which accounts for an increase of just Rs. 45,000. The remaining increase was in Wynaad (Rs. 21,700) and Mangalore South (Rs. 25,000) and in both these cases the increase was due to expansion of timber operations. The decrease under 'firewood and charcoal' was due to less quantity of fuel felled in the Nilgiris. The increase under 'feed and keep of livestock' was due to the transfer of 5 working elephants from the Nilambur Exploitation Unit to other divisions of the circle. The expenses on maintenance of elephants in the Exploitation Unit are borne by the concern itself and are not included in the circle expenditure under 'feed and keep of cattle'. Thus the effect of the transfer was increased expenditure for the circle under the head. The requirements of the year involved a less amount of expenditure on roads and bridges.

The decrease under 'regeneration' was due to no Hopea sowings being undertaken in North Mangalore (whereas in the previous year 500 acres in Someshwar were regenerated), and as tending operations in South Mangalore were undertaken only on a limited scale.

In Wynaad, there was an increase of Rs. 3,042 due to larger area of the plantations tended.

Capital expenditure — 15,601

The chief variations were 'under purchase of livestock' (-Rs. 2,897), 'roads and bridges' (-Rs. 4,422), 'buildings' (-Rs. 6,837) and 'demarcation' (-Rs. 1,315). The larger expenditure under 'purchase of livestock' during the previous year was due to the purchase of 23 Dharwar buffaloes. The decrease under 'roads' was mainly in Palghat where special expenditure for construction of inspection paths to open up the inaccessible Attapady Reserve

had to be incurred in the previous year. In South Mangalore also there was decrease on 'roads' as only one expensive item, viz., completion of Aletti road at a cost of Rs. 4,663 was undertaken during the year against two such items costing Rs. 6,904 in the previous year. Under 'buildings' the decrease was chiefly in the Wynaad where a Public Works Department building was transferred to the Forest Department at a cost of Rs. 10,000 during the previous year. In Palghat, no new rest-houses or bungalows were constructed, as in the previous year. There was, however, an increase in North Mangalore due to the construction of quarters for the range clerk and peon of the Sankernaraina Range and a double guards shed at Andar. Nilambur also shows an increase, due to the part construction at a cost of Rs. 3,230 of Extra Assistant Conservator's bungalow.

Under 'demarcation' no expenditure was found necessary in South Mangalore as in the previous year.

Establishments under 8 C (i) District Establishments
and 52 A C (ii) Regeneration + Rs. 16,583

The increase occurred under 'Pay of Officers — Voted' (+Rs. 8,414), 'Pay of Establishments—Voted' (+Rs. 3,055), Travelling allowance of officers and establishment (+Rs. 12,425), and cost of passage (+Rs. 3,697), paid to an Imperial Forest Officer. There was decrease under 'Pay of Officers—Non-voted' by Rs. 6,968.

The increase in Pay of Officers and Establishment was with reference to increased rates of pay, special pay and leave allowances drawn by the several officers during the year. A larger amount under Travelling Allowance on transfer had to be paid to officers and subordinate staff consequent on the several transfers and additional posting during the year. The decrease under 'Pay of Officers—Non-voted' was due to the posting of officers drawing less pay.

19. The outstandings of revenue at the close of the year in connexion with the sales amounted to Rs. 1,73,339 of which Rs. 24,027 fell due before the 31st March 1929. In addition, revenue to the extent of Rs. 1,09,094 was outstanding on account of sales at the Kasargode and Nanjangode depots in charge of the Forest Utilization Officer.

20. Of the revenue realized in this circle, 82 per cent was from 'major produce', 8 from 'minor produce' and 10 from other sources. Of the expenditure 58 per cent relates to Exploitation, 22 to 'Improvement and upkeep of forests' and 20 per cent to miscellaneous items.

CHAPTER VI.—RESEARCH AND EXPERIMENTS.

The sylvicultural research work is conducted by the Forest Research Officer under the control of Working Plans Conservator, the research plots being located in all the divisions of this circle.

The following works were conducted by the divisional staff.

South Kanara.—As a result of collection of reliable data for Hopea bark and the opinion expressed by the Leather Trades Institute, Madras (referred to in last year's report) a contract has been entered into by Messrs. Gordon, Woodroffe & Co., Madras, to purchase from Mangalore North and South divisions large quantities of Hopea bark for two years. This bark is collected departmentally from Hopea trees felled in annual coupes and bark which till now used to be wasted, is now sold at a fair margin of profit. The firm is willing to buy all that we can thus give them. Hence it may be affirmed that Hopea bark has been established as a good material for tanning leather.

Wynaad.—One acre in 1928 regeneration area in Begur range was planted with teak stumps in April 1928 to see the result of very early planting. It proved a failure for want of rains immediately after planting. But one more acre planted at the same time in Chedleth range proved very successful as there were a few showers in April 1928.

In 1928 regeneration area of Begur range, two acres were sown with Boga (*Tephrosia candida*) seeds between lines of teak, to see if Boga would keep down the weeds. Germination was poor and the result proved very disappointing.

An experiment over 40 acres in Begur range to see if lantana could be destroyed by burning proved a complete failure. Roots remained undamaged and lantana is reported to have come up stronger and denser than before.

Nilambur—(*Tephrosia candida*).—Boga seeds were sown in May 1928 in a 5-acre plot in 1926 teak regeneration area at Munda-cadava. The germination was good and the plants came up so well that they flowered in September 1928 and were so tall that they had to be pruned in October 1928 to save teak from suppression. Thereafter the Boga has had to be cut back twice as it continued to overtop the teak.

Experiments made in Nilambur division, both by the Forest Research Officer and the District Forest Officer, have shown that Boga cannot be introduced in the first year with teak, as it grows faster than ordinary weeds and is inclined to damage young teak plants partly by shading them and partly by setting up root competition. In Travancore (whence we got the idea of introducing Boga) it is sown in the year following teak regeneration, and its

function is purely to improve the soil, Boga being a leguminose plant. This is being done now and result will appear in future reports.

Palghat.—Trials were also made in Palghat and Wynaad to introduce Coffee robusta as a cover crop, but seeds failed to germinate.

In the Palghat nursery, experiments were tried at Dhoni with seeds of Ceylon Satinwood and Andaman Padauk. Similarly nursery experiment for evergreens was started in Silent Valley near Neelikal. Results are being watched.

CHAPTER VII.—ADMINISTRATION.

Mr. A. A. F. Minchin, Conservator of Forests, held charge of the circle from 1st April 1928 to 4th August 1928, and Mr. F. R. Madan, for the rest of the year under report.

Tours.—His Excellency the Governor, accompanied by Her Excellency Lady Goschen, visited the saw mill and the forests near Chedleth of Wynaad division on 8th October 1928.

The Chief Conservator visited portions of Wynaad, Palghat and the Nilgiris divisions.

The Conservator spent 185 days in camp touring in all divisions and inspection notes were written on the forests of Palghat division.

All the District Forest Officers, except South Mangalore alone, spent more than the prescribed minimum period in camp. The short touring of District Forest Officer, South Mangalore (Mr. Barrington), by thirteen days is due to illness in his family and also due to shortage of travelling allowance allotment.

Inspection of district and range offices and sale depots.—The Conservator inspected all the District Forest Offices and the District Forest Officers, all the Range Offices in their divisions. The following are the only sale depots in the circle.—Mysore, Hangarkatte, Coondapur, Sowda, and Mangalore—and all of them were inspected by the District Forest Officers concerned.

District Forest Officers' accounts inspection.—The Accountant-General's staff inspected, during the year, the accounts of all the forest divisions excepting Nilambur and Palghat, and the results were satisfactory. The accounts of Palghat were inspected after the close of the year, in April 1929.

As regards Nilambur division, which is under commercial accounting, the Assistant Director of Commercial Audit conducts a quarterly audit. The Assistant Director also audited the Wynaad division accounts and prepared a balance sheet in the commercial form.

Vernacular Training School.—The fifth session of the Vernacular Training School was held in the Palghat division from 1st May 1928 to 31st October 1928. Ranger M.R.Ry. A. Siddhan Pillai was the Senior Instructor till end of September 1923 when due to his going on sick leave, the charge of the school was given to Range Officer, Palghat range, M.R.Ry. A. Rama Hebbar. M.R.Ry. P. Sankunni Nayar was the Junior Instructor for the whole period. The session started and closed with 29 students (2 foresters and 27 forest guards). All the students were awarded certificates, 12 were placed in first and 17 in second class. The health of the students was on the whole satisfactory and discipline was good.

Health of establishment and Sanitation.—The health of establishment was, as usual, bad especially in Wynaad and in portions of Palghat.

Casualties.—In Wynaad one forester and one guard died of pneumonia.

In Nilambur one forest guard died of snake-bite.

In Palghat one forest guard was killed by a wild elephant in January 1929.

CHAPTER VIII.—GENERAL.

(i) FORMATION AND MANAGEMENT OF PANCHAYATS.

(To include the Forest Village System.)

The management of three reserves (viz., Tenkahola, Todar and Hosabettu) by panchayats under the Forest Village System was continued in North Mangalore division, and these have been reported to have worked satisfactorily.

In Mangalore South, of the two forest village panchayats already in existence for Balleri and Porkala reserves, the management by the Balleri Panchayat was not satisfactory. In addition, the villagers were not at all keen on its continuance and hence it was dissolved (vide Chief Conservator's Proceedings No. 368, Routine, dated 4th October 1928). The other panchayat is reported to have continued to work satisfactorily, mainly due to the keenness of the President Rev. D'Souza.

(ii) MEASURE FOR IMPROVING LOCAL SUPPLIES AND FACILITIES.

The special concessions granted to the ryots of South Kanara were continued and it is regrettable that in spite of warnings, there is scarcely much improvement in the attitude of villagers, and instances of abuses are frequent.

In North and South Mangalore the maximum rates which might be charged by the departmental coupe contractors for sale of forest

produce to the public for bona-fide domestic and agricultural purposes were fixed by the Conservator and published in the District Gazette. In South Kanara logs and scantlings of different sizes were, as usual, sold in retail at fixed rates at the sale depots of Mangalore, Coondapoor and Hangarkatte.

In Nilambur all the major produce is extracted departmentally.

In Wynaad the local demand is, in general, met from the extensive private forests and unreserved lands.

In the Nilgiris the demand of the ryots and planters, for small timber, fuel and bamboo was, as usual, met under the permit system. The Badagas on the plateau continued to get their annual supply of firewood from shola forests on an annual permit costing one rupee per house.

As regards improving the water-supply in grazing ground, no special steps were considered necessary owing to copious rainfall in the Circle. But there are a large number of instances where ryots have been allowed to use for cultivation, water from jungle streams and for which merely a nominal fee is charged.

(iii) TIMBER AND SANDALWOOD TRANSIT RULES.

Timber transit rules.—These are in force in all divisions except the Nilgiris, and are reported to have worked satisfactorily. The revision of the rules for the Palghat Forest division is still under correspondence with the Chief Conservator.

Sandalwood transit rules are in force only in North and South Mangalore divisions and these are reported to have worked satisfactorily.

(iv) JUNGLE TRIBES.

North Mangalore.—The 'Kudubies', the only jungle tribe in these parts, get some employment in the forests on works connected with fire protection and manufacture of cutch (Catechu).

South Mangalore.—The Marattis and Malekudis continue to practise shifting cultivation (kumri) in unreserves of Kasaragode taluk by cutting and burning forest growth. Attempts are reported to be made by the Labour department to get them to take to more settled and improved methods of cultivation.

Wynaad.—The policy of assigning lands to Kurumbars free of assessment, for cultivation with a view to settling them in the forest for procuring labour for departmental works was continued. They were also allowed free grazing and some were granted advances for purchase of cattle for cultivation of lands assigned to them.

The Nilgiris.—Several Kurumbars in Mudumalai range are employed as elephant men. These and Chetti ryots living within

the forests have been granted lands free or on paltry fees for cultivation on condition that they should supply labour to the department. In Sigur Range the Kasubas were continued to be encouraged to settle in Anaikatti by giving them free lands for cultivation. In Coonoor Range the Irulars and Kurumbaras were employed in the extraction of sandalwood and in clearing the district boundary. They are also encouraged to settle in the forests by giving lands free for cultivation.

Palghat.—There are now 17 Mulsar settlements in Bolampatty and Mannarghat Ranges. These people live by cultivating lands assigned to them by the Forest department free of assessment. Recently the District Board has claimed cess for even these lands and the question of paying land cess by the Forest department is under correspondence.

The Irulars in the Bolampatty Valley are allowed to cultivate Tuckles within our regeneration areas and this arrangement is working well, and the people are contented.

(v) MINING AND QUARRYING.

Nil.

(vi) LIVESTOCK.

Elephants.—There were 83 elephants at the beginning of the year, 24 were captured and 7 were born in captivity, making a total of 114.

The casualties during the year were as follows:—

Four (3 new captures and 1 calf born in captivity) died of the following causes. One died, partly of injuries received in its struggles to escape from the kraal and partly due to a gangrene in its tail which the animal would not allow to be treated. One died of diarrhoea. One died of anæmia. One died of premature birth.

One capture bolted away from Wynaad and could not be recaptured, though it was last traced on the Bhavani in Salem district.

Seventeen elephants were sold for Rs. 28,250. The number at the end of the year was 92.

Other animals.—There were 12 bullocks and 42 buffaloes at the beginning of the year. Of which 3 of each were sold; 1 bull and 2 buffaloes died. The balance at the end of the year was therefore 8 bullocks and 37 buffaloes and 4 asses.

(vii) VETERINARY ESTABLISHMENT.

There were, as before, two Assistant Veterinary Inspectors—one for Nilambur and a second for live-stock of Wynaad and

Nilgiris. The work of these two Assistants was supervised by the Inspector of Livestock who in addition attended to the animals of the South Kanara districts of this Circle.

(viii) CIVIL SUITS.

South Mangalore.—The amount outstanding against sawing contractor K. Velu Nair referred to in the last report, was written off by Chief Conservator in No. 7878-28, dated 28th February 1929, and the case against him was withdrawn on the advice of the Collector.

Nilambur.—The appeal by the Uralan of Trikalayur Devaswam, referred to in the last report, has been disposed of by the High Court. The only modification in appeal was an order to the District Court to decide the amount to be recovered from the Nilambur Tirumalpad to whom the amount as originally decided by the District Court, was already paid.

The decree obtained against the Uralan referred to in the previous report still remains unexecuted and the matter is in the hands of the Collector. The appeal preferred to the District Court by Mr. Ramu Pattar against the decision of the District Munsif, Manjeri, referred to in the last report was dismissed with costs.

The suit filed by the department against Naduvath Manakkal Subramanian Nambudripad of Wandur (lessor of Chathamborai forest) for the recovery of Rs. 1,475 was decreed in favour of Government. The Collector is reported to be taking steps to execute the decree.

ANNEXURE.

NORTH MANGALORE DIVISION.

Description.—The division consists of the northern portion of the South Kanara district. The important forests cover the western slopes and the Terai of Western Ghats up to the Mysore Frontier. On the Ghat slopes the 'Kumri' cultivation and permit system of the past has been responsible for the disappearance of most of the merchantable timber. The heaviest stand of timber is now found along the Ghat between 1,500 and 2,000 feet level. The forests on the Ghat slopes are both evergreen and deciduous and some of the trees, notably Poonspar (*Calophyllum elatum*) and Kiralbhogi (*Hopea parviflora*) attain immense sizes. As we approach the coast, the quality of the forests deteriorates as the rainfall decreases and population and cultivation increase. The outlying hills near the coast are fuel forests. *Acacia Sunda* is a special feature of the division. It is confined to the laterite hilly plateau between the Sea and the Ghats in Coondapoor taluk.

2. *Area of reserved forests and lands.*—Three hundred and fifty-nine square miles.

3. *How the forest district is split up into subordinate administrative charges.*—

Name of range.	Number of beats.
1. Coondapoor	18
2. Shankaranaraina	10
3. Udipi	14
4. Mangalore	8
Total ...	50

To help the four Rangers in execution of works and for protection of reserves there is a staff of 14 Foresters and 73 Forest Guards and Watchers. One additional Ranger was employed for greater portion of the year for stock-mapping reserves.

4. *Cost of administration*—

	RS.
District Forest Officer	9,692
Forest Rangers	12,245
Subordinate staff	21,047
Clerical and menial staff	8,554
Miscellaneous including contingencies	1,818
Total ...	53,556

5. *Cost under other important heads*—

Timber operations	23,788
Firewood	250
Sandalwood	207
Feed and keep of livestock	5,098
Regeneration	2,693
Protection from fire	2,332
New Works—Buildings	3,496
Do. Wells	322
Other Miscellaneous items	5,625
Total ...	43,811

6. *Income from main sources*—

	From reserves.
Timber	41,496
Firewood	14,315
Grazing	5,469
Other minor produce	9,570
Miscellaneous revenue	10,421
	81,271
Deduct--Refunds	137
Total ...	81,134

	From unreserves.	RS.
Timber	...	8,298
Firewood	...	8,229
Sandalwood	...	1,772
Bamboos	...	21
Other minor produce	...	1,201
Total ...	...	19,521

7. *Chief works done in the division.*—The principal items of works carried out were, exploitation of timber in three centres amounting to 57,322 cubic feet to supply sleepers to the railways and timber to the coast markets; sandalwood extraction ($1\frac{1}{8}$ tons), construction of buildings, artificial regeneration (Hopea and Acacia Catechu) and fire-protection. In addition stock maps for six reserves were prepared to collect data for preparing a scheme of exploitation and regeneration.

SOUTH MANGALORE DIVISION.

Description.—The division extends from near Kudremukh Hill (the highest point in the Western Ghats of South Kanara) on the north, to Malabar on the south, the Arabian Sea on the west and up to Coorg and Mysore on the east. It covers the slopes of the Western Ghats and their foot hills drained by the Netravati, Kumardbari, Chandragiri and Nileshwar rivers. The highest peak, Kudremukh, is 6,200 feet above sea level.

The lower slopes of the Ghats and the foot hills are clothed with dense evergreen and semi-evergreen forests containing magnificent trees but majority of which are of unsaleable species, the principal useful species being Hopea, Poonspar, Terminalia tomentosa, Terminalia paniculata, Xylia and also some scattered White Cedar and Wild Jack. Trees up to 150 feet in height and 15 feet in girth are not uncommon. Ebony, Red Cedar and Acrocarpus also occur to a very limited extent in some localities. Five varieties of canes are found in evergreen belts and of which the Naga (Cobra) cane is the most sought after. Bamboos and reeds occur in plenty. There are three cardamom estates on steep upper slopes of the Ghats.

Next to the semi-evergreen is the deciduous zone which yields fairly large quantities of timber and fuel. The principal species of these forests are Teak, Xylia, Terminalias, Rosewood, Benteak, Benga and Albizzias. A small quantity of sandalwood is found but practically the whole of it occur in unreserves and in kunki lands.

The rainfall is very copious and in Nalkur at foot of the Ghats even 195 inches have been recorded in a single year.

2. *Area of reserved forests and lands.*—Four hundred and forty-four square miles.

3. *How the forest district is divided into subordinate administrative charges.*—

	Name of range.	Number of beats.
1. Pattur	...	14
2. Kasaragod	...	14
3. Uppinangadi	...	9
4. Beltangadi	...	6
		43

A staff of 14 foresters and 62 forest guards and watchers is employed to help the 4 rangers in execution of works and for protection of reserves. A special duty ranger was solely in charge of the construction of an important road and exploitation in Alteti West reserve (Kasaragod range).

4. *Cost of administration.*—

	RS.
District Forest Officer and Assistant Conservators	20,902
Rangers	12,973
Subordinate and protective staff ...	18,727
Clerical and menial staff ...	8,853
Miscellaneous including contingencies	3,270
	64,725

5. *Cost under other important head.*—

Extraction of Timber	57,365
Feed and keep of Livestock	13,035
Sowing and planting	1,243
Protection from fire	2,062
Roads—New works	5,993
Buildings—New works	3,693
Other miscellaneous items	5,415
Net	88,806

6. *Income from main sources.*—

<i>From reserves.</i>				
Timber	36,902	(By this division.)		
	70,620	Credited in Forest Utilization Division.		
Firewood	1,479			
Bamboos	352			
Grazing	9,863			
Minor produce	5,514			
Other miscellaneous items	11,370			
	1,36,100			
Deduct—Refunds	930			
	1,35,170			
<i>From unreserves.</i>				
Sandalwood	3,492			
Timber	6,036			
Firewood	896			
Other minor produce	5,197			
Bamboos	19			
	15,640			

7. *Chief works done in the division.*—The principal activities of the division were the extraction of about 201,000 cubic feet of timber (for supply to the Parappa saw mill, for railway sleepers and for coast market) and upkeep of Hopca regeneration areas (about 5,000 acres). About 2½ tons of sandalwood was also extracted. A Working Plans Officer was engaged throughout the year in stock-mapping, enumerating and collecting other data for preparation of a regular working plan for the whole division.

WYNAAD DIVISION.

Description.—The Wynaad Forest Division covers the northern strip of Malabar from the Nilgiris district on the east to Tellicherry on the west and borders Coorg and Mysore on the north. On the Western Ghats their slopes (both east and west) and foot hills is good evergreen tropical jungle. On the coastal plain immediately west of the Ghats is semi-evergreen and deciduous forests of fair quality. On the Wynaad plateau, east of the Ghats, is good deciduous forests, gradually deteriorating towards the east to the borders of the Nilgiris where the forest is rather stunted with large expanses of tall and dense elephant grass. The rainfall varies from 182 inches at Makki on the Ghats to 51 inches at Boothakal in Begur range and near the Coorg border.

The elevation of the plateau is a little under 3,000 feet on the average. It is hilly with occasional hills rising to over 5,000 feet. The forests of the Ghats and the Wynaad plateau are very malarious.

2. *Area of reserved forests and lands.*—Two hundred and sixty-three square miles.

3. *How the forest district is divided into subordinate administrative charges.*—

Name of range.	Number of beats.
1. Kennoth	5
2. Begur	8
3. Chedleth	...
4. Soutans' Battery	...
	13

Although there are only four ranges, yet on account of extensive timber and regeneration works and to make allowance for frequent illness, an additional staff of three or even four rangers has to be employed according to necessity. These rangers are helped by a staff of 15 foresters and 56 forest guards and watchers. Chedleth and Sultan's Battery ranges are not divided into beats for protective purposes, as due to their very remote situation little protection is required.

4. *Cost of administration.*—

	RS.
District Forest Officer and his assistant	22,923
Rangers	28,409
Subordinate protective staff	21,473
Clerical and menial staff	15,414
Assistant Veterinary Inspector and staff	3,855
Miscellaneous including contingencies	5,469
	95,543

5. *Cost under other important heads—*

	RS.
Extraction of timber	87,004
Feed and keep of livestock	32,083
Sowing and planting	14,112
Protection from fire	1,307
Purchase of livestock (elephant-capturing operations).	4,206
Buildings—New works	4,025
Roads—New works	1,637
Other miscellaneous items	18,042
	1,62,416

6. *Income from main sources—**From reserves.*

	RS.	
Timber	1,38,194	(By this division.)
	1,59,201	(By the Forest Utilization Officer.)
Bamboos	1,855	
Grazing	4,496	
Other minor forest produce ...	6,605	
Other miscellaneous items ...	29,939	
	3,40,290	
Deduct—Refunds	131	
	3,40,159	

From unreserves.

Timber	3,102
Firewood	1
Other minor produce	305
	3,408

7. *Chief works done in the division.*—One hundred and eighty-seven thousand eight hundred and fifty-four cubic feet of timber were felled, converted and transported to Mysore Depot for sale, for supply to the mill at Chedleth and for the supply of sleepers. One hundred and sixty-four acres of new plantations were regenerated and 767 acres of plantations tended. Elephant-capturing operations were conducted at a cost of Rs. 2,504 and resulted in the department capturing nine elephants (of which six were young calves).

NILAMBUR DIVISION.

Description.—The Nilambur Forest Division lies in the water-shed of three rivers, the Chaliarpuzha, the Karampuzha and the Punnapuzha, and their tributaries. The three join near Nilambur, and the main river thus formed is known as the Chaliar. It forms the principal means of export for

the Nilambur timber, most of which is floated down to Beypore on the coast for sale. The bulk of the area of the division is in a compact block, situated on the outer slopes and foot hills of the Kundah range of the Nilgiris, from 8,200 feet down to 120 feet elevation. The remainder consists of scattered blocks in the plains (mostly held by Government on lease) and it is these blocks which contain most of the famous Nilambur teak plantations. These plantations cover an area of about 10 square miles and are all situated close to the main rivers.

The natural forest are of the mixed semi-deciduous type up to an elevation of about 3,000 feet. Between 3,000 and 6,000 feet the forests are mostly evergreen. Above 6,000 feet tree growth is scattered and stunted, and most of the vegetation consists of grass only. Of the natural forests, the semi-deciduous type is the more valuable both from the point of view of superiority of species in the timber market and by reason of accessibility for extraction. The finest growth in this type of forest is in the foot hills and up to about 2,500 feet on the slopes. Only the lower portions of the semi deciduous forests are being worked at present, though a project for extending exploitation to higher elevations is under consideration.

2. *Area of reserved forests and lands.*—One hundred and twenty-six square miles.

3. *How the forest district is split up into subordinate administrative charges.*—

Name of range.	Number of beats.
1. Nilambur	4
2. Amarampalam	1
	5

To help the two territorial rangers in extensive timber and regeneration operations there are always two or three assistant or special duty rangers. In addition, there are 18 foresters and 37 forest guards and watchers.

4. *Cost of administration—*

	RS.
District Forest Officer and his assistant	17,200
Rangers and Assistant Veterinary Inspector	12,800
Subordinate protective staff	16,600
Clerical and menial staff	10,000
Miscellaneous including contingencies	507
	57,107

5. *Cost under other important heads—*

Timber operations	1,73,600
Bamboos	16,600
Feed and keep of livestock	42,200
Sowing and planting	18,700
Fire-protections	1,001
Miscellaneous items	163
	2,52,264

6. *Income from main sources—*

						RS.
Timber (revenue realized both by District and through Forest Utilization Officer)	...	...	...	...	...	4,44,500
Bamboos	...	...	...	...	...	10,700
Minor forest produce	...	...	...	...	...	3,000
Sale of elephants and cattle	...	...	...	...	...	3,500
Total	...	...	...	...	...	4,61,700

7. *Chief works done.*—Main works are large scale Timber and Regeneration Operations and which are summarized as follows:—

						C. FT.
Final clearfelling and extraction in mature teak plantations	...	...	...	...	...	111,000
Final clearfelling and extraction in natural forests	...	...	...	...	...	70,500
Subsidiary (selection) fellings and extraction in natural forests	...	...	...	...	...	116,300
Handsawing of sleepers, 2,331 Broad Gauge, 902 Meter Gauge Thinnings in teak plantations—520 acres	...	...	...	...	...	85,500
Regeneration with teak on old plantation clearings	...	...	...	...	...	200
Regeneration with teak on natural forest	...	...	...	...	...	90
Regeneration with miscellaneous species	...	...	...	...	...	50
Tending of young plantations	...	...	...	...	...	600

Elephant capturing (one tusker aged about nine years was secured) and fire protection are other important works.

The timber is floated for sale to Beypore depot near Calicut, but part of it is first converted at the Government Saw Mill situated at Beypore. Timber logs are mainly dragged by elephants, but during the year a caterpillar ten ton holt tractor obtained from Coorg, was also in use in dragging logs.

PALGHAT DIVISION.

Description.—The Palghat Forest Division extends over a portion of Malabar district, on west from near the Sispara (the Pass leading from Malabar to the Nilgiris), due east up to and across the Coimbatore district boundary. Thus the Palghat Forest Division falls in two revenue districts of Malabar and Coimbatore. Important deciduous forests of Bolampatti Valley and Walayar and evergreen forests of Chenat Nair, Attapady and Silent Valley are the chief reserves included in this division. Various types of forests ranging from dry scrub jungle of Thadagam Valley with less than 20 inches of rainfall, to the virgin evergreen forests of Silent Valley receiving over 200 inches of rainfall (and infested with wild elephants) are found in this division.

3. *How the forest district is split up into subordinate administrative charges—*

Name of range.						Number of beats.
1. Palghat	...	...	...	...	...	10
2. Bolampatti	...	...	...	...	...	12
3. Mannarghat	...	...	...	...	...	10
Total	...	...	...	...	...	32

A staff of 13 foresters and 76 forest guards and watchers help the rangers in protection of reserves and in the execution of works.

4. *Cost of administration—*

						RS.
District Forest officer	...	...	...	...	...	9,761
Assistant Conservator	...	...	...	...	...	2,887
Rangers	...	...	...	...	...	8,951
Subordinate and protective staff	...	...	...	...	...	19,052
Clerical and menial staff	...	...	...	...	...	7,992
Vernacular Training School	...	...	...	...	...	9,706
Miscellaneous including contingencies	...	...	...	...	...	3,145
Total	...	...	...	...	...	61,494

5. *Cost under other important heads—*

Timber operations	...	...	...	...	...	45,471
Sowing and planting	...	...	...	...	...	3,803
Fire protection	...	...	...	...	...	2,717
Roads and bridges—New works	...	...	...	...	...	1,228
Other miscellaneous items	...	...	...	...	...	11,428
Total	...	...	...	...	...	64,647

6. *Income from main sources—*

From reserves—						RS.
Timber	...	...	...	...	...	10,234
Firewood	...	...	...	...	...	46,938
Bamboos	...	...	...	...	...	23,178
Grazing	...	...	...	...	...	5,713
Minor produce	...	...	...	...	...	3,094
Miscellaneous items	...	...	...	...	...	7,738
	...	...	...	...	...	96,945
Deduct refunds	...	...	...	...	...	40
Total	...	...	...	...	...	96,905

From unreserves—

	RS.
Timber	2,250
Firewood	2,015
Minor produce	3,995
Total ...	8,260

N.B.—Reasons why revenue under timber is much less than expenditure is that Silent Valley sleeper operations were just begun in this year and hence revenue from sleepers already prepared and delivered to the railways, will as usual be credited in the following year. Similarly some revenue from kolmarams also will be collected after April 1929. The total of such revenue from both sources amounts to Rs. 67,990.

7. *Chief works done in the division.*—The most important work was the starting under very difficult conditions, of Timber operations in the inaccessible Silent Valley Reserve. The success achieved being very satisfactory these operations (mainly to supply mesua sleepers and incidentally for working Dicopsis, Poon, etc., for kolmarams) are to be continued, on more extensive scale, in future.

Other main works were regeneration operations, viz., about 97 acres of teak planting in Chenat Nair, Dhoni and Walayar Reserves; 25 acres of sowings of teak and other timber species carried out in Bolampatty Reserve under Tuckle system (Ponam); clearing and climber cutting over 1,350 acres in Walayar and Bolampatty Valley Forests.

THE NILGIRIS DIVISION.

Description.—The forest division extends over the whole of the Nilgiris district. In the south-west, stretching from the lofty crests overlooking Malabar, to Ootacamund town lie the grass covered downs (the kundahs). The centre south and south-east of the plateau which once might have been evergreen forests, is now occupied mainly by Badaga cultivation and flourishing tea estates. The north and north-east of the district is mainly reserved forests which are of great climatic use in protecting the outer slopes, but scarcely of any economic value except for some sandalwood in the lower dry belts. The Mudumalai forests occupying the north-west corner of the district, and with an average elevation of about 3,000 feet contain valuable species such as rosewood, teak and the terminalias, but the quality of the timber is much degraded from over-exploitation at the end of the last century and by constant fires. The Mudumalai reserve came into the possession of the Forest department by purchase from the Tirumalpad of Nilambur, only in the year 1919.

2. *Area of reserved forests and lands.*—491 square miles.

3. *How the forest district is split up into subordinate administrative charges.*—

	Name of range.	Number of beats.
1.	Ootacamund	16
2.	Coonoor	22
3.	Segur	7
4.	Mudumalai	8
	Total ...	53

The four rangers are helped by a staff of 13 foresters and 69 forest ards and watchers.

4. *Cost of administration—*

	RS.
District Forest Officer and his assistant	21,073
Rangers	12,229
Subordinate protective staff	24,998
Clerical and menial staff	11,790
Miscellaneous including contingencies	3,700
Total ...	73,790

5. *Cost under other important heads.—*

Timber	4,393
Firewood	13,226
Sandalwood	1,206
Feed and keep of livestock	17,832
Elephant capturing operations	2,250
Sowing and planting	3,105
Fire protection	2,205
Other miscellaneous items	12,090
* Nilgiri Game Association	5,311
Total ...	61,618

6. *Income from main sources—**From reserves.*

	RS.
Timber	19,751
Firewood and charcoal	52,741
Sandalwood	9,639 †
Bamboos	684
Grazing	6,201
Minor produce	3,762
Other sources (includes value of elephants sold and shooting licence fees)	11,811
Total ...	1,04,589
Deduct—Refunds	41
Net ...	1,04,548

* The last item is refund of shooting licence fees collected by District Forest Officer on half of the same Association and credit for which appears under Revenue side under other items.

† Includes Rs. 1,505 credited in V Circle.

RS.

From unreserves.

Timber	...	...	...	...	266
Firewood	...	...	...	...	2,377
Bamboos	...	...	...	...	13
Minor produce	...	...	...	...	320
Total	...	...	...	...	2,976

7. *Chief works done in the division.*—Timber and elephant capturing operations in Mudumalai range, Departmental fuel operations and planting mainly of eucalyptus species in Coonoor and Ootacamund ranges, and the sandalwood collections in Segur and Coonoor ranges, are the main works of the district. But the District Forest Officer and Rangers, Ootacamund and Coonoor, have in addition to spend a lot of time investigating and submitting proposals to Government, on the numerous applications received mainly from Planters, for bits of reserves.

SUMMARY OF PROGRESS DURING THE FIVE YEARS, 1924-25 to 1928-29.

The important events worth recording are—

Portable Saw mills were installed at Beypore (Nilambur), Chedleth (Wynaad) and Parappa (Mangalore South). All these three mills are controlled by the Chief Forest Engineer and the sawn outturn is disposed of at Beypore, Nanjangode and Kasargode depots by the Forest Utilization Officer. The total quantity of timber sawn by these three mills from the time of their installation upto 31st March 1929 was 612,885 cubic feet.

The Exploitation of the Nilambur Valley forests was brought under the Commercial Accounting System (Chapter II of Account Code) with effect from 1st April 1925; and since then the accounts of the division are audited quarterly by the Assistant Director of Commercial Audit. The accounts of saw mills and depots where mill-sawn timber is sold are also similarly audited. Wynaad division accounts, though not brought under Chapter II of Account Code, are also similarly audited.

The Forest Research section was transferred from the control of this circle to that of Working Plans Circle from 1st May 1925.

The abnormal floods of July 1924, which caused so much havoc in Malabar, were responsible for the complete destruction of 167 acres of young plantations and nurseries formed during the year in Nilambur and in addition 21 acres of plantations were completely lost by the erosion of the river bank caused by the floods.

Administration.—The following officers were in charge of the circle.

	From	To
Mr. R. D. Richmond	1st April 1924	6th May 1925.
Mr. T. A. Whitehead	7th May 1925	8th November 1925.
Mr. H. A. Latham	9th November 1925	1st June 1926.
Mr. T. Clear	2nd June 1926	23rd March 1927.
Mr. A. Wimbush	24th March 1927	...
Mr. A. A. F. Minchin	25th March 1927	4th August 1928.
Mr. F. R. Madan	5th August 1928	31st March 1929.

Area.—The areas at the commencement and close of the quinquennium are given below :—

	Beginning of 1924-25.	Close of 1928-29.
	SQ. MILES.	SQ. MILES.
Reserved forests	1,844	1,839
Reserved lands	106	106
Total.	1,950	1,945

The decrease in the area of reserved forest is mainly due to the disreservation and assignment of lands for coffee and tea cultivation in the Nilgiris division, in accordance with G.O. Mis. No. 64, dated 12th January 1927. In the two years after this Government Order was issued, an area of 4,195 acres had to be disreserved to meet the heavy demand of planters.

Forest Settlement.—The area pending final settlement at the close of the quinquennium was 81.34 square miles, of which 75 square miles relate to the settlement of Mudumalais and Kumbarakolli blocks in the Nilgiris division. These forests were acquired at a cost of Rs. 1,82,144 from the Tirumalpad of Nilambur and came into the formal possession of Government in June 1925.

Demarcation.—The total length of artificially demarcated boundaries at the beginning of the quinquennium was 5,442 miles against 5,471 at the end.

Working Plans.—The important working plans and schemes prepared during the period are—

- (1) A working plan for the Catechu areas of Coondapoor Range, North Mangalore division.
- (2) Revised working plan for Nilambur forests.
- (3) Do. Wynaad forests.
- (4) Do. Beypore Cocoanut topo.
- (5) Do. Walayar reserved forest.
- (6) Do. Bolampatty Valley of Palghat division.
- (7) Do. Mudumalai forests and the Plantations of Ootacamund and Coonoor ranges of the Nilgiris division.
- (8) A scheme for sandalwood areas of Nilgiris division (Segur and Coonoor ranges).

In addition at the close of the quinquennium the preparation of regular working plans were in progress in the following localities:—

- (1) Mangalore South for the whole division.
- (2) In Nilambur for the new Amarampalam Reserve.
- (3) In Palghat for Chenat Nair Reserve.

The areas under sanctioned working plans at the commencement and close of the period were 365 and 395 square miles respectively. Now that a Working Plans Circle has come into existence, the details of progress made will be dealt with in full in that Circle report.

Communications and Buildings.—The average annual expenditure was Rs. 73,262 against Rs. 88,000 during the previous quinquennium. During the period large outlay was incurred on the construction of buildings and roads especially in South Mangalore, Nilambur, Wynaad and Palghat divisions.

The most important buildings completed during the period were —

- (1) Construction of two bungalows at Kadiri for the District Forest Officers of North and South Mangalore divisions at a cost of Rs. 37,172.
- (2) Construction of a bungalow for the District Forest Officer, Palghat (about Rs. 18,000).
- (3) Construction of clerks' and peons' quarters at Bishopdowns, Ootacamund, at a cost of Rs. 61,312.

As all these works were carried out by the Forest Engineering Branch, the expenditure was debited to that Branch.

Forest offences.—The average annual number of offences reported during the period were 1,693 against 1,778 in the previous quinquennium.

Fire protection.—The area under special protection decreased from 1,132 to 1,097 square miles.

The system of early Burning was in force in parts of North Mangalore, Wynaad and the Nilgiris divisions only. The area early burnt has been gradually brought down to what can be attempted satisfactorily by the staff available, for it is realized that the correct time for such burning is very limited, being only two or three weeks. Hence instead of attempting to burn extensive areas, as was done when the system was first introduced, all energies have to be concentrated in burning what constitute "danger zones," e.g., in neighbourhood of lines, paths, etc.

Protection from cattle.—As was the case during the last quinquennium the whole forest area was closed to goats. Of the area of 1,945 square miles of reserved forests and lands, 1,339 square miles or 69 per cent were opened to all animals except goats, and 261 square miles were open to all animals except goats and sheep. Nilambur is the only division where no grazing of any kind is permitted. For the remaining divisions, the incidence of grazing in the last year of the quinquennium varied from 6.6 in Palghat to 18 in Wynaad.

Regeneration of forests.—The total expenditure incurred on sowings and planting amounted to Rs. 2,10,993 in this period of five years. The main feature under this heading for the present quinquennium is an advance in concentrated artificial regeneration of the economically important timber species.

The artificial regeneration of teak and *Hopea* was successfully undertaken over larger areas than in the previous quinquennium, regeneration with *Hopea parviflora* being chiefly confined to South Kanara whilst teak plantations were extended in Wynaad, Nilgiri-Mudumalai and Walayar (Palghat). The problem of second rotation crop in the teak plantations of Nilambur has been partially solved on the silvicultural side by proper soil aeration but the introduction of 'Ponam' cultivation in Nilambur has not given satisfactory results. Plantations of the less important timber species have also been formed with a fair amount of success over small areas with a view to ascertain the conditions necessary for their future extension.

South Mangalore.—Artificial regeneration of *Hopea* over 668 acres mostly in Parappa and Mundaje-Kap Reserves was successfully established. Sowings of miscellaneous species such as *Terminalia tomentosa*, *Gmelina arborea*, *Melia dubia*, and also teak, over an area of 180 acres, scattered over the division, appear to give hopes of fair success and are being watched with interest. In addition seeds of various species were sown to supplement the coppice of valuable species over 300 acres clearfelled as fuel coupes.

North Mangalore.—Sowings and plantings of *Hopea* were done over about 1,929 acres mostly in Halesomeshwar, Sabladi and Kodiamale Reserves with fairly satisfactory results. *Acacia sundra* was tried over about 284 acres in Catechu coupes but the results were poor because of insufficient overhead and side light and drip. Seventy-five acres of unsuccessful sowings in Baindur Reserve were resown in 1929 with moderate success.

Wynaad.—Teak was planted on a larger scale than ever before: about 489 acres in Chedleth and Begur Ranges were fairly successfully planted up. Wild pigs have caused some damage to the 1928 Begur plantation by pulling out and chewing the stumps; but the casualties have since been replaced. Attempts were made in 1926 and 1927 to raise plantations of Rosewood, *Pterocarpus*, *Albizia*, *Melia dubia*, *Lagerstroemia lanceolata*, *Gmelina arborea*, *Adina cordifolia*, *Stephegyne parviflora*, *Terminalia tomentosa*, *Acrocarpus* and *Artocarpus hirsuta* and in all 61 acres were planted up. Of these *Adina* and Rosewood, *Albizia Odoritissima*, *Pterocarpus* and *Gmelina* showed moderate promise.

Palghat.—In the Chenat Nair evergreens, 60 acres of logged area were attempted to be regenerated with *Hopea*, and *Dichopsis*, but the result was scarcely satisfactory. In addition 70 acres of the lower deciduous slopes of the Dhoni Valley were planted with *Mahogany* of which about 50 have been partially established. In Coupe I (area 485 acres) of Silent Valley evergreens, gaps caused by the felling of about 1,310 mature timber trees were sown mostly with *Acrocarpus fraxinifolius* and some *Artocarpus hirsuta* in 1928-29. In all 8,723 patches were sown and the success so far is good. Teak was planted over 30 acres in Chenat Nair Reserve with very encouraging results. With the object of increasing the percentage of Teak in the Pole Forests of Walayar, 360 acres of felled coupes were planted with Teak stumps in patches where growth of valuable species was not sufficient. In the "Ponam" Working Circle of Bolampatty Range 126 acres were sown with seeds of *Pterocarpus*, Rosewood, *Terminalia tomentosa*, *Albizia*, Teak, *Mahogany* and *Nim*, but the results have not been quite encouraging, mainly due to long breaks in rainfall in the growing season.

Nilambur.—Four hundred and twenty-six acres of mature teak plantations were clearfelled and regenerated with Teak and about 38 acres with other

species. But the results did not compare favourably with the first rotation crop. The causes adversely affecting a second rotation teak crop are an insufficient burn due to fact that most of the material in a teak plantation are saleable and as soil seems to have deteriorated not being fully covered under a pure teak crop. Hence experiments are now being conducted to improve the fertility of the soil by introducing cover crops especially a *Leguminose* plant called Boga (*Theprosa candida*). Floods of 1924 partly accounted for the failure of that year's plantation.

In addition 493 acres of virgin forests were clearfelled and regenerated with Teak and 151 acres with Rosewood, *Terminalia tomentosa*, etc., species. Teak has given quite satisfactory results especially in New Amarampalam. Attracted by the excellent results obtained in Travancore, in raising Teak plantations with field crop (Ponam), attempts were made to stock part of the above areas (about 342 acres) on similar lines. The dearth of land in Travancore induces the Ponamdar to pay greater attention to rules regarding timely sowings, weeding, etc., of forest crop, than at Nilambur. Hence our endeavours in this direction were discouraging. However 10 acres attempted under departmental "Ponam" in 1926 have given more encouraging results.

Nilgiris.—In the Mudumalai plateau 207 acres were clearfelled and attempts were made at regenerating them with Teak by stumping, dibbling, planting and by departmental tackle. The earlier efforts were a failure but more recent attempts at growing teak with departmentally raised field crops (Tackles) have yielded more promising results steady progress is being achieved and once the system of departmental Tackles is well organised and properly understood the cost of raising teak plantations would be substantially reduced.

On the Nilgiri plateau 85 acres of hardwood *Eucalyptus* were successfully planted in the place of *Frenela* and inferior Australian wattles. Fifty-one acres were stocked with bluegum and *Cryptomeria japonica* mixed with *Pinus khasya* was raised successfully over 8 acres in Aramby Reserve.

Yield and outturn.—There has been a steady progress in the departmental exploitation for timber as can be seen from the following figures:—

			C. FT.
1924-25	...	...	675,000
1925-26	...	...	670,000
1926-27	...	...	745,000
1927-28	...	...	713,000
1928-29	...	...	942,000
Total	...	...	3,745,000

The total quantity exploited during the five years was 3,745,000 cubic feet as against 2,563,000 cubic feet in the previous quinquennium.

It has been found possible to expand fellings as the newly created Working Plan Circle was able to prepare up-to-date working plans for the principal timber forests of Nilambur, Wynaad, Nilgiris-Mudumalais and Wala-yar (Palghat). Part of the increased outturn (612,835 cubic feet) was marketed after conversion at the 3 Government Saw Mills established since 1925 at Beypore, Chedleth and Parappa. The operations to supply sleepers to the Railways are also steadily expanding and in 1928-29 the number of

sleepers made amounted to 23,200 B. G. units. This number will be easily doubled in the near future, as the exploitation of what were hitherto believed to be inaccessible evergreens of Silent Valley Reserve, started in 1928 has proved to be a very profitable undertaking.

Financial results.—The net result for the five years was a deficit amounting to Rs. 80,940 or an average deficit of Rs. 16,188 per annum, as against a surplus of about Rs. 45,000 referred to in paragraph 12 of the Conservator's report for the previous quinquennium.

It has however to be recorded that for the last year of the present quinquennium, i.e., for 1928-29, there was a marked change for the better and the circle showed a net profit of Rs. 2,16,142. This was achieved mainly by expansion of timber operations referred to above under "Yield and outturn."

It must however be pointed out that the following items of revenue which should have been credited to the circle accounts by end of the quinquennium have been omitted for reasons noted below:—

(a) According to the commercial system of accounting the net profit made by Nilambur concern in a year is given credit in the accounts of only the following year. For this reason a sum of Rs. 78,783 out of the profit actually realized in 1928-29 will appear in next year's accounts.

(b) According to recent arrangements with the Railways the entire revenue for sleepers supplied in a year is paid for and credited to the accounts of the following year. This has unnecessarily reduced the profit by Rs. 1,71,562.

As both these systems came into vogue only during the period under report, similar profits of the previous quinquennium were not credited to accounts of this period.

It is only fair to consider this revenue in this report as large sums debited to expenditure side have appeared in our accounts.

Thus if these two items of revenue are added, the financial result would show a net profit amounting to Rs. 1,69,405.

On the expenditure side a reference may be made to certain special items. Due to the destruction of all buildings in Nilambur division during the Mappilla ryots and in order to provide good quarters for subordinates and officers who have to work in the very unhealthy tracts of Wynaad, a sum of Rs. 38,860 had to be incurred during this quinquennium. A sum of Rs. 2,10,993 was spent on sowings and plantings. The Ootacamund municipality had to be paid (in spite of protests) Rs. 13,763 in shape of land cesses for reserves included within the Municipal limits. Till May 1925, the Forest Research section for the whole Presidency was attached to this circle and expenditure on this score amounted to about Rs. 53,000. Similarly the expenditure incurred on account of the Inspector of Live-stock who looks after animals of other circles also is debited fully to this circle. The proportionate share which should be excluded amounts to just about Rs. 10,000.

OOTACAMUND,
2nd October 1929.

F. R. MADAN,
Acting Conservator of Forests, VI Circle.

ADMINISTRATION REPORT OF THE MADRAS FOREST
COLLEGE, COIMBATORE, FOR THE PERIOD FROM
1st APRIL 1928 TO 31st MARCH 1929.

CHAPTER I.—CONSTITUTION.

Staff.

Principal.—The office of Principal was held by Mr. C. R. F. Williams throughout the year.

Instructors.—The posts of Senior and Junior Instructors were held as follows:—

Name of officer.	Period.
<i>Senior Instructors.</i>	
Mr. D. F. Stileman	1st April 1928 to 1st July 1928.
Mr. J. C. Wrench	2nd July 1928 to 31st March 1929.
(This officer was attached to the College from 16th June to 1st July 1928.)	
Mr. R. H. Mitchell	1st April 1928 to 14th July 1928.
Mr. P. W. F. Walpole	15th July 1928 to 31st March 1929.

Junior Instructors.

Mr. M. C. Chandy	1st April 1928 to 10th July 1928. Vacant from 11th July 1928 to 8th August 1928.
Mr. C. M. Belliappa	9th August 1928 to 31st March 1929.
Mr. M. S. Raghavan	Throughout the year.

Sub-Assistant Surgeons.—Messrs. M. B. Victor, A. Apprameswaran, I. Vasudeva Rao, Chintan Nayar and M. D. Umapathi were attached to the College during the camping periods as Medical Officers and they delivered occasional lectures in First Aid and Camp Hygiene. In Headquarters First Aid lectures were delivered to the senior students by the Medical Officer in charge of the Lawley Road Dispensary.

All students were instructed in Physical Training and Drill by the College Havildars under the supervision of the second Senior Instructor (Messrs R. H. Mitchell and P. W. F. Walpole).

Board of Visitors.—The Ex-officio Presidentship of the Board of Visitors was held during the year under report by Mr. R. D. Richmond, Chief Conservator, from 1st April 1928 to 7th August 1928

and Mr. A. Wimbush, Acting Chief Conservator, from the 8th August 1928 to 31st March 1929.

The following officers were members of the Board during the year :—

Name of officer.	Period.
Mr. A. Wimbush	1st April 1928 to 7th August 1928.
Mr. A. A. F. Minchin	Throughout the year.
Mr. T. Clear	Do.
Mr. K. R. Venkatramana Ayyar	Do.
Mr. D. T. Barry	1st April 1928 to 6th June 1928 ;
Mr. F. R. Madan	7th June 1928 to 31st July 1928. 8th August 1928 to 31st March 1929.
Mr. J. H. Longrigg	1st August 1928 to 31st March 1929.
Mr. T. A. Whitehead	Throughout the year.

CHAPTER II.—INSTRUCTION.

1. *Special lectures.*—Mr. Pearce, the Logging Engineer, gave a series of lectures on practical map making and map reading, on extraction by mechanical means as applied in India and also practical instruction in contour mapping by eye ;

2. Mr. H. P. Ward, Forest Utilization Officer, gave a practical demonstration of sleeper passing to the students of the Senior Division.

3. Mr. E. S. Dawson, Forest Engineer, gave practical instruction in—

- Methods of correct logging for the Saw Mills ;
- Chenat Nair timbers ;
- Saw Mill management.

4. Mr. Sharma, Seasoning Expert, gave practical instruction in Seasoning of timber.

5. Mr. Devadoss, Inspector of Livestock, gave a series of lectures on treatment of livestock generally.

In addition various Range officers and District Forest Officers gave practical instruction to the students in camp.

The students visited the following mills and factories :—

- (1) Kanjikode and Palghat Match factories.
- (2) Saw Mills at (1) Olavakot, (2) Beypore and (3) Mount Stuart.
- (3) Standard Furniture Company and Parry and Company's Saw Mills at Calicut.

Special work.—(1) Actual planting by the students of an area with teak stumps at Walayar.

(2) Survey of area and preparation of map and a simple working plan for the Lovedale School Forests.

1926-28 *Division.*—The final examination for the 1926-28 Division was held in June 1928. Thirty-two students appeared for the examination all of whom obtained Higher Standard Certificates. The general standard of this division was rather better than that of last year. The class average being 67 per cent against 66 per cent. No student obtained the Honours Certificate the highest student securing 79.5 per cent marks. This year the Bombay students carried off most of the prizes for the first time. The Madras students were not up to the standard of previous years. These form the last few members of the old Deputy Ranger class.

The following list shows the certificates awarded in order of merit :—

Number and name of student.	Circle, Province or State to which he belongs.
1. B. Wadhvani	Bombay.
2. T. N. V. Ramanujachari	IV Circle.
3. D. Patra	Orissa Feudatory States
4. A. Dubashi	Bombay.
5. Viraswami Nayudu	VI Circle.
6. J. Mascarenhas	Bombay.
7. M. Chitre	Do.
8. A. Muhammad Akbar	VI Circle.
9. Parthasarathi Nayudu	II Circle.
10. G. Gangolly	Bombay.
11. E. Chelvam	Central Provinces
12. Shahabuddin Memon	Bombay.
13. B. Chowdhary	Central Provinces
14. Wali Muhammad	Do.
15. A. Bendigiri	Bombay.
16. Abdul Bazaek	I Circle.
17. S. Anwar Ali	Central Provinces.
18. G. Rangaraju Nayudu	Do.
19. A. Majid Khan	Do.
20. Sohan Singh	Bombay.
21. D. P. Ketkar	Central Provinces
22. P. Sundaram Pillai	I Circle.
23. Rajaram Pillai	IV Circle.
24. Y. Anjaneyalu	I Circle.
25. Muhammad Ahmed Khan	Central Provinces.
26. Mirza Yacob Baig	Hyderabad.
27. A. Ghaffar Khan	Do.
28. G. Chandhari	Central Provinces.
29. M. Ahmed Khan	Do.
30. S. Bohidar	Gangpur State, O.F.S.
31. G. Verma	Central Provinces.
32. A. Raghavayya	Private student.

Government and other prizes were awarded as follows :—

1. *Gold Medal*.—For the best second year student—B. Wadhwani.

2. *Campbell Walker Prize*.—For the best student in Forestry—B. Wadhwani.

3. *Brazier Prize*.—For the best practical all round Ranger—Sohan Singh.

4. *The Lodge Prize*.—For the best second year student in Forest Engineering—B. Wadhwani.

5. *The Madras Conservators' Prize*.—For the best seed 2nd year student in Survey and Drawing—B. Wadhwani.

6. *The Madras Conservators' Prize*.—For Botany—J. Mascarenhas.

7. *The Madras Conservators' Prize*.—For Range Administration—T. N. V. Ramanujachari.

8. *Madras Chief Conservators' Prize*.—For the best junior student—Jai Singh.

9. *Indian Forest Prize*.—For an essay by the present students—Jai Singh.

10. *Pentland Shield*.—For best all round athlete—Sohān Singh.

11. *Fischer Cup*.—For tennis—Sohan Singh.

12. *Moppil Nayar Cup*.—For Maraton race—(1) Sitaram Singh, (2) Astewala.

13. *Swimming Medal*.—G. B. Gangolly.

14. *Cowley Brown Cup*.—For the Inter-division Hockey—1926-28 division.

Messrs. M. F. Bridge, J. K. Pearce, J. M. Sweet, M. V. Laurie, D. M. Currie, E. V. Padmanaha Pillai, E. S. Dawson, H. P. Ward conducted the final examinations in June 1928.

As usual the students found difficulty in expressing themselves really intelligently in English and technical subjects and the difficulty of making them apply the principles learnt has been commented on by more than one examiner.

1927-29 *Division*.—This division, the present senior year began the year 27 strong, 26 of whom sat for the final examination. One student, R. Ponniah died at the General Hospital, Coimbatore, in March this year as a result of severe dysentery.

The final examination in Physical Science was held in June 1928 with satisfactory results. The best student of this batch is Jai Singh, a Central Provinces student.

First Aid Examination.—Thirty-two students were examined in First Aid by a medical officer of the Government Hospital, Coimbatore, and 29 students gained the Saint John's Ambulance Proficiency certificate.

1928-30 *Division*.—This division began with 17 students one of whom (a Central Provinces student) was reverted on account of continued sickness and long leave and another (a Hyderabad student) who was unable to follow the course was sent down after the first periodical examination. The present strength of the class is 15. The class average is 70 per cent while the top student has 79 per cent. This is a Central Provinces student.

The number of students admitted during the year into the College is considerably less than in previous years, the average admissions since the inception of the College being 27. The decrease is mostly due to the fact that there was only one Madras student this year against the usual number 8.

The concession of the reduced rate of tuition fees, viz., Rs. 500, for the whole course for two Madras students was sanctioned in 1927. This has only been taken up in one instance.

Periodical examinations.—The periodical examinations held during the year show that the two divisions are making satisfactory progress.

Practical training in headquarters.—Besides the usual Saturday morning excursions, a number of other days were devoted to practical work in the estate. The demonstration forest afforded opportunities for applying sylvicultural and utilization principles. A certain amount of engineering was also carried out.

Prize giving.—The annual prize giving was held at the College on the 30th June 1928 when the Honourable Diwan Bahadur M. Krishnan Nayar, Member of the Executive Council, Madras, presided and very kindly presented the prizes and certificates. The usual garden party in the College grounds followed.

CHAPTER III.—ADMINISTRATION, TOURING, HEALTH AND CONDUCT.

ADMINISTRATION.

Board of Visitors' Meeting.—The Board of Visitors' meeting was held on Friday, the 29th June 1928. The following subjects of importance were discussed and decided :—

1. *Additional camping period at Walayar*.—In order to make the College course more practical an area of 22 acres of forest in Walayar was taken over by the College in March 1927 and it was decided with the consent of the Chief Conservator and Conservator,

VI Circle, that coupes of approximately 5 acres should be demarcated by the students annually, sold by the District Forest Officer in the usual sales, and the area burnt lined, staked and planted with teak by the students on their return from hill tour. This was carried out for the first time in 1928 (August).

In order to take full advantage of the rains it was suggested that the junior division of the College should camp at Walayar for 10 days in June each year between the written examination and the end of the term, when they will plant up the area with teak stumps. This additional camp was approved by the Board.

2. *Return of tuition fees in the case of students sent down as being unable to profit by the course.*—It was decided that there was no good reason why fees should be refunded in the case of a student sent down from the College. It was considered that the authority deputing a student is responsible for his selection and for his ability to follow the course.

3. *Payment of tuition fees in advance for six months instead of one year.*—This was not accepted, as in this case the Madras Government will be put to a greater loss than at present and there was no reason why this Government should suffer for the error in selection made by another party.

As shown by the figures given in statement No. I appended to this report the actual net cost of the College to Government this year has been Rs. 64,471 against Rs. 58,834 of the previous year. The increase is due to the number of students from outside Provinces and States being less by 10 which resulted in the decrease of Rs. 15,000 under tuition fees as compared with the previous year.

Touring.—The camping during the year was carried out in accordance with the sanctioned programme—vide details below:—

April and May 1928—1926-28 Division.—Arambyshola Camp.—Final examinations in survey and working plans were conducted by outside Examiners, and the Conservator, VI Circle, examined the students in practical silviculture.

A general inspection of the eucalyptus forests was carried out, and a simple working plan prepared for the Lovedale School forests.

Under Engineering, a cantilever bridge was constructed, and various road estimates and alignments were undertaken.

1. *27-29 Division, Bandyshola, Coonoor Camp.*—A general study of Eucalyptus growth was undertaken, and practical instruction in the making of charcoal given. Enumerations and volume estimation were carried out, together with a little tending among the new hardwood coupes.

Under Engineering the main instruction was in road alignment and map making with the trailer tape. Exercises in lining and, staking an area for planting were also given.

June 1928, August-September 1928--1927-29 Division, Walayar Camp.—This camp was largely taken up by weeding and replacing casualties in the coupe planted with teak stumps in June.

The enumeration, demarcation and survey of the 1929 coupe, construction of a trestle bridge across the Walayar stream and general inspection of district areas completed the programme here.

November-December 1928--1927-29 Division, Nedungayam Camp.—This was as usual one of the most interesting camps. Several days were spent in Calicut inspecting saw mills, depots and factories, and a general inspection of the teak plantation in Nilambur and Nedungayam undertaken. The regeneration areas were closely studied, and the natural jungle at the foot of the Nilgiri hills.

Stem analysis and timber rafting were gone into practically.

• Lines and levels were run, and a plan drawn up for a suspension bridge across the river at Nedungayam.

Map making by the trailer tape, enumerations, and road alignment were also carried out.

The students were instructed in swimming and tested at the end of the camp.

The Conservator, Working Plans Circle, examined the students in Practical Silviculture.

January-February 1929—Dhoni Camp, 1927-29 Division.—The students made a general study of extraction by mechanical means, and also the question of regeneration of evergreen areas. Several enumerations were undertaken and a number of days spent in map making and road alignment.

The Saw Mill at Olavakkot was visited twice and the seasoning plant studied.

The Conservator of Forests, Sixth Circle, examined the students in Practical Silviculture.

September-October 1928—Sativayal Camp, 1928-30 Division.—The first camp of the College year was devoted to general instruction in the principles of Silviculture and a good deal of survey work was undertaken.

November-December—Mount Stuart Camp, 1928-30 Division.—The regeneration of the teak areas was thoroughly gone into, and enumerations in the natural mixed teak as well as evergreen jungles carried out. The identification of shola species took some little time.

A certain amount of actual thinning was undertaken.

Under Engineering the main items were study of road construction, some bridges, map making and survey.

January-February 1929—Kargudi Camp, 1928-30—Division—A fair amount of time was devoted to fire protection work, and to study of the teak regeneration areas. Enumerations were carried out, and road alignment, map making and survey were gone into practically.

Tour journals.—A record of all work done in camp is maintained in the form of tour journals and District Forest Officers are informed of any work carried out by the students which might be of use or interest to the division.

A separate tour journal to show the work carried out in the College teak area at Walayar was opened during the year.

District Officials.—The very warm thanks of the College are due to the officials of the districts visited who so kindly not only did all in their power to make our camps comfortable but went out of their way to show us all that was of interest in the locality and in the midst of their work spared time to give practical instructions to the students who learnt a good deal from them.

Inspection.—The students were inspected at Nedungayam by the Conservator, Working Plans Circle, and at Arambhyshola and Dhoni by the Conservator, Sixth Circle. The Chief Conservator inspected the students while at work near Wellington.

Swimming.—Swimming was practised at Kargudi by the junior students in the Moyar river. During Nedungayam camp the students of the Senior Division were tested in swimming and student G. B. Gangolly was awarded a medal by the Athletic Club for swimming.

Health.—The students while at the College are subjected to semi-military discipline. There is no doubt that the system of regular exercise consisting of compulsory games and daily physical training combined with regular medical attendance turns out a very smart healthy student.

The health of the students was generally good in all camps except at Dhoni where on account of the feverish season the number of students with fever was great.

Conduct and discipline.—The standard of discipline at the College has been satisfactory and the conduct of the students good.

CHAPTER IV.—THE GASS FOREST MUSEUM, AND COLLEGE LIBRARY.

1. *Museum.*—Mr. G. Viswanatha Ayyar, the Curator, was in charge of the Museum throughout the year.

Three coloured plates showing different stages in the germination of three timber species, and two anatomical diagrams were prepared and exhibited. A representative collection of samples of the more important timber species of the Presidency together with the minor forest produce pertaining to them was taken from the Museum, and put on show in the "Park Fair Exhibition" held in Madras during the Christmas.

A paper on the "Identification of timber" was read by the Curator in the "Indian Science Congress." The key for identification of fifty of the more important Madras timbers prepared already was further improved, and published. A short course of lectures was given by the Curator to the senior students of the College on timber identification and Systematic Botany.

A large number of sheets were added to the Herbarium, and some correctly named spores were despatched to Oxford and Cambridge.

That the Museum is becoming more and more interesting and instructive to visitors is shown by their increase in number from 29,846 to 31,850.

2. *Library.*—Eighty-two books were added to the library during the year.

CHAPTER V.—SUPERVISION, WATER-SUPPLY, ROADS, BUILDINGS, Etc.

Supervision.—Mr. A. Marudachalam Pillai continued as Overseer throughout the year. Mr. M. S. Raghavan as House Tutor.

Water-supply.—The water-supply has been satisfactory.

Office establishment.—Mr. K. S. Seshagiri Rao, the permanent Manager, has been transferred to the Conservator's office at Salem and the office Accountant is acting for him. The work of the office staff has been satisfactory.

Roads.—All the existing roads have been kept in proper repair.

Buildings.—All the buildings in the Estate including the hostel blocks were maintained by the Public Works Department. The accommodation in the store godown was found insufficient for

storing the tents of the Chief Conservator, the Engineering and Working Plans branches, sanction has now been obtained for converting the unused saw-pit into a godown. The work has now been taken on hand.

Athletic ground.—During the year a sum of Rs. 190 was spent for improvements of the athletic grounds.

CHAPTER VI.—GENERAL.

Stock taking—General stock.—The stock of the College was checked in detail in July 1928 by the staff of the College and found correct. The articles found useless or unserviceable were written off after proper sanction.

Saleable stock.—A list of articles in saleable stock which have been in stock for some time and for which there was no demand was made out and sold in auction, the difference between the book value and the amount realized being written off under proper sanction.

Athletics.—Athletics forms a compulsory part of the College curriculum and is particularly important. The number of students available has been twenty below the average of past years. This has naturally affected in all branches of sports, especially as, apart from hockey, very few students of either year have a natural bent towards outdoor games.

The annual College sports were held in October and as the weather was fine, it was very successful. The Richmond Cup which is awarded to the student obtaining the greatest number of points in the more important events was won by A. Astewala, a Bombay student who secured 25 points. The various events were on the whole fairly well contested, and there was a definite improvement in the standard for long and high jumps.

The Cowley Brown Cup for inter-division hockey was won by the senior division by four goals to one after a good game.

The Marathon race over a seven-mile cross-country course, was won by the senior division with 144 points to 114. The first student—home—Sitaram Singh, completed the course in 45 minutes and won the cup presented by M.R.Ry. K. Rama Raja Mannarghat Mupil Nayar Avargal.

The Pentland Shield awarded to the best all round athlete was won by A. Astewala, a Bombay student.

The Fischer Cup for tennis was won by D. V. Nagaratnam, Madras student.

As neither the seniors nor juniors had any previous experience in cricket, it was not possible to enter a team this year, especially as the local tournaments take place in August and September soon after the College year begins.

The hockey team, though good, was beaten in the first round of the Y.M.C.A. Tournament after a good game. The Walayar and Sadivayal camps rather interfered with combined practice which is so necessary.

The post of vice-presidentsip of the athletic club was held during the year as follows:—

Mr. D. F. Stileman ... 1st April 1928 to 1st July 1928.
Mr. J. C. Wrench ... 2nd July 1928 to 31st March 1929.

COIMBATORE,
25th August 1929.

C. R. F. WILLIAMS,
Principal, Madras Forest College,
Coimbatore.

Statement No. I—Statement showing Revenue and Expenditure at the Madras Forest College, Coimbatore, during 1928-29.

Budget heads.						Amount.		
						RS.	A.	P.
						<i>Receipts.</i>		
VIII. Forests (e)	Miscellaneous—							
(2. Forest College	...	...	...	...	...	54,122	6	0
(3) Rents	...	...	...	...	...	1,705	8	0
Total						55,827	14	0
Deduct refunds						980	6	6
Net revenue						54,847	7	6
						<i>Expenditure.</i>		
Pay of officers—								
Non-voted						23,519	1	0
Voted						26,369	13	0
Pay of establishment—								
Permanent						19,668	12	0
Temporary						2,087	1	0
Allowances—								
Non-voted—								
Cost of passage						96	7	1
Travelling allowance						3,147	1	0
Voted—								
Travelling allowance						7,267	12	0
Honoraria—Voted						855	0	0
Non-contract contingencies—								
Non-voted—								
Rates and taxes						107	10	0
Voted—								
Pay of menials						2,121	4	0
Rents						22,767	8	0
Telephone charges						175	0	0
Miscellaneous						4,255	15	5

Statement No. I—Statement showing Revenue and Expenditure at the Madras Forest College, Coimbatore, during 1928-29—cont.

Budget heads.	Amount.		
	RS.	A.	P.
<i>Expenditure—cont.</i>			
Supplies and services—General—			
Apparatus and materials	2,694	14	0
Books and periodicals	215	12	0
Miscellaneous	2,751	6	0
Grants-in-aid—Recurring—Miscellaneous—			
Grant to athletic club	400	0	0
Works—			
Forest College works—			
52-A—Capital outlay on forests B—Conser-			
vancy and works—Buildings—Works in			
progress	189	6	0
8 (b) Works—Repairs	2,585	9	0
Total expenditure	1,21,275	3	6
Deduct—			
Revenue realized	54,847	7	6
Expenditure on Museum—			
(a) Pay of Curator	1,538	3	0
(b) Pay of Museum watchers and			
other expenses at the Museum			
in connexion with exhibits	418	3	0
	1,956	6	0
	56,803	13	6
Net cost on account of the College ..	64,471	5	6

Statement No. II—Madras Forest College, Coimbatore, 1928-29.

Serial number and name of student.	Circle or State to which attached.
1. M. G. Nayudu	V Circle.
2. L. V. Joshi	Central Provinces.
3. Nirpat Singh Todmar	Do.
4. E. Cameron	Do.
5. S. L. Dube	Do.
6. S. L. Parasar	Do.
7. B. Raj Singh	Do.
8. K. M. Thomas	Bombay.
9. L. S. Mutkekar	Do.
10. R. S. Deshpande	Do.
11. M. M. Asadi	Do.
12. Y. K. Vaze	Do.
13. H. B. Mohssin	Hyderabad.
14. B. B. Das	Court of Wards.
15. A. B. Phadke	Jawhar State.

ADMINISTRATION REPORT OF THE FOREST ENGINEERING BRANCH FOR THE OFFICIAL YEAR 1928-29.

I. INTRODUCTION.

The past year has been one of uncertainty. The policy of the Forest Department has changed radically from that of 1923-26 with the new administration, and as the work of the Forest Engineering Branch must necessarily depend almost entirely on the quantities and distribution of raw material made available for extraction and marketing, plans of work outlined before 1926 have had to be materially altered to meet new conditions. Government did not see fit to accept or lay down any definite programme of development or to relieve the commercial activities of duplication of accounts and divided control. Mr. Pearce's 5-year programme and the reorganization proposals of 1927 have died a natural death.

Progress has however been made.

2. The position of the Chenai Nair concern has again improved until it now not only meets all its actual running expenses but is carrying a considerable share of the depreciation on plant, roads and machinery.

The portable saw mills have improved their efficiency, and while Chedleth and Top Slip were only beginning to show normal working during the last two months of the year, they have since shown very marked improvement and should approach the working results of the other mills by the end of the current year.

It is very interesting to note that, despite the very large losses shown by the theoretical method of commercial book-keeping adopted, taking all forest divisions where saw mills were or are located and comparing revenue and expenditure under the ordinary Government accounts for a like period of years, before and after the establishment of the Saw Mills, an increase in net revenue for the divisions concerned of Rs. 4,36,553 is shown. This makes clear that the losses shown in the audits are not real or actual. Where small actual losses are made by the mill in itself they are often more than made up by the indirect benefits accruing from the spread of general overheads over a larger outturn and from the fact that large quantities of inferior logs are not dumped on the market thereby reducing prices and producing a large surplus of logs in depots which cannot be sold currently, and which rapidly deteriorate in value.

3. Utilization sales have again increased to over 13½ lakhs and the overhead costs have been reduced by 50 per cent.

Sleepers supplied to the railways increased from 34,444 in 1927-28 to 55,694 in 1928-29 and total sales from this source from Rs. 2,00,533 to Rs. 3,72,421.

4. The logging Engineer completed the field work of mapping and cruising in the New Amarampalam Reserve, submitted a

final report on the Someshwar and Andar cruises in South Kanara, and made good progress in the mapping and enumeration for the Mount Stuart working plan.

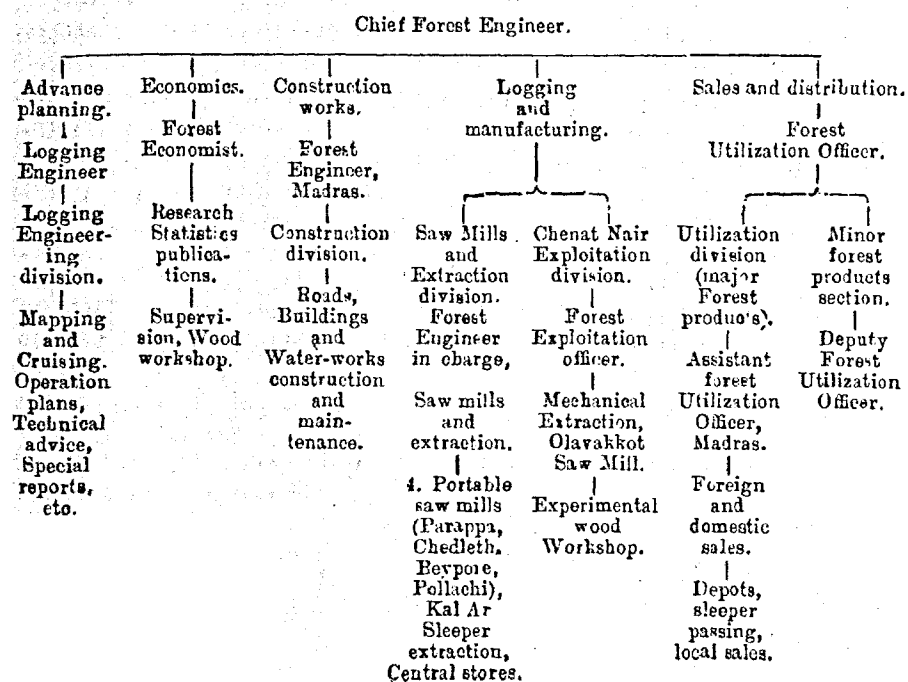
5. The Forest Engineer in charge of Roads and Buildings completed residential buildings at Chittoor and Olavakkot, nearly completed the one at Vellore in six months working time, and completed nearly six miles of metalled road in the Chedleth Range in the Wynaad, besides carrying out a number of surveys and preparing detailed estimates for new works to be undertaken.

6. The sleeper and timber extraction work in the Kal Ar Valley in the Anamalais continued on an increased scale and returned a substantial profit.

7. The Forest Economist completed an extensive report on Bombay, Madras and Hyderabad markets for Madras timbers; compiled a uniform log measurement book for the use of the Forest Department, and made a start in the systematic filing of information bearing on the work of the department for reference.

8. Some changes were made in the organization of the Forest Engineering Branch caused by the abolition of the post of Assistant Forest Utilization Officer, West Coast, and by the installation of the experimental wood workshop at Olavakkot under the general direction of the Forest Economist.

Organization Chart of Forest Engineering Branch.



II. THE CHIEF FOREST ENGINEER.

This post was held by Mr. C. S. Martin during the entire year.

2. Frequent inspections of field work were made during the year and tours were made during the ten of the twelve calendar months. Altogether 111 days were spent in camp.

3. Early in February a complete review of the work of the Forest Engineering Branch was submitted to Government with recommendations for the permanent organization of the Branch after the completion of the Chief Forest Engineer's and the Logging Engineer's terms of service.

III. THE LOGGING ENGINEERING DIVISION.

During the year this division again increased the work turned out as will be seen below :—

	1926-27.	1927-28.	1928-29.
Baselines run—Miles ...	42	42.1	72.2
Acres mapped and cruised.	11,200	15,470	21,535

That the cost per acre increased considerably was undoubtedly due to the necessarily high cost of coolie labour in Amarampalam; the fact that a much larger proportion of the total area was 100 per cent cruised; to the exceptionally bad year for malaria at Mount Stuart, and last but not least that men cannot be expected to work year after year at heart-breaking work with no increase of pay and no hope of promotion. Government would undoubtedly have saved money by accepting some of the many proposals put forward looking toward the betterment of these men's lot. They have had verbal promises of improved conditions from two Chief Conservators of Forests, none of which could be given effect to.

In spite of the higher cost, when distributed on a basis of less than one pie per cubic foot, it will be recovered many times over, when the timber is finally extracted, by savings in laying out transportation systems and by the avoidance of guessing as to how much and what species of timber are to be found on the areas.

I consider this the most worthwhile work undertaken by the Forest Engineering Branch. Without the accurate information gained by it no really sound plans for forest development can be formulated.

The Logging Engineer's report on the year's work follows :—

ADMINISTRATION REPORT OF THE LOGGING ENGINEERING DIVISION FOR THE YEAR 1928-29.

The staff of the Logging Engineering division was concentrated on two projects during the year under review. The mapping and cruising of the area designated in the Nilambur Working Plan as the "Inaccessible Working Circle" which was initiated during 1926-27 and continued during the

last few months of 1927-28, was continued as the "New Amarampalam Project." This area comprises the watersheds of the Karimpuzha and Thallipuzha rivers in New Amarampalam reserved forest, and is bounded on the west by the boundary of the "Conversion Working Circle" of Nilambur division; on the north-east, east and south-east by the Nilgiri district boundary; and on the north-west and south-west by the reserve boundaries. Before the Logging Engineering division started work in this area only the western fringes had ever even been explored, and no inspection paths existed in the interior. This is absolutely virgin forest, running from 400 up to over 5,000 feet elevation above sea level, and the urgent completion of the mapping and enumeration of the merchantable timber area, required to permit the Logging Engineer to make detailed exploitation plans before the expiry of his contract in 1929, was a herculean task. The other project carried on during the year was the mapping and cruising of the Ulandi and Tunacadavu ranges, Tekkadil leased forest, in South Coimbatore district, designated as the "Mount Stuart Project." This was undertaken to provide the data on which to base a revision of the working plan and to supply an accurate large scale topographic map which would enable exploitation routes and operations to be more efficiently and economically planned and organized. During the first two months of the year under review the Logging Engineer was absent on deputation to the Government of India in the capacity of Consulting Forest Engineer for the Andaman Islands. The balance of the year he held charge of the Logging Engineering division.

2. *New Amarampalam Project*—The mapping and cruising of the area south of the Karimpuzha (river) bounded by the Inaccessible Working Circle boundary on the west and the Panapuzha on the east, baselines for which had been run during the previous year, was carried out from after the Easter holidays upto the break of the monsoon in June. A few strips left unfinished were completed after the monsoon. A total of 2,500 acres was topographic mapped on the scale of 100 yards to the inch with 20 feet contours and 66½ per cent cruised (enumerated). An area of 1,185 acres in the vicinity of Gomanmalai (mountain peak) was mapped and cruised 33½ per cent.

During the monsoon, when field work was impossible, the office compilation of the preceding year's field work was done. This included maps and cruises of the Silent Valley Project, Kal Ar Valley (Anamalais, Valparai) Project, Nilambur Conversion Working Circle Enumeration Project for the Working Plans Circle, and New Amarampalam Project.

In October field work on the New Amarampalam Project was resumed. Two sub-projects were formed; the Karimpuzha sub-project working up the Karimpuzha Valley under Mr. B. Janakiram Singh, I. F. S. and the Thallipuzha sub-project under Mr. B. A. Cariapa, Extra Assistant Conservator of Forests. Heavy, late rains and consequent floods in the rivers engendered great difficulties in transporting samans and establishing camps, so that regular work did not get under way until in November. While the baseline surveying parties continued the primary baselines up the valleys, the rest of the parties were occupied in building paths to open up the country for access to the base camps, in clearing camp sites; and transporting tents, corrugated iron sheets, and thatties for huts; and in building camps. It must be remembered that no paths existed in the area worked this season and a great deal of time of subordinates' labour and consequent cost was

spent in opening up the area. Everything had to be transported in by coolie head-loads as we could not borrow any elephants from the district, they being all engaged in floating work.

The problem of coolie labour was a formidable one. We could not take any local labour as the Nilambur Forest district had first claim on their services. Consequently we had to go outside the area of local labour supply and recruit coolies from as far away as Manuarghat in the Palghat division. As the coolies would not remain in camp longer than 10 days, and as a large number of coolies were required to clear strip lines and do other coolie work fast enough to keep the large staff of cruisers and topographers employed, a special labour recruiting organization was effected. Ranger Swamikutty of the Utilization division with headquarters at Calicut was in general charge of the labour supply, with forester Theyunni Menon engaged full time in recruiting. Theirs was not an easy job, for it required a great deal of persuasion to get the coolies to come up to work in the depths of this unknown jungle, and they had to advance large sums of money on their own responsibility before the coolies would leave their villages. They both merit the greatest credit for not only keeping the field parties steadily supplied with the required number of coolies, but also for obtaining some Rs. 12,000 worth of labour on about 50 per cent advances without the loss of one pie of Government money—a truly meritorious record.

The Karimpuzha sub-project continued the theodolite-traversed dumpy-levelled "A" baseline along the south bank of the Karimpuzha from Edakutti across the Panapuzha and the Maiyankallanpuzha and crossing to the north bank of the Karimpuzha at Meenmutti (near where the 2,000 feet contour crosses the river). A half mile wide belt adjoining this baseline was mapped and cruised 100 per cent. From Meenmutti the 'A' baseline was continued east along the north bank of the Karimpuzha to near the limit of timber growth at the head of the valley. Another theodolite line designated as 'B' baseline was run west from Meenmutti along the north bank of the river and the traverse closed at the starting point. The closing error in elevation was only 2½ feet in a distance of 4½ miles. Paralleling the 'A' and 'B' baselines we ran compass-traversed, double Abney-levelled secondary baselines near the upper edge of good timber growth on the north side of the valley. All traverses were closed within the permissible limit of error. The north side of the valley was mapped from these baselines on the 100 yards to the inch scale. Cruising of alternate blocks about half a mile in width and running from the river up to the limit of timber growth was done 100 per cent and 40 per cent, respectively. The narrower south side of the upper Karimpuzha valley was similarly mapped and cruised from a series of compass baselines. The field work in this valley was completed by the end of the year under review.

Base camps were established at Meenmutti, at the end of the 'A' baseline, and at Manalthoda about half way between. A number of temporary camps were built at higher elevations convenient to the various areas in which work was carried on.

The Karimpuzha sub-project party consisted of rangers K. K. Appayya and P. M. Mathew, and, during the last quarter, R. A. Pingale, head surveyor, Achuthan and 12 foresters, some few of whom were nearly always on leave. The work turned out by them included construction of 24 miles of paths; building four temporary bridges (the first ones built were washed away

by the late floods); clearing campsites and building six camps; surveying 16.4 miles of theodolite baselines and 11.8 miles of compass baselines, and mapping and cruising 3,800 acres of timber.

The Thallipuzha sub-project established base camp at the juncture of the Chinnathallipuzha and Thallipuzha rivers. Compass traversed, double Abney-levelled baselines were first run up the Chinnathallipuzha valley, one along the river and the other near the upper edge of timber growth along the west side of the valley. The traverses were closed with an error of $7\frac{1}{2}$ feet in elevation, and 15 links in distance, the total distance being 5.4 miles. This area, including the narrow east side of the valley was mapped on the 100 yards to the inch scale and cruised, some 100 per cent, but mostly 40 per cent. A stadia transit baseline was run east up the Thallipuzha, with another stadia transit baseline along the south side of the valley total 2.8 miles. A further extension of 2 miles of compass baseline was run in this valley. The south side of the Thallipuzha valley which bears one of the heaviest stands of timber was mapped and 100 per cent cruised. As the growth at the far eastern end of the valley was poor, about 400 acres of this area was plane-table stock mapped and 100 acres or 25 per cent sample strip cruised. A tie line was run up over the pass east of Kuttrekal peak and down to tie into the Karimpuzha valley baseline system, closing with an error of 6 feet in elevation between the Thallipuzha and Karimpuzha baseline systems.

Having completed their work in Thallipuzha valley, toward the end of February the crew was transferred to the Karimpuzha valley to help finish the work there. One party ran 1.3 miles of compass baseline at the western end of the Karimpuzha area, and mapped and cruised 410 acres adjoining that done in 1926-27. Another party augmented by a few foresters from the other sub-project, took up the plane-table stock mapping on a scale of 8-inch to the mile and sample strip cruising of the area between the Panapuzha and Arikajampuzha rivers, and of the south-eastern portion of the Maiyankallanpuzha valley adjoining that which had been intensively mapped and cruised by the Karimpuzha party. The area stock mapped included 1,580 acres of good timber, 1,950 acres of fair timber and 470 acres of poor timber growth, total 4,000 acres, plus a large acreage of barren rocky patches which had to be gone over to find the timber areas, but which has not yet been measured up. This area is topographically the most difficult in the inaccessible working circle and will doubtless be the last to be exploited. To open up this area 18 miles of paths are cleared.

The Thallipuzha sub-project party consisted of rangers T. D. Ponnayya and U. Vriddhachalam and ten foresters. Surveyor Pianatharibara Ayyar divided his time between this and the Mount Stuart Project. The work turned out by the party consisted of: in the Thallipuzha valley building 14 miles of paths, constructing two bridges, building three camps, surveying 11 miles of baselines and the tie line, surveying $5\frac{1}{2}$ miles of path constructed in the 1926-27 area after it was mapped, check cruising 180 acres in the 1926-27 area, and mapping and cruising 2,350 acres. The work done in the Karimpuzha side is given in the preceding paragraph. In addition three camps were built.

The new Amarampalam Project was practically completed by the end of the year under review. In April check cruising of a number of important areas was done, and some more sample strips run in the plane-tabled area, and the staff was then transferred for office compilation. A total of some

20,000 acres of accessible timber in the Karimpuzha and Thallipuzha watersheds has been mapped and cruised. The only areas of the inaccessible working circle that have been omitted are the Karimpuzha valley in the south-west corner of the circle, and the south bank of the Korampuzha in the north-west corner. These are relatively small areas, the former being very steep and broken country. They lie in entirely separate watersheds and would have to be tapped by entirely separate transport routes, and do not affect the consideration of the exploitation of the main Karimpuzha-Thallipuzha watersheds.

In considering the cost of mapping and cruising in new Amarampalam Project for the year, one cannot simply divide the total expenditure by the number of acres. The paths built by the Logging Engineering Division during the course of the work remain as inspection paths for the future and will be used for all forest administration and working in this area. Had we not built them, the District staff would have had to do it, for it is essential that all the reserved forest areas in which forest operations will sooner or latter be carried out be thus opened up by inspection paths. That this is a departmental policy is evident from the fact that a considerable mileage of inspection paths are being built in the Silent Valley at a cost of approximately Rs. 150 per mile. In fact that Nilambur District staff once started to build a path from Pulimunda up the Thallipuzha valley, but gave it up after a few miles. We have handed over to the district a net-work of paths that, providing they are kept cleared after the monsoons, will enable inspecting officers to cover practically the entire timber area. The paths up the two main valleys are connected with a path over the dividing ridge so that inspecting officers can go up one valley, cross over the divide and return by the other valley. Some of the paths we have constructed are good enough to rate as bridle paths; others are footpaths cleared sufficiently for coolie head-load transport. It is therefore only fair that the cost of the paths should not be considered a direct charge against the mapping and cruising, and that the expenditure thereon should be deducted from the total. During October practically no work could be done because of the unusual late heavy rains. This was no fault of ours and it is not just to charge the cost of establishment for that month to the work. During the monsoon office work period, beginning the middle of June, the men were engaged principally on the compilation of other projects of the preceding year, so the pay of establishment for that month cannot be charged to new Amarampalam Project.

In accordance with the foregoing, the following is the total expenditure on the staff of the new Amarampalam Project for the months of April, May, half of June, November, December, January and March:—

	RS.	A.	P.
Pay and non-voted travelling allowance of officers	7,728	13	0
Pay of rangers and foresters	8,033	9	0
Travelling allowance and allowances of rangers and foresters (including voted travelling allowance of extra Assistant Conservator)	8,770	9	0
Total	24,532	15	0

	RS.	A.	P.
Expenditure on coolie labour (during the entire year), Thallipuzha ...	6,379	15	0
Expenditure on coolie labour (during the entire year), Karimpuzha ...	10,818	7	0
Total ...	17,198	6	0

Deduct for cost of paths in accordance with preceding paragraph :—

	RS.	RS.
Labour : 38 miles, at Rs. 100 per mile, 3,800		
18 miles, at Rs. 67 per mile, 1,200		
Staff for aligning and supervision of construction : 56 miles at Rs. 33 per mile	5,000	
	1,850	
Total ...	6,850	

Note.—No accurate record was kept of the expenditure on path work for labour separately nor of the time the subordinates spent on path work; so exact cost cannot be determined. However, it is thought that the above is a fair average figure including the cost of bridges. It compares quite favourably with the Silent Valley figure of Rs. 150 per mile which is believed to be for labour alone and does not include cost of supervision by subordinate staff.

Deducting the expenditure on paths as above we get as the expenditure on mapping and cruising work :

	RS.	A.	P.
Officers	7,728	13	0
Rangers and foresters	14,954	2	0
Coolie labour	12,198	6	0
Total ...	34,881	5	0

For this expenditure the following work was done :

Construction of 12 camps,
Surveying of 46 miles of baselines,
Mapping and cruising of 14,245 acres.

On an acreage basis this works out to the following cost :

	Per acre.
	RS.
Project officers	0.543
Rangers and foresters	1.050
Coolie labour	0.855
Total ...	2.449
	or
Rs. 2 7 2	

This does not take into account deductions that might deservedly be made for the handing-over-to-the-District value of the camp sites which were cleared and scraped clean of all undergrowth and which remain available

for pitching the tents of inspecting officers; nor for the corrugated iron roofed hut left at Meenumutti which makes a rough but convenient overnight halting place for inspecting officers or their accompanying subordinates. The thatched roof coolie lines remain but will probably not last long. The other corrugated iron sheets which were used to roof temporary huts were handed over to the District Forest Officer. On the other hand if the Rs. 3,691-3-0, expenditure on pay and travelling allowance of the staff for October were added, it would increase the cost by annas 4 per acre. On a cubic foot basis the cost of mapping and cruising works out to less than 1 pie per cubic foot, on the timber cruised for extraction, even including October expenditure.

It will be observed that the labour cost was much higher than in preceding years. This was because under the difficult conditions enumerated in the fifth paragraph of this report we had to pay the coolies annas 12 per diem plus pies six per coolie per day commission to gang maistries without whom the required number of coolies could not be obtained. Also the coolies had to be paid for the two days required to walk up to the camps from Nedungayam where they were handed over by the Recruiting staff, and after they had worked 10 days, for another two days going down. As the coolies also had to spend several days going each way between their homes and Nedungayam we could not get out of paying them for all their days in the forest. Every effort was made to reduce the labour cost, but it could not be done and still obtain sufficient coolies to complete the project by the end of the year as we were required to do. Had the completion of the project not been a matter of such great urgency and could more time have been taken and a smaller crew accordingly employed, the cost on account of coolie labour could probably have been reduced.

It should be remarked that the subordinates on New Amarampalam Project had a very hard job to do, and that most of them did their best. They had to do extremely arduous work under difficult living conditions. They had to work in camp for 20 days at a stretch during which time they had two batches of coolies. At the end of the 20-day camp they were permitted to return to their families at Nilambur for a few days, which amounted to compensation for the Government holidays during which they did field work, and to get food supplies for the next 20th day camp. Nilambur being a two-day march from most of the camps, more than half of their relief period was occupied in making the journey. Some of the men needed considerable driving, and one forester had to be dismissed, but most of the men did their best to complete the Project on schedule. This too despite the fact that they got no more pay than their brethren in the regular line who could not conceivably have as strenuous sustained work to do. All of the rangers did very good work, and Rangers Mathew, Appayya, Vridhachalam and Poovayya were recommended for early promotion. Among the foresters, in his report Mr. Singh specially mentioned A. M. L. D'Souza and K. S. Muthana. Forester Poovappa, a recent graduate of the Madras Forest College, was made an Acting Ranger for purposes of discipline and control of foresters in the field and he did a ranger's work on forester's pay, the special allowances I tried to obtain for him being refused by higher authorities.

3. *Mount Stuart Project.*—The mapping on a scale of 12 inches to the mile and 100 per cent cruising of the timber in the Mount Stuart area was continued by an enlarged crew under the supervision of Mr. M. V. Laurie, I.F.S., Working Plans Officer. Mr. Laurie's administration report for the

year under review follows. It should be mentioned that a different system of cruising, as decided upon by the Working Plans Conservator, is used at Mount Stuart. There the calipering is done by coolies, who use calipers with each foot girth class indicated by a distinctive colour which the caliper-coolie shouts out to the forester-cruiser, who tallies the tree accordingly, and estimates the merchantable length of the bole. On the New Amarampalam Project the forester-cruisers caliper the trees themselves, recording the diameter breast height to the nearest inch, and estimating the diameter at mid-height as well as the length of bole. The difficulties mentioned by Mr. Laurie therefore do not arise. However it must be said that where the cruiser does the calipering himself he can only cruise a strip two chains wide and keep up with the Topographer who gives him his acre guide, while the Mr. Stuart Cruiser with three caliper coolies can do a strip three chains wide. Mr. Laurie's suggestion to replace coolies with a cadre of temporary forest guards is a good one, providing they can be utilized on other work during the monsoon. Otherwise they would be an additional cost burden during the monsoon when no field work can be done, and the educated subordinates are engaged in office compilation.

WORKING PLANS OFFICER'S ADMINISTRATION REPORT ON MOUNT STUART PROJECT.

"The work on this Project was continued on the same lines as in the previous year, the only difference being that a running check cruise of about 5 per cent on the whole area was carried out, and stricter adherence to the prescribed limits of error in topography was enforced. This resulted in a distinct improvement in the accuracy of the cruising, and less subsequent rectification of topography in the field.

Field work was recommenced after the monsoon in September and continued until the end of March, when, owing to the high incidence of malaria among the men, it was found advisable to stop the field work, and retire to a healthy locality for the compilation of maps and cruise figures. The average field strength throughout the year was two rangers, 12 foresters and one surveyor. During most of the time before Christmas 3 parties were working daily, but during the latter part of February and in March, it was often only possible to get one party out, and on one or two days in March only two men out of 15 were working! The total number of days field work lost owing to sickness was 333 days. (Logging Engineer's note: This means that during the nine months field work season *over a year* of the working time of one man was lost because of fever.) I attribute the greater incidence of fever this year chiefly to the fact that most of the men had been working on this project last year, and had had much fever which had lowered their vitality and resistance to attacks.

The difficulty of obtaining labour was as acute as in the previous year. No local labour was available and all coolies had to be imported from Chalagudi, Palghat and Mannarghat, and it was difficult to persuade them to stay more than a month or six weeks at a time. The constant training of coolies, involving as it did training new hands afresh each time, and the low quality of the labour available, seriously affected the accuracy of the cruising. Many of the coolies did not know the names of the trees and a number of them (about 35 per cent) were found to be more or less colour blind and could not distinguish the colours on the calipers. The foresters found it

very difficult to control the coolies who tended to be careless and inaccurate in their measurements, and most of the inaccuracies are attributable to bad work by the coolies. If it were possible to recruit a cadre of temporary forest guards for cruising work, the work could be controlled much more effectively, and all disadvantages of the frequent changes of coolies would be avoided. The cost of a guard on Rs. 15 plus allowances would be about the same as that of a coolie on annas 12 a day working 24 days in the month, and the outturn and the quality of the work would be better. Two such guards could do the work of 3 coolies.

During the year one Deputy Ranger and two foresters from Bengal were attached to the project for training, and later on one Ranger and two foresters were deputed by Coorg to learn mapping and cruising and were attached to this project for training.

The total area cruised during the year under question was 7,290 acres, which brings the total area cruised up to 11,182. 26.2 miles of baseline were run bringing the total up to 54.8 miles. The cost of the actual field work completed during the year is as follows:—

	RS.	A.	P.
Pay and allowances of Rangers, foresters and surveyor for the 9 months of field work ...	2,533	8	0
Coolie labour	6,013	7	0
Erection of sheds for subordinates and coolies .	801	2	0
Contingencies and miscellaneous	46	12	0
Total ...	16,394	13	0

7,290 acres at Rs. 2-4-0.1 per acre

The increase in cost is due partly to the fact that most of the area cruised was much more heavily timbered than the area cruised in the previous year, but chiefly to the much greater amount of sickness during the year."

4. It will be observed that the cost per acre in both projects was considerably more than in preceding years. This is mainly accounted for, as previously mentioned, by unavoidably high coolie labour costs in New Amarampalam Project, and by unusually great loss of working time of the staff through fever in Mount Stuart Project. I believe another reason for the increased cost is the fact that most of the Rangers and foresters in the Logging Engineering division have been engaged in the arduous work of mapping and cruising for 4 or 5 years without any compensation by way of special pay or allowances or promotion, which they merited and deservedly expected. They are getting weary and despondent, at the lack of any monetary recognition, and look with envy on their more fortunate brother subordinates in the regular line whose life is a much easier one. This mental attitude cannot help but be reflected in their work, even though they try to do their best. They feel no incentive to exert that extra effort which means more acres per diem covered and correspondingly lower cost per acre. I have observed that it takes increasingly more 'driving' by the officers to maintain progress. As long as they get no more pay nor faster promotion than their brother subordinates doing ordinary work in the regular line, it is impossible to dispel this feeling of discouragement among the more experienced men who have put in years of hard work in the Logging Engineering division without recognition, despite the efforts of their superior officers to obtain for them the rewards they merit.

5. *Office staff.*—After a long struggle, sanction for adequate office establishment for the Logging Engineer was finally obtained. The original office establishment of one accountant and one tour clerk on the lowest grade of pay, which despite large increases in field staff and consequent heavy increase in office work during the past several years had not been augmented, was increased in December by the addition of a head clerk, an accountant on a higher scale of pay, enabling a better qualified man to be obtained, and an assistant clerk. Pending receipt of sanction for adequate office staff, Mr. C. Mahony, Extra Assistant Conservator of Forests, was posted by the Chief Conservator to help with the office work. When the additional establishment was obtained, Mr. Mahony was put on to learning the mapping and cruising and other work of the Logging Engineering division.

The accounts of the Logging Engineering division for 1928-29 were audited by the audit staff of the Accountant-General's Office soon after the close of year and were pronounced to be satisfactory.

6. At the beginning of the year Mr. P. W. F. Walpole held charge of the Logging Engineering division, and continued in charge until May, when the Logging Engineer returned from his deputation to the Andaman Islands and resumed charge. After returning, in addition to organizing and directing the field and office compilation work of the projects of the division, the Logging Engineer had the heavy task of completing his Consulting Engineer's report on Forest Exploitation in the Andaman Islands.

During the year under review the Logging Engineer wrote the final Report on Someshwar-Andar Project and formulated and submitted proposals for working for the next two decades.

During the last six months of the year Ranger P. A. Venkataraman of the Logging Engineering division was on deputation to the Philippines studying Logging and Milling."

IV.—THE FOREST ECONOMIST.

The most important works carried out during the year under review by the Forest Economist were the compilation of a very detailed timber market report covering Madras, Bombay, Mysore and Hyderabad, which is now in the hands of the printer; and the calculation of uniform measurement tables for logs to be used in all the divisions of the department.

2. The former volume can only be of use if the information contained therein is kept up to date by recording current market information as it becomes available. For this purpose the report has been interleaved with blank pages on which such information may be noted.

3. The measurement tables were much needed as it was found that different methods of measurement were used in the various divisions of the Presidency and no uniform set of measurement tables was in existence.

4. The first year's working of the Wood Work Shop at Olavakkot was very successful and produced valuable knowledge of the qualities and possibilities of a number of Madras timbers as

will be seen from a perusal of the report on its working. The net cost was small in comparison with the results obtained.

5. The exhibit at the Park Fair held in Madras during the Christmas holidays was the most successful yet held by the department.

As this is one of the few opportunities offered to bring the work of the Forest department to the direct notice of the public, it serves a very useful purpose and should be made a permanent part of the department's activities.

The report of the Forest Economist follows: The sections on the Wood Workshop and the Madras Park Fair were prepared by Mr. E. S. Dawson who has given much time and energy toward making these features of the work successful.

PROGRESS REPORT ON ADMINISTRATION OF THE ECONOMIST'S SECTION OF THE FOREST ENGINEERING BRANCH FOR THE YEAR 1928-29.

"The post of the Forest Economist was held by Mr. J. A. Master, I.F.S., up till 11th October 1928, the date on which he proceeded on four months' leave. He was succeeded by Mr. C. S. Martin, Chief Forest Engineer, who continues to discharge the duties of the Economist, in addition to his own.

The clerical staff consisted of one clerk-typist (tour clerk), one ledger clerk and two temporary clerks for a period of two months. The ledger clerk's services were not utilized, as he was more urgently needed by the Forest Utilization Officer to pull up arrears of work. Subsequently, this clerk's post was transferred to the Forest Utilization Officer in G.O. No. 2003, Development, dated 27th November 1928.

Against two temporary clerks sanctioned for two months for the compilation of the Volume Tables, one was employed for less than three months.

Library.—Useful and interesting books were added to the library. The following books were ordered for the library before 31st March 1929:—

1. "Veneers and Plywood." By Knight and Wulpi.
2. "Air Seasoning and Conditioning of Timber." By Major F. M. Oliphant.
3. "Dry Rot in Wood." (Forest Products Research Bulletin No. 1.)
4. "Commercial Timber Trees of the Malay Peninsula." By Foxworthy.
5. "Modern Plywood." By Shirley B. Wainwright.
6. "Beautiful Floors." By Longbell Lumber Company.
7. "Casein and its Industrial Applications." By E. Sutermeister.
8. "Modern Furniture Veneering." By Edward W. Hobbs.
9. "The Principles of Kiln-Seasoning of Timber, Part I: Types of Commercial Kilns in use." By S. T. C. Stillwell.
10. "Timber Trade Lectures, 1927-28."

The first four books only were received within the year and the next five subsequently, as the order for most of the books was placed after October 1928. The remaining one book is expected to be received shortly. The books in the library are being constantly referred to by Forest officers and also by some business people. During the latter half of the year, the stock was examined and issues checked. The library is now functioning well.

The following periodicals were received and circulated by this office to the officers of the Engineering branch :—

1. "The Timberman."
2. "The Indian Forester."
3. "The American Forests and Forest life."
4. "The Australian Forestry Journal."
5. "The Mermaid."
6. "The Hardwood Record."
7. "The Tropical Agriculturist"
8. "The Timber Trades Journal."
9. "The Capital."
10. "Forestry: The Journal of the Society of Foresters of Great Britain."
11. "Empire Forestry Journal."

Out of these, Nos. 3 and 7 were ordered to be discontinued from January 1929. The rest are now being received regularly and their circulation has now been regularised.

Ledger filing.—The clerk sanctioned for this work was engaged otherwise in the Forest Utilization office. No appreciable work was done. But the new tour clerk appointed on 11th October 1928, is working at ledger-filing during his leisure, and the work is progressing since January 1929. Important articles from journals, etc., are being ledger-filed regularly now. A reference book is also being opened to facilitate reference.

Liaison between Forest Economists, Madras and Dehra Dun.—Closest co-operation and contact were maintained between this office and the Forest Research Institute, Dehra Dun, in the matter of supplies of timber for various tests carried out there, of specimens for identification, etc. The tests are carried out under projects. The Forest Economist, Dehra Dun, prepares a plan of research work every year. Supplies of timber for projects I, II, VII and VIII were made during the year and the costs were borne by this office, as was agreed upon in the Utilization Conference of 1922. The cost of supplies made and other particulars are furnished below in a tabular form :—

Pro- jects.	Names of species.	Wherefrom supplies made.	Quantity.	Cost.	Date of supply.
I and II.	1. Adina Cordifolia ..	South Coimbatore Division.	C. Ft. 259	RS. A. 254 9	March 1929.
	2. Terminalia tomentosa.				
	3. Calophyllum elatum..	Do.	330 and 9	254 10	August 1928.
	4. Dysoxylum malabaricum.		Disos.		
	5. Chloroxylon swietenia.	Vizagapatam. ..	5 logs of 3 to 5 feet girth.	Not yet supplied.	..
VII.	1. Eugenia Gardneri ..	South Mangalore.	747	441 12	December 1928.
	2. Dichopsis elliptica ..	Exploitation Division.	977	1,221 13	Dec. 1928 and Jan. 1929.
	3. Terminalia tomentosa.	Nilambur Division.	360	329 9	March 1929.
VIII.	1. Canarium strictum ..	Saw Mills and Extraction Division.	Each 1 log.	108 0	February 1929.
	2. Calophyllum wightianum.				
	3. Bischofia Javanica.				
	4. Cullenia excelsa ..				
	5. Dichopsis elliptica ..				
			Total.	2,620 5	

As regards Project VII (Kiln-seasoning), the Forest Research Institute is working through all the important Indian timbers and getting out charts of the optimum conditions for seasoning in drying kilns. It is reported that these are already being used largely by the Jubbulpore Gun Carriage Factory and the few others who have installed timber dryers. The object of this project is to demonstrate to timber users that the majority of Indian woods can be used for various purposes, provided, they are correctly seasoned first, and that it is unnecessary to specify teak for all purposes as at present. It is expected that the tests to be carried on Terminalia tomentosa, Eugenia Gardneri, and Dichopsis elliptica, will enhance their value and increase the demand for them. Logs of Terminalia tomentosa were asked for in January 1929, and they were supplied in March 1929.

The logs supplied for Project VIII, are for tests as to their suitability for Veneers and Plywood to be made into boxes and furniture.

The supplies of timber made for Projects I and II are for timber testing of small clear specimens and of constructional sizes, respectively.

Five logs of 3 to 5 feet girth were asked for by the Forest Economist, Dehra Dun, in November 1928, for test under Project I, as he was unable to obtain logs bigger than about 1 foot girth. As logs of the required girth are found available in Vizagapatam, the supply has been arranged from there. The supply will be made during the current year.

Project IV: Air Seasoning Experiment of Sleepers at Pollachi.—This work was entrusted to Mr. Benjamin, Forest Utilization Ranger, who carried out the necessary work, as per instructions contained in Project IV. The Experiment was concluded by Dr. S. N. Kapur, Officer-in-charge, Seasoning Section, Dehra Dun. He visited the place with Mr. Dwaraka Pershad, Lower Grade Assistant, with a kiln-operator and a kiln attendant, on 7th April 1929, and recorded the final observations laid down in the experiment. As the experiment is completed the 272 broad gauge and meter gauge sleepers were ordered to be auctioned. The results of the experiment are not yet to hand.

Tests of sleepers at Guindy—The results of the tests from Guindy, which were forwarded to the Imperial Forest Economist early in May 1928, were received back with his remarks, in February 1929. These were sent again to the Guindy College and they are now with the Principal.

Pacilneuron indicum.—Logs of this species for trial for golf shafts and fishing rods could not be supplied this year, as the area in which it occurs, was not reached by the Extraction Party. The supply will be made during 1929-30.

As the Madras and Southern Mahratta Railway were very keen to see how this species would serve as sleepers, 15 broad gauge sleepers were sent to Dehra Dun for 'preliminary tests' under Project IV. A complete report is not yet available, as strength, hardness, spike pulling tests, etc., remain to be carried out. The experiments carried so far, on preservation with antiseptics, have proved to be satisfactory.

Timbers supplied for Exhibition in the New Museum, Dehra.—A short summary of remarks on the merits of the Madras timbers supplied for the exhibition, was obtained during the year. It is very interesting and is given below :—

"Short notes of opinions formed on the several Madras timbers which have been through the shops both for museum exhibition work and for timber testing projects ;"

1. *Gluta Travancorica*.—This timber was made up into a semi-circular book and file cabinet and was also used in conjunction with the Burma *gluta* (*G. Tryanoe*) in the making of a carved exhibition sideboard. The timber works well, without any special workshop features having to be introduced. It also carves easily and cleanly and lends itself to an excellent spirit polish finish. Unfortunately, however, the consignment of this timber received from Madras gave heavy making up losses as the planks were short, narrow, waney and cracked. This, it is hoped, is the exception, as the timber is unquestionably a fine cabinet and furniture wood.

2. *Dalbergia latifolia*.—Part of this consignment was made into a small dining table which turned out extremely well, the working costs comparing favourably with those of teak. The percentage of waste in making up was low. This timber is without doubt excellent for furniture fitments, and general utility work. It will also peel and make up into a fine plywood, and the figure is such that quartered match effects can be obtained with judiciously cut veneers.

3. *Acrocarpus fraxinifolius*.—It is regretted that the consignment of planks received here were badly cracked, off colour and useless for exhibition. The planks were however used in the making of a store cupboard for petrol tins. Unless the planks received here were not fair specimens of the quality of this timber, it is doubtful if the wood would be taken up by the cabinet trade for other than backing, studding or something of that kind.

4. *Hopea parviflora*.—Is being made up into a small exhibition table. This stuff has a nice close grain, turns beautifully and can be brought up to an excellent spirit polish finish. The timber appears to be very suitable for furniture, and I should say it would both look well and stand up well as a parquet floor. *Hopea parviflora* should also be useful for interior fitments and possibly certain parts of railway carriage construction.

5. *Terminalia tomentosa*.—(Laurel) has been used in the making of several exhibits including a fire screen, lamp stand, seat crub, and a very handsome carved writing table. This timber was of a fine rich colour which stands out well when made into good class furniture. As is usual with this wood, however, we experienced some little trouble from cracking in timber over 3 inches thick, the carved legs of the writing table having to be made up twice before assembling the job. Since assembly and during the last four months the legs have again slightly opened. The drawers, which were originally a perfect fit, have been eased twice in the same period. Except for this defect the timber worked up well at a cost equivalent to that of teak working costs. A reciprocating frame saw with a good stiff medium gulletted hardwood tooth gave good conversion results.

6. *Mahogany* from Nilambur, Madras, though slightly interlocked, peels well and makes up into a fair plywood panel of not over ornamental figure. It stands up well under both water and mechanical tests. If this timber is available in commercial quantities at the right price, it would, in my opinion, be worthy of further consideration. A carved dining room side table was made from this timber which though very light in colour when newly made up, has toned down and richened considerably. Mahogany presents little or no difficulties in working up and appears to be very suitable for furniture work.

7. *Bischofia javanica* (bishop wood).—Bishop wood though containing a gritty substance (possibly resin) which makes the timber a little hard on fine edged machine tools, compares favourably with teak in the matter of working costs.

The colour is somewhat against this timber for furniture and cabinet making, but it should be suitable for constructional work and possibly parts of railway carriage building.

This wood can easily be brought up to a decent paint and varnish finish—not suitable for turnery work.

8. *Dysoxylum malabaricum* (white cedar).—A fine clean light coloured timber which when cut tangentially presents a fine mottled figure. The stuff is easy to work up to a good finish and will take a fine polish without preliminary filling. Should make up into good furniture and fitments and appears to be the type of timber suitable for bus and motor-car constructions and interiors.

9. *Terminalia paniculata* (kindal).—Kindal, in plank form, is subject to body and end cracks. Fibres are often interlocked and unsuitable for taking heavy gauge screws near the ends of planks, even when bored.

We have had trouble with seasoned kindal swelling and shrinking abnormally during various seasons.

The timber requires no special machine feature and works up to a fair finish quite easily. Not suitable for furniture but would probably do quite well for certain classes of constructional work, agricultural implements and a grade of plywood suitable for tea chests, if not too heavy.

10. *Vateria indica* (white dhup).—Easy to work up to a fairly decent finish under ordinary workshop conditions, not ornamental and therefore not suitable for better class furniture. This wood is open grained and not the type to take a polish. It could be varnished on top of a couple of coats of paint.

If treated with a preservative, this timber would be suitable for panel backings or work of like description or could be used in unseen jobs, such as drawer bottoms, backs and sides, etc. Would peel for cheap plywood and may possibly do for matches.

11. *Grewia tiliaefolia*.—A close-grained hard timber with plenty of life in it, straight grained, not difficult to work, but a little hard on high-speed cutters. A small amount of back bevel on plane knives and cutters is recommended; rather heavy and not sufficiently ornamental for furniture making. Working costs should not be in excess of teak or sal.

12. *Alstonia scholaris*.—was tried out at a moisture content of approximately 10 per cent. This specimen has been attacked by some form of pinhole borer which had eaten well into the heart of the timber; the resultant holes had taken up moisture, causing black stains.

The timber is soft and easily worked but does not appear to be durable.

Not suitable for good furniture and fitments but may be useful for making cheap brush backs, light packing cases, model-making, toys, light dry coopering, matches, pattern-making and shingles (if treated).

The mahogany supplied is now being identified.

As a result of the various species supplied to Dehra for tests and exhibition, the Imperial Forest Economist has directed to us some enquiries for timber.

Identification.—To identify the mahogany supplied from Nilambur for exhibition in the new museums, botanical and wood specimens of the two varieties of mahogany occurring in that division were collected and despatched to Dehra in May 1929. They are now under examination.

At the suggestion of the Chief Conservator of Forests, Madras, wood and botanical specimens of the commoner species of *Amora* and *Aglaia* were arranged for collection from Tinnevely forests. The specimens of the latter were despatched to Dehra in November 1928, while the former species has not as yet been identified by the Range officer, Kanhikuttu Range.

In December 1926, a specimen of a perfumed wood from Tripoli was received in this office through the Chamber of Commerce, Madras. It was forwarded to Dehra Dun for identification. It resembled that of *Lansium anamalayanum*. There was no such specimen at the Forest Research Institute and so the supposition could not be confirmed. Wood and botanical specimens of *Lansium anamalayanum* were needed by Dehra. Specimens supplied in August 1927 were found to be not that of *Lansium anamalayanum*. The collection of the specimens was again arranged with the Forest Engineer-in-charge, Exploitation Division, during the year under report and were despatched in May 1929. If the investigations that are now being carried out prove this species to be identical with that from Tripoli, then there will be a good market for this timber.

Specimens.—A fair quantity of wood specimens was distributed to enquirers both in India and abroad. The samples were supplied free to those who needed them from a business point of view.

Twelve pieces of *Grewia tiliaefolia* for trial as pick handles were supplied to the Indian Trade Commissioner, London, in September 1928, and they are now reported to be under trial.

Samples of *Rosewood*, *Indian laurel* and *Poon* were despatched to the Western Paint and Varnish Company, Duluth, U.S.A., for their exhibition of various woods of the world for interior finishing, with a view to developing some business in the United States. They were also requested to refer any enquiries they might receive to the Forest Utilization Officer, Madras.

No report on samples of *Anogeissus latifolia* supplied to the Indian Trade Commissioner last year for test as to their suitability for pick and shovel handles has as yet been received. We are, however, told that the firm to whom the samples of axle-wood were submitted for trial were very much occupied with business and that the report would be forwarded to us as soon as available.

The supply of a sample consignment of *Cullenia excois*, *Dichopsis elliptica*, and *Calophyllum tomentosum* logs was arranged to be made at cost price to the Western Indian Match Company, Madras, for trial as matchwoods during March 1929. The supply was made in May from Olavakkot.

Mr. Rudolph Block of New York is making a collection, upon a scientific basis, of the interesting woods of the world, in the form of walking sticks, as a medium for presenting the varieties and beauties of the species. He has collected up to now 1,400 sticks of different woods of the world. He is very desirous of obtaining a specimen wood of *Pleurostyliia wightii* in 1927, as he could not get a scientifically identified specimen from elsewhere. The supply was made from *Visagapatam* in January 1929, and the actual costs incurred were paid by Mr. Block.

As he was also anxious to obtain specimens of the ornamental and rarer woods that are found here, that were not included in his collections, he wrote to us in 1926. After some correspondence with him and Dehra Dun, a sample each of (1) *Acrocarpus fraxinifolius*, (2) *Calophyllum tomentosum*, (3) *Dysoxylum malabaricum*, (4) *Grewia tiliaefolia*, (5) *Lagerstromia lanceolata*, (6) *Pterocarpus marsupium* and (7) *Xylia xylocarpa* were despatched to him from Olavakkot during May 1929, as these species were not found in his latest list of collections.

Publications—Volume Tables.—The compilation of this work was done by Mr. Master. Out of the two clerks sanctioned for two months, only one was actually employed for under three months. The Volume Tables are now under fair print. Subsequently, at the suggestion of Mr. Richmond, Chief Conservator of Forests, Madras, the Preface to the Volume Tables was altered and some notes and instructions were also added. They have been submitted to the Chief Conservator of Forests for approval and will be forwarded to the Press on receipt.

The object of this work is to prescribe a common and ready method of calculation of round timber volumes, suitable to the Madras Forest Department, for adoption in all its depots.

In this connexion, the co-operation of Mr. Gilbert, Superintendent, Government Press, Mount Road Branch, is very much to be appreciated.

Market Report.—Early during the year, Mr. Master, the then Forest Economist, toured over all the important timber business centres of the Madras Presidency and West Coast with a view to study the market conditions, species most in demand, sizes, sale prices, uses and other technicalities of the timber trade. He interviewed many merchants and has written a very useful and interesting report, which will shortly be printed for the use of the various District Forest Officers and Conservators.

Cellulizing.—Government have been addressed to sanction a project for the testing of cellulizing process on our varied hardwood timbers for two years. This process, if not too costly, will have a tremendous influence in the uses of tropical hardwoods, now often little used on account of difficulty of seasoning them, their liability to quick decay in a tropical climate and to the attacks of termites. In other words, if practicable, this process would enable us to supplant teak and a few other superior timbers which are now growing scarce with other cheaper timbers.

Messrs. E. L. Bruce & Co., Memphis, U.S.A., the owner of the patents, have been addressed in January for the use of the patents on a non-commercial scale. Their reply is awaited.

Wood workshops at Olavakkot.—The construction of the workshops was completed during the year and work is now in progress there. Mr. Dawson, Forest Engineer-in-charge, Exploitation division, is in charge of the workshops. The object in running this shop is for establishing new uses for Madras timbers. Various articles of furniture, etc., were turned out in the shops and they were exhibited at Madras during the Park Fair and Exhibition, 1928–29. Some of the less known species, to which no particular uses have been prescribed, have been ordered to be tried for furniture.

Park Fair Exhibition, 1928–29.—This is an annual carnival held during the Christmas holidays, under the auspices of the South Indian Athletic Association, Limited, in the Presidency town and people attend it in numbers. This year we had the Wood Workshop working and we wished to

exhibit these products. The exhibit was intended to show the products being turned out in the Experimental Wood Workshop and Saw Mill at Olavakkot with a view to establishing the uses and qualities of local timbers. As the exhibition tended to bring us in contact with several sections of the public who were not familiar with our activities, we participated in the Exhibition with Government sanction; and Mr. Dawson, Forest Engineer, Olavakkot, was put in charge of the work. He came over to Madras with the exhibits and made the exhibition a success. Many of the exhibits were sold on the grounds and Mr. Dawson was able to canvass several orders for timber during the Exhibition.

The Economist's work is kept up and supplies of logs and samples to Dehra, etc., are arranged more promptly than had been possible in the past. The clerk's work under the supervision of the head clerk of the Chief Forest Engineer's Office has been very satisfactory.

The statement of costs of tools, etc., is appended hereto.

EXPERIMENTAL WOOD WORKSHOP.

The following is the report by Mr. E. S. Dawson, I.F.E.S., Forest Engineer-in-charge, Exploitation Division, Olavakkot:—

"The Experimental Wood Workshop was installed with a view to experimenting with various timbers for tool handles and furniture and for utilizing waste pieces from the Olavakkot Saw Mill.

The erection was completed at the end of March 1928, but it will be some time before regular work can be started as it is necessary to try out the market with various items of furniture to see in what direction the demand lays before proceeding to manufacture anything on a large scale.

Also we have to observe some of the timbers under various climatic conditions before we can be certain that they will be suitable for the purposes for which they are being tried."

Acrocarpus fraxinifolius has been found to be very satisfactory for door frames and the styles and rails of doors, but reacts to climatic conditions too easily in board form owing to the open grained nature of this timber to ever be a real success for panelling work. The colour which is a sort of salmon pink rather goes against it for a furniture wood, unless it is stained some other colour. It works easily, however, and is suitable for chairs and small teapots.

It is a timber which will no doubt be used more extensively for building purposes in the future than it is at present as it is fairly light and strong. It will also be suitable for three ply wood.

Albizia odoratissima has also been tried for furniture and found to be fairly satisfactory provided that it is well seasoned. It is rather too open grained, however, to be an ideal furniture timber, but it is not difficult to work and will stand up all right in almirahs and dressing tables providing that it is well varnished. It is not difficult to get nicely marked boards and it looks very attractive when it is made up. Would make a very fine veneer wood except for the presence of pin knots which occur rather too frequently for high-class work.

Nauclea purpurea has also been tried for furniture with satisfactory results in small articles but is not recommended for panelling work.

Lansium anamalayanum has been found just as satisfactory as *Dysoxylum malabaricum* for all furniture purposes and it requires an expert to tell the difference between the two timbers when they are made up. *Lansium anamalayanum* is somewhat softer than *Dysoxylum malabaricum* and slightly more open grained but it gives off the same pleasant cedar smell and is practically as durable.

Stereospermum xylocarpum has been tried extensively for office chairs, tables and desks and has proved particularly good. It is a moderately hard timber and takes a good polish. The light colour is rather against it for more high class furniture.

Calophyllum tomentosum.—Wide boards are easily obtainable in this timber which is fairly straight grained, soft, easily worked and takes a good polish. Cheap furniture is being experimented with in this timber and will doubtless prove satisfactory in fairly dry localities. It is a very attractive wood and will be suitable for three ply work and a certain class of veneer work. At present there is a large demand for it for motor-bus bodies for which it is ideally suited on account of its lightness and strength.

Grewia latifolia (tiliaefolia).—This timber has now become firmly established on the market for general building purposes. It is in demand largely for gun carriage poles on account of its strength and elasticity. Tool handles have also turned out satisfactorily and the wood turns and works easily. It is very close grained, takes a good polish and is suitable for small articles of furniture. It is not readily attacked by white-ants.

Terminalia tomentosum (Indian laurel).—This timber has been tried in various articles of furniture. It is extremely hard to work but it takes a very fine polish. It does not stand up very well in the solid in large articles of furniture in the Malabar climate and its real use is obviously as a high class veneer wood in European countries. Figured logs in this timber are in great demand at present for overseas shipment.

Hemicyclia Elata has also been tried and found to be excellent for tool handles.

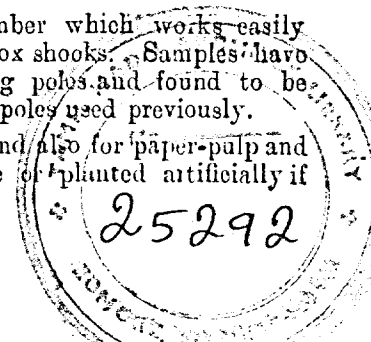
Wrightia tinctoria and *Adina cordifolia* have proved the best timbers for turnery purposes so far, for making penholders and trinket boxes. Both timbers can be lacquered easily.

Terminalia belerica.—The find of the year is considered to be *Terminalia belerica* as a tool-handle wood.

It is almost as good as *Grewia* for this work and once it is established on the market will provide a use for thousands of cubic feet of this timber which up to the present has practically been regarded as useless and left to rot in the forest. In fact this information alone is worth much more than the 15,000 rupees which Government have spent on installing the Experimental Workshop.

Polyalthia fragrans.—This is a light white timber which works easily and has been used extensively at Olavakkot for box shooks. Samples have been submitted to Jubbalpore for flag signalling poles and found to be very satisfactory for replacing the deodar and ash poles used previously.

It will be an ideal timber for three ply work and also for paper-pulp and should be encouraged to grow naturally if possible or planted artificially if necessary.



Timbers suitable for the above mentioned two industries and also for high class veneer work will be much more in demand in 25 years' time than *Mesua Ferrea* and *Hopea Parviflora* which are two of our best timbers at present but used almost exclusively for sleepers. They are both difficult to grow artificially, however, and now that the steel sleeper is rapidly replacing the wooden sleeper in India it seems futile to try and grow them at all, even for building purposes. Rolled steel joists are being used now where heavy wooden beams were used previously and neither *Mesua Ferrea* and *Hopea Parviflora* will prove popular in the future for building purposes on account of their excessive weight. Many of the timbers suitable for three ply work, paper-pulp and veneer work which are comparatively easy to grow are considered to be of little value now because these industries have not yet reached India.

But it is interesting to note that nearly half the world's supply of timber last year was utilized by the above three industries and this fact should be kept in mind when planting trees for the future.

The cost of the Experimental Workshop for the first year, i.e., 1928-29, is attached.

Chenat Nair Exploitation Experimental Workshop expenses for the year ending 31st March 1929.

	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
To cost of timber taken for manufacture, 1,090-4-00 cubic feet	1,542 15 0	1,542 15 0	By sale of furniture and manufactured articles	4,127 7 6	4,127 7 6
To Expenses—			By stock on hand, Timber 353-1-6 cubic feet	537 2 0	
Salary of Forest Engineer and Mechanical Expert	2,400 0 0		Manufactured articles	1,334 5 0	1,871 7 0
Wages	345 6 8				
To Salary of Establishment	954 1 3				
Manufacturing expenses	1,086 13 6				
Petty purchases of stores used up	662 11 0				
Fuel used	246 6 0				
Loss on revaluation in tools	41 7 0	5,736 13 5			
To Depreciation on Machinery	571 9 6				
Buildings	233 13 3	805 0 9			
To Share of Chief Forest Engineer's supervision	600 0 0	600 0 0	Loss on working .. .. .	.. .. .	3,415 12 8
To Interest on Capital	729 8 0	729 8 0			
			Total ..	Total ..	9,414 11 2

E. S. DAWSON,
Forest Engineer, Olavakkot.

PARK FAIR EXHIBITION, 1928-29.

*Report of E. S. Dawson, Esq., I.F.E.S., Forest Engineer-in-charge,
Exploitation Division, Olavakkot.*

It was decided to exhibit some of the products from the Experimental Wood Workshop at Olavakkot in addition to the various species of timber which are to be found in the Madras Forests.

A very keen interest was evinced by many timber merchants in some of our junglewoods, particularly Grewia and poon, which are not used extensively on the East Coast as yet. In fact owing to the thousands of people who passed through the booth every day during the afternoon and evening it was impossible to deal with all the enquiries.

While people were moderately interested in our ordinary country wood boxes and box shooks there were many more enquiries for boxes and chests made of three plywood and the general indications are that there would be a ready market for this commodity if we were in a position to supply it.

The general public were also interested in the camp furniture made in the Experimental Workshop at Olavakkot and practically all the exhibits taken up to Madras were sold. In this connexion it was noticed that there was very little demand for teakwood furniture provided that rosewood was available. Also white cedar and other light coloured species did not sell readily as opposed to the darker species. The camp rocking chair and the Roorkee chair appeared to be the more popular and were taken in preference to the camp folding chair and the ordinary deck chair. These points have been carefully noted for future reference.

It was apparent that all the products of the Experimental Workshop at Olavakkot would find a ready sale if only they are sufficiently advertised.

The only way in which this could be done would be to have a small show-room in some prominent place in Madras, or else get some well-known business firm to exhibit our goods for a fixed annual charge. A little later when the work has become more standardised a catalogue might be got out to advantage.

As a result of the exhibition this year orders for poon planks for motor-bus bodies from various firms amounting to over Rs. 25,000 annually were secured. Other important orders secured were poon for the Executive Engineer, Dowlaishweram, for constructing rafts, and karimarudu logs for Mr. David, Ceylon. Altogether over Rs. 30,000 worth of business was transacted and there is considerable scope for acquiring plenty of orders.

The ground acquired for the Forest booth this year, although larger than the previous year, was not nearly large enough for the exhibits to be properly displayed and it was found impossible to deal with enquiries and book orders satisfactorily with a large crowd surging through the booth all the time.

I would recommend, therefore, that a large area be acquired next year which will give sufficient room for a space to be set apart for an office where orders and enquiries can be dealt with. Also a larger staff of attendants will be required to regulate the crowds of people who pass through the booth and answer minor enquiries.

Only subordinates with a thorough knowledge of our various timbers are of any use.

I particularly want to thank Mr. Ramunni Menon, Ranger, Mr. Visvanatha Ayyar, Curator of the Forest College, and P. Kumaran, Accountant, for the hard work which they put in to make the Exhibition a success. These men had to give up the whole of their Christmas holidays and had to be in constant attendance at the stall from 8 a.m. to 10 p.m. daily."

V.—FOREST ENGINEER, MADRAS (CONSTRUCTION) DIVISION.

The Capital works undertaken by this division decreased largely during the year due to the completion of the programme for residential buildings and of the last of the major road construction projects.

As the amount of this type of work decreased, Capt. H. A. Irwin, on the completion of his agreement with the Forest Department, was transferred to the Mettur Project and the remaining work was very competently carried out by Mr. VanHaeften.

This work has since been amalgamated with that of the Chenat Nair Commercial Concern under Mr. E. S. Dawson, Forest Engineer, Madras.

ADMINISTRATION REPORT OF THE WORKS UNDER THE FOREST ENGINEER, MADRAS, FOR THE YEAR FROM 1ST APRIL 1928 TO 31ST MARCH 1929—

Officers-in-charge of the Division during the year were—

(1) Captain H. A. Irwin, M.C., Forest Engineer, 1st April 1928 to 10th August 1928 Afternoon.

(2) C. J. VanHaeften, Esq., B.Sc., Acting Forest Engineer, 10th August 1928 to 31st March 1929.

The works carried out during the year were—

(1) *Construction of a District Forest Officer's quarters at Chittoor, Estimate Rs. 20,000.*—This work was started late last year and about Rs. 2,000 was spent in that year. The work was completed within the year. Due to economy, it was found possible to do certain extra works not provided for in the estimate, such as a staircase, double-doors to the halls and dining rooms, etc.

The building was handed over to the District Forest Officer on 16th April 1929. The expenditure on the work was Rs. 21,861-13-2. Government sanction has been applied for an additional allotment of Rs. 2,130 to meet the excess cost of land acquired. The provision for this item in the original estimate was only Rs. 200.

(2) *Construction of District Forest Officer's quarters at Vellore, Estimate Rs. 23,000.*—The work was sanctioned early in the year, but was not started until September 1928 as a claim preferred by some Muhammadans in regard to two tombs on the site had first to be settled by the Collector.

Once started, rapid progress was made on the work and by the end of the year the masonry in the main building had reached roof level. When the work was in progress the District Forest Officer proposed an upstairs room in place of 2 rooms in the out-houses. His proposal was supported by the

Conservator. The matter was referred to the Consulting Architect to Government who finally decided on that the walls and foundations provided for in the estimates were not sufficiently strong to admit of a room in the upper story. Pending his decision, work on the outhouses was held up.

The work has since been transferred to the charge of the District Forest Officer, Vellore, under orders received from the Chief Conservator of Forests. The expenditure on the work during the year was Rs. 18,804-9-6.

(3) *Construction of a District Forest Officer's quarters at Olavakkot, Estimate Rs. 18,000.*—This work was sanctioned in G.O. Mis. No. 550, Development, dated 27th March 1928. The work was put in hand in May and completed within the year. The building was handed over to the District Forest Officer early in April 1929.

A small area of land, required for the well has yet to be formally acquired. The land itself was entered upon with the permission of the owner and work in it completed. Information as regards the actual cost of the land has not yet been received from the Revenue Department.

The expenditure on the work during the year was Rs. 16,474-7-0. The cost of certain wood, etc., has been adjusted in April 1929.

(4) *Construction of a road from Chedleth Saw Mill to Chedleth, Amount of Estimate Rs. 35,000.*—This estimate was sanctioned in G.O. Mis. No. 552, Development, dated 23rd March 1928.

Arrangements were made to start the work in April.

On account of dearth of local labour, the labour required had to be recruited from Palghat and other places. Owing to the locality being very malarious great difficulty was experienced in keeping these coolies on the workspot for any length of time. Fresh gangs had therefore to be frequently recruited.

Only stone slab culverts were provided for in the original estimate, but in place of eight of these armco pipes have been laid.

The work was completed within the year and handed over to the District Forest Officer on 30th April 1929.

The following survey works were done during the year:—

(1) Investigation of roads from Topslip to Sungam and Topslip to Karianshola.

(2) Investigation of a road to Ulandi Saddle.

(3) Investigation of roads in Silent Valley.

All these alignments have been inspected by Chief Forest Engineer and orders have been issued that levels be taken and detailed estimates prepared.

The following estimates were submitted during the year:—

(1) Construction of ranger's quarters at Beypore, estimate Rs. 3,000.

(2) Fixing a windmill to the well in the District Forest Officer's quarters at Mangalore, estimate Rs. 3,000.

(3) Extension of Anaipadi-Topsip Road, estimate Rs. 8,000.

(4) Construction of Topsip-Sungam Road, estimate Rs. 11,500.

(5) A rough cart-track from Topsip to Saddle in Karianshola, estimate Rs. 8,750.

(6) Construction of a road from Chellimalai to Patrakad, estimate Rs. 60,000.

(7) Road bridge or bridges over the Karianpuzha river near Nedunayam in Nilambur, estimate Rs. 1,00,000.

The maintenance of the Amarampalam-Anaipadi Road was handed over to the District Forest Officer, South Coimbatore, on 1st June 1928, as also the maintenance of the telephone line from Pollachi to Anaipadi.

(General)

The following officers and subordinates were working during the year:—

(1) Mr. C. J. VanHaoften, Extra-Assistant Conservator, was engaged in supervising works at Olavakkot and Investigation works at Silent Valley, Topslip, etc., till he took charge of the division on 1st August 1928.

(2) Mr. K. P. Chatthu Nayar, was in charge of Chedleth road work which he completed satisfactorily.

(3) Mr. H. Myers, Ranger, was in charge of the Investigation works at Topslip and Silent Valley, after the Amarampalam-Anaipadi road and the telephone lines were handed over to the district. The alignments were done satisfactorily.

(4) Mr. C. S. Ramanathan, Ranger, was in charge of the construction of the District Forest Officer's quarters at Chittoor and Vellore. Both works have been carried out satisfactorily.

(5) Mr. C. Sridharannadiar, Forester, was in charge of the construction of the District Forest Officer's quarters at Olavakkot. The work has been completed satisfactorily.

(6) Mr. Sheikh Muhammad, Forester, was employed in assisting Mr. K. P. Chatthu Nayar on the Chedleth Road. He died on 1st August 1928 of severe malaria.

The office establishment consisted of 1 Accountant and Manager, 2 clerks, 1 typist and 1 tracer.

The two clerks' posts have been abolished as per orders of the Chief Conservator of Forests with effect from 1st May 1929.

A statement showing the expenditure on all works in Form Nos. 70 and 85 are enclosed.

VI.—SAW MILL AND EXTRACTION DIVISION.

While considerable new work was turned over to this division during the year general progress was made.

The congestion of carting at Parappa and Chedleth was removed and costs of operation were reduced in all activities except in the case of the Pollachi-Topsip Saw Mill which was moved during the year and where special conditions existed which seriously affected its working.

The division is still seriously hampered by having to keep two entirely separate sets of accounts, one of them entirely hypothetical which does not present the true financial condition of the concerns. In all, sixteen sets of separate accounts have to be kept.

In addition to this the office work is continually upset by the visits of auditors. During the first five months of the current year, for three months auditors were in the office and current work could not be kept up. This condition of affairs is entirely unnecessary and also adds excess charges on to the accounts of the concerns without any resulting benefit.

2. *Central Stores*.—This section has worked very satisfactorily during the year and has proven to be an undoubted economy to the concerns which it serves.

3. *Beypore Saw Mill*.—While a smaller quantity of logs was converted during the year, sawing costs were reduced by over 2 annas per cubic foot and the average selling price for the outturn increased by over 2 annas per cubic foot. The selling price is now over Rs. 3-5-0 per cubic foot as against Rs. 2-10-0 in 1926-27 and Rs. 3-2-0 in 1927-28, an advance of over 11 annas per cubic foot. This shows the value of gradually working up the sale of *graded* sawn material. During the same period teak log prices have increased by 7 annas per cubic foot due largely to the selling of logs by grades and to the removal of the inferior grades from the market.

4. *Pollachi-Topslip Saw Mill*.—This saw mill, alone of all the activities of the division showed a poorer result than for the previous year. This was due to the dislocation caused by the move; to an exceptionally bad fever season at Topslip which caused crew after crew to run away or left the few men remaining too weak with fever, or too few in numbers to run the mill; and to the inefficient control exercised by incompetent foresters and foremen in charge of the mill.

Fortunately, these disabilities have now been overcome and the mill is fast approaching the efficiency of the other saw mills and will make a very decided improvement during 1929-30.

It is a surprising thing that while log prices have advanced 5 annas per cubic foot to an average of Rs. 1-12-0 for 1928-29 due to the removal of old surplus logs stocks and to the careful regulation of sales, the price for sawn material has declined until on an average only 2 annas more per cubic foot is received for sawn material than is obtained for the better class logs.

Only 38,543 cubic feet of logs were sawn by this mill as against 65,394 cubic feet during 1927-28. This smaller intake accounts for the increase in the cost of sawing. The conversion percentage increased from 30.8 per cent to 34.9 per cent but is still the lowest of any of the saw mills and is due to the very poor class of logs consumed. These logs are measured without allowances being made for defects which is bound to make the mill costs high.

5. *Chedleth Saw Mill*.—While the costs of sawing at this mill have improved by 2 annas per cubic foot during the year the intake of logs decreased from 51,848 in 1927-28 to 41,084 cubic feet. The percentage of conversion increased from 27.7 per cent to 37.1 per cent.

Here as at Topslip conditions have improved immensely and the mill is now approaching normal efficiency.

The striking thing about this mill is the fact that the prices received for material other than teak at Nanjangud are very much better than those received for similar material in the Madras Presidency. This also seems to be the case with regard to log sales.

6. *Parappa Saw Mill*.—This mill continues to be the spot mill of this division. Costs were again reduced during the year by over 4 annas per cubic foot. The intake of logs was increased from 64,683 cubic feet to 82,618 cubic feet and the outturn percentage increased by 4 per cent.

7. *Kal Ar Valley Sleeper extraction*.—The profits on this operation have considerably increased. The number of sleepers produced only increased from 12,680 to 12,718, but 751 *kolmarams* and *chattams* were extracted in addition to the sleepers.

8. *Nilambur Mechanical extraction*.—This operation was hampered by its late start which threw the entire programme of operations out of gear due to the fact that the machine can only be moved across the rivers from one field of work to another between monsoons. It was only able to put in about five months of effective work which seriously affected costs.

A more normal schedule of operation should be reached during 1929-30.

9. The report of the Forest Engineer in charge of the division follows:—

SAW MILLS AND EXTRACTION DIVISION—ADMINISTRATION REPORT.

During the year under review the work of the division has been increased by—

- (a) Taking over from Utilization division the transportation of sawn outturn from Chedleth Saw Mill to the depot at Nanjangud.
- (b) Taking over from Utilization division the transportation of sawn outturn from Parappa Saw Mill to Kasaragod depot.
- (c) Care and maintenance of water-supply for Topslip settlement.

Staffs.—A fairly efficient staff of machine operators has been obtained for all mills, the majority of these men have started as coolies and worked their way up. There is no difficulty in retaining men at Beypore and Parappa, but in the case the Chedleth Topslip, few men, however well

paid, will remain after two or three attacks of fever. In many cases they become so weakened from fever that they are of very little use. The greatest difficulty is experienced in recruiting any kind of labour for either of these mills.

Charge.—The charge of the division was held as follows:—

W. F. Chipp, Esq., 1st April 1928 to 22nd June 1928.

6th November 1928 to 31st March 1929.

J. A. Wilson, Esq., 23rd June 1928 to 5th November 1928.

Office.—In October last Government sanctioned the two remaining posts required to complete the office staff.

2. After considerable delay in finding candidates with the necessary qualifications, both posts were filled and the work of overtaking the heavy arrears of various sections was commenced. At the close of the year much had been done, but to bring the work to a proper state of efficiency there is still leeway to make up.

3. Both Code and commercial accounts are maintained for all concerns. The office is inspected and test audited by the Accountant-General. The Assistant Director of Commercial Audit also quarterly audits all accounts. With two different audit staffs examining and perusing books and accounts, the office is more often than not being audited. These continued audits considerably interfere with current work, before the arrears of work caused by one audit can be overtaken another is due and so on, in this way the office work can very seldom be said to be up to date.

Central Stores.—During the year the stock of Tractor spares from the Chanat Nair Exploitation division was taken over, and the supply of all Tractor spares for both divisions is now made through this agency.

2. The stocks of all spares and stores maintained has proved adequate for all ordinary repairs and replacements. This method of supply has fully justified itself and caused a considerable financial saving to the various concerns who draw their supplies through this section of the division.

3. During the year various items in stock are often checked and at the final check and audit on 31st March 1929, it was found that there were no deficiencies.

On 1st April 1928 the opening balance of stores was Rs. 11,256-0-7.

At the close of the year the stock was Rs. 28,448-3-1. (Tractor spares Rs. 15,382-12-3.)

Beynore Saw Mill.—The remodelling of this mill during the previous year has fully justified the expenditure incurred.

2. In December 1927 a key press was ordered from Messrs. Marshall Sons & Co., Ltd., Madras, patterns of the keys required to be made, were forwarded to the Firm on 6th February 1928. The machine was received and erected on August 1928, it was then found that no index plate to the cutter blocks had been supplied by the makers. Also that, despite pattern keys having been sent, the carriage to receive the block of wood to be shaped for a key was 1 inch too short. Several other defects were found. The Firm sent their Engineer to examine the machine and he acknowledged it was not to specification. Various parts have had to be returned for alterations and at the close of the year these had not been received back.

3. The intake of logs was 86,090 cubic feet and the outturn 45,280 cubic feet with a final conversion of 52.6 per cent which considering the class of logs converted at the high standard of grade required in outturn is considered good. In addition to the sawn outturn 464 tons of slabs and rippings and 4,217 cubic feet odds and ends were obtained.

4. No railway sleepers were sawn during the year, the work being confined to special size orders and stock sizes.

5. The maximum working hours were 2,415, of which 2,358 hours were worked by machines, only 57 hours or 2.3 per cent were lost by breakdowns. Considering that two of these petrol engines are nearly ten years old, this is a creditable record for the staff.

Topslip Saw Mill.—This mill was moved from Pollachi to Topslip in March of last year.

2. The operators who had received a certain amount of training at Pollachi refused to work at Topslip and left shortly after the move. Operators from other mills when ordered to Topslip invariably resigned. A new staff had therefore to be trained, some months were taken up in obtaining suitable men and then more time in training them. Malabar men have proved the best type to train for machine work, but unfortunately they will not go to this district, and others had to be searched for. During the whole year this constant changing of men has taken place and it is only now after nearly a year's work that a passable crew has been got together.

3. The position of the supply of coolie labour for semi-skilled work has been more difficult than that for operators. The near-by plains men will only remain at Topslip for a limited period, and a further difficulty arises because they have not the slightest aptitude for this class of work and cannot learn even by constant repetition. Coolies were imported from other districts but these constantly ran away. A trial is now being made with some men from Cochin State but they are not a promising lot.

4. The mill also suffered by having two unsatisfactory and lazy foresters who did very little except complicate the very simple accounts. A forester is now posted here who has been tried and has done good work at another mill.

5. A Fordson engine and winch, transferred from Chanat Nair Exploitation division where it was no longer required, was erected in February. This engine will drive the re-sawing section of the mill and relieve the steam engine of this work. The whole of the machines required about 25 per cent more power than the steam engine could develop. This alteration has made a great improvement to the cutting speed of the machines. In addition the winch has been rigged to work a yarding cable by means of a gyn pole and logs from the farthest corner of the depot can now be fed to the breakdown saw without having to be moved by elephants or carts. In addition to effecting a considerable financial saving, it allows the mill staff to obtain any species or size of log required for the mill within a few minutes of the need arising.

6. An experiment was made in altering the length of the Bolter machine to allow longer pieces up to 17 feet to be re-sawn. This has proved most successful and increased the utility of this machine by 50 per cent.

7. The Super-Sentinel Steam Engine has given a considerable amount of trouble; this has been chiefly due to the fact that the machines required about 40 per cent more power than the maximum developed. Several new tubes have had to be fitted and the firebox rebuilt. With the installation of the Fordson (paragraph 5 above), the position has been considerably improved.

8. The in take of logs was 38,543 cubic feet and the outturn 13,408 cubic feet giving a final conversion figure of 34.8 per cent. In addition, slabs and porotes were obtained.

9. The maximum working hours were 1,827 of which 1,788 were worked. The work during the year has been most unsatisfactory due to the causes beyond our immediate control. With the alterations and additions carried out at the close of the year, it is confidently expected that a big improvement will be effected in the coming financial year.

Chedleth Saw Mill.—At the close of the year it was found that the majority of the operators had become practically useless through constant attacks of fever. The whole of the badly infected men were got rid of and replaced by surplus men, from the discontinued shift at Olavakkot Mill, who have continued to work in the mill during the year.

2. The last of several useless foresters was got rid of and the post temporarily filled by a liange officer who has had a most difficult task in rectifying the timber accounts incorrectly kept by two successive foresters.

3. The transport work of sawn outturn to Nanjangod was taken over from the Utilization division in October, and the long-standing accumulation of over 20,000 cubic feet was transported to Nanjangod before the end of December. Considerable delay and trouble arose in getting receipts from the depot for what had been delivered, but as soon as this had been cleared up the final results of the census, carried out by Mr. Mathew, Assistant Conservator of Forests in March and April 1928, were completed and the accounts compiled correctly up to date.

4. Considerable repairs and renewals were necessary, caused by a number of incompetent operators who had from time to time been employed. These were carried out and the in take raised to over 6,000 cubic feet per month at the close of the year.

5. The supply of coolie labour has improved and if the present men can be retained should not cause as much trouble as in previous years although owing to the mills' isolated position it will always be a difficult problem to maintain an adequate and useful labour force.

6. The majority of the old useless logs had been either converted or disposed of at the close of the year. The new stock delivered was of a much superior grade and from such, a fair percentage of outturn can be expected.

7. The in take was 41,084 cubic feet and the outturn 15,249 cubic feet with a final conversion of 37.1 per cent. Considering the quality of the logs this percentage is satisfactory.

8. The maximum working hours were 2,261 of which 2,078 were worked, the mill was idle for nearly one month during the change of operators.

9. During the year the health of everyone has much improved, the work of the compounder has proved most efficient and the average time lost due to sickness has been greatly reduced.

Parappa Saw Mill.—This mill has worked constantly during the year under review. Practically no changes have occurred amongst staff or operators. An ample supply of fairly useful coolie labour is available.

2. To complete the thorough conversion of slabs an additional Rip Bench was added, this has enabled much closer conversion to be made and the percentage of outturn increased by 4 per cent.

3. The work of transporting outturn from the mill to Kasaragod was taken over from the Utilization division in October and all arrears cleared up by December.

4. The sale of porotes and ripping of teak species is satisfactory, but very little demand exist for waste of other species.

5. The in-take of logs was 82,618 cubic feet and the outturn 38,572 cubic feet giving a final conversion of 46.7 per cent.

6. The maximum working hours were 2,463 of which 2,431 were worked.

7. The work of the mill for the year was most satisfactory.

Aletti Crossing—Temporary Bridge.—A temporary removable bridge was constructed over the Paiswani River at Aletti, the total length being 180 feet in 12 spans.

2. The bridge is constructed in sections and can be laid or removed by a few days work.

3. A full note giving the details, etc., was submitted by Mr. J.A. Wilson, Deputy Conservator of Forests, on 16th May 1929.

Kal Ar Valley Sleeper Project.—The work of sleeper extraction proceeded along the north side of the Valley, the yield remaining fairly even until the junction of the Nal Ar with the Kal Ar was reached; from this point eastwards it becomes gradually less and it is proposed to cease work about 2½ miles from the junction of these streams where the yield will not justify any type of road and the dragging becomes too expensive to extract it at a profit.

2. The soil formation cart road has now been completed for about 3½ miles and only about 400 yards remains to be made in the next year. At present it is proposed that this road shall terminate at this point as the yield further up the valley will not justify a cart road.

3. It is estimated that there is sufficient yield on the present working side of the valley to last until September or October next. After completing the north side arrangements have been made to continue on the southern side of the valley.

4. *Labour.*—The position has improved and sufficient sawers were obtained to complete the arranged programme.

5. The outturn during the year was 11,792 B.G. and 926 M.G. all of *Mesua ferrea* species and 251 kolmarams and 500 chattams of *Dichopsis elliptica*.

6. No advances were made to contractors and no bad debts were incurred during the year.

7. No contribution has been received from the Cinchona Department towards the roads constructed upon the area.

Nilambur Mechanical Extraction.—This section was formed for the mechanical extraction from the various Nilambur Valley Forests.

2. The equipment was purchased from the Coorg Forest Department and consisted of one Holt 46/60 10-ton Caterpillar Tractor with two drum attachment, various wire ropes, blocks and tackle.

3. The engine reached Nilambur at the end of March 1928 but owing to various delays the equipment was not received and work started until the middle of May.

4. A complete logging crew had to be recruited and fortunately a fairly good tractor driver was available but the whole of the remainder had to be recruited and trained. Local coolies were not the right type, and men were obtained from the Mannarghat district. To commence, a forester who had experience of Tractor yarding was loaned by the Chenat Nair Exploitation Division and afterwards replaced by a forester of this division.

5. The delay in receipt of the equipment threw out the entire programme of work and caused considerable expense in moving the tractor to other areas when the river was in flood.

6. By October the crew were becoming of some use, work began to improve and continued so until the areas on the right-hand side of the Nilambur river had been cleared up about the middle of December. It was then proposed to take up other work in the Nedungayam area but owing to changes in the programme of work the area was not ready. The result was that at the end of December the engine had to be laid up and crew discharged. This was most unfortunate as several months' teaching at considerable expense was thrown away.

VII.—CHENAT NAIR EXPLOITATION DIVISION.

The results of the past years' work again show a decided improvement and the concern is now not only paying for its actual cost of operation but is paying back to Government Rs. 53,257 in part costs of roads, depreciation on plant and machinery, etc. During 1929-30 the concern should return nearly a lakh of rupees to Government in such overheads and in addition be entirely self-supporting. As the gradual placing of sawn jungle woods on the market is a most important factor in improving the financial outturn of the Government forests, this saw mill is serving a most useful purpose and the benefits from such pioneer work will be increasingly apparent in the forest surpluses in years to come.

2. The Forest Engineer's remarks on the charges made to the concern for depreciation of permanent metalled roads are very much to the point as this charge is made on an asset that does not and cannot depreciate. Taking this charge which amounted to Rs. 29,287 and interest of Rs. 31,743 neither of which would be charged in actual commercial accounts the concern really made a net book profit of Rs. 15,544 during the year, besides which it carried Rs. 6,900 of the cost of the Chief Forest Engineer and his office; Rs. 6,196 of leave and pension charges, and paid Rs. 11,691 on depreciation of plant and machinery and running in charges. Thus Government had a net gain, from the concern

during the year of Rs. 28,640 which it will lose when the plant is closed down; also as pointed out above this net gain to Government will be more than doubled in 1929-30 if the plant is permitted to operate for the entire year.

3. The changing values in forest produce mentioned by the Forest Engineer is a very important point to be considered in planning future forest policy. The use of lumber as such is fast being supplanted by its conversion into veneers, plywood, paper pulp and fabricated and built up lumber. This means that the forest growth of the future will consist largely of quick growing timbers which can be managed on short rotations. Of this growth every item will eventually be utilized from the natural gums and resins of the wood to the bark and twigs. Forestry will then become much more of a commercial function than it is at present.

4. The Wood Workshop is fully justifying itself and is producing valuable results at a very small net cost to Government.

5. The machine shop is cutting down our repair bills and reducing the time lost by breakdowns.

The Report of the Forest Engineer, Olavakkot, follows:—

ADMINISTRATION REPORT, 1928-1929—CHENAT NAIR EXPLOITATION DIVISION.

Introduction.—The forecasted improvement of the financial position of the Chenat Nair Exploitation Commercial Concern during the year has been fully realized in accordance with the budget figures submitted in September 1927, when a loss of Rs. 51,100 was budgeted for as opposed to Rs. 2,43,731-8-9 in 1926-27 and Rs. 84,776 in 1927-28, the actual loss for 1928-29 being Rs. 45,486-2-0. This loss is composed entirely of indirect charges as follows which would not have to be charged at all in ordinary accounting by a non-commercial division:—

	Rs.
Interest charges on capital investments	31,744
Chief Forest Engineer's overheads	7,200
Leave and pension contribution	7,154
Passage pay contribution	600
Audit fee	1,000
	47,698

The interest is, of course, a profit to Government and can, therefore, be ignored when estimating the actual loss.

In addition a sum of Rs. 29,287-4-0 has been placed in the Road Depreciation Reserve Fund and Rs. 4,026-8-6 has been charged against this year's profit and loss account out of the Rs. 10,000 spent in completing the Olavakkot-Elival main road in 1927-28. This should really have been charged to capital instead of which this division has had to meet it out of revenue.

Also Rs. 14,478 has been paid towards depreciation of plant and machinery, and Rs. 3,253 for running in charges when the mill was erected in 1924. It will be seen, therefore, that Rs. 98,743 has to be met annually, i.e., Rs. 47,698 in indirect charges and Rs. 51,045 in depreciation to roads, plant and machinery before there can be any thought of making a profit.

Out of this total of Rs. 98,743, a sum of Rs. 53,257 has been paid during 1928-29. Thus by keeping the mill running, Government have recovered Rs. 53,257 which they would have lost if the mill had been closed down as was proposed.

While the charges made in regard to depreciation of plant and machinery are fair, the charges in regard to road depreciation are unduly heavy.

For instance there is no actual depreciation on a main metalled road, which is being fully maintained in good working condition annually out of revenue charges. Yet this division is being called upon to pay off the sum of Rs. 31,985 in depreciation charges on the Olavakkot-Elival road which is and will continue to be the main artery to more than half of the Chenat Nair reserve forest. Also even though the temporary roads were built in the first instance for the Exploitation Division, yet they have opened up many thousands of acres of what were previously inaccessible forests and have improved the value of these forests three or four hundred per cent. This should now be taken into consideration and the depreciation charges on all these roads revised.

For instance, a sum of Rs. 10,000 annually can now be realized by the Palghat Division from the Elival Valley forests by sales of firewood, bamboos and minor forest produce alone on account of these roads being in existence. Even if Rs. 5,000 a year is spent on maintaining them which is more than would be required in the ordinary way—there will still be a surplus revenue of Rs. 5,000 annually.

It is, therefore, unreasonable to assume that these roads have no value when the exploitation work is finished and the amount chargeable to the Exploitation Division as depreciation should be made in proportion to this fact instead of making it write off the total value of the roads as is being done at present over a short period of about three years.

Logging and exploitation.—The policy adopted during the year was to convert all *Hopea*, *Mesua ferrea* and *Cylia Xylocarpa* into sleepers in the forest and bring all other timbers to the mill to be sawn into scantling and box boards according to the species.

The following quantities of sleepers were sold during this year compared with quantities sold last year :—

	1927-28.	1928-29.
Broad gauge	7,259	12,439
Meter gauge	11,999	11,018
Special	502	245
Narrow gauge	52	...

The revenue obtained for these was Rs. 1,25,790, the gross profit being Rs. 66,875-5-0 from which the following overheads had to be met :—

	RS.	A.	P.
Share of Forest Engineer's pay and establishment and Chief Forest Engineer's charges.	9,441	2	4
Depreciation to roads	6,542	12	0
Repairs to roads	2,787	10	8
Forest Utilization Officer's overheads.	4,813	0	0
Total	23,584	9	0

The net profit was, therefore, Rs. 43,293-12-0 on sleeper operations one.

The actual cost per sleeper is given below, overheads being shown separately for comparative purposes with non-commercial divisions :—

	1927-28.			1928-29.		
	RS.	A.	P.	RS.	A.	P.
Broad gauge actuals including clamping and loading.	3	9	9	3	8	3
Overheads	2	1	0	1	6	6
Total cost	5	10	9	4	14	9
Meter gauge actuals including clamping and loading.	1	11	9	1	10	11
Overheads	0	15	10	0	10	10
Total cost	2	11	7	2	5	9

Logs.—Work was organized so that the top areas worked in the dry weather and the lower areas during the monsoon. The work is getting further away from the mill all the time and a slightly higher carting rate had to be paid. Also the tractor yarding costs were slightly higher this year owing to the poor stand and scattered nature of the timber and the frequent long moves to new rigs that had to be made. Over the total area worked the average stand was not even 200 cubic feet per acre.

Such a poor stand is extremely difficult and expensive for mechanical logging but next year we shall have reached the area where there is an average stand of over 400 cubic feet to the acre and yarding costs will decrease considerably. There was 150,364 cubic feet of timber felled for the mill and 86,554 cubic feet for sleepers during the year. One lakh sixty seven thousand five hundred and eighty three cubic feet was yarded, the excess under yarding being forest balances from the previous year. The tractors yarded 84,500 cubic feet of this and the balance was yarded by elephants in the lower areas during the monsoon.

It is owing to the fact that we managed to keep the felling, yarding and carting work in full swing during the monsoon that we have been able to show a reduction in cost of logs delivered at the mill this year in spite of increased actual charges, as the overheads were able to be distributed over a larger quantity and were consequently less per cubic foot.

The same applies to sleepers and out of 23,702 sleepers obtained more than half were sawn during the monsoon months. Considering that the average rainfall in the Elival Valley is about 175 inches, it is no mean feat to keep work going on all the year round and the Forest staff have worked very hard to accomplish this, particularly Rangers Ramunni Menon and Sankunni Menon and Foresters Muthanna and Achayya.

Ranger Sankunni Menon was deputed to the Phillipines in September 1928 for training in Forest Engineering and Ranger Ramunni Menon was left in charge of the entire extraction work, i.e., felling and logging, tractor and elephant yarding, sleeper sawing and all carting work in addition to the construction of several miles of new roads. He managed the whole of this work in a quiet and efficient manner and a great deal of the improvement in the financial position of the division this year is due to his loyalty and devotion to duty.

One lakh seventy-seven thousand and six hundred cubic feet of logs, 52,342 cubic feet of sleepers and 4,356 cubic feet of vittams and other sawn produce were carted to Olavakkot, i.e., 2,34,298 cubic feet of timber altogether in addition to 72,527 cubic feet of fuel.

The actual cost of logs delivered at the mill was Re. 0-9-5.16 plus Re. 0-5-8.86 overheads or Re. 0-15-5.02 per cubic foot altogether as opposed to Re. 1-0-3.14 in 1927-28.

About four miles of Forest road and 2,200 yards of 6-foot bridle path was constructed during the year at a cost of Rs. 20,000. A rest house was also constructed in the Top area at a cost of Rs. 2,980. Also temporary quarters for the subordinates and tractor crews were built at a cost of Rs. 1,447 and will be occupied immediately after the monsoon to enable these men to spend more time on the work instead of wasting so much time travelling to and from Olavakkot.

Heavy monsoon damages was sustained on the Forest roads and Rs. 1,878 had to be spent in repairs to these roads.

Saw Mill.—In 1926-27 a double shift worked throughout the year and in 1927-28 a double shift worked for six months and a single shift for the other six months.

During the year under review the mill worked only one shift yet more cubic feet of logs were converted than in 1926-27 when a double shift was working all the time and a much higher percentage of outturn was obtained. The following table shows the quantities of logs converted, outturn obtained and the cost of sawing (including overheads) during the past four years.

Year.	Logs converted.	Sawn outturn.	Percentage of outturn.	Cost of sawing per cubic foot.	Cost per cubic foot of sawn timber.
	C. FT.	C. FT.		RS. A. P.	RS. A. P.
1925-26	63,705	35,375	51.00	1 15 1.1	3 11 1.1
1926-27 (a) ..	176,025	75,648	43.02	1 4 3.98	3 8 0.49
1927-28 (b) ..	165,827	85,986	51.85	1 1 0.006	2 12 9.70
1928-29 (c) ..	176,451	102,857	58.29	0 11 8.49	2 6 4.32

(a) Two shifts, full time. (b) Two shifts for 110 days. (c) One shift.

It will be seen from the above that considerable improvement has taken place in outturn and that the sawing cost has been steadily reduced.

In fact for this year the *actual* cost of sawing is only Re. 0-6-9.55 the balance of Re. 0-4-10.94 being overheads.

The year was started with an opening balance of 13,256 cubic feet and 58,357 cubic feet of junglewood scantlings were handed over to the Utilization Division during the year. 27,586 cubic feet was sold by them through the Agent and 5,985 cubic feet (less 1,350 cubic feet which was actually sold by this division and passed through the Forest Utilization Officer's books) were sold direct leaving a balance of about 38,000 cubic feet in stock on 31st March 1929.

The sales made by this division realized a little over the cost of production while those made by the Utilization Division resulted in a dead loss of over Re. 1 per cubic foot. It is obvious, therefore, that the more special orders we can get the better as less will go into stock to be sold at a loss.

Dry kiln.—The kiln was working fairly regularly during the year and 21,100 cubic feet of timber was seasoned. The actual cost for the year is Re. 0-5-0 and including overheads it comes to Re. 0-7-6 per cubic foot against Re. 0-9-7.85 per cubic foot for 1927-28. The cost would have been reduced further had it not been for the big cross sections of hardwood species seasoned for executing military orders for which an enhanced rate for seasoning would have been charged.

The capacity of the kilns has been increased considerably since the remodelling of same last year and more uniform and satisfactory results have been obtained.

Box section.—The box section was not working to full capacity during the year, as there were not sufficient box boards and only 18,228 cubic feet of timber was available for manufacture.

Machine shop.—The machine shop belonging to the Saw Mills and Extraction Division and attached to this Saw Mill was working throughout the year and all petty repairs, etc., to the machinery were done by our own staff at Olavakkot as well as petty repairs for other portable mills under the Forest Engineer in charge, Saw Mills and Extraction Division.

Half the share of interest and depreciation on the above machinery was charged to Saw Mills and Extraction Division.

The high percentage of outturn and low cost of production in both logging and in the Saw Mill were due to the retrenchment effected during the previous year, closer supervision and because staff are getting more experienced and efficient.

Total sales have again increased from Rs. 2,39,545-13-6 to Rs. 2,58,399-14-7 as shown below:—

Classification.	1926-27.	1927-28.	1928-29.
	Value.	Value.	Value.
	RS. A. P.	RS. A. P.	RS. A. P.
Sleepers .. ..	.. ..	1,00,331 6 0	1,25,790 6 0
Sawn timber	1,08,295 13 1	1,06,693 15 8	85,378 12 7
Manufactured articles	23,585 15 10	10,958 7 8	23,332 9 0
Kolmarams, vittams, etc. .. ..	.. ..	8,749 8 0	3,580 2 0
Logs	11,488 2 11	1,964 2 0	8,759 13 0
Fuel	4,114 3 6	5,678 9 2	4,876 12 0
Bamboos .. ..	.. ..	5,169 13 0	5,625 0 0
Miscellaneous	1,093 12 10	.. ..	1,647 8 0
Total	1,48,678 0 2	2,39,545 13 6	2,58,399 14 7

General.—There was nearly a 50 per cent improvement in the financial position this year over last year's figures and with better conditions for the tractors and reduced costs in yarding and sleeper work which are certain to be effected this current year the position is more encouraging, and there is no doubt but what we shall be able to just about balance the budget for the first time. Everything depends on the sales of sawn timber however. At any rate, we know now that practically all our jungles can be disposed of at a profit providing that the total cost of extraction is not more than eight annas per cubic foot and the milling charges not more than eight annas.

Some of the better class species can even be extracted profitably up to twelve annas per cubic foot—but for general purposes the average selling rate should be taken as Rs. 1-8-0 per cubic foot for most classes of jungles and future exploitation schemes should be based accordingly on that figure.

The charge of the division was held throughout the year by Mr. E. S. Dawson, I.F.E.S.

VIII.—FOREST UTILIZATION DIVISION.

The work of this division improved considerably during the year. Sales increased by nearly a lakh of rupees to over 13 lakhs and more important still the overheads were reduced from 6·7 per cent of the turnover to 3·8 per cent.

The expense of selling would have been further reduced had Government seen fit to pass orders on the new agreement negotiated with the Agent at the end of his current contract early in November 1928. This new agreement would have reduced his commissions by $3\frac{1}{2}$ per cent from 11th November 1928 onwards. However as no orders were passed he benefited throughout the remainder of the year by being able to retain his old commission rate.

2. Fifty-five thousand six hundred and ninety-four sleepers were supplied to the Railways during the year as compared with 34,444 in 1927-28 and the gross income from this source increased from Rs. 2,00,533 to Rs. 3,72,421.

This increase was due almost entirely to better organization.

3. The increase in total sales is all the more praiseworthy in view of the fact that the sales of teak logs at Beypore decreased from 113,130 cubic feet to only 41,776 cubic feet.

Sales of sawn timber increased from Rs. 3,03,374 in 1927-28 to Rs. 3,64,568 during 1928-29. One of the principal reasons for the improvement in the log market was the fact that the conversion of inferior logs into sawn material not only prevented the markets from being flooded with logs but also gave the outturn a wider distribution, as sawn products can carry more railway freight than logs and therefore reach a much wider market.

4. There seems a slight tendency for log and sawn timber stocks to increase in the depots. This should be guarded against and improvement has already been affected during the opening months of 1929-30.

5. The Forest Utilization Officer notes that sales at Olavakkot depot were bad due to so many unknown and inferior species being placed on the market. Yet according to the sales statements the quantities of timber sold at this depot and the average sale price exceeded the averages in every depot except Nanjangod and the sales of scantlings at Olavakkot nearly doubled in value over those of 1927-28.

Likewise, although Kasaragod is held to be such a poor market for sawn material other than teak, yet more timber at better prices was sold at this depot than was the case at Pollachi, which is supposed to be a good market.

6. The overseas trade shows signs of improvement again due to the demand arising for laurel. This demand is now far in excess of the supply.

The report of the Forest Utilization Officer follows :—

ADMINISTRATION REPORT OF FOREST UTILIZATION DIVISION FOR 1928-29.

At the commencement of the year the division held control of the following timber depots :—

- Beypore (for Nilambur commercial concern),
- Pollachi (for Mount Stuart commercial concern),
- Olavakkot sawn timber depot only (for Chenat Nair commercial concern),
- Nanjangod with a grading station at Chedleth (for Wynaad division), and
- The sleeper depot at Pollachi (for Valparai Project).

On 1st July 1928 the carting of timber from Parappa to Kasaragod and Chedleth to Nanjangod was handed over to the Forest Engineer in charge, Saw Mills and Extraction, therefore the grading stations at Parappa and Chedleth were transferred to Kasaragod and Nanjangod, respectively.

The post of Assistant Forest Utilization Officer, West Coast, was abolished on 15th April 1928 therefore almost throughout the whole year the organization of all these depots was carried out by the Forest Utilization Officer aided by the Assistant Forest Utilization Officer both with headquarters in Madras.

Various reductions in the field staff have been made during the year, the post of Special Duty Ranger, Podanur, was abolished as from 1st April 1928, the Range Officer thus released was placed in charge of Pollachi depot. Consequent upon the handing over of all carting work from Parappa to Kasaragod and Chedleth to Nanjangod the depots of Kasaragod and

Nanjangod were placed under one Range Officer as from 16th August 1928 and the other Range Officer was transferred to the ordinary line. Unfortunately, Range Officer B. K. Krishna Rao who was in charge of these two depots, died of fever on 22nd October 1928 after a very short illness; no Range Officer could be spared to replace him, therefore the two depots were placed under the charge of a senior forester, but the arrangement has not turned out very satisfactorily. Between October and April the services of the Special Duty Range Officer, Calicut, were placed at the disposal of the Logging Engineer whenever required, for recruiting labour for the new Amarampalam Project, this work took up a considerable portion of his time.

The details of staff in the division at the end of the year are shown under the heading of Administration.

Operations.—According to the audited figures the turnover of the Forest Utilization division for 1928-29 is Rs. 13,16,184, being an increase of Rs. 93,398 over 1927-28, at the same time the overheads of the division were reduced from 6.7 per cent in 1927-28 to 3.8 per cent in 1928-29.

Details for the total turnover in 1928-29 are given in statement I.

Beypore depot.—In the case of logs and poles the receipts from Nilambur were 248,059 cubic feet and the disposals 245,119 cubic feet. The demand for teak was exceptionally good, as there is a general shortage of teak on the West Coast and it is anticipated that high prices will be maintained during 1929-30 also. Good prices were obtained for pillamaradu (*Terminalia paniculata*), karimaradu (*Terminalia tomentosa*), ventteak (*Lagerstroemia lanceolata*) and irul (*Xylia xylocarpus*) through forward sales, while the prices fetched in auction were satisfactory. With the exception of irul of which there are large stocks on the West Coast, prices for the other species should rise slightly in the coming year.

The mill was kept supplied with logs throughout the year and the disposals from stock were practically equal to the receipts from the mill. The prices received for scantlings were on a par with current market rates.

Statement II shows the timber dealings during the year.

Pollachi depot.—Auction sales of logs were held monthly during the year, 78,906 cubic feet, were sold against an in-take of 90,050 cubic feet. A large auction sale was held at the end of March the results of which are not included in the above figures therefore the unsold balance at the end of year is not as large as it appears.

Sales were only fairly well attended and the price of teak did not rise as much as in other depots, on the other hand the junglewood species improved in price considerably, very good prices being obtained for pillamaradu (*Terminalia paniculata*), ventteak (*Lagerstroemia lanceolata*) and vengai (*Pterocarpus marsupium*).

There was a large stock of old spokes and felloes at the beginning of the year which were sold at good rates considering their condition.

The transactions in sawn timber were very small, chiefly on account of the mill being moved to Topslip during which time it did not work, also it was greatly hampered through boiler trouble and the staff being attacked with fever. The receipts were 13,161 cubic feet and 14,899 cubic feet were sold. Details of receipts and disposals are shown in statement III.

Kasaragod.—Log sales were not very encouraging. 13,266 cubic feet of logs and poles were received of which 8,559 cubic feet were sold and removed, a further sale of 4,900 cubic feet was effected but as the timber was not removed before the close of the year it is not shown. Kasaragod itself is a very poor market, and the prevalent species such as karimaradu (*Terminalia tomentosa*) and pillamaradu (*Terminalia paniculata*) are not used on the West Coast, this timber has therefore to come east and pass on its way Kallai, which produces better logs at relatively cheaper rates, added to which the railway freight from Kasaragod is more than from Kallai or Calicut. The sale of sawn scantlings was poor, the year opened with a stock of 15,579 cubic feet and closed with 29,100 cubic feet, in stock the sales being 25,794 cubic feet. Owing to the partial failure of carting arrangements in the early part of the year, followed by the monsoon, large stocks of timber which had been exposed to the rain and sun were received in November, December and January and it was found difficult to dispose of such large stocks nearly all of which had lost colour and were poor in quality, added to the fact that Kasaragod and neighbouring localities form a poor market.

Also this depot is handicapped by the fact that only very short logs go into the mill at Parappa, consequently the scantlings only average seven to eight feet in length.

Details of receipts and disposals are noted in statement IV.

Nanjangod.—The receipts of logs were 59,112 cubic feet, 40,713 being sold and removed during the year, the closing balance was 18,992 cubic feet, nearly the whole of which had been sold in auction towards the end of the year but had not been removed by 31st March 1929. The prices realized were exceedingly good, no less than Rs. 2-13-2 per cubic foot being obtained for the whole of the teak stocks sold, both bad and good. Auctions were well attended and competition was very keen. 21,319 cubic feet of scantlings were received and 9,206 cubic feet sold, the apparently poor sales were caused by the fact that almost the whole quantity was received between November and March and there was no time to clear more before the year closed. It is not anticipated however that there will be any difficulty in the disposal of stocks from this depot as the market and demand are good. Statement V shows the dealings during the year.

Olavakkot.—The results of the sales effected in this depot are not very satisfactory, during the year 62,850 cubic feet were received from the mill, of which 54,700 cubic feet were of unknown and inferior species, and 33,572 cubic feet were sold, the stock at the end of the year being 37,281 cubic feet. This depot is always faced with the fundamental difficulty of placing on a very conservative market, large stocks of timber, many species of which are totally unknown in most parts of the Presidency, and some species of which are of distinctly inferior quality. Early in the year the prices of the inferior classes of timber were raised on two occasions, these rises may have been excessive within a short space of time, especially when many of the species were only just getting a footing in the market, with the result that the demand fell. During the coming year all the scantlings and plank sales are being placed under the Forest Utilization division and when stocks have been brought to normal, it is hoped that better and more frequent sales will result, with an ultimate rise in price.

The position of the receipts and disposals on 31st March 1929 is given in statement VI.

Other operations.

Sleepers.—The Railways for the first time agreed to accept second-class sleepers at two-thirds the price of first class with the result that the percentage of rejections was considerably reduced. A new method of strapping the ends of sleepers was tried by driving Stuart's clamps into the ends of the sleeper instead of the old method of binding with hoop iron. The new method although not perfect, was certainly more effective than the old method. The statement given in Statement VII shows the number of sleepers actually despatched to the railways and the amounts realized. The Railways agreed to accept from the Forest Department a quota of 40,131 B.G., and 18,575 M.G., and up to the end of March 37,646 B.G. and 18,048 M.G. had been inspected and passed by the Forest Utilization division, the remainder (2,485 B.G. and 527 M.G.) were passed early in April thus completing the quota, the short supply, although small, is regrettable and is due to certain divisions being unable to supply their estimated quota by due dates.

Inspections of depots and auctions.—The Forest Utilization Officer and Assistant Forest Utilization Officer toured continually throughout the year, passing sleepers, holding auctions and inspecting the depots, two hundred and four days being spent in camp.

All depots have been inspected at regular intervals throughout the year, and stock taking in part or whole has been carried out.

Overseas Trade.—Although the Agency with Messrs. W. W. Howard Brothers and Company was terminated in December 1926, final accounts are not yet forthcoming owing to the inability of the firm to account for all our stocks standing in their name on the books of this division. A small sum is still to be accounted for but as the High Commissioner has undertaken the audit of their accounts, it is hoped that the final adjustments will soon be made.

Proposals were submitted to Government in February 1927 for appointing other Agents, but the year has elapsed without any final orders having been received. However the export of logs for direct sale and through Messrs. Pierce Leslie and Company on consignment sale, considerably increased during the year.

The position of the consignments made through Messrs. Pierce Leslie and Company is as given in Statement VIII.

As most of the logs were exported during the latter part of the year, the results of these transactions cannot yet be estimated. The exports on account of direct orders are noted in Statement IX.

Two orders were received late in the year, but export was not effected until after the year closed.

It will be noticed that the majority of the logs exported were Laurel (*Terminalia tomentosa*) and as this timber was little known hitherto on the European and American markets, these sales were somewhat in the nature of an experiment.

Home Trade.—The demand and prices of timber in general showed a decided improvement, this is partly due to the grading of logs, and that most of the inferior logs have been taken off the market and cut up in the mills, also general scarcity of teak almost throughout the Presidency. An

order of 7,500 cubic feet of teak logs was obtained from the Madras and Southern Mahratta Railway all of which was met from the Pollachi, Mysore and Nanjangod depots.

Regarding sawn material, the Railways placed orders for special sawing order, to the extent of nearly Rs. 58,913-12-0. The Public Works Department have also placed many indents with the division. The bazaar market has been supplied chiefly through the Government Sales Agent who has handled 105,181 cubic feet during the year valued at Rs. 2,64,282. His relations with the Forest Utilization division have been satisfactory.

Financial.—The turnover of the Forest Utilization division during the year was Rs. 13,16,184 whereas the figures for the division from its inception in 1925-26 to date are as follows:—

	RS.
	3½ LAKHS.
1925-26	9¼
1926-27	12¼
1927-28	...

this shows a steady increase and it is hoped 1929-30 will show more satisfactory results still.

Administration.—The following officers held charge of posts during the year:—

Forest Utilization Officer ...	Mr. J. W. K. Wernham from 1st April 1928 to 12th April 1928.
Forest Utilization Officer ...	Mr. H. P. Ward from 13th April to the end of the year.
Assistant Forest Utilization Officer.	Mr. H. P. Ward from 1st April 1928 to 12th April 1928.
Assistant Forest Utilization Officer for West Coast.	Mr. V. S. Kuppuswami from 1st April 1928 to 15th April 1928.
Assistant Forest Utilization Officer, Madras	Mr. V. S. Kuppuswami from 16th April 1928 to end of year.

On 31st March, the subordinate staff consisted of —

Field staff.

- 1 Special Duty Ranger, Calicut.
- 3 Depot Rangers : Beypore 1, Pollachi 1, Olavakkot 1.
- 7 Foresters : Beypore 2, Pollachi 2, Kasaragod 2, Nanjangod 1.
- 4 Depot clerks : (permanent and temporary), Pollachi 1 (permanent), Beypore 1 (temporary), Olavakkot 2 (stock keepers).
- 9 Watchers : Beypore 3 plus 1 (tope watcher), Pollachi 2, Kasaragod 2, Nanjangod 1.
- 5 Peons : Kasaragod 1, Calicut 1, Beypore 1, Pollachi 1, Olavakkot 1.

Headquarters staff.

- 1 Tour clerk.
- 1 Accountant.
- 9 Clerks (including Deputy Forest Utilization Officers).
- 7 Peons.

STATEMENT II
The Beynere Depot—Receipts and Disposals for 1928-29.

Species.	Opening stock.	Receipts.	Total.	Sales.	Issues to saw mill.	Other disposals.	Closing stock.	Sale amount.	Average rate per cubic foot.
<i>Logs—</i>									
1. Teak Logs ..	C.F.T. 34,826	C.F.T. 135,552	C.F.T. 171,378	C.F.T. 41,776	C.F.T. 86,520	C.F.T. (a) 5,233	C.F.T. 37,819	R.S. 97,279	R.S. A. P. 2 5 3
2. Pillamaradu ..	..	45,325	45,325	45,325	..	..	..	47,441	1 0 9
3. Karimmaradu ..	2,155	2,654	4,709	4,709	..	..	..	4,373	0 14 10
4. Ventek ..	..	9,405	9,405	4,728	..	..	4,677	4,252	0 14 5
5. Iru ..	..	8,537	8,537	8,537	..	..	..	8,871	1 0 8
6. Rosewood ..	..	296	296	295	..	..	..	444	1 8 0
7. Miscellaneous ..	.. 86	440	526	514	..	(b) 12	..	109	0 3 5
8. Measurables and poles ..	3,841	44,949	48,790	47,444	..	(c) 25	1,321	40,385	0 13 7
Total ..	40,908	248,058	288,966	153,329	86,520	5,270	43,847	2,03,154	..
<i>Sawn materials—</i>									
9. Teak ..	10,709	49,700	53,499	42,249	..	..	11,250	1,40,923	3 5 4
10. Teak sleepers B.G. No. 145 ..	466	..	466	466	..	..	..	1,490	..
11. Teak rejected scantlings ..	342	3,844	4,236	3,452	..	..	..	2,510	0 11 9
Total ..	11,667	46,544	58,201	46,167	..	..	12,034	1,44,953	..
Add sale amount of Poles—rippings and wastage ..									6,318
Deduct adjustment on account of 1927-28 year's sales ..									10,208
Net total ..									2,471

(a) Despatched to F.U.R.O., Feroke.

(b) Used departmentally.

STATEMENT III.

Pollachi Depot—Receipts and Disposals for 1928-29.

Species.	Opening stock.	Receipts.	Total.	Sales.	Other disposals.	Closing stock.	Sale amount.	Average rate per cubic foot.
Logs—	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	RS.	RS. A. P.
1. Teak ..	3,980	41,304	45,308	36,054	10	8,644	38,158	2 6 6
2. Karimmaradu ..	..	(a) 24 10,286	10,428	8,986	(b) 55 (c) 17	1,370	10,840	1 3 4
3. Pillamaradu ..	1,153	(a) 142 11,539	12,743	9,357	..	3,386	11,613	1 3 10
4. Rosewood ..	5,123	(a) 41 32,999	9,155	8,322	(b) 28	805	16,035	1 14 9
5. Venteak ..	220	(a) 33 9,716	9,945	5,657	..	4,288	7,415	1 5 0
6. Vengai ..	3,022	(a) 9 5,078	8,101	6,243	..	1,858	7,853	1 3 8
7. Miscellaneous ..	160	7,873	8,038	3,687	(d) 613	3,738	3,392	0 14 8
Total ..	13,638	90,050	103,718	78,906	743	24,089	1,45,116	..
8. Teak poles Nos. ..	..	3,912	3,912	1,773	(e) 200	1,939	586	..
9. Teak spokes ..	10,876	6,571	17,447	13,811	..	3,636	11,141	..
10. Vengai spokes ..	5,442	3,282	8,724	6,906	..	1,818	..	..
" felices ..	..	707	707	..	..	707	..	..
" felices ..	..	354	354	..	..	354	..	..
Total ..	..	..	11,727	..	..	..	..	..
Grand Total ..	..	..	1,56,843	..	..	..	..	..
Deduct last year's adjustment ..	..	..	9	..	..	..	..	..
Total ..	..	..	1,56,834	..	..	..	..	..

(a) Excess in stocktaking.

(d) Despatched to Dehra Dun.

(b) Consigned to Messrs. Peirce Leslie & Co.

(c) Used departmentally.

(e) Issued to the Assistant Conservator in charge, Udumalpet Range.

Pollachi Depot—Receipts and Disposals of saw on timber for 1928-29.

Species.	Opening stock.	Receipts.	Total.	Sales.	Other disposals.	Closing stock.	Sale amount.	Average rate per cubic foot.
Teak	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	RS.	RS. A. P.
Teak ..	2,864	4,769	7,633	5,631	210	1,942	14,304	2 8 3
Other species ..	4,343	8,392	12,735	9,218	226	3,410	11,277	1 3 7
Total ..	7,207	13,161	20,368	14,849	436	5,352	25,581	..
Sales of Porotes ..	..	..	..	..	..	..	504	..
Deduct adjustments of 1927-28 ..	..	..	..	..	..	..	1,82,919	..
Net total ..	..	..	..	..	..	..	1,82,859	..
(a) Deficit in cross cutting.	..	..	..	..	..	..	..	..
(b) Deficit in stock-taking.	..	..	..	..	..	..	..	..
(c) Departmental use.	..	..	..	..	..	..	..	..

STATEMENT IV.
Kasaragod Depot—Receipts and disposals for 1928-29.

Species.	Opening stock.	Receipts.	Total.	Sales.	Other disposals.	Closing stock.	Sale amount.	Average rate.	Remarks.
Logs—									
Karimmaradu ..	C.F.T. 515	C.F.T. 1,863	C.F.T. 2,368	C.F.T. 2,317	..	21	Rs. 2,731	Rs. A. P. 1 2 7	
Pillamaradu ..	..	5,598	5,598	642	..	4,956	557	0 13 11	
Rosewood ..	..	429	429	290	..	139	562	1 15 0	
Other species ..	..	421	421	315	..	106	192	0 9 9	
Teak poles ..	..	4,965	4,965	4,955	..	..	3,722	0 12 0	
Total ..	515	13,266	13,781	8,569	..	5,222	7,764	..	
<i>Sleepers received from District Forest Officer, South Mangalore.</i>									
Xylia B.G. ..	..	756	756	459 I 79 II 43 Rejections.	..	175	8,672	8 0 0	
				466 I 26 II 9 Rejections.	..	..	420	5 5 0	
				110 Rejections.	..	146	78	1 13 0	
Xylia M.G. ..	..	647	647	3,037 I 129 II 110 Rejections.	..	..	1,398	3 0 0	
				904 I 28 II 36 Rejections.	..	..	52	2 0 0	
				..	..	..	11	1 3 0	
Hopea B.G. ..	..	3,730	3,730	25,814 734 193	..	454	2,712	8 8 0	
				..	..	..	56	5 11 0	
Hopea M.G. ..	..	1,153	1,153	..	..	185	43	1 13 0	
				..	..	..	..	3 0 0	
				..	..	..	..	2 0 0	
				..	..	..	..	1 3 0	
Total ..	..	..	..	..	..	..	35,219	..	
Poon squares sizes kolmarams and chattams ..	739	691	1,430	1,124	..	306	1,391	1 3 9	

Kasaragod Depot—Receipts and disposals for 1928-29—cont.

Species.	Opening stock.	Receipts.	Total.	Sales.	Other disposals.	Closing stock.	Sale amount.	Average rate.	Remarks.
Mill sawn timber—									
Teak ..	C.F.T. 5,838	C.F.T. 16,009	C.F.T. 22,447	C.F.T. 14,351	C.F.T. ..	8,096	Rs. 45,772	Rs. A. P. 3 3 0	
Other species ..	9,741	22,729	32,470	10,693	23	21,004	15,012	1 6 6	
B.G. 158 ..	..	..	..	181	..	..	484	..	
M.G. 379 ..	..	..	..	569	..	..	1,120	..	
Total ..	15,579	39,333	54,917	25,794	23	29,100	62,388	..	
Add sale amount of cut ends, porotes, etc. ..	..	..	..	..	..	..	427	..	
Grand total ..	..	..	..	..	..	..	99,405	..	

STATEMENT V.

Nanjangud Depot—Receipts and disposals for 1928-29.

Species.	Opening stock.	Receipts.	Total	Sales.	Other disposals.	Closing stock.	Sale amount.	Average rate.
Logs—	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	RS.	RS. A. P.
Teak	666	56,415	57,081	40,674	(a) 73	16,334	1,14,853	2 13 2
Vengai	..	1,334	1,334	39	..	1,295	68	1 12 0
Rosewood	..	1,363	1,363	..	..	1,363	..	..
Total ..	666	59,112	59,778	40,713	73	18,992	1,14,921	..
Sawn timber—								
Teak scantlings.	1,540	14,181	15,721	8,255	(a) 48	7,418	27,314	3 4 11
Teak sleepers Broad Gauge No. 36.	113	..	113	113	..	..	360	..
Teak sleepers Metre Gauge No. 129.	193	..	193	193	..	..	516	..
Other species.	297	7,138	7,435	645	(a) 92	6,698	1,822	2 13 2
Total ..	2,143	21,519	23,462	9,206	140	14,116	30,012	..
Add sale of 500 Metre Gauge sleepers from Chickenji Saw Mill at Rs. 3-6-0 per sleeper.							1,688	..
Add sale of Porotoc	..	..	..	..	..	..	210	..
							1,46,831	..
Deduct last year's adjustment		..	..	..	..	..	1,546	..
							Net Total ..	1,46,285
Mysore Depot—								
Sale of 5,939 cubic feet of teak logs		..	..	..	..	..	17,880	3 0 2

(a) Used departmentally.

STATEMENT VI.

Olavakkot Depot—Receipts and disposals of sawn timber for 1928-29.

Species.	Opening stock.	Receipts	Total.	Sales.	Other dis- posals.	Closing stock.	Sale amount.	Average rate per cubic foot.
	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	C.F.T.	RS.	RS. A. P.
Nilambur teak ..	891 {	14,376 562 }	15,829	13,012 {	355 958* }	1,504	48,727	3 11 11
Elival teak ..	694	216	910	695	92	123	2,314	3 5 3
Other species ..	11,591	62,634	74,225	32,877	4,190	37,158	53,754	1 10 2
Total ..	12,285	62,850	75,135	33,572	4,282	37,281	56,068	..
Deduct adjustment of 1927-28 sales .. .. .			.. ..	.. ..	.. ..	.. ..	— 434	..
						Net total ..	55,634	..

* Consigned for overseas sales.

STATEMENT B.

Valparai sleeper project—Pollachi—Receipts and disposals, 1928-29.

[illegible]

STATEMENT VII.

Statement showing sleepers actually despatched in 1928-29 (1929-30 contract).

Division.	Broad-gauge.				Metre-gauge.				Grand total.
	I class.	Amount.	II class.	Amount.	Total.	I class.	Amount.	II class.	Total.
	Nos.	Rs. A.	Nos.	Rs. A.	Rs. A.	Nos.	Rs.	Nos.	Rs. A.
Olavakkot ..	9945	83,543 8	523	2,899 13	86,443 5	10503	31,650	575	1,191 4
Valparai ..	9840	83,649 0	421	2,394 7	86,044 7	1019	3,057	12	24 0
Kasaragod ..	3554	29,950 8	208	1,153 6	31,103 14	1732	6,196	71	142 0
Wynaad ..	2320	19,720 0	84	477 12	20,197 12	1353	4,069	54	108 0
Nilambur ..	2090	16,720 0	48	255 0	16,975 0	848	2,544	14	28 0
South Mangalore ..	252	2,016 0	9	47 13	2,063 13	618	1,854	11	22 0
North Mangalore ..	1734	14,739 0	13	73 15	14,812 15	697	2,091	5	10 0
Kalghat ..	6560	55,760 0	300	1,706 4	57,466 4	992	2,976	37	74 0
Tinnevely ..	156	1,326 0	13	73 15	1,399 15	280	840	29	58 0
	36451	3,07,415 0	1619	9,082 5	3,16,497 5	17842	54,267	868	1,667 4
									55,924 4
									3,72,421 9

To complete the 1929-30 contract 2,485 Broad gauge and 527 Metre gauge sleepers were passed since 1st April 1929.

STATEMENT A.

Messrs. Howard Bros., in account current with the Forest Utilization Officer, Madras.

Date.	Particulars.	Account sale number.	Net. amount.	Debits.	Credits.	Division to be credited.
st April 1928	To balance, B.E.	..	£ s. d.	£ s. d.	£ s. d.	Nilambur.
August ..	To overcharge of rent "Clan Monroe"	..	..	277 18 11	..	Wynaad.
July ..	By wages paid for turning down logs	..	..	8 16 3	1 5 4	Do.
September ..	By excess credit afforded in a/c sale No. 140, remeasurement	141	..	..	..	Do.
October ..	To sale of laurel "Clan Bassano"	142	..	1 17 7	..	South Coimbatore.
	Do. "City of Madrid"	143	..	21 15 7	..	Do.
	Do. do.	144	8 7 11	20 16 10	..	Do.
	Do. "Clan Macavish"	144	117 4 3	..	..	Do.
	Do. "MacKenzie"	144	29 13 4	..	..	Do.
	Do. "Stuart"	144	31 4 0	..	..	Do.
	Do. "MacKenzie"	144	26 6 5	..	..	Do.
November ..	Do. "Stuart"	144	19 17 6	..	..	Do.
	Do. do.	144	9 5 4	241 18 9	..	Wynaad.
	Do. "Bassano"	145	2 1 8	..	..	Do.
	Do. "City of Madrid"	145	1 12 8	..	..	Do.
	Do. "Bassano"	145	10 9 1	14 3 5	135 0 0	South Coimbatore.
December ..	By remittances received	..	68 4 5	..	..	Wynaad.
	To sale of laurel "Clan Stuart"	146	24 0 0	..	..	Do.
	Do. "MacKenzie"	146	11 10 3	103 14 8	70 0 0	Wynaad.
	Do. "Bayanavoo Renald"	..	..	..	..	Wynaad.
	By remittances	147	14 12 11	13 14 5	..	Wynaad.
	To sale of laurel "City of Madrid"	..	0 18 6	..	..	Wynaad.
January ..	By returns inwards, "Bassano"	..	2 5 0	..	2 1 8	Wynaad.
February ..	By balance	..	0 3 4	..	496 3 7	
	Total ..	..	..	704 15 5	704 15 5	
	To balance carried down ..	..	496 3 7	..	..	

STATEMENT VIII.
Messrs. Peirce Leslie & Co., Consignments, 1928-29.

Division.	Species.	Stock on 1st April 1928.	Despatches in 1928-29.	Sales in 1928-29.	Gross Amount.	Expenses incurred by Forest Utilization division.*	Net amount.	Average rate per cubic foot.	Stock on 31st March 1929.
Exploitation division.	Teak ..	220-565	973-743	639-660	4,464 6 3	235 6 11	4,228 15 4	..	973-743
Wynaad division.	Rosewood ..	..	875-598	..	1,750 13 7	..	1,750 13 7	4 8 0	256-503
	Laurel ..	..	2,122-444	57-444	3,148 5 6	749 4 9	2,399 0 9	30 7 1 5	2,065-000
South Coimbatore.	Rosewood ..	503-703	75-430	538-953	355 5 0	78 12 7	276 8 5	4 7 6	47-180
	Laurel ..	..	55-010	55-010	..	..	..	5 0 5	..
	Marjakadam-bai ..	118-000	..	..	..	..	..	..	118-000
	Total ..	947-268	4,102-225	1,589-067	9,718 14 4	1,063 8 3	8,655 6 1	..	3,460-426

* These figures do not include district expenses.

STATEMENT IX.

Overseas sales in 1928-29 booked directly by the Forest Utilization division.

Division.	Quantity.	Species.	Sale amount.	Forest Utilization division expenses.	Net amount to be realised.	Rate per cubic foot on sale amount.	Remarks.
Wynaad Do.	5 167 43 1,481	Rosewood Laurel ..	RS. A. P. 835 0 0 3,975 0 0	RS. A. P. 462 12 0	RS. A. P. 4,317 12 0	RS. A. P. 5 0 0 2 8 0	One log sold at Rs. 6 per cubic foot.
South Coimbatore Do.	19 811 1 42	Rosewood Teak ..	1,622 0 0 168 0 0	341 3 2	1,448 12 10	2 0 0 4 0 0	
Total ..	68 2,501	....	6,600 8 0	803 15 2	5,796 8 10	..	

IX.—MINOR FOREST PRODUCTS SECTION.

This work was continued under the personal direction of the Chief Conservator of Forests.

2. A steady market for Hopea-bark has now been secured which absorbs all available outturn.

3. The Deputy Forest Utilization Officer, after special training in lac operations in Behar and Orissa and at Dehra Dun, has now made definite proposals for starting the industry in the Madras Presidency.

4. A start was made in the sorting and grading of *Myrabolams* with good results.

The report of the Deputy Forest Utilization Officer follows:—

REPORT OF THE DEPUTY FOREST UTILIZATION OFFICER.

Minor forests products section.

The chief items of work carried out in the Minor Forest Products Section during 1928-29 were—

Helping the trade.—The right to remove minor forest produce from the reserves was leased out as usual to local contractors. So one of the chief items of work in this section continued to be the bringing of the contractor and the purchaser into direct touch.

Many enquiries were received from individuals and firms, local and foreign, who were furnished with the information and the samples asked for. Holders of minor forest produce stocks, District Forest Officers as well as contractors, who were in touch with this office were kept informed of the current rates of their produces, trend of the market, and were supplied with a list of likely buyers.

A price list showing the local sale rates for various minor produces in the chief markets in this Presidency was compiled periodically and communicated to the Forest officers. It is proposed to supply copies of this price list to the chief firms dealing in minor produces.

Grading of myrabolams.—All the myrabolams collected from the Government as well as zamindari forests were sent down by the contractors to a central depot in Salem town where they were graded generally into two, sometimes into three grades, and sold in public auction twice a week. The owner of the depot who conducts the sales in the presence of the contractors or their agents is paid a percentage on the sale amounts as his commission. It is reported that these auctions command a good sale and are attended by purchasers from the adjoining districts.

The Salem myrabolams are of superior quality and are much valued by the tanners. I found them used by the tanners at Tuni and Rajahmundry in the Circars. So their whole output is absorbed in South India itself.

Collection of information.—It was not always possible to furnish all the information asked for by inquirers as it was not available in this newly created office. Further, literature available on this little known subject of minor forest produce is very meagre. The Deputy Utilization Officer had

therefore to look out for useful information from other Provinces and countries and from various sources which entailed a perusal of several trade journals, bulletins and books.

During his stay at Dehra Dun he went through almost all the permanent record files in the offices of the Forest Economist (Minor Forest Products Section) and the Forest Chemist in the Forest Research Institute, and took copious extracts from them for filing in the ledger files.

The ledger files were added to during the year, and extracts from and references to trade journals, reports, bulletins and books were inserted therein.

Statistics giving the annual outturn of the various minor products were obtained from the districts and posted in the stock book. The annual export and import figures relating to minor forest products were also obtained from all the Port Officers and recorded. A record of the market rates of the important products was maintained.

Scientific examination of some products.—Further analytical examination of *Hopea parviflora* bark and *Terminalia pallida* nuts and their effects in tanning were continued by the Research Chemist, Leather Trades Institute. Samples of catechu prepared from *Acacia Sundra* trees in Kurnool and Cuddapah were sent to the Forest Chemist, Forest Research Institute, for analytical examination to know the exact percentage of 'Keorsal' found in them as the manufacture of 'katha' along with cutch would be more profitable.

Sale of ivory.—All the ivory, viz., 25 tusks and 73 pieces, that was in stock at the close of the previous year was sold. The tender accepted was Rs. 9-8-0 per pound for the big tusks, Rs. 4-8-0 per pound for the smaller tusks and Rs. 2 per pound for the small pieces. The total sale amount for the 265 lb. 11 $\frac{2}{3}$ oz. of tusks and 22 lb. 3 $\frac{2}{3}$ oz. of pieces was Rs. 2,233-3-0.

Four pieces weighing 22 $\frac{1}{4}$ tolas which were received in March 1929 were in stock at the close of the year.

It was noticed that fresh ivory is liable to lose up to 5 per cent of its weight by dryage.

Cultivation of lac on Shorea talura—Results achieved.—The lac cultivation started in 1927 in Thalli reserve, North Salem district, was purely experimental to study the climatic conditions of the locality as they exert a large influence on and sometimes are the deciding factor on the suitability or otherwise of a locality for lac cultivation. It was extended to Jowligiri in 1928. During the year three crops in Thalli and three in Jowligiri were raised.

These experiments have established that Hosur plateau is suitable for lac cultivation.

2. It takes about 13 months to raise three crops which are generally styled as pre-monsoon, monsoon and post-monsoon crops. The pre-monsoon crop took the least time 16 weeks to mature, the monsoon crop took 18 to 19 weeks to mature, and the post-monsoon crop cover the longest periods 20 to 21 weeks.

3. The yield in a normal crop is generally four times the seed used. Best crops have yielded up to 9 times the brood lac put off. The monsoon crop yields the richest harvest whilst the poorest yield is generally obtained from the post-monsoon crops.

The post-monsoon crop generally gives a poor yield as it is cultivated in a period when the mean temperature and average rainfall and humidity are low.

Forty pounds of brood lac obtained from Mysore was expanded in 13 months (in three successive crops) to 2,560 lb. of brood lac.

4. The experiments have also served as a demonstration of the up-to-date method of cultivating lac successfully. Crops have been successfully raised both in Thalli and in Jowligiri reserves.

5. One ranger, one forester and two guards have been trained up for this work.

Disposal of brood lac, grain lac, etc.—Due to a shortage of suitable shoots for utilizing the whole quantity (2,562 lb.) of the brood lac harvested at the close of 1928, and to the absence of a market for broodlac in Southern India, about 1,670 lb. of brood lac were lent to the Mysore State and the Indian Institute of Science, Bangalore, on condition that they should return it whenever it is required by us. The value of 2,562 lb. of brood lac at Rs. 10 per 28 lb. (Tumkur rate) would come to Rs. 915.

The phunki lac, which was scraped and washed, has yielded about 400 lb. of grain lac and 65 lb. of Molemma. This stock alone at the current Calcutta rate is worth about Rs. 600.

Pruning experiments—Observations made.—When lac cultivation is newly started in a locality almost every host tree has to be pruned to get a framework of succulent shoots to serve as efficient food suppliers to the lac insect. So it was also decided to study the shoot-bearing habits of *Shorea talura* in response to different modes of pruning and done in different seasons to know the best method to which and the season when the trees respond most by sending out the largest number of vigorous shoots. Nearly 1,500 poles were pruned, some heavily some lightly and some moderately, during the different months of the year and kept under observation.

Observations made so far indicate the *Shorea talura* trees should generally be pruned two to three years before infecting them with the lac brood, and trees pruned during July–August and November–December have produced many and better shoots. Moderate lopping has given better results than light lopping; heavy lopping should be avoided.

Schemes for lac cultivation.—A scheme for the introduction of systematic cultivation of lac on *Shorea talura* in North Salem district was drawn up and submitted to the Chief Conservator of Forests for sanction.

Information about the occurrence of the other important lac hosts, viz., *Schleichera trijuga*, *Butea frondosa* and *Zizyphus jujuba* and *Zizyphus xylopyra* in sufficient numbers in the different districts of this Presidency is being collected with a view to select suitable centres for starting lac cultivation on those trees as well.

Catechu.—At the close of last year an experiment to prepare cutch from *Acacia sundra* trees was carried out in North Cuddapah district. A Ranger who had some training of this work and two men who are reported to be experts in manufacturing catechu and specially engaged for this operation were in sole charge of this experiment. The work progressed for about three weeks when it was stopped as an unexpected difficulty cropped up due to the final extract not cooling rapidly and in its rolling into balls. The balls cracked badly and fell into pieces when handled.

In all 175 sundra trees were felled for the stills. Of these 170 trees were chipped yielding 4,959 lb. of chips. The total cost of felling and cleaning and of chipping the 170 trees was Rs. 15-8-0 and Rs. 15-10-0 respectively. twenty cart-loads of dry fuel were collected and transported to the kiln site at a cost of Rs. 18.

Four thousand nine hundred and fifty-nine pounds of red wood chips were boiled and they yielded 1,058 balls of catechu weighing 456 lb. The catechu prepared was of a low grade and may secure in the market about Rs. 160 per candy (560 lb.).

As the catechu balls were so brittle as to render their transport difficult it was advised that the stock may be disposed of locally.

Cassia auriculata.—To obtain *Cassia auriculata* bark from plants and coppice shoots of known ages and growing on different soils, with a view to determine their tanning contents and to know at what age they give the best tanning results, it was decided to grow them in plantations.

The first plantations were formed in 1927-28 in Gunda reserve, Hospet range, Anantapur district, and near Bailuti in Kurnool West district. Seeds were sown in furrows 4 feet apart and 6 inches deep during June 1927. The Gunda plantation contains a fair number of seedlings all over it. Growth is decidedly much better along deep furrows and by the streamlets running in the area. Tallest plants are over 3 feet high, have developed side branches and look well established. In the Bailuti plantation the operation was a failure as almost all the seedlings dried up in summer. As the area selected cannot be considered suitable for the purpose in view, it was since decided with the approval of the Conservator to abandon it and to carry out further sowings in the large, open, well-drained area close to the Range office at Pecheruvu.

During the year another 10 acres were sown in Gunda reserve, but due to the absence of rains for two weeks after the sowing was done, the germination was slow and in patches, which has led to several blanks in the plantation, especially in the gravelly soil portion.

In the 5-acre plot selected at Pecheruvu 18 measures of seeds were sown along the furrows at intervals of 4 feet. Since the ranger delayed the sowings till late in July, the expenditure incurred by him was disallowed by the Conservator. Germination was successful but during the summer many seedlings are reported to have died.

The total cost of ploughing, sowing and fencing the 10-acre plot in Gunda reserve was Rs. 20 annually. For the Bailuti plantation the cost of ploughing and sowing came to Rs. 16-4-0 but fencing and other contingencies costed Rs. 24-12-0.

An area of about 5 acres fairly stocked with *Cassia auriculata* shrubs in Bandri reserve, Anantapur district, was selected and demarcated. All the 410 cassia shrubs in it were coppiced in July 1928. At Pecheruvu, the 7 years old cassia shrubs in the old plantation were cut back during April 1928. It is reported that all the stools have sent out luxuriant shoots, each stool about 16 shoots on an average, varying in height from 1 to 4 feet and in girth from $\frac{1}{2}$ to $2\frac{1}{2}$ inches, and that most of these coppice shoots bear flowers and fruit this year.

Cassia fistula.—Next in importance to the well-known Avaram (*Cassia auriculata*) bark is the bark of *Cassia fistula* which is largely used in tanning hides. There is a large and regular demand for this valuable tanning bark, so much so, its whole output is consumed in Southern India itself.

The question of exploiting it regularly from the Government forests in this Presidency with a view to obtain a sustained yield of bark of a suitable and uniform grade for tanners was examined.

The Conference of the Conservators had decided that the planting of *Cassia fistula* for bark would not pay.

To determine the most economic rotation for exploiting this bark for tanning purposes, it was decided to carry out experiments to ascertain the age at which bark from coppice shoots contains the highest percentage of tannin and gives best tanning results. It was first proposed to coppice 100 trees annually during the next six years to get bark 1 to 6 years old. But it was subsequently found that the required number of coppice shoots of known ages could be had in the worked clear felled coupes. On the suggestion of the Conservator they were selected and numbered serially in coupes V to XI of Devancheruvu block 1. Bark from these shoots will be extracted and sent to the Leather Trades Institute for examination during next year.

Hopea parviflora bark.—The Leather Research Chemist who examined the *Hopea* bark sent the following report:—

"The bark is fairly rich in tannin. Next to wattle, myrabolams and divi divi, it is the richest of the South Indian tanning materials as seen from the table below:—

Material.	Tannin content.
<i>Acacia decurrens</i> —Wattle	35.7
<i>Cesalpinia coriaria</i> —Divi divi	33.6
<i>Terminalia chebula</i> —Myrabolams	27.0
<i>Hopea parviflora</i> bark	25.4
<i>Cassia auriculata</i> —Avaram	16.6
<i>Cassia fistula</i> —Konnai	11.2

"The leather produced from this bark is of a fairly light shade but slightly more brown than is required for the South Indian Export Trade."

The Principal, Leather Trades Institute, Madras, added, "that the last results obtained with *Hopea* bark have been very satisfactory from the colour point of view. The leather however has not got exactly the feel required but I am trying to get this in subsequent lots."

Bark from the branches and the trunks of *Hopea* trees was analysed separately for their tannin contents. The branch bark gave 19.7 per cent of tannin whilst the trunk bark's tannin contents varied from 18.56 to 20.95 per cent.

For experimental purpose 10 tons of bark was supplied last year at Rs. 60 per ton. It was decided during the year to levy a seigniorage on this bark and to fix the rate at Rs. 75 per ton f.o.r. Kasaragod.

As the properties of this bark are becoming known, a demand for it is arising. Enquiries were received from well-known English firms asking whether regular supplies of this bark could be guaranteed. As such enquiries were also received direct by the Conservator, VI Circle, he has since decided to deal with this produce himself.

Wattle bark.—Imports of wattle bark from South Africa, chiefly Natal, into Madras increased from 800 tons in 1924 to 16,205 tons in 1928, and its price ranged from £11-12-0 to £13-8-9 per ton in the year under report.

This bark is not at present used by skin tanners, but it is reported to be used by practically every hide tanner in this Presidency. As the tanners have become accustomed to its use and supplies of this bark of a uniform quality are obtained readily by rail from Madras, it is being used to an increasing extent by the tanners, and consequently its import into Madras is expanding at a very rapid rate. Last year's imports alone came to 16,205 tons costing about Rs. 26,66,482.

There are grass areas on the Nilgiris and Palnis which are more or less suitable for growing *Acacia decurrens* (Black wattle). It was decided to lease out some thousands of acres in those grassy areas to private agencies for cultivating wattle.

Tamarind.—In Lower Godavari division the seigniorage on tamarind had continued for years at one anna per maund. The question of raising it was investigated in the last year and the Collector was advised to increase it to 2 annas per maund. The seigniorage was tentatively increased to one and half annas from 1st August 1928 and the Collector reminded about reviewing the question of raising it to 2 annas as originally recommended.

At one anna per maund the total seigniorage collected in 1927 was Rs. 22,534. The present increase of half an anna in the rate would bring in an additional net revenue of eleven thousand rupees annually.

Staff.—During the year under report, the Deputy Forest Utilization Officer was away from Madras Presidency from 1st August 1928 to 13th February 1929. He was deputed first to Behar and Orissa for 4 months to study lac operations in that province, and then to Dehra Dun for a period of two months for training in the Forest Research Institute (Minor Forest Produce Section). He was, however, in charge of the office throughout the year.

All the correspondence, typing, copying out of extracts and ledger filing and all other items of work of this section was carried out with the aid of my tour clerk.

X. CONCLUSION.

The work of the Forest Engineering branch has been much affected by the uncertainty of its future organization and it is hoped that a definite policy will be laid down by Government during 1929-30.

A detailed examination of the work accomplished during the period 1923-1929 will disclose many permanent benefits derived, the value of which can only be assessed during the years to come.

Large areas have been mapped and cruised, giving an accurate idea of the forest wealth existing in the more remote areas of the Presidency; indicating how and at what cost it may be extracted; and also clearly showing where Forest Research can best be applied if knowledge is to be gained concerning many species of timbers existing in large quantities but not yet used commercially.

The supply of sleepers to the railways has been organized and placed on a profitable basis.

The economic desirability of securing wider markets for forest products in other than log form has been demonstrated. The fullest return from forest management can never be attained unless this policy is followed and amplified in future years. If based on private industries rather than Government controlled concerns the result would be much better. Unfortunately however the inherent inefficiency of Government operation and the unfortunate uncommercial form in which the accounts have been presented have tended to alarm rather than encourage such private enterprise.

In any case the value of the work accomplished will be more appreciated 10 years hence than it is to-day.

The work of officers and staff merits high praise as only those in close contact with the work can realize the severe conditions under which it is accomplished and the many discouragements that continually harass the personnel.

ENCLOSURE

SUMMARY OF PROGRESS IN THE FOREST ENGINEERING BRANCH DURING THE FIVE YEARS—1923-24 TO 1928-29.

The Forest Engineering Branch at the beginning of the period was just organized. A Forest Utilization Officer had been appointed and a Forest Exploitation Officer in charge of the Chenat Nayar Exploitation Division. The Logging Engineer had just started training men for mapping and cruising field work.

By the end of 1928-29 the organization had increased to four divisions, the Forest Utilization Division, and as Saw Mills and Extraction Division being added. Besides the ordinary divisional work an experimental wood workshop was being operated at Olavakkot under the Forest Economist and considerable work of a general nature was being done by the Chief Forest Engineer and his establishment. The supervising staff of the branch consisted of the Chief Forest Engineer, Logging Engineer, Forest Engineer incharge Saw Mills and Extraction Division, and four Imperial Officers.

(2) *Chenat Nayar Exploitation*.—A Saw mill and box plant were erected during 1924-25. By the end of 1928-29 the greater part of the Chenat Nayar reserve lying on the southern slopes of the hills had been logged. The value of sales of all the products of the operation had increased steadily to Rs. 2,58,400 in 1928-29. The costs of logging and milling were still being reduced and markets for the products were gradually becoming established.

(3) *The Logging Engineer*.—From early organization stages the Logging Engineer's Division had completed the intensive mapping and cruising of 93,174 acres of remote and inaccessible forest on an average scale of 300' to the inch.

The development scheme for the forests in the North Mangalore Division of South Kanara was in the final stages of preparation and that for the New Amarapalam Forest was nearing completion. The scheme for the development of the Tinnevely Evergreen Forests was lying dormant pending a decision by Government as to whether they were going ahead with the Papanasam Power Development Scheme.

(4) *Utilization*.—This most important part of the general scheme of organization had gradually increased its activities until its annual turnover had reached 13½ lakhs of rupees during 1928-29.

The business of supplying the railways with sleepers had been organized and built up from nothing to a supply of 38,070 broad-gauge and 18,650 meter-gauge sleepers with a total value of Rs. 3,72,422. This does not include the very considerable business done with the railways in the form of logs and sawn timber.

Arrangements had also been made to supply railway keys from teak waste pieces.

The contract in force with Messrs. Howard Bros. & Co., of London for the sale of logs and sawn material abroad was abrogated and a new and more favourable contract was in process of negotiation with a firm having head-quarters in the presidency. Sales of sawn scantlings increased from zero to a value of Rs. 3,71,000 during 1928-29.

(5) *Saw mills and extraction*.—During 1925-26-27 for ^{use of} portable forest saw mills were installed at Beypore, Pollachi, Chedleth and Parappa.

In 1928-29 these mills cut 248,355 cubic feet of logs from which 112,509 cubic feet of sawn timber were obtained. This was all sold in local markets and realized Rs. 3,97,003 gross.

(6) *Engineering and Construction*.—Late in April 1924 all general engineering work such as roads, buildings, water works, telephone lines, etc. was placed under the control of a Forest Engineer.

During the five years under review 26½ miles of metalled roads were constructed, eight residential buildings for District Forest Officers were completed, clerks quarters at Ootacamund were erected, the forest settlement at Topslip was built; Topslip water-supply system, Topslip-Pollachi Telephone line, Kodamadi suspension bridge and other smaller works were completed. Twenty-four miles of metalled roads were maintained and numerous surveys made and estimates prepared.

(7) The Forest Economist produced much valuable work during the period under review. A library, supplemented by ledger files, concerning all current scientific data bearing on the identification and utilization of tropical timbers, was started and maintained; such information was circulated periodically to Forest Officers; grading rules for logs and sawn timber were drawn up; log measurement tables with instructions for use were compiled and printed for distribution to all District Forest Officers and comprehension market reports for all of South India and the Bombay Presidency were prepared and are now being printed.

(8) The Deputy Forest Utilization Officer compiled much useful data on the production and marketing of minor forest products and after special training had made a start towards introducing the lac industry into Madras.

(9) *Administration*.—Mr. C. S. Martin held charge of the Forest Engineering Branch from its inception until he took leave on September 1926. From then until 1st June 1927 Mr. J. K. Pearce was Chief Forest Engineer, Mr. Martin resuming charge from the latter date to the end of the quinquennium.

(10) The principal results of the work reviewed have been; the training of permanent members of the Forest Department in the preparation of

data on which working plans and large extraction estimates may be based; and in the operation of both mechanical extraction and forest saw mills.

The organization and gradual increase of direct business with the railways, in sleepers, logs, and sawn scantlings has had a very important bearing on the increase in revenues.

Another important development has been the disposal of all old surplus accumulations of logs by the use of portable saw mills. The log supply is now controlled by market demands and prices as there is always an alternative outlet for the logs in the form of sawn outturn from the mills. Also wider marketing information is being obtained and local rings of buyers do not exercise the influence they once did in keeping sale prices to a low level.

Markets are also being built up for sawn timber and there is now a wider and more general demand for the products of the forest.

(11) Direct financial results are difficult if not impossible to arrive at but it may be noted that the average financial position of the divisions in which forest saw mills were located has improved by several lakhs of rupees over the preceding five years.

C. S. MARTIN,
Chief Forest Engineer.

MADRAS,
14th August 1929.

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