

REVIEW
OF
FOREST ADMINISTRATION
IN
BRITISH INDIA
FOR THE YEAR
1896-97.

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CHAPTER I.

EXTENSION AND ORGANIZATION OF THE FOREST AREA.

I.—ALTERATIONS IN AREA.

The alterations which took place during the year in the area of Reserved forests are shown in the following table:—

PROVINCE.	AREA OF RESERVED FORESTS, IN SQUARE MILES.				REMARKS.
	In 1895-96.	Added in 1896-97.	Excluded in 1896-97.	At close of 1896-97.	
Bengal	5,877	...	1	5,876	(a) Includes 158 square miles of leased forests. (b) Includes 261 square miles of leased forests. (c) Includes 619 square miles of <i>taungya</i> areas. (d) Includes 227 square miles of <i>taungya</i> areas. (e) Includes leased forests in the Dangs, estimated at 679 square miles.
North-Western Provinces and Oudh	3,766	80	24	(a) 3,822	
Punjab	1,680	2	1	(b) 1,681	
Burma (Lower)	7,378	197	325	(c) 7,250	
Burma (Upper)	5,439	1,394½	25½	(d) 6,808	
Central Provinces	19,293	99	134	19,258	
Assam	3,685	...	4	3,681	
Coorg	238	...	...	238
Ajmere	139	...	...	139
Baluchistan	175	...	5	170	
Andamans	73	12	...	85	
TOTAL	47,743	1,784½	519½	49,008	
Berar	4,178	23	22	4,179	
Total Bengal Presidency	51,921	1,807½	541½	53,187	
Madras	12,388	863	113	13,138	
Bombay	(e) 12,173	831	18	(e) 12,986	
GRAND TOTAL	76,482	3,501½	672½	79,311	

There was thus an increase in the total area of Reserved forests of 2,829 square miles, as compared with an increase of 2,211 square miles in the previous year. As anticipated in the Review for the year 1895-96, there were large increases in Upper Burma, where 1,394 square miles were added to reserves. Further large areas in Upper Burma were examined and in various stages of settlement, and some 5,000 square miles of forest will probably be shortly formed into reserves. Important areas were also added in Madras and in Bombay.

The following table gives the total areas of all forest lands under the management of the Department at the close of the year :—

PROVINCE.	FOREST AREA, IN SQUARE MILES.				Proportion of Forests to whole area of Province.	REMARKS.	
	Name.	Area, in square miles.	Reserved.	Protected.			Un-classed State.	TOTAL.
						Per cent.	
Bengal	151,535	5,876	(a)3,378	4,034	13,288	8.76	(a) Rough estimate.
North-Western Provinces and Oudh.	107,129	(b)3,822	94	43	3,959	3.69	(b) Includes 158 square miles of leased forests.
Punjab	103,436	(c)1,381	(d)2,877	2,258	6,816	6.58	(c) Includes 261 square miles of leased forests, and excludes 123½ square miles managed by the Military and Civil authorities.
Burma (Lower)	87,831	(e)7,250	(f)	...	7,250	8.25	(d) Exclusive of 131½ square miles managed by the Civil authorities.
Burma (Upper)	81,026	(b)6,808	(f)	...	6,808	8.40	(e) Includes 619 square miles of taungya areas.
Central Provinces	86,643	19,258	...	352	19,610	22.63	(f) Chapter IV of the Burma Forest Act and of the Upper Burma Forest Regulation extends protection to certain trees and produce in unoccupied lands generally. The area of these undemarcated lands to which protection is afforded is not known.
Assam	45,378	3,681	...	11,244	14,925	32.88	(g) Includes 227 square miles of taungya areas.
Coorg	1,532	238	650	...	888	56.13	(h) Village lands managed by the Forest Department, but not yet brought under the Ajmere Forest Regulation.
Ajmere	2,711	139	...	(i)10	149	5.50	(i) Baluchistan left out of account.
Baluchistan	...	170	...	...	170	...	(j) Includes the area of the leased forests in the Dangs, estimated at 679 square miles.
Andamans	2,000	85	...	1,868	1,953	97.65	
TOTAL	669,271	49,008	6,999	19,809	75,816	(k)11.30	
Barar	17,717	4,179	...	...	4,179	23.59	
Total Bengal Presidency.	686,988	53,187	6,999	19,809	79,995	(l)11.62	
Madras	88,975	13,138	...	5,769	18,907	21.25	
Bombay	110,277	(j)12,986	2,025	4	15,015	13.61	
GRAND TOTAL	886,240	79,311	9,024	25,582	113,917	(m)12.83	

The total area of lands under the control of the Forest Department at the close of the previous year stood at 112,511 square miles, and there has consequently been an increase of 1,406 square miles. The area of Protected forests rose by 677 square miles owing to the conclusion of the Kangra and Kulu settlements. The area of Unclassed forests, from which Protected forests were formed, similarly decreased. The following shows the details of changes in the various provinces :—

Bengal.—There were but few changes of importance; an area of 500 acres was excluded from Reserved forests for tea cultivation in the Tista Division; from the Protected forests, the area of which, however, is not at present known, 59 square miles were excluded for the extension of cultivation in the Sundarbans. The area of Unclassed forests remained unchanged at 4,034 square miles.

North-Western Provinces and Oudh.—There was no change in the area of Protected and Unclassed forests. The area of Reserves shows an increase of 56 square miles owing to the inclusion therein of the leased forests of Tehri-Garhwál.

Punjab.—The following are the most important changes which occurred during the year :—

In Kangra 452,793 acres of Unclassed forests were made Protected forests. In Kulu 2,680 acres of Unclassed forest were made Protected, and in Shahpur 505,466 acres were transferred from the charge of the Civil authorities to that of the Forest Department. This area, together

with some 273,000 acres from the Jhelam and Chenab Divisions, was formed into the new Shahpur Division.

Burma.—The following extract from the Local Government's review explains the changes which took place:—

"At the beginning of the year the area of Reserved forests in Lower Burma was 7,378 square miles. In the Tenasserim Circle a recomputation of areas from accurate survey maps reduced the area of Reserved forests from 4,332 square miles to 4,143 square miles, while in the Pegu Circle a net increase of 62 square miles was due to the same cause. In Upper Burma the total area of Reserved forests at the commencement of the year was 5,438 square miles. In the Eastern Circle 584 square miles and in the Western Circle 857 square miles of new reserves were added. The total area of Reserved forests in Burma at the close of the year was 14,058 square miles, of which 845 square miles were burdened with *taungya* privileges, against 12,817 square miles and 710 square miles in the previous year."

The following statement gives the areas of Reserved forests in each Circle at the close of the year:—

CIRCLE.	AREA IN SQUARE MILES.			Proportion of forests to area of Province.
	Reserved forests.	Taungya areas.	Total.	
Pegu	2,737	371	3,108	...
Tenasserim	3,894	248	4,142	...
Total Lower Burma	6,631	619	7,250	8.25
Eastern	2,446	165	2,611	...
Western	4,135	62	4,197	...
Total Upper Burma	6,581	227	6,808	* 8.40

Central Provinces.—The following statement contrasts the areas and classification of the forests as they stood at the beginning and end of the year, respectively:—

CLASS.	AREA, IN SQUARE MILES.					
	SOUTHERN CIRCLE.		NORTHERN CIRCLE.		TOTAL.	
	June 1896.	June 1897.	June 1896.	June 1897.	June 1896.	June 1897.
A	6,252	7,313	4,274	5,293	10,526	12,606
B-I	1,047	1,131	1,864	1,856	2,911	2,987
B-II	2,328	1,142	3,528	2,523	5,856	3,665
Unclassed	343	336	16	16	364	353
TOTAL	9,970	9,922	9,682	9,688	19,657	19,610

The decrease in area of 53 square miles in the Southern Circle is due to disforestation (21 square miles), the correction of areas by forest survey (13 square miles), and to the re-adjustment of the boundaries of excised lands (9 square miles). In the Northern Circle correction of areas has added 11 square miles, but disforestation has taken off 5. Part of this disforestation is due to the exchange of land on account of the Khandwa water-works and part to petty re-adjustments of village boundaries, all of which were effected in the districts of Damoh and Sangor.

In the Southern Circle, 119 square miles were either excised for cultivation or about to be so dealt with, and in the Northern Circle proposals for considerable excisions in Betul and Nimar were under consideration. The question of excision in Mandla remained unsettled at the close of the year.

Assam.—The area of Reserved forests was reduced by 4½ square miles for the extension of tea cultivation, that of Unclassed forests was reduced by 444 square miles, owing mainly to the relinquishment of waste-land grants. The area of Unclassed forests is now placed at 11,244 square miles, but the true area is not at present known.

Coorg.—The area of Reserved forests remained unchanged. From Protected forests 4 square miles were excluded, of which 2,000 acres were a grant for the cultivation of tea.

Ajmere.—There were no changes in the area of the forests.

Baluchistan.—The plantations of Shibu and Khushdil, which had proved failures, were disforested during the year, thus reducing the area of State forests by 5 square miles.

Andamans.—An area of 12 square miles was added to Reserved forests during the year, and shortly after its close a further area of 35 square miles, situated for the most part between Jirgatang and Middle Straits, South Andaman, was reserved, bringing the total area to 120 square miles.

Berar.—There were various changes in the classification of the forests, the total area being increased by 1 square mile.

Madras.—Eight hundred and forty-five square miles were constituted Reserved forests, but the total area of these, owing to disforestation for extension of cultivation and rectification of areas, was increased by 750 square miles only. The area of reserved lands fell by 921 square miles, of which 850 square miles were constituted reserves as above. The following statement gives the changes in the three Circles during the year :—

CIRCLE.	AREA, IN SQUARE MILES.					
	On 1st July 1896.	Added during 1896-97.	Excluded during 1896-97.	Increase or decrease.	On 1st July 1897.	
Northern	Reserved forests . . .	4,134	349	38	+311	4,445
	Reserved lands . . .	2,424	126	436	-310	2,114
Central	Reserved forests . . .	5,106	281	41	+240	5,346
	Reserved lands . . .	1,776	158	421	-263	1,513
Southern	Reserved forests . . .	3,148	233	34	+199	3,347
	Reserved lands . . .	2,490	48	396	-348	2,142
Total	Reserved forests . . .	12,388	863	113	+750	13,138
	Reserved lands . . .	6,690	333	1,254	-921	5,769
GRAND TOTAL . . .	19,078	1,196	1,367	-171	18,907	

Bombay.—The following extract from the Resolution of the Bombay Government on the Forest Administration Reports shows the changes of the year :—

"The following statement shows the changes that have taken place in the forest area during the year under review :—

CIRCLE.	AREA ON 1ST JULY 1896.			ADDED.		EXCLUDED.		AREA ON 30TH JUNE 1897.		
	Reserved.	Protected.	Total Forest Area.	Reserved.	Protected.	Reserved.	Protected.	Reserved.	Protected.	Total Forest Area.
	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.
Northern Circle . . .	1,184 ¹ / ₂	434 ¹ / ₂	1,618 ¹ / ₂	8 ¹ / ₂	...	1 ¹ / ₂	1 ¹ / ₂	1,191 ¹ / ₂	434 ¹ / ₂	1,625 ¹ / ₂
Central Circle . . .	6,337 ¹ / ₂	12 ¹ / ₂	6,350 ¹ / ₂	14 ¹ / ₂	...	1 ¹ / ₂	1 ¹ / ₂	6,352 ¹ / ₂	12 ¹ / ₂	6,364 ¹ / ₂
Southern Circle . . .	2,910 ¹ / ₂	2,334 ¹ / ₂	5,245 ¹ / ₂	704 ¹ / ₂	...	5 ¹ / ₂	766 ¹ / ₂	3,704 ¹ / ₂	1,678 ¹ / ₂	5,278 ¹ / ₂
Sindh Circle . . .	1,060 ¹ / ₂	4 ¹ / ₂	1,064 ¹ / ₂	78 ¹ / ₂	...	...	3 ¹ / ₂	1,064 ¹ / ₂	4 ¹ / ₂	1,064 ¹ / ₂
TOTAL . . .	11,493 ¹ / ₂	2,785 ¹ / ₂	14,278 ¹ / ₂	821 ¹ / ₂	...	7 ¹ / ₂	766 ¹ / ₂	12,308 ¹ / ₂	2,025 ¹ / ₂	14,333 ¹ / ₂

* Excluding the area of leased forests in the Dangs, which is given as 678¹/₂ square miles.

† Exclusive of an area of 3¹/₂ square miles of Unclassed forest.

In the Northern Circle the settlement operations added 4,924 acres to the North and Central Thana forests. In the Central Circle the area was increased by the rectification of book entries affecting some 4¹/₂ square miles, and by the reservation of some 10 square miles, chiefly in the Satará district. The principal changes occurred in the Southern Circle, where in Kánara 664 square miles and in Bijápúr 88 square miles of Protected forest were converted into Reserve d, while fresh reserves, measuring 23¹/₂ and 8 square miles, respectively, were created in Bijápúr and Kolába. In the Sindh Circle the alterations were unimportant, but it is noted that 3,514 acres were lost by erosion on the banks of the Indus."

II.—FOREST SETTLEMENTS.

In most provinces the selection and settlement of the areas to be maintained as permanent Forest estates is nearing completion, and in cases, as in the Central Provinces, the settlement work remaining is confined to that connected with the excision of areas to be given up for cultivation. In Upper Burma, Bengal and Madras alone do large areas still remain to be dealt with. In Burma much good progress was made, resulting in the final settlement of 1,406 square miles. At the close of the year no less than 4,900 square miles were in various stages of settlement, and further tracts in the Upper Chindwin, Myitha, Ruby Mines, and Shan States Divisions had been examined with a view to their settlement. In the Punjab, the conclusion of the Kangra settlement, which added an area of 707 square miles to Protected forests, is the chief feature of the year. In Madras 845 square miles were finally notified and 4,019 square miles were undergoing settlement at the close of the year. It is estimated that there remain some 4,000 square miles still to be taken in hand, and the work will probably take another five years to complete. In Bombay 820 square miles were finally notified reserves. The chief work remaining is in the Southern Circle, where some 1,100 square miles remained to be dealt with at the close of the year.

The following table shows the changes which took place in the area of forest lands under the control of the Department :—

PROVINCE.	ALTERATIONS IN AREA, IN SQUARE MILES, DURING 1896-97.								REMARKS.
	RESERVED FORESTS.		PROTECTED FORESTS.		UNCLASSIFIED STATE FORESTS.		TOTAL.		
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	
Bengal . . . . .	...	1	...	59	...	...	...	60	(a) Five acres obtained by rectification of previous area figures.
North-Western Provinces and Oudh.	(a)80	(b)24	...	...	...	...	80	24	(b) Due to rectification of previous area figures.
Punjab	2	1	1,501	...	(c)	(d)714	1,503	715	(c) Two hundred and forty-eight acres gained by river action.
Burma (Lower)	197	325	...	...	...	...	197	325	(d) Includes 188 acres lost by river action.
Burma (Upper)	1,394	25	...	...	...	...	1,394	25	(e) Ninety square miles obtained by rectification of previous area figures, and 9 square miles by survey re-measurements.
Central Provinces	(e)99	(f)134	...	...	...	12	99	146	(f) Seventy-nine square miles due to rectification of previous area figures, and 34 square miles to re-adjustment of boundaries.
Assam . . . . .	...	4	...	...	363	707	263	711	(g) One hundred and nineteen acres obtained by rectification of previous area figures.
Coorg . . . . .	...	...	...	4	...	...	...	4	(h) One square mile and 393 acres due to rectification of previous area figures.
Ajmere . . . . .	...	...	...	...	...	...	...	...	(i) Seventeen square miles obtained by rectification of previous area figures.
Baluchistan . . . . .	...	5	...	...	...	...	...	5	(j) Thirty-three square miles due to rectification of previous area figures.
Andamans	12	...	...	...	...	13	12	15	(k) Thirty one square miles obtained by rectification of previous area figures.
Net Total increase or decrease.	1,265	...	1,433	...	...	1,183	1,520	...	(l) Ninety-four square miles due to rectification of previous area figures.
Berar	(g)23	(h)22	...	...	...	...	23	22	(m) One hundred and nineteen acres obtained by rectification of previous area figures.
Net Total increase or decrease, Bengal Presidency.	1,266	...	1,433	...	...	1,183	1,521	...	(n) One square mile and 393 acres due to rectification of previous area figures.
Madras	(i)863	(j)113	...	...	(k)333	(l)1,254	1,196	1,367	(o) One hundred and nineteen acres obtained by rectification of previous area figures.
Bombay	820	7	4	761	...	...	824	768	(p) One hundred and nineteen acres obtained by rectification of previous area figures.
GRAND NET TOTAL INCREASE OR DECREASE.	2,829	...	681	...	...	2,104	1,406	...	

The details of work done in the various provinces are as follows:—

Bengal.—One hundred and ninety-one square miles of forest in the Darjeeling, Tista and Kurseong Divisions were settled during the year. The whole area of Reserved forests, as given in Form No. 46, has now been finally settled. An area of 848 square miles, almost entirely in Chittagong, was undergoing settlement at the close of the year. The question of selection of fuel and fodder reserves to be managed by the Department as Reserved or Protected forests in the Jalpaiguri district remains undecided.

North-Western Provinces and Oudh.—The Local Government thus fully shows the progress made:—

“In the Central Circle, the only areas finally notified under section 19 of the Forest Act were the two small forests of Baldhoti and Kalimath in the Naini Tal Division, aggregating one square mile. On the other hand, the work of settlement was practically completed in the case of large and important areas, and arrangements had been concluded for taking in hand during the ensuing year the settlement of extensive tracts in the Tarai and Bhabar. In the same Circle various revisions of previous settlements under section 21 of the Forest Act had made progress, and the question of incomplete settlements effected in the case of certain areas originally notified under section 34 was finally disposed of by the publication of notifications ordering the settlement, under Chapter II of the Forest Act, of the Jhansi and Lalitpur forests (Eundelkhand Division), and of the village lands of Chandi in the Chandi reserve of the Ganges Division.

In the Oudh Circle, the only existing settlements are connected with exchanges of land consequent on the re-alignment of the forest boundaries, and progress was here delayed by the difficulty of compiling accurate detailed schedules which should be mutually acceptable to the two parties interested.

In the School Circle, the work mainly consisted of certain boundary revisions in the Jannsar Division, the effect of which was to exclude from the reserved forests some six square miles of cultivation.”

Punjab.—The chief feature of the year's work was the completion of the settlement of the Kangra protected forests, area 707 square miles. The Kangra jagir forests still remain to be dealt with. The Shahpur-Kandi forest settlement report awaits the orders of Government. No other important settlement work was pending at the close of the year.

Burma.—Good progress was made in the settlement of reserves and in the selection of further valuable tracts suitable for reservation. The following areas were finally settled during the year:—

	Square miles.
Pegu	Nil.
Tenasserim	18
Eastern	531
Western	857
TOTAL	<u>1,408</u>

A further area of some 4,800 square miles, all of which have not however been brought on to Form No. 47, was undergoing settlement at the close of the year. Several tracts of forest, hitherto unvisited, were examined by local officers, more particularly in the Upper Chindwin, Myittha, Ruby Mines and Shan States Divisions.

Central Provinces.—In the Southern Circle, the forests of Maulabhanja and Halsari Dongri, area 10 square miles, were settled during the year. In the Seoni district two blocks, with an area of 19 square miles, were undergoing settlement and were notified during the year as proposed reserves under section 4 of the Indian Forest Act.

In the Northern Circle the small block of Jalandar was the only area settled. In the Damoh division, as soon as excisions for ryotwari settlement have been completed, the reservation of the remaining unclassed forest area will be taken in hand.

Assam.—There were no forests settled during the year. The settlement of the two blocks of Barail and Langting-Mahar, area 201 square miles, was taken in hand.

Coorg.—No settlement work was undertaken. Pressure of other work prevented the enquiry into, and record of, the rights in the Protected forests.

Ajmere and Baluchistan.—The only work done was the revision of the record of rights and concessions, and this was concluded during the year. In Baluchistan all rights in existing State forests have been settled and no new work was necessary.

Andamans.—Twelve and a half square miles were settled and formed into the Dhani-Khari reserve, whilst 40 acres were also added to the Brigade Creek reserve. Some 35 square miles of forest have also been formed into reserves since the close of the year.

Berar.—There was no work under this head.

Madras.—The progress made is shown in the following table:—

DATE.	FINALLY NOTIFIED DURING THE YEAR ENDING WITH		SETTLED AND REPORTED OF.		UNDER SETTLEMENT.		TOTAL YET TO BE REPORTED.	
	Number.	Area, in square miles.	Number.	Area, in square miles.	Number.	Area, in square miles.	Number.	Area, in square miles.
30th June 1896 .	185	853	208	1,986	333	2,747	541	4,733
30th June 1897 .	136	845	{ 143 —4 }	{ 1,453 —11 }	357	2,577	500	4,030

* Blocks notified during 1896-96, but taking effect only during 1897-98.

The area finally notified was thus 845 square miles, as compared with 853 square miles in the previous year. This does not by any means represent all the work done, no less than 4,019 square miles being in various stages of settlement. It is estimated that there remains an area of 4,030 square miles still to be taken in hand.

Bombay.—The Bombay Government remark—

“Forest Settlement Reports were completed during the year for the Dahanu, Umbargaon, and Murbad ranges in Thana, and considerable progress in settlement took place also in Kanara. In all Circles the work is now well advanced; in the Northern little remains but the revision of the Mandvi Taluka; in the Central the acquisition of 15,816 acres of occupied lands within sanctioned forest limits is still under negotiation; in the Southern the statistical statement furnished shows an area of 1,118 square miles unfinished, which, however, has been reduced by one-half by the sanction of proposals dealt with since the date of the report, and by the correction of inaccuracies in the original notification of area; in Sindhi the settlement of 16,862 acres is under the consideration of the Revenue officers. It is unfortunate that, owing to the deputation on famine duty of the Forest Settlement Officer, it was impossible to proceed with the field work of the Southern Circle.”

III.—DEMARCATIION.

The principal new demarcation work of the year was again in Madras and Bombay, where settlement operations are in full progress. In the former Presidency 1,376 miles and in the latter 3,107 miles of new boundary were demarcated. A considerable amount of preliminary demarcation and clearing of existing boundaries was also carried out. In the Bengal Presidency the demarcation of settled forests is nearly complete, with the exception of the Protected forests in Kangra and 816 miles of boundaries in Upper Burma. The chief remaining work is in Madras, where 3,041 miles, and in Bombay, where 9,332 miles (chiefly in the Central Circle), remain undemarcated. A total expenditure of Rs. 1,11,900 was incurred during the year on demarcation, of which Rs. 56,000 was spent on new work.

The following table shows the detail of the boundaries in the various provinces at the close of the year 1896-97 :—

PROVINCE.	CIRCLE.	Length of boundaries artificially demarcated during the year.	Length of previously existing boundaries repaired.	Length of previously existing boundaries not repaired.	Total length of artificial-ly marked boundaries at the close of the year.	Length of bound-aries not demar-cated at the close of the year.	Length of natural bound-aries not requiring artificial marks.	Total length of bound-aries at the close of the year.	EXPENDITURE ON DEMARCATION DURING THE YEAR.	
									On new work.	On repairs.
		Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Rs.	Rs.
Pengal	.....	11	2,027	249	2,287	...	1,702	3,989	106	8,573
North-Western Provinces and Oudh	Central Circle	8	810	1,579	2,397	...	614	3,011	248	2,348
	Oudh "	1	247	981	1,229	11	332	1,572	69	2,209
	School "	52	244	342	638	112	359	1,109	1,406	2,005
	Total	61	1,301	2,902	4,264	123	1,305	5,692	1,723	6,562
Punjab	.....	799	1,941	7,341	10,081	4,889	1,185	16,155	1,843	5,240
Lower Burma	Pegu Circle	92	613	872	1,577	...	903	2,480	299	2,902
	Tenasserim Circle	139	183	1,985	2,307	20	641	2,968	1,596	1,449
	Total	231	796	2,857	3,884	20	1,544	5,448	1,895	4,441
Upper Burma	Eastern Circle	182	353	1,051	1,586	274	92	1,952	1,713	1,941
	Western "	290	9	947	1,246	542	1,433	3,221	2,831	139
	Total	472	362	1,998	2,832	816	1,525	5,173	4,544	2,080
Central Provinces	Northern Circle	9	9,043	1,660	10,712	...	1,182	11,894	540	1,729
	Southern "	246	10,396	1,004	11,646	150	1,123	12,919	1,410	4,318
	Total	255	19,439	2,664	22,358	150	2,305	24,813	1,950	6,047
Assam	.....	26	1,088	17	1,131	3	1,353	2,437	616	2,115
Coorg	.....	...	248	6	254	...	11	265	773	158
Ajmere	.....	...	2½	198½	201	...	158	359	...	15
Andamans	.....	12	10	28	45	5	69	119	30	15
Baluchistan	.....	...	173	99	272	...	49	321	...	...
Berar	.....	78	989	230	1,297	38	180	1,515	841	952
Total Bengal Presidency	.....	1,945	28,376½	18,584½	48,906	6,044	11,386	66,336	13,821	36,198
Madras Presidency	Northern Circle	509	1,150	2,677	4,336	1,544	615	6,495	7,038	4,022
	Central "	629	1,327	9,625	11,581	1,063	186	12,830	7,581	4,097
	Southern "	238	549	4,411	5,198	434	749	6,381	2,102	6,247
	Total	1,376	3,026	16,713	21,115	3,041	1,550	25,706	16,721	14,366
Bombay Presidency	Northern Circle	260	744	1,926	2,330	2,024	323	4,882	4,814	257
	Central "	2,746	945	10,923	14,614	7,178	860	22,647	16,917	4,691
	Southern "	20	4	14,358	14,382	71	981	15,434	3,888	0
	Sindh "	81	1,375	425	1,881	64	556	2,501	240	...
	Total	3,107	3,068	27,032	33,207	9,332	2,725	45,264	25,859	4,957
GRAND TOTAL	.....	6,428	34,470½	62,329½	103,228	18,417	15,661	137,306	56,401	55,521

N. B.—Boundaries include, besides the outer perimeter, the limits of enclosures of private and other lands within the forests, but not the limits of sub-divisions, such as blocks, compartments and coupes.

The detail of work in the different provinces was as follows:—

Bengal.—The total length of boundaries stands at 3,939 miles, of which 2,287 are demarcated artificially. Eleven miles of new boundary was completed and the whole length of boundary requiring artificial marks has now been completely demarcated. Two boundary disputes in the Palamau Division remained unsettled, but the outstanding dispute regarding the boundary of the Baikantpur estate was practically settled at the close of the year. A total expenditure of Rs. 679 was incurred chiefly on repairs.

North-Western Provinces and Oudh.—In the Central Circle, the newly formed reserve of Balldhoti-Kalimath was demarcated, bringing the total number of miles of boundaries demarcated artificially to 2,397. All forests in this Circle are now demarcated, but some work still remains connected with the demarcation of village lands inside the forests of the Garhwal and Naini Tal Divisions. Some important work was done in clearing boundary lines, useful also for fire conservancy, in the Bundelkhand Division. In the Oudh Circle the demarcation of boundaries by monoliths was continued, and an expenditure of Rs. 278 was incurred, mostly on repairs; 11 miles only still require new demarcation. In the School Circle there remain 112 miles requiring demarcation, chiefly in the leased forests. Fifty-two miles of new lines were demarcated during the year in the new leased forests and in cultivated lands disforested in the Jaunsar Division.

Punjab.—Four hundred and ninety-one miles in Shahpur, and 237 miles in Montgomery were demarcated during the year. Rupees 1,343 were spent on new work and Rs. 240 on repairs. A good deal of demarcation work still remains to be done in the Kangra Division, where the new Protected forests are as a rule undemarcated.

Burma.—The work of the year is thus described by the Local Government—

"The demarcation of 231 miles of reserve boundaries was carried out in Lower Burma at a cost of Rs. 1,895, and an outlay of Rs. 441 was incurred on repairs to, and renewal of, boundary marks. In Upper Burma 472 miles of boundary were demarcated at a cost of Rs. 544, and Rs. 2,090 were spent on repairs to existing marks. The total length of boundary still remaining to be demarcated is 836 miles, of which 816 miles are in Upper Burma and 20 in Lower Burma."

Central Provinces.—In the Northern Circle, all boundaries of forests are demarcated, but there still remains much work in the demarcation of forest villages, as well as in improving boundaries in the Nimar Division. In the Southern Circle, 126 miles remain in Chanda, 14 in Balaghat and 10 in Bilaspur. Two hundred and forty-six miles of new lines were demarcated, whilst 10,396 miles of lines were cleared. A total expenditure of Rs. 7,997 was incurred, of which Rs. 6,047 were spent on repairs.

Assam.—The total length of demarcated boundaries stands at 1,131 miles. Twelve miles of new lines were demarcated in Goalpara and 14 miles in Lakhimpur, whilst an expenditure of Rs. 115 was incurred on repairs.

Coorg.—All Reserved forests are demarcated, and remaining work consists of clearing lines and erecting supplementary pillars. Good progress was made in this work during the year. A considerable amount of demarcation work will probably eventually be required in the Protected forests.

Ajmere.—A large portion of the forests were demarcated, and boundaries, where incorrect, were rectified. A good deal of useful work was also done by clearing lines demarcating village boundaries. Some village lands inside the forests still require demarcation.

Andamans.—Ten miles of lines were cleared, and 12 miles of the Dhani-Kbari reserve were permanently demarcated. Five miles of boundaries remained undemarcated.

Baluchistan.—The necessary repairs to boundary marks were carried out by the Forest establishment. No new work was necessary.

Berar.—The boundaries of State forests "A" and "B" are in good order, but those of class "C" require some further expenditure to render them so. Seventy-eight miles of new demarcation was done, and a total expenditure of Rs. 1,793 was incurred.

Madras.—A large amount of demarcation work was done, 1,376 miles of new permanent work having been completed, as compared with 2,189 miles in the previous year. The cost per mile amounted to Rs. 12-2-5, which is somewhat in excess of the cost during 1895-96. One thousand six hundred and seventy-one miles of preliminary demarcation were also carried out; and clearing of old boundary lines was undertaken over no less than 3,026 miles. The total expenditure during the year on demarcation amounted to Rs. 31,000, of which Rs. 16,700 were spent on new work.

Bombay.—The following extract from the Bombay Government's review shows the work done during the year—

"The following statement compares the length of boundary demarcated and the cost with the figures of the preceding year :—

Circle.	1895-96.		1896-97.	
	Length, in miles, of boundary lines cleared.	Cost.	Length, in miles, of boundary lines cleared.	Cost.
	Miles.	Rs.	Miles.	Rs.
Northern	130½	1,878	260	4,814
Central	669	6,420	2,743	16,917
Southern	124	862	20	3,888
Sindh	176	929	81½	240

In the Central Circle the work was pushed on as a measure of famine relief, with very satisfactory results, both in the extent of boundary cleared and in the reduction of cost. Progress was made in the Northern Circle, while in Sindh special causes interfered to retard operations. In the Southern Circle the restriction of forest expenditure on account of famine checked the progress of the work in the Belgaum and Dhárwar districts, and only 20 miles are shown in Form No. 48 as having been newly demarcated in the whole Circle; but in Bijapur the preparation of stone pillars for boundaries before laid out was undertaken as a form of famine relief, and Rs. 2,210 out of the total sum of Rs. 3,888 expended on demarcation were devoted to that object. None of the reports show how many miles of forest boundary still remain to be demarcated."

IV.—SURVEYS.

During the year under review, in addition to the Imperial Forest Survey Branch, five full parties of the Survey of India Department and part of a sixth party were employed upon forest survey operations. The tracts operated on by the Survey of India Department were the forest reserves in the Bombay and Madras Presidencies, as well as the forests in Lower Burma and the Central Provinces, and small areas were also surveyed in the Himalayas. The operations of the Imperial Forest Survey Branch were confined to the Central Provinces, Punjab, Upper and Lower Burma.

The total outturn during the year of forest surveys, executed on various scales by the above combined agency, amounts to 4,823 square miles, of which 1,563 square miles were surveyed by the Imperial Forest Survey Branch, in addition to 802 square miles of topographical survey in the Chamba State for incorporation in the 1' standard maps of the Punjab. The area surveyed by the several parties of the Survey of India Department, *viz.* 3,260 square miles, is slightly in excess of that surveyed last year, but the cost-rates in Bombay, Burma, and the Punjab are all higher than usual.

The following tabulated statement exhibits the details and areas on the different scales, as well as the cost-rates, of the several branches of the survey operations :—

AREAS SURVEYED AND COST-RATES PER SQUARE MILE.

PRESIDENCY OR PROVINCE.	DETAIL SURVEY AND PREPARATION OF MAPS ON SCALES OF																								TOTAL TOPOGRAPHICAL SURVEYS.		TOTAL EXPENDITURE IN 1906-07.						
	TRIANGULATION.				TRAVERSING.				1"=1 mile.				2"=1 mile.				4"=1 mile.				6"=1 mile.				16"=1 mile.		1906-07.	1905-06.	Forest Survey Branch.	Survey of India Department.			
	1906-07.		1905-06.		1906-07.		1905-06.		1906-07.		1905-06.		1906-07.		1905-06.		1906-07.		1905-06.		1906-07.		1905-06.		Sq. m.	Sq. m.	R.	R.					
	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	R.	Sq. m.	Sq. m.	R.	R.					
North-Western Provinces and Oudh.	...	...	392	13	...	...	51	9	...	...	...	...	...	...	...	...	...	421	20	...	...	...	...	...	...	...	421	8,547	...		
Punjab	...	...	1,165	3	...	...	...	...	802	9	621	12	...	...	...	...	...	87	30	92	37	...	...	...	...	...	...	889	713	11,124	...
	191	30	116	20	...	...	...	...	...	...	...	...	...	...	...	...	...	191	33	(f) 200	82	...	...	...	...	...	...	191	200	...	23,493
Burma	2,235	8	560	7	(d) 357	35	464	19	...	...	...	...	...	...	...	...	...	268	103	174	92	...	...	...	...	...	...	268	174	57,253	...
	...	...	638	21	512	82	746	59	...	...	...	...	106	51	111	85	396	170	339	158	...	...	...	...	...	...	...	501	450	...	1,14,234
Central Provinces	327	9	804	11	(d) 45	10	374	7	1,002	43	1,025	42	206	(e) 43	127	42	1,208	1,152	(c) 64,623	...
	1,770	7	1,165	7	(d) 408	8	1,497	14	...	...	...	...	...	...	...	...	...	697	71	651	81	...	...	...	...	...	...	697	651	...	89,155
Madras	1,450	(g) 25	...	...	(d) 524	...	...	...	...	...	...	...	...	...	...	...	...	121	324	...	...	...	...	...	...	...	...	121	...	...	78,904
	1,000	(g) 17	1,815	(g) 12	(d) 728	...	(d) 820	...	...	...	...	...	...	...	...	...	...	1,027	65	961	54	...	...	...	...	...	...	1,027	961	...	87,782
Bombay	1,376	7	505	5	244	8	344	12	522	78	829	56	168	136	108	122	33	156	15	130	723	852	...	82,337
TOTAL	2,562	...	2,921	...	392	...	889	...	802	...	621	1,357	...	1,712	206	...	127	...	2,365	2,460	1,35,587	...
	5,787	...	4,239	...	2,416	...	3,407	106	...	111	...	2,953	...	2,983	...	168	...	108	33	...	15	...	3,260	3,217	...	4,75,885	
GRAND TOTAL	8,349	...	7,160	...	2,808	...	4,296	...	802	...	621	...	106	...	111	...	4,310	...	4,695	...	168	...	108	...	239	...	142	...	5,625	5,677	6,11,472	...	

* Surveys executed by the Forest Survey Branch, the topographical cost-rates of which include expenditure on classification of forests and soils. The other surveys are by the Survey of India Department.
 (a) Cost of drawing and publishing the 4" maps of North-Western Provinces and Oudh.
 (b) Includes Rs. 1,368 on account of drawing and publishing 4" and 1" maps of Bahadr and R219 for computation charges for Chamba survey.
 (c) Includes Rs. 3,360 on account of drawing and publishing maps of Jubbulpore, Narsinghpur, and Bhandara Divisions and Rs. 668 for leveling operations.
 (d) Linear miles.
 (e) Average cost of both 4" and 16" surveys.
 (f) Incorrectly shown in previous year's statement as 413.
 (g) Includes traversing.

The total expenditure incurred on 2,365* square miles of provincial forest surveys by the Forest Survey Branch was ₹1,35,587, whilst the Survey of India Department expended a sum of ₹4,75,885 on the survey of 3,260 square miles of forest reserves, making a total aggregate expenditure of ₹6,11,472 for the year, as shown in the above statement, against an expenditure of ₹5,26,983 in the previous year.

In addition to the regular professional surveys, a large amount of survey work in the way of boundary and compass surveys and the preparation of sketch-maps was done departmentally by Forest officers, more particularly in Burma and Madras.

The following statement gives the areas operated on topographically in connection with the Forest Department by the professional agency of the Forest Survey Branch and the Survey of India Department since 1873 and up to the close of the year under review, and the map of India which is attached locates the areas already dealt with and shows the tracts that still remain to be brought under survey:—

SURVEY YEAR.	BENGAL.		NORTH-WESTERN PROVINCES AND OUDH.				PUNJAB.		BURMA.		CENTRAL PROVINCES.		ASSAM.	Bihar.		MADRAS.	BOMBAY.			By Forest Survey Branch.	By Survey of India Department.	
	Scale.		Scale.				Scale.		Scale.		Scale.		Scale.	Scale.		Scale.	Scale.					
	4"	2"	12"	8"	4"	2"	4"	1"	4"	2"	16"	4"	4"	4"	2"	4"	16"	8"	4"			
1873 to 1896-1896.	115	...	3	...	4,411	305	1,473	3,940	923	7	823	4,670	613	936	1,231	...	...	...	...	18,339	...
1896-97	537	216	...	215	494	...	1,007	...	2,951	1,157	...	4,134	...	...	...	5,118	207	3,203	2,530	...	20,736
1896-97	...	...	...	...	...	...	87	802	268	...	208	1,002	...	...	...	...	...	...	...	2,306	...
1896-97	...	...	...	...	...	...	191	...	395	106	...	697	...	...	...	1,148	33	169	522	...	3,260
TOTAL	652	216	3	215	4,905	305	2,757	3,742 ^(a)	4,537	1,270	1,029	10,503	613	936	1,231	6,266	240	3,371	3,012	...	20,794	24,018
	667				5,328			6,499		5,807		11,632	613		2,157	6,366		5,653			20,794	24,018

* Surveys executed by the Forest Survey Branch. The other surveys are by the Survey of India Department, and the areas have been taken from a statement furnished by the Surveyor-General and from Annual Reports of the Survey of India Department.

(a) Includes an area of 3,742 square miles on the 1" scale surveyed for topographical purposes.

The above statement shows that a total area of 40,980 square miles, on various scales, has been surveyed for forest purposes, and that an area of 2,742 square miles of intervening tracts has been topographically surveyed to complete the 1" standard maps of the Punjab.

Work done during the year in the various provinces was as follows:—

Bengal.—No surveys were done by professional agency, but 212 miles of boundary surveys of Protected forests were completed by the Land Revenue Settlement Department in the Kolhan Government estate in the Singhbhum Division, and some petty operations, comprising boundary and coupe surveys and surveys of paths and road-traces, were carried out by departmental agency at a cost of ₹579. Form No. 49 shows that the large area of 3,293 square miles of Reserved forests still remains to be surveyed, but the Government of India hope that the necessary arrangements to complete the survey of all areas for which maps are urgently required will shortly be found feasible.

North-Western Provinces and Oudh.—With the exception of 76 square miles, 73 of which represent the chir forests recently leased from the Tehri-Garhwal Raja, the general survey of all three Circles has been completed by professional agency and the mapping of the forests of the School and Central Circles is also practically finished. The mapping of the Oudh forests is still incomplete, owing chiefly to the pending of settlement of the Nepal-Kheri boundary and the final survey of the alignment of the Tulsipur forest boundary. In the School Circle, a surveyor was employed departmentally in mapping 1,024 acres of *chaks* in the Jaunsar Division and subsequently in correcting the sketch map of the Tehri-Garhwal leased chir forests, where 35 miles of boundaries were surveyed. In Form No. 49 for the Central Circle, an area of

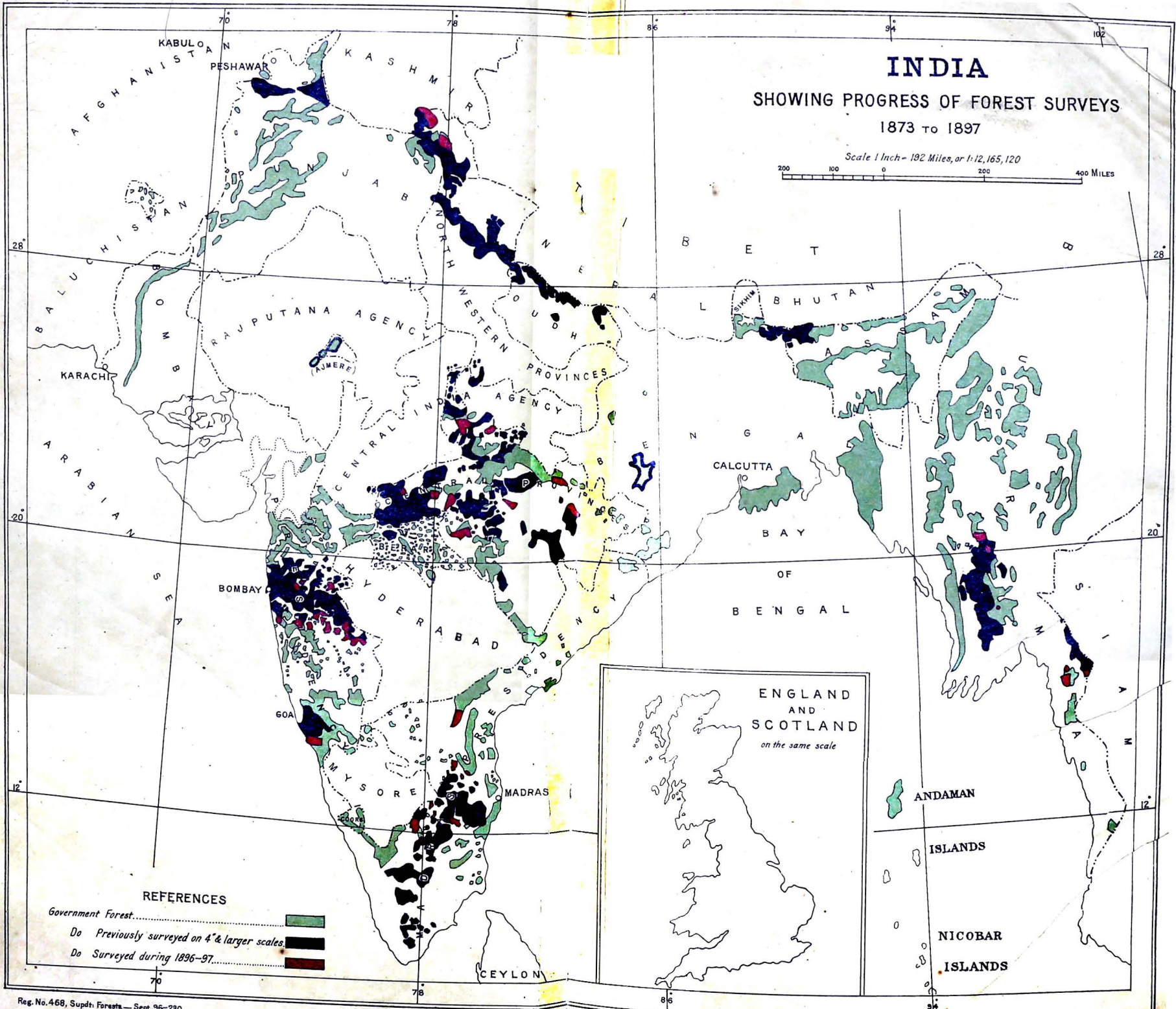
INDIA

SHOWING PROGRESS OF FOREST SURVEYS

1873 TO 1897

Scale 1 Inch = 192 Miles, or 1:12,165,120

200 100 0 200 400 MILES



REFERENCES

- Government Forest.....
- Do Previously surveyed on 4" & larger scales.....
- Do Surveyed during 1896-97.....

4 square miles of Protected forests in the Bundelkhand Division is returned under head of "special surveys," and one square mile in the Naini Tal Division was surveyed by local agency. The total amount expended on these surveys was R394.

Punjab.—In the districts of Kulu and Kangra, and in the Sirmur, Patiala and Kalsia States, a forest area of 191 square miles, and comprising 80 forest blocks, was surveyed on the 4" scale by No. 18 Party of the Survey of India Department, at a cost-rate of R93 per square mile. The cost-rate is somewhat higher than it was in the previous year. In Chamba, a party of the Forest Survey Branch was at work and completed a topographical area of 839 square miles, 87 square miles of which were surveyed on the 4" scale for forest purposes, and 802 square miles were surveyed on the 1" scale for the purpose of completing the standard topographical map of the country. The cost of the 4" detail survey was R30 per square mile, and the 1" topographical work cost R9 per square mile. The areas given above are for the Survey year, ending 30th September, and *not* the Forest year.

Burma.—Professional survey parties were at work in both Upper and Lower Burma during the year. No. 20 Party of the Survey of India Department was engaged in surveying forest tracts in the Toungoo, Shwegyin, and Pegu Divisions and completed the following detail areas :—

Three hundred and ninety-five square miles of reserved forests on the 4" scale at a cost-rate of R170 per square mile, against a cost-rate of R158 in the previous year, and 106 square miles of unclassified forests on the 2" scale at a cost-rate of R51 per square mile; some traversing in advance was also done. Three detachments of the Forest Survey Branch were also employed in Burma and operated on the reserved forests in the Pinyinana and Ruby Mines Divisions in Upper Burma and the Salween-Attaran Division in Lower Burma. Triangulation was extended over an area of 2,235 square miles in the Salween-Attaran and Ruby Mines Divisions, and 357 miles of traversing was done in the Pinyinana forests. The total area topographically surveyed on the 4-inch scale by this Branch was 268 square miles at an average cost-rate of R103 per square mile. The cost-rate is slightly higher than usual, owing to higher charges for a Deputy Superintendent, as well as a proportionate amount of the Superintendent's pay having been included on account of supervision, yet the cost-rate compares most favourably with the cost-rate of the Survey of India Department, which was R170 per square mile for similar work. The officer in charge of No. 20 Party thus accounts for the high cost-rate of the work of his party—

"The cost-rate, calculated as in former years, shows a small increase, though in reality the work is again cheaper. This is partly explained by the share of supervision, etc., that formerly was taken by the triangulation falling this year on the detail work; and partly by the extra cost of an Assistant Superintendent and probationary Sub-Assistant Superintendent attached to the Party, more for the purpose of training than because they were actually required."

Local officers in Burma completed a considerable amount of compass surveys and prepared a good many skeleton maps which, no doubt, will prove most useful for forest administrative purposes pending the preparation of more accurate maps by professional agency.

Central Provinces.—The surveys in the Central Provinces were in continuation of the previous year. Five detachments of the Forest Survey Branch and No. 14 Party of the Survey of India Department were engaged in the operations. The field operations of the latter Party were confined to the districts of Damoh, Bilaspur and Sambalpur; the detail survey of the forests in Damoh were brought to a close and work was begun in Bilaspur; whilst triangulation and traversing were extended in the Sambalpur and Bilaspur districts. The total outturn of 4" topography by this party was 697 square miles at a cost-rate of R71. The remaining portion of the work in districts Bilaspur and Sambalpur has been transferred to the Forest Survey Branch for completion. The Forest Survey Branch continued the survey of the reserved forests in the districts of Raipur, Balaghat, Nagpur, Wardah, Chindwara and Saugor. The survey of the forests in Raipur and Balaghat having been brought to a close during the year under review, work was commenced in the districts of Seoni and Bilaspur. The total area topographically surveyed on the 4" and 16" scales was 1,208 square miles at an average cost-rate of R43 per square mile, as compared with an area of 1,152 square miles at R42 per square mile in the previous year. The total aggregate outturn of topographical work by the double agency of the Forest Survey Branch and No. 14 Party of the Survey Department was 1,903 square miles against 1,803 in the previous year. Survey work is now completed in the districts of Balaghat, Bhandara and Raipur in the Southern Circle, as well as in the districts of Jubbalpur, Narsingpur and Damoh in the Northern Circle; little remains to be done in Nagpur and Wardah, but an area of about 300 square miles, in addition to the previous survey in the districts of Hoshangabad and Nimar, will have to be mapped when

the work of excision for ryotwari settlement has been completed. The survey of the forests in the districts of Saugor, Seoni, Chindwara and Bilaspur is in progress, and it is expected that survey work will shortly be extended to the districts of Sambalpur, Mandla and Chanda, which are the only districts which remain to be brought under survey.

The Conservator, Northern Circle, complains of the delays that occur in the receipt of forest maps, and in paragraph 25 of his report gives a statement which certainly invites comment. The Forest Survey Branch is only responsible for the mapping of the forests in the districts of Jubbulpur, Narsingpur and Saugor in this Circle, and complete sets of forest maps for the two former districts are now in the hands of the Conservator; the survey of Saugor is still in progress, but the Conservator has already been supplied with 9 sheets of this district. Delays in issuing some of the forest maps are often unavoidable, chiefly owing to the numerous excisions which are constantly taking place for ryotwari settlement and the difficulties and delays which occur in ascertaining and often re-surveying the revised boundaries, and in such cases the map-printing has to be held in abeyance pending the final settlement of the forest boundaries; and this was particularly the case with many of the maps of the Dhanwahi pargana of the Mandla district, which, for administrative purposes, forms part of the Jubbulpur Forest Division and is referred to by the Conservator in his statement under that head. The forests in the districts of Hoshangabad, Betul, Nimar and Damoh were surveyed by the Survey of India Department, and steps are being taken to ascertain the cause of delay in issuing the forest maps of these districts, and which it is hoped will lead to the early issuing of most of the sheets.

Assam.—There is little to record under this head; some minor surveys were undertaken by departmental agency, chiefly boundary surveys. The expenditure charged against surveys during the year was Rs81. From Form No. 49 it would appear that there is a forest area of 3,148 square miles remaining to be taken under survey.

Coorg.—In this Division, beyond the survey of 7½ miles of roads and 6½ miles of fire-lines, nothing in the way of surveys was done. It is contemplated to put a trained Ranger on the preparation of stock maps, if his services can be made available.

Ajmere.—Arrangements have been made for a rough survey being undertaken to correct certain discrepancies brought to notice in the areas of some of the Merwara forests, and as soon as the survey which is being carried out has been completed, it will be possible to correct the discrepancies referred to, and the Government of India trust that steps will be taken to bring this necessary work to conclusion as speedily as possible.

Baluchistan.—Nothing was done during the year in the matter of surveys.

Andamans.—No actual surveys were done, but as it was necessary to ascertain the localities of light coloured padouk timber suitable for extraction from the forests, the padouk tracts were examined, located and plotted on the existing maps. The navigable channels on the east coast from Shoal Bay to Long Island were also examined and plotted on the existing map.

Barar.—No surveys to record during the year, but good progress was made in the publication of 1" maps compiled for the most part locally from 8" settlement maps of Barar, and re-drawn and published under the direction of the Superintendent of Forest Surveys at Debra Dun.

Madras.—An additional survey party was transferred to Madras during the year to expedite the survey of the forest reserves in that Presidency, maps of which are required as soon as possible. Hence two full parties, *vis.* No. 9 and No. 19, of the Survey of India Department, were engaged throughout the year on surveying and mapping the Madras forests. The two parties completed the topographical survey of 1,148 square miles on the 4" scale, of which 811 square miles were reserved forests, as compared with 964 square miles surveyed in the previous year by Party No. 19. The cost-rate per square mile of topography by No. 19 Party was Rs65 and the triangulation and traversing cost Rs17 per square mile, giving a total cost of Rs82 per square mile, as compared with Rs66 in the previous year. The cost-rates are in excess of the past four years, which is due to various causes, the principal one being the difficult nature of the country combined with the density of the forests in the Kurnool District. The Conservator remarks that it is very improbable that the cost per mile will, as long as the party is employed in such difficult country, fall to the previous low rate of Rs66. The outturn of topography by the second Survey Party No. 9, employed in Madras, was very small and the cost-rate of the work was abnormal, it having reached the very high figure of Rs349 per square mile, *vis.* Rs24 for detail survey and Rs25 per square mile of triangulation. The abnormally high rate is partly attributed to the inefficiency of the subordinate staff and to the heavy cost for the transfer of the party from the Central Provinces for work in Madras, as well as to unfavourable weather, but it is hoped by the Government of India that the steps which are being

taken to ensure the more efficient working of the survey in future will considerably reduce the expenditure. Much has been done departmentally in the way of boundary and other surveys, and in the matter of keeping the existing maps up to date, which is noticed with satisfaction.

Bombay.—In continuation of the previous season's operations, No. 17 Party of the Survey of India Department was employed in surveying the reserved forests in all three Circles. The work comprised the detail survey on the 8" scale of teak reserves in the Thana district; the completion of 4" detail survey in the Poona district; the 8" survey of teak reserves; the 4" survey of ordinary forest reserves; the 16" survey of babul reserves in the Ahmednagar district; and the detail survey on the 4" scale in North Kanara. The total area topographically surveyed amounted to 723 square miles; as compared with 952 in the previous year, which shows a considerable falling off in the matter of outturn of area, and it is also noticeable that the average cost-rate per square mile on all three scales of 4, 8 and 16 inches to the mile are considerably in excess of the previous year's work, as will be seen from the following statement, which exhibits the areas and cost-rates for 1895-96 and 1896-97, as given in the Survey of India reports.

1895-96.			1896-97.			Difference in cost per sq. mile.
Scale.	Area, in sq. miles.	Cost-rate per sq. mile.	Scale.	Area, in sq. miles.	Cost-rate per sq. mile.	
		R			R	R
4"=1 mile . . .	829	66	4"=1 mile . . .	522	78	12
8"=1 mile . . .	108	122	8"=1 mile . . .	168	136	14
16"=1 mile . . .	15	130	16"=1 mile . . .	33	156	26
TOTAL . . .	952	...	TOTAL . . .	723	...	...

The cost-rate of the 16" work has been commented on by the Survey Commissioner and Director, Land Records and Agriculture, and he remarks that "the work was done by junior men and should have been more closely supervised."

In Sindh there is little to record under head of surveys; the riverain survey has been completed and the maps have been found to be most useful.

V.—WORKING-PLANS.

Considerable progress has been made during the year in the preparation of working-plans. In the North-Western Provinces and Oudh, 5 plans dealing with an area of 1,345 square miles were sanctioned, bringing the total area under organized working to 3,301 square miles, or 83 per cent. of the whole forest area. Excellent progress has also been made in both the Northern and Southern Circles of the Central Provinces. In the former Circle, although no plans were actually sanctioned, a large amount of excellent work was accomplished, and the next few years will show a large increase to the area under working-plans. In the Southern Circle, 11 plans for an area of 1,633 square miles were sanctioned, and plans dealing with a further area of 3,553 square miles were under preparation. In Burma much work remains to be done, more particularly in Upper Burma, where valuable teak forests are year by year being added to reserves.

Of the total forest area in the Bengal Presidency, as it stood at the close of the year (79,995 square miles), working-plans are now in force over 13,737 square miles, or 17 per cent. This area is covered by 83 working-plans, showing that the average area dealt with in each plan is about 166 square miles. Ten years ago, in 1886-87, the number of plans in force was 6, and the area covered by them was 339 square miles. During that year 5 plans, with an area of 230 square miles, were sanctioned, and 12 plans, with an area of 644 square miles,

were submitted to the Inspector-General of Forests for his opinion. During the year under notice 21 plans for 3,479 square miles were sanctioned, and 28 plans for 4,706 square miles were submitted for the opinion of the Inspector-General of Forests. In addition to this, preliminary proposals for 27 plans, dealing with 3,904 square miles, were examined in the Office of the Inspector-General of Forests. From this it is evident how great the progress made has been, and it is satisfactory to observe that at the same time a considerable improvement has been attained in the character of the plans proposed, which are now much more simple and more practical than those which were first prepared.

As regards the due observance of the provisions of existing plans, it may be said that they are more and more strictly carried out as experience and a properly trained executive staff enables the controlling officers to better carry out the works laid down. There is little to find fault with in this respect, and though, with the increase in the number of working-plans, the work of control in the Office of the Inspector-General of Forests becomes heavier year by year, the fact that the plans are better worked up to, and that the control forms are better prepared than was formerly the case, has hitherto prevented undue pressure. The following Forms show for the provinces in the Bengal Presidency (A) the area brought under sanctioned working-plans up to the close of the year; (B) the progress made in the preparation of working-plans during the year; and (C) a comparison of the work done with that still remaining:—

(A)

Areas brought under the control of sanctioned Working-Plans up to 30th June 1897 in the provinces of the Bengal Presidency.

PROVINCE.	FOREST AREA, IN SQUARE MILES.				Area for which working-plans were prepared and sanctioned up to 30th June.	Proportion of forest area under sanctioned working-plans.
	Reserved.	Protected.	Unclassed State.	Total.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
					Square miles.	Per cent.
Bengal	5,876	3,378	4,034	13,288	(a)4,250	32
North-Western Provinces and Oudh.	3,822	94	43	3,959	(b)3,301	83
Punjab	1,681	2,377	2,258	6,316	(c)606	10
Burma (Lower)	7,250	...	...	7,250	1,509	21
Burma (Upper)	6,808	...	...	6,808	37	1
Central Provinces	19,253	...	352	19,610	(d)2,441	12
Assam	3,681	...	11,244	14,925	533	4
Coorg	238	650	...	888	116	13
Ajmere	139	...	10	149	139	93
Ealuchistan	170	...	...	170	...	...
Andamans	85	...	1,868	1,953	...	...
Berar	4,179	...	...	4,179	721	17
TOTAL	53,187	6,999	19,809	79,995	13,737	17

N.B.—For explanation of the figures in columns 3 to 5, please see the remarks column of the area statement on page 2.

(a) In 1895-96 this was shown as 4,309 square miles; it has now been reduced to 4,250, as 59 square miles were transferred to the Civil Department for cultivation during 1896-97.

(b) Last year this figure was 2,290 square miles; during 1896-97 it was reduced to 2,283 by rectification, and increased by 1,018 square miles (=3,301 square miles) for newly sanctioned plans. In addition 327 square miles of old areas, which have already been accounted for, were revised and sanctioned during the year.

(c) Excludes 33 square miles (Changa Manga plan) of old areas now revised; also 1 square mile reduced by rectification.

(d) At the close of 1895-96 the area was 794 square miles, and during 1896-97 14 square miles were added by rectification and 1,633 square miles for new working-plans, making a total of 2,441 square miles.

(B)

Progress made in Working-Plans in the provinces of the Bengal Presidency during 1896-97.

PROVINCE.	PRELIMINARY PROPOSALS SUBMITTED TO THE INSPECTOR GENERAL OF FORESTS FOR WORKING- PLANS.		COMPLETED PLANS SUBMITTED FOR OPINION AND REMARKS OF IN- SPECTOR GENERAL OF FORESTS.		PLANS FINALLY SANCTIONED BY LOCAL GOVERNMENTS ON RECOMMENDATION OF THE INSPECTOR GENERAL OF FORESTS.	
	No.	Area for which prepared.	No.	Area for which prepared.	No.	Area for which prepared.
		Square miles.		Square miles.		Square miles.
Bengal	1	183	2	224	...	...
North-Western Provinces and Oudh	2	71	4	(a)918	5	(a)(b)1,345
Punjab	2	366	5	(c)296	2	(d)177
Burma (Upper)	1	79	...	...	1	37
Burma (Lower)	8	451	1	148	1	148
Central Provinces	9	2,176	14	2,976	11	1,633
Berar . . . . .	...	...	1	5	...	...
Coorg	3	439	...	...	...	...
Ajmere	1	139	1	139	1	139
TOTAL	27	3,904	28	4,706	21	(e)3,479

(a) Includes 284 square miles of old working-plans (Palani-Kohtri 118 and Ganges working-circle 141) now revised.

(b) Also includes 73 square miles (Hirapur working-plan) already dealt with in the Bhira range working-plan.

(c) Includes 143 square miles of old working-plans (Upper Ravi 111 and Changa Manga 32) now revised.

(d) Includes 33 square miles of Changa Manga working-plan now revised.

(e) Includes 350 square miles of old areas for which new plans have now been made; the actual progress for new areas is therefore 3,479-350=3,129 square miles.

(C)

Comparative Statement of progress made in Working-Plans during 1896-97.

PROVINCE.	AREAS FOR WHICH WORKING-PLANS HAVE BEEN COMPLETED AND SANCTIONED.		AREA FOR WHICH WORKING-PLANS ARE BEING COMPILED.		Areas for which Working-Plans have still to be taken in hand.	Total forest area, as in Form No. 46.	REMARKS.	
	At commencement of the year.	During the year.	At commencement of the year.	Taken in hand during the year.				
1	2	3	4	5	6	7	8	
	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.		
Bengal	(a)4,250	...	407	...	8,631	13,288	(a) Last year the area was 4,309 square miles, of which 59 square miles were transferred to the Civil Department for cultivation during 1896-97.	
North-Western Provinces and Oudh.	Central Circle	(d)896	(b)574	(c)14	(e)25	318	1,827	(b) Garhwal plan, 427 square miles, plus 147 square miles on account of new areas in Ganges plan. The areas of the old Ganges Plans (Palain-Kohiri, 113 square miles and 141 square miles, Ganges Working-Circle) are already shown in column 2.
	Oudh "	957	(e)149	...	...	188	1,244
	School "	(f)430	295	...	...	163	888
Punjab	(g)551	(h)145	1,624	479	4,017	8,816	(c) Excluding old areas now being revised and already included in column 2.	
Burma (Lower)	Pegu Circle	1,023	21	2,065	3,109	(d) According to last year's statement this should be 804, but during 1896-97 the area of the Kinnara working-plan was reduced by 3, and the Lanadawac plan by 5, square miles.
	Tenasserim Circle	832	148	...	150	3,511	4,141	
Burma (Upper)	Eastern Circle	...	37	...	66	2,508	(i)2,611	(e) Excluding 73 square miles (Hirapo working-plan) sanctioned during the year, as this area forms part of the general plan for the Bhirra range forests included in column 2.
	Western "	...	...	...	...	4,197	(j)4,197
Central Provinces	Northern Circle	4,186	2,494	3,008	9,688	(f) In 1895-96 this was shown as 429; it has now been increased by 1 square mile, owing to rectification of area in the Dehra Dun forests.
	Southern "	(n)808	1,633	2,890	663	3,928	9,922	
Assam	533	...	...	...	14,392	14,392	(g) Similarly this should be 552, but the area was reduced by 1 square mile on account of rectification in Bashahr.
Berar	721	...	4	...	3,454	4,179	(h) Excluding 32 square miles (revised Chauga Mangu plan) sanctioned during the year but already included in column 2.	
Coorg	116	...	57	29	686	888	(i) These are reserved areas only and exclude 13,508 and 16,103 square miles, respectively, of forests which have been afforded protection under the regulations as a preliminary to being reserved.	
Paluchistan . . . . .	...	...	...	...	170	170	(j) Includes 11,244 square miles of unclassified forests for which working-plans are not required at present.
Andamans . . . . .	...	...	...	...	1,953	1,953	(k) Excludes 26 square miles of pasture reserves which are not to be organized.
Ajmere . . . . .	...	139	...	...	10	149	(l) The Conservator states that these figures represent area of forests as sealed, and, therefore, they will not compare with figures in Form No. 46.
Total Bengal Presidency	(o)10,617	(p)3,120	9,182	3,927	53,149	79,995	(m) Includes 1,750 square miles marked out for ryotwari and 18 square miles of unclassified forest for which no working-plan is required.	
Madras Presidency.	Northern Circle	52	...	718	...	5,789	6,559	(n) Increased by 14 square miles owing to rectification of area.
	Central "	78	103	...	15	6,663	6,859	
	Southern "	53	31	12	24	5,369	5,489	
TOTAL	188	134	730	39	17,321	18,907	(o) According to last year's statement this should be 10,670, but during 1896-97 it was reduced by 53 square miles by transfers, etc., see (a), (d), (f), (g) and (n).	
Bombay Presidency.	Northern Circle	566	45	(l)779	(l)1,390	(p) Excluding 359 square miles of old areas revised and sanctioned during the year but already accounted for in column 2, see (b), (c) and (k).
	Southern "	682	...	91	221	(k)4,258	(k)5,252	
	Central "	888	...	1,552	326	3,598	6,364	
	Sindh "	...	...	...	...	1,065	1,065

1 N.B.—For Madras and Bombay the figures in columns 2 and 3 have been taken from the statements given in the annual reports, but it is not known what areas have been actually sanctioned.

Details of work done in the various provinces are given below.

Bengal.—No new plans were sanctioned during the year, but plans dealing with the Tista valley, the Tista Division and the Jalpaiguri forests, in all an area of 407 square miles, were practically completed. The area of reserved forests still to be taken in hand stands at 2,932 square miles, of which large areas in Chittagong and Palamau are not in immediate need of being placed under systematic plans.

North-Western Provinces and Oudh.—Nearly all the forests in these provinces are now under sanctioned working-plans. There remain only 619 square miles to be dealt with, situated chiefly in the Bundelkhand, Jaunsar and Gonda Divisions. It has been decided that in Bundelkhand no plan is at present required. In Gonda and Jaunsar arrangements have already been made to prepare plans; so that ere long all plans required for settled forests will have been completed. The revision of existing plans, as well as the preparation of new plans for newly settled areas, will however continue to need attention.

Punjab.—A working-plan for the Kalachitta forests in Rawalpindi, area 145 square miles, was sanctioned and plans were in hand for the Kaghan and Kulu protected forests, the Simla Municipal forests, the Mailsi, Kabirwala and Montgomery forests. The working-plans for Kalesar and Changa Manga were under revision, and the revised plan for the latter was sanctioned during the year. Of the reserved forests, only 603 square miles now remain to be dealt with, but there are 1,287 square miles of protected and 2,127 square miles of unclassed forests which still require to be taken in hand.

Burma.—The following extract from the Burma Government's Resolution on the forest reports fully summarizes the work of the year:—

"A working-plans party was employed in the Tenasserim Circle during the year and collected data for the Kysukmasin and Saing-Yan6 reserves. The working-plan for the West Swa, L6nyau, and Sabyin reserves was sanctioned during the year, as were the proposals for the systematic working of teak in the unreserved forests of certain divisions of the Pegu Circle. A working-plans party commenced work in the Pyinmana forests and completed the field operations in connection with the Yeni reserve. A working-plan for the Mohnyin reserve in the Katha Division, which was prepared by the Divisional Officer, was also sanctioned during the year. In their orders on last year's report the Government of India advised that all available resources of the province for the preparation of working-plans should for some years be concentrated on the leased forests of Upper Burma. If this recommendation is adopted, the working-plans party now employed in the Tenasserim Circle will be transferred to Upper Burma at the close of the present working season. While recognizing the need for working-plans in Upper Burma, the Lieutenant-Governor is not fully satisfied of the expediency of postponing such operations indefinitely in Lower Burma. He proposes to consider the question further at the end of the present working season. In view of the approaching expiry of the leases of the Chindwin forests, at present held by the Bombay-Burma Trading Corporation, the question of the future administration of the forests was considered during the year of report. It was decided that they should be examined as thoroughly as possible during the present camping season, with a view to obtaining an estimate of the timber probably available for extraction. This examination is now being carried out."

Central Provinces.—Excellent progress was made in both the Northern and Southern Circles. The Government of India in their review on the forest administration of the year remark—

"The progress made in the preparation of working-plans is noticed with particular satisfaction. In the Southern Circle, plans dealing with an area of 1,633 square miles were sanctioned during the year, and plans for a further area of 3,553 square miles were under preparation. In the Northern Circle, although no plans were actually sanctioned, a large amount of excellent work has been completed, and it is clear that the Conservator will shortly succeed in placing all the forests of his Circle, so far as this is required, under systematic plans of management. Form No. 50, showing the progress made in working-plans, has now been prepared in accordance with the instructions given in paragraph 4 of the Government of India's review of the forest reports for 1895-96, and shows the state of affairs much more clearly than in previous years."

Assam.—Of the total area of reserved forests—3,632 square miles—533 only are under working-plans. Of this area 522 square miles is in Goalpara, where hitherto it has not been found possible to work out the number of trees available under the plan. The only new work of the year was the preparation of a scheme, auxiliary to the Goalpara plan, to regulate the removal of trees other than sal; this was in hand at the close of the year and has since been sanctioned.

Coorg.—The Government of India remark—

"Although Form No. 50 shows that no new working-plans were sanctioned during the year, a considerable amount of work has been done under this head, and it is noticed with satisfaction that plans dealing with an area of 86 square miles were practically completed during the year. The plan for the sandalwood areas is still awaited. The cost of completed working-plans, to which attention was drawn in the Government of India's orders on the Forest Administration Report for 1895-96, is now calculated to be R64 per square mile, instead of R138 per square mile as incorrectly entered in the report for that year."

Working-plans for the Arkeri, South Dubare, and Devamachi forests were completed, but not sanctioned during the year, and it is hoped that the whole area of reserved forest will shortly be worked under working-plans.

Ajmere.—The revision of the original working-plan, which had been found unsuitable, was undertaken and completed during the year.

Baluchistan.—Nothing was necessary under this head.

Andamans.—Some preliminary work was done in the examination and plotting on the map

of areas of padouk, evergreen and mixed forests, the examination of navigable channels, and the enumeration of padouk trees and their classification into sound and unsound, good and bad coloured trees. The observations taken tend to show that 22 per cent. of the mature trees are unmarketable owing to unsoundness or defects, 9 per cent. are marketable, but of inferior colour, whilst 40 per cent. alone are marketable trees of good colour.

Berar.—A working-plan for the Akola babul tract of 4 square miles was completed. A large amount of work was carried out in the preparation of provisional plans which were being compiled for an area of 2,172 square miles. All the forests in Berar will shortly be worked under permanent or provisional plans of working.

Madras.—The Government of India in their review remark—

“Some progress has been made in the preparation of working-plans, which were completed during the year for an area of 317 square miles; plans for an area of 769 square miles were under preparation at its close. With surveys and settlement work still incomplete, rapid progress in this direction can perhaps scarcely be expected. But wherever surveys have been completed and maps have been prepared, it is hoped that the importance of working the forests under carefully considered schemes of management will be kept prominently in view and working-plans pressed on.”

In the Madras Presidency an area of 17,821 square miles still remain to be taken in hand.

Bombay.—The progress made is thus noted in the Bombay Government's Resolution—

“In the Northern Circle, working-plans were completed for the Godhra, Mshim, Bassein and Vada forests, and the plans for five other forest ranges were under consideration or preparation; in all 20 per cent. of the total forest area is under sanctioned working-plans. 1,184 coupes were marked out on the ground, and this work is being carried on in advance of requirements.

The progress made in the Central Circle is not clearly shown in the report; but from Form No. 50 it appears that, while plans for an area of 1,878 square miles have been taken in hand, none were actually completed during the year. The Conservator states that 42 per cent. of the whole area is under detailed treatment by means of provisional working-plans; the area under sanctioned plans is, however, less than 14 per cent. His Excellency the Governor in Council recognises the difficulties attendant on the rapid completion of the demarcation of compartments, but must insist that no effort be spared with the establishment available to carry out in their entirety the views of this Government and the Government of India as detailed in paragraph 5 of letter No. 959—173-5 F. of October 14th, 1897, from the latter Government.

In the Southern Circle two parties were at work, and made satisfactory progress in the collection of data for future plans. The area under sanctioned plans amounts to 13 per cent. of the whole.

In Sindh a beginning was made in the preparation of working-plans; though impeded first by demarcation work, which was under the same officer, and subsequently by the plague; fair progress was made in the Sukkur Division.”

VI.—COMMUNICATIONS AND BUILDINGS.

A total expenditure of R1,64,900 was incurred upon roads and bridges, as against R1,43,800 in the previous year. Of this amount R75,000 were expended in the construction of new roads, chiefly in Bengal, North-Western Provinces and Oudh, Berar and Madras. In the latter Presidency commendable activity in opening out communications is to be observed, R30,000 having been spent on new roads, as against R12,000 in the previous year. The chief work was in the Southern Circle, where some important roads were constructed in North Coimbatore. Nearly R90,000 were expended on the repair of existing communications. As usual, the largest expenditure was incurred in the North-Western Provinces and Oudh, where R34,000 were required to keep the roads in order. Of this sum R19,500 were spent in the Central Circle, where the roads were generally much damaged by heavy rainfall.

Under tramways, there is little of interest to add to the remarks made in the Review for the year 1895-96. The existing tramways in the Punjab, Andamans and Madras continued to yield useful service. In this connection it is observed that the working of the tramway in South Coimbatore is stated to have resulted in a loss of R22,973, as compared with what the cost would have been if country carts had been employed. But it appears that without the tramway the wood could not be exported at all, carts not being available or very deficient in number. Under such circumstances, calculations of the

kind are meaningless, and it would be more correct to credit the tramway with the net profit which has been realized from the sale of the otherwise unexploitable wood.

On buildings a total expenditure of R2,61,000 was incurred, of which R1,81,000 were spent on new buildings. The principal expenditure was in Upper Burma, where the construction of rest-houses for officers and of quarters for subordinates received considerable attention. The total expenditure on communications and buildings amounted to R4,26,000, as against R3,96,700 in the year 1895-96. The details of expenditure in the various provinces under new work and repairs are shown in the following table:—

PROVINCE.	NEW WORK.		REPAIRS.		TOTAL.
	Buildings.	Roads.	Buildings.	Roads.	
	R	R	R	R	R
Bengal	12,407	10,480	10,132	14,226	47,245
North-Western Provinces and Oudh	21,809	13,832	13,164	34,477	83,372
Punjab	13,004	1,271	4,771	2,346	21,392
Barma (Lower)	25,450	543	3,967	1,522	31,482
Barma (Upper)	42,249	1,037	4,789	600	48,675
Central Provinces	9,389	1,192	4,580	2,748	17,909
Assam	3,372	568	7,751	2,130	13,821
Cooch	2,530	609	647	1,886	5,722
Ajmere	21	307	52	24	404
Baluchistan	124	150	124	...	398
Andamans	161	24	448	2,453	3,085
Berar	2,290	7,469	3,154	5,749	18,662
TOTAL BENGAL PRESIDENCY	1,32,946	37,432	53,579	68,160	2,92,167
Madras Presidency	29,134	30,252	19,208	17,016	95,610
Bombay Presidency	19,139	7,421	7,112	4,636	38,308
GRAND TOTAL	1,81,219	75,155	79,899	89,812	4,26,085

The details of work done in the various provinces are as follows:—

Bengal.—The following statement contrasts the expenditure of the year with that of 1895-96:—

NATURE OF WORK.	BUILDINGS.		ROADS AND BRIDGES.		TOTAL.	
	1896-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.
	R	R	R	R	R	R
New construction	18,507	12,407	14,133	10,480	32,640	22,887
Repairs	8,929	10,132	9,317	14,226	18,246	24,358
Unapportioned	671	664	1,011	441	1,582	1,105
TOTAL	28,007	23,203	24,461	25,147	52,468	48,350

The expenditure was thus Rs. 118 less than in the previous year. No expensive buildings were constructed. The chief works were the completion of rest-house at Mamrim in Darjeeling, and the construction of a bungalow at Bamanpokri in Kurseong at a cost of Rs. 776. New buildings were commenced at Kuntimari in Jalpaiguri and at Ranamundle in Angul. The Darjeeling catchery, in which the offices of the Conservator and of the Divisional officer were located, was burnt down. Seventy-two miles of new roads were constructed at a cost of Rs. 10,480. Of these 34 miles were in the Darjeeling Division, 11 miles in Singhbhum and 41 miles in Palamau.

North-Western Provinces and Oudh.—The nature and cost of the works executed under this head are summarized and compared with the results of the previous year in the following table:—

CIRCLES.	ROADS AND BRIDGES.		BUILDINGS.		Other works.	Total.	Percentage in gross expenditure.
	New works.	Repairs.	New works.	Repairs.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Central	* 8,916	19,509	7,573	3,106	1,407	40,510	13.34
Oudh	1,649	8,019	8,253	5,091	3,742	26,754	10.12
School	3,267	6,949	6,074	4,967	2,407	23,664	7.72
TOTAL	13,832	34,477	21,899	13,164	7,556	90,923	10.40
Total, 1896-97	48,309		35,063		7,556	90,923	10.41
Total, 1895-96	54,158		47,767		6,356	1,06,301	11.62

* The actual cost was Rs. 8,916, but of this sum Rs. 2,994 (on the construction of the Dhanour-Kathol cart-road) was charged in the accounts of 1897-98.

The above statement shows that some Rs. 18,000 less were expended on communications and buildings than in the previous year. The difference occurs mainly in the Oudh Circle under "New buildings," which show an expenditure of Rs. 8,253 only for 1896-97, as compared with Rs. 22,773 in the previous year.

The Local Government remarks—

"The smallest expenditure on buildings would appear to occur in the Central Circle, which, on the other hand, spends largely on communications. The up-keep of its roads and bridges absorbed Rs. 19,509 during the year under review, as compared with Rs. 26,294 in the previous year. This outlay is explained by the mountainous and less accessible character of the bulk of the Central Circle forests, and by the higher rates for labour which there prevail."

Punjab.—The following statement contrasts the expenditure with that of the previous year:—

YEAR.	ROADS AND BRIDGES.			BUILDINGS.			Percentage to gross income.
	New work.	Repairs.	Total.	New work.	Repairs.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1895-96	1,408	2,260	3,668	6,423	3,364	9,787	14
1896-97	1,271	2,346	3,617	13,004	4,771	17,775	2.0

The expenditure on roads thus remained much the same; 37 miles of new roads and paths were constructed and 4½ miles were repaired, chiefly in the hill divisions, where much damage is done to the roads by storms and landslips. Under buildings the increase of Rs. 8,000 is due to the construction of a new forest office at Abbottabad at a cost of Rs. 500. The buildings at Pakka Mari, Lyallpur, and at Bela Thatha Faqirulla in Chonab were completed. Rest-houses at Langera in Chamba and at Mastgar in Kangra were completed. A number of outhouses, rangers' quarters and huts for forest guards were also completed. There still remains much work to be done in providing suitable quarters for subordinates.

Burma.—The expenditure incurred was as follows:—

CIRCLE.	ROADS AND BRIDGES.		BUILDINGS.	
	New work.	Repairs.	New work.	Repairs.
	₹	₹	₹	₹
Pegu	543	1,188	20,109	2,052
Tenasserim . . . . .	...	334	5,341	1,015
TOTAL LOWER BURMA	543	1,522	25,450	3,067
Eastern	792	115	29,288	2,068
Western	245	485	12,961	2,724
TOTAL UPPER BURMA	1,037	600	42,249	4,792
Total Burma, 1896-97	1,580	2,122	67,699	8,756
Total Burma, 1895-96	1,785	2,091	55,304	8,859

In the Tenasserim Circle, rest-houses were built at Bōndaung (₹800), Mepat (₹425) Tamagwe (₹450), and several quarters for subordinates were in hand. A considerable amount of blasting work was done in the Bōn stream, which was cleared of boulders over $\frac{1}{4}$ of a mile at a cost of ₹793. One thousand and eighty-nine rupees were also expended on blasting operations in the Tavoy river in the South Tenasserim Division. In the Pegu Circle, a forest bungalow was constructed at Pegu at a cost of ₹9,966, and subdivisional officers' quarters at Zigōn (₹1,842), and Tharrawaddy (₹1,361). A forest office was built at Bassein (₹1,000). Rest-houses were built at Thēgōn (₹500), Waing (₹600), and Kyetpaung (₹300). A good deal of blasting work was carried out in the feeders of the Taungnyo stream, and ₹1,692 were expended. The lower reaches of the same stream were also cleared at a cost of ₹410.

In the Eastern Circle, Upper Burma, rest-houses were built at Nampu (₹300) and at Kayon (₹512) in the Bhamo Division. In Katha ₹3,543 were spent on new buildings, of which the most important were a forest office at Mogaung (₹2,550) and rest-houses at Nam, and Mawhun (₹1,000). A new rest-house (₹1,200) was built at Bernardmyo orchard in the Ruby Mines Division, and ₹1,728 were spent in re-building the sub-divisional house, office, etc. at Mogōk. Only in Katha was any expenditure on roads incurred. Rupees 750 were spent in rendering the road between Nyaungbinseik and Mantōn passable for elephants. In the Western Circle, the chief buildings constructed were a forest office at Mōnywa (₹4,650) and a subdivisional house and office at Gangaw (₹3,560). The expenditure on roads (₹730) was incurred principally in the Upper Chindwin, where the path from Sinlamaung to Nankara was nearly completed.

Central Provinces.—The expenditure of the year contrasted with that of 1895-96 was as follows:—

YEAR.	BUILDINGS.		ROADS AND BRIDGES.		TOTAL.
	New work.	Repairs.	New work.	Repairs.	
	₹	₹	₹	₹	₹
1895-96	15,511	4,157	3,027	4,823	27,518
1896-97	9,389	4,580	1,192	2,748	17,909

There was thus a falling off in expenditure of nearly ₹10,000. In the Northern Circle 59 miles of new roads were made, and 193 miles were repaired at a cost of ₹402 and ₹729, respectively. Sixty-seven miles of roads were in addition constructed as famine relief works. Forty new buildings were constructed at a cost of ₹4,093, whilst ₹2,005 were spent on repairs. In the Southern Circle 33 miles of new roads costing ₹790 were made, and ₹1,985 were spent on repairs. One hundred and thirty-eight new buildings, chiefly rangers' and forest guards' quarters, were constructed for ₹4,861.

Assam.—The total expenditure, including other works, was Rs15,210, compared with Rs21,971 in 1895-96. Eight miles new roads were made in Goalpara at a cost of Rs417. In Kamrup fifteen new bridges were constructed on the Barbakra road. The roads and bridges in the Kamrup and Garo Hills Divisions were very much damaged by the earthquake.

On new buildings the sum of Rs3,372 was expended; the principal buildings were—addition to Dhubri bungalow (Rs719), inspection bungalow at Jamduar (Rs489) and rangers' quarters at Kochugaon (Rs232). A large amount of damage was caused in the Kamrup and Garo Hills Divisions, and most of the buildings were demolished by the earthquake. It is estimated that they cannot be replaced for less than Rs20,000. The bungalow at Tezpur was burnt down by an incendiary.

Coorg.—The amount spent was much the same as in the previous year. Fourteen miles of new roads were made in the South Coorg Sub-division and two new bridges were constructed over the Kalhalla and Nagerhole streams. The Dubaré rest-house was completed at a cost of Rs1,376; a guard's hut at Murkal and a forester's hut at Tittimatti were also constructed.

Ajmere.—A complete system of roads to tap the forests of North Todgarh has been drawn up and sanctioned; 12 miles were constructed during the year at a cost of Rs295. A forest guard's hut was built at Mir Shah Ali (Rs21), and the quarters which were under construction for the Forest Officer at Ajmere were completed by the Public Works Department during the year.

Baluchistan.—Nearly 1 mile of paths was constructed in the Zangi Lora plantation, and the path leading through the North Zargun State forest was extended by 6 miles. New quarters were built for the forester of the Ziarat range for Rs124.

Andamans.—The Local Government remark—

"The total expenditure on communications and buildings amounts to Rs3,085, against Rs2,428 in the previous year. The roadway and tram-line from Kadakachang through the Wimberley Gunj Valley to the Goplakabang creek cost Rs1,606. The up-keep of the 6½ miles of tram-lines cost Rs46. A new barrack was constructed at Bajajag and three guard-houses for police when employed on protective duty. All existing barracks and other buildings were kept in repair."

Bengal.—The Commissioner in his review of the Forest Report says—

"The expenditure on roads increased from Rs7,625 to Rs13,218, while that on buildings decreased from Rs6,203 to Rs5,444. Eleven new wells were sunk at a cost of Rs1,143 and a few old ones were cleaned at a cost of Rs131. The expenditure incurred on petty works amounted to Rs459. The total amount expended was Rs20,441 against Rs15,058 in the preceding year, the increase being chiefly due to a larger expenditure on roads. All available funds were utilized for making roads in order to provide work for labourers during the scarcity."

Madras.—The following shows the expenditure of the year compared with that of the year 1895-96:—

	1895-96.	1896-97.
	Rs	Rs
Roads and bridges	28,313	47,268
Buildings	41,108	48,342
Other works	2,662	4,223

There was thus a large increase in the expenditure under roads. In the Northern Circle the expenditure on roads was Rs12,738 chiefly in Kistna, Godavari and Kurnool. In Godavari 10 miles and in Kistna 38 miles of new roads were made. In the Central Circle Rs7,398 were spent. Three and-a-half miles of new road were made in Cuddapah for Rs1,685. In North Arcot the new Peddur Ghat road was continued, and two new roads in Salem were made. In the Southern Circle Rs27,132 were spent chiefly in North Coimbatore, where 20 miles of the Gundila Valley road were opened out at a cost of Rs7,000, and 9½ miles of bridle road were made. A masonry bridge on the new Papanasam road was commenced and Rs2,482 spent on it during the year. In North Malabar 10 miles of new roads were constructed. Under buildings the chief new works constructed were—

Northern Circle.—Construction of rest-houses in the Agency tract of Godavari, 7 new range camps in Kistna and a rest-house at Bukkapatnam in Anantapur.

Central Circle.—Some rest-houses in Chingleput and Salem. The bungalow at Dugurazpatnam was purchased from the Public Works Department for Rs2,000.

Southern Circle.—A rest-house at Muthabaruttu in Tinnevely; a rest-house at Punachi, and a workshop for the saw-mill in South Coimbatore; some rest-houses and a range office in North Coimbatore. In South Coimbatore ½th of a mile were added to the tramway, which now runs over 1½ miles.

Bombay.—The following table gives the expenditure incurred by Circles :—

CIRCLE	NEW WORK.		REPAIRS.		TOTAL.
	Buildings.	Roads.	Buildings.	Roads.	
	₹	₹	₹	₹	₹
Northern	1,846	2,005	1,809	689	6,349
Central	4,377	...	1,744	817	6,938
Southern	12,794	5,416	3,224	3,130	24,564
Sindh	122	...	335	...	457
TOTAL	19,139	7,421	7,112	4,636	38,308

There was thus a total expenditure of ₹38,308, as against ₹19,215 in the previous year.

In the Northern Circle a rest-house was built at Kogda (₹116) and 16 houses for subordinates were constructed ; 3 forest posts were built in the Panch Mahals and a well was sunk at Kandalpada.

In the Central Circle, a forest office was built at Nevasa in the Ahmednagar Division (₹2,167), and ₹1,442 were spent on alterations and additions to existing buildings.

In the Southern Circle, 9 forest houses were partly constructed in North Kanara and ₹7,437 spent during the year. Other chief works were a saw-mill shed (₹1,067), a forest office at Siddapur, and the construction of 6 wells in South Kanara.

In Sindh there was no work of importance.

Under roads, 50 miles of new roads, chiefly in Surat, were made in the Northern Circle at a cost of ₹1,043. In the Central Circle there was no new work. In the Southern Circle two important new roads were made from Barchi to Nana-Kesrodga, 6 miles (₹2,620), and from Bilki to Siddalgundi, 6 miles (₹2,343).

CHAPTER II.

PROTECTION AND IMPROVEMENT.

I.—GENERAL PROTECTION.

There has been a considerable decrease in the number of cases of breaches of the forest laws taken into Court, as will be seen from the following table. The percentage of convictions has been maintained above 80 per cent. Offences compounded show still in the Bengal Presidency a larger percentage of all cases taken cognizance of than in either Madras or Bombay. However, there seems to be a tendency in the latter Presidencies to make greater use of this more lenient method of dealing with forest offences.

PROVINCE.	Number of cases taken into Court.		Number of cases compounded.		TOTAL.		Proportion of convictions to the total number of cases decided by the Courts.	
	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.
							Per cent.	Per cent.
Bengal	279	264	1,158	1,163	1,437	1,427	87.8	89.7
North-Western Provinces and Oudh	134	125	481	637	615	762	76.8	84.0
Punjab	1,009	1,058	2,393	2,317	3,402	3,375	79.2	81.3
Burma (Lower)	301	434	1,890	2,158	2,191	2,592	82.4	88.7
Burma (Upper)	180	389	413	428	593	817	80.5	75.1
Central Provinces	346	372	4,156	4,285	4,502	4,657	80.8	80.7
Assam	93	122	249	311	342	433	86.0	81.1
Coorg	10	8	100	130	110	138	90.0	62.5
Ajmere	81	46	129	25	210	71	97.5	100
Baluchistan	40	72	246	7	286	79	65.0	90.9
Andamans	5	1	...	...	5	1	100	100
TOTAL	2,478	2,891	11,215	11,461	13,693	14,352	81.4	82.1
Berar	148	95	743	618	891	713	80.4	77.9
Total Bengal Presidency	2,626	2,986	11,958	12,079	14,584	15,065	81.4	81.9
Madras	4,025	3,862	5,793	4,631	9,818	8,393	83.3	79.4
Bombay	2,127	2,632	5,198	4,843	7,325	7,475	75.8	80.4
GRAND TOTAL	8,778	9,480	22,949	21,453	31,727	30,933	80.9	80.5

In the following table the offences are classified in accordance with their character:—

PROVINCE.	CASES TAKEN INTO COURT.				COMPOUNDED CASES.				CASES IN WHICH THE OFFENDERS REMAINED UNDETECTED.				TOTALS OF EACH CLASS OF OFFENCE.				GRAND TOTAL OF CASES.	
	Injury to fire-protected forests by fire.	Unauthorized felling or appropriation of wood and minor forest-produce.	Grazing without permission in tracts in which grazing is prohibited.	Other offences.	Injury to fire-protected forests by fire.	Unauthorized felling or appropriation of wood and minor forest-produce.	Grazing without permission in tracts in which grazing is prohibited.	Other offences.	Injury to fire-protected forests by fire.	Unauthorized felling or appropriation of wood and minor forest-produce.	Grazing without permission in tracts in which grazing is prohibited.	Other offences.	Injury to fire-protected forests by fire.	Unauthorized felling or appropriation of wood and minor forest-produce.	Grazing without permission in tracts in which grazing is prohibited.	Other offences.		
Bengal	27	194	18	41	...	677	388	123	47	7	4	1	74	878	410	106	1,527	
N.-W. P. and Oudh	27	60	24	20	33	165	219	67	49	2	...	...	109	233	243	67	673
Punjab	91	558	263	104	5	1,149	1,141	42	99	62	33	8	195	1,770	1,437	154	3,556	
Burma (Lower)	14	248	1	44	3	1,441	6	437	13	23	...	...	30	1,713	7	4.1	2,206
Burma (Upper)	1	152	1	29	5	298	11	117	16	...	...	...	...	440	12	146	629
Central Provinces	140	140	32	21	62	2,379	1,438	374	120	84	...	...	812	2,509	1,470	305	4,790
Assam	4	69	6	20	2	269	10	25	15	1	...	...	21	379	16	45	561
Coorg	2	6	...	5	...	12	65	23	...	...	...	...	3	184	11	9	115
Ajmere	3	71	5	2	...	118	6	6	...	5	...	1	3	194	11	9	217	
Baluchistan	4	23	4	1	1	63	164	...	3	10	...	1	8	108	108	2	294	
Andamans	...	5	5	5	5
TOTAL	313	1,534	354	287	101	6,490	8,468	1,214	382	195	37	11	778	8,228	3,869	1,512	14,375	
Berar	19	101	11	26	23	603	92	81	30	18	...	...	67	723	103	67	949
Total Bengal Presidency	332	1,635	365	318	129	7,102	3,560	1,345	382	218	37	11	843	8,060	3,062	1,569	13,334	
Madras
Bombay	97	997	806	418	27	2,067	2,782	418	1,863	1,716	1,360	58	1,467	4,752	4,038	589	12,000	
GRAND TOTAL	...	...	...	...	...	...	...	...	...	...	...	...	2,428	19,679	13,372	3,679	39,656

The majority of offences may be classed as theft or attempted theft of forest produce. A serious point brought out in the table is that, apart from Madras, which has not submitted the necessary details, the origin of forest-fire remained undetected in a large proportion of cases. In the Bengal Presidency the offenders remained undetected in 362 cases out of 776, and in Bombay in 1,363 cases out of a total of 1,487 cases.

II.—PROTECTION FROM FIRE.

In addition to the general protection against fires by the laws of the country, a considerable area is annually protected by artificial isolation and a cordon of fire-watchers. An analysis of this work is given in the following table:—

PROVINCE.	AREA, IN SQUARE MILES.				Proportion of failures to area attempted.		COST				Proportion of area under fire-protection to total area of forests in charge of Forest Department.	
	Attempted.		Protected.				Per square mile protected.		Per acre protected.			
	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.
					Per cent.	Per cent.	Rs	Rs	Pies.	Pies.	Per cent.	Per cent.
Bengal	1,957	1,957	1,895	1,373	3·16	29·84	5½	7½	1·7	2·2	14·73	14·66
North-Western Provinces and Oudh	3,012	2,840	2,923	2,514	2·98	11·47	21½	21½	6·3	7·2	76·08	72·76
Punjab	533	703	531	643	1·30	8·53	19½	4½	5·8	1·3	7·89	11·66
Burma (Lower)	1,056	781	981	712	7·10	8·83	55½	59½	16·5	17·7	14·56	10·57
Burma (Upper)	767	526	324	467	57·75	11·21	29½	12½	8·5	3·7	11·26	9·67
Central Provinces	5,961	5,875	5,728	5,485	3·89	6·63	9½	10½	3·0	3·0	30·40	29·87
Assam	1,202	1,202	1,195	1,053	0·50	12·40	7½	9	2·1	2·6	3·05	7·81
Coorg	204	204	201	182	...	10·80	40½	54	12·1	16·1	22·97	22·87
Ajmere	139	127	139	127	...	...	3½	2½	0·9	0·8	93·23	85·23
TOTAL	14,836	14,215	13,919	12,556	6·18	11·67	11½	15½	4·3	4·7	*20·13	*19·70
Berar	1,429	1,419	1,398	1,391	2·17	1·97	9½	9½	2·8	3·0	34·19	33·96
Total Bengal Presidency	16,265	15,634	15,317	13,947	5·82	10·79	15½	15½	4·2	4·6	*20·88	*20·48
Madras	5,862	5,594	5,287	5,241	1·4	6·3	7½	8	2·2	2·4	28·41	29·32
Bombay	9,270	9,403	8,760	8,721	5·5	7·2	3½	3½	1·1	1·1	61·74	62·81
GRAND TOTAL	30,897	30,631	29,364	27,909	4·9	8·9	10½	10½	3·10	3·11	*27·63	*27·75

*Baluchistan and Andamans left out of account, as no special measures were taken for protection from fire.

During the year under review, 29,364 square miles were thus successfully protected at a total cost of Rs 3,03,638. The cost of such protection varies from Rs 2-0 to Rs 5-4-0 per square mile. This policy has occasionally been criticized, and I have for this reason endeavoured to collect statistics regarding the sylvicultural and reproductive benefits derived from fire-protection. My data are as yet very incomplete, and I may perhaps be accused of using them to prove foregone conclusions which I am known to hold in regard to the great value of fire-protection, as compared with any other attempt or outlay we may make or incur towards the improvement of our forests. The data, however scanty as they are still, all tend in the same direction and merely vary as

regards the magnitude of the influence exercised. They show, moreover, that it is quite possible to collect, even now, much useful information from the past history of the forests, and to draw conclusions of some value by comparing the results gathered from fire-protected and non-protected blocks of similar constitution and position; and that it is by no means necessary, as suggested by various officers, to wait for 5, 10 or 15 years for the doubtless more accurate information which selected sample plots would yield in time. There is no question that the constitution of such sample plots is an excellent plan, which should not be lost sight of; but in the meantime many of our forests are still exposed to annual fires, because the outlay necessary to protect them is considered disproportionate to the future benefits derivable. This, and the fact that my appeal for information has been met by many in a very half-hearted way, are my excuse, if excuse be needed, for writing on this subject a little more fully than is usual in an annual Review.

Almost from the time Forestry was introduced into India, it was recognized that forests of pines and other gregarious trees could neither thrive nor reproduce themselves satisfactorily without being protected from fire, and almost all the more valuable areas containing forest of this kind have been thus protected for years with the very best of results. As regards forests, however, in which the more valuable trees occur only sporadically in a peuplement of other species, opinions have been by no means so decided in favour of fire-protection, and, even where they were held, it was by many officers considered preferable to concentrate reproduction and the necessary fire-protection by means of artificial cultivation. Many valuable plantations have thus been formed, but the procedure must always be connected with the danger of insect plagues; and this has already been borne out by experience.

It has often been argued that the very presence of teak and other trees of the more valuable species found in mixed forests, which for centuries were probably exposed to fires, indicates that these conflagrations do no permanent damage and in fact foster the stronger species as against other more susceptible ones. The most plausible attack against fire-protection in such forests was contained in the statement made in Burma a couple of years ago, that the reproduction of teak was less favourable in fire-protected forests than in exposed areas. This statement was for the time being accepted as correct by several observant officers, but though I had not sufficient recent experience in those forests to contradict it, I accepted it only under protest and I addressed the Local Government on the 26th April 1897 as follows:—

“I have the honour to state that I have carefully read the opinions on the effect of fire-protection to which your letter gives cover. During my recent tour in Burma I have, moreover, given special attention to the subject in question, and have by renewed observation confirmed the conclusions at which I had arrived during my previous residence in Burma and in the course of several official visits to that country.

“2. Evergreen, tidal and riparian forests may be left out of consideration, as they do not burn; and, as regards the question under consideration, we have, therefore, only to deal with the deciduous forests. In the majority of the opinions before me, this class of forests had been treated as uniform in their composition and characteristics. This, however, is by no means the case; and in order to enable us to gauge correctly the extent of the effects of fires on these forests, it seems to me essential that the main class, deciduous forests, should be further sub-divided in accordance with their composition. I intentionally use the words ‘extent of the effects,’ for, in all forests through which a fire passes, the same effect must be produced either in a greater or less degree. And as the composition of a forest varies, so must the effects of fire therein be more or less pronounced.

"3. Forests of pure *engdain* may for the present be left out of discussion, and I propose to deal only with such forests as contain teak, cutch, pyinkado, or any other species of commercial value.

"The sub-classes which I propose to adopt for my purpose are—

- "(a) Forests in which the valuable species are found with an undergrowth of evergreen dense, periodically and gregariously flowering bamboos, which more or less prevent the natural reproduction of tree-growth at any other time, except whilst the bamboo is seeding.
- "(b) Forests in which the undergrowth consists of bamboos with a lighter foliage and which flower sporadically in stems or clumps as well as gregariously, and in which tree reproduction can always take place, but more specially when the cover has been opened out by the general, but also by the sporadic, flowering of the bamboo.
- "(c) Forests in which the more valuable trees are found in a mixed or pure forest (which latter is, apart from small areas, almost entirely confined to cutch), and with an undergrowth of shrubs and herbaceous plants and grasses only.

"4. The observations generally recorded that little or no humus, in the sense usually adopted, is found in any of the sub-classes of the deciduous forests in Burma, even when fire-protected for some years, must be accepted as correct.

"However, there can be no doubt that in fire-protected forests, the leaves and other decaying vegetable substances are returned to the earth, and that the chemical properties of humus are imparted to the surface-soil, which is moreover loosened by the action of myriads of earth-worms, ants, beetles, etc.

"It seems to me immaterial whether the manuring principles are brought back to the soil by direct decomposition, or in a more indirect manner through the faeces and decomposing bodies of worms and insects, like stable manure ploughed under in fields.

"In the case of fires the wind dissipates the ashes and the rain washes them away, especially on hilly ground. Very little of what has been extracted from the soil by vegetation is returned to it.

"5. In forests of sub-class (a), protection from fire, or the occurrence of fire, can have no direct influence on the actual reproduction of trees, except during, and for some years after, the flowering of the bamboos. A fire when the culms begin to dry and before the bamboo seed has germinated might, perhaps, even be beneficial in this respect, but at an incalculable cost to the growing stock. Moreover, it is not at all certain how much a fire, which would of necessity be fierce, might affect the seeding power of mature trees during the critical period when re-production can take place.

"Apart, however, from this, to my mind, unsolved problem, the fact remains that constantly recurring fires must injuriously affect the producing power of the soil. It is true that the fine, pure, fertile loam produced by animal life out of decaying vegetable substances is also liable to be washed away by rain, but, as pointed out by Mr. Oliver, a covering of dead leaves remains long enough on the ground to prevent this. This is especially noticeable in forests of sub-class (a), where dead bamboo leaves cover the action of worms till the very end of the rains. The fact that the nutritive agencies are absorbed by the soil, instead of being stored on the surface in the form of a more or less inflammable material, renders an occasional fire less hurtful to the growing stock, as well as to the soil, than it would be in cases where such a layer of humus is present; and, in consideration of this fact, the use of properly controlled fires in selected areas is indicated when the bamboos flower in forests of this sub-class. In view, however, of the uncertainty as to whether the seeding power of the trees on the ground may not be temporarily affected by such fire, it would seem only provident to be prepared with an adequate supply of seed collected elsewhere.

"Fire-protection in Burma has not been established sufficiently long to give data regarding the increase in the rate of growth of teak and other valuable trees in fire-protected areas as compared with those in areas exposed to fires; but as the general aspect of the vegetation in such areas as have been fire-protected for some time has become much more luxuriant, there is every reason to believe that the growth of such trees has benefited in the same manner. The increased luxuriance of growth, generally, is specially observable in deciduous forests of this sub-class.

"6. Forest fires in forests of sub-class (b) are harmful throughout their existence. Trees of all age-classes are scattered over the ground, and the younger ones are more seriously affected by being scorched or cut back than those which have outgrown this danger. That in spite of this we find the teak better represented in forests of this sub-class which have

burned over year after year than any other species, merely indicates, in my opinion, that the former is more capable of withstanding, and to a certain extent of outgrowing, the effects of fire than any other tree.

"I am aware that the proportion of teak seedlings in burned forests of this sub-class is, owing to its superior power of resistance, greater than in protected forests; and I do not wish to contradict the statements made, more freely in the 'Indian Forester' than in the official correspondence it is true, but still on record, that the actual number of teak seedlings in unprotected forests is greater than in fire-protected areas.

"There are reasons for this. The ground may be clearer and the cover overhead less dense; and especially where the plants cut back, and which have sent out new shoots, are allowed to count as seedlings, the statement may be correct. 'F.B.D.' in the 'Indian Forester' of July last, accepts it as such, but pertinently adds 'we do not want annual fires for germination.' I fully agree in this, for it is unquestionable that each successive fire destroys the problematical advantages established by its forerunner. Granted that the teak trees in areas overrun by fires seed more freely (a crop of despair), that the number of teak seedlings in such forests is larger, I know that those grown in a fire-protected area are healthier, grow faster, and will yield better timber. A tree inside a fire-trace may have a more severe struggle to get its crown above the undergrowth; but to make fire do the work of improvement fellings is too absurd to be seriously considered.

"Taking everything into consideration, the effect of fires in forests of sub-class (b) on reproduction, not merely germination, but including the earlier stages of the teak tree's life, is, in my opinion, most pernicious. I feel convinced that a serious study of the problem at any place where a fire-trace runs through a teak-producing area of sub-class (b) will, if the observations extend to seedlings and to young growth up to 20 feet in height, prove my assertion to be correct.

"That constant fires retard the growth of established trees, affect their health, injure the timber, and even kill numerous trees, has been accepted even by those whose battle-cry has been 'too much fire-protection.'

"The injurious effect on the soil in forests of sub-class (b) is even more pronounced than in sub-class (a). The rain acts more directly on the soil, and the numerous stone-covered pinnacles in unprotected forests show the extent to which the soil is washed away.

"In fire-protected forests of sub-class (b) the insect world and worms work below a cover of leaves, which protects the assimilation of the nutritive substances with the soil, if not throughout the year, still till a living cover of grasses and herbs has established itself.

"7. Forests of sub-class (c) are, as regards teak, of much smaller extent and chiefly confined to Upper Burma, but as catch-producing areas they are of great importance.

"The teak in these forests is chiefly produced in family groups, the formation of which can be encouraged and accomplished without the use of fires. In forests of this sub-class fires have no *raison d'être* whatsoever. The extent to which catch reproduction takes place in suitable localities, by no other means than fire-protection, forming thickets in but few years, has frequently been observed, and no further arguments are needed to show the advisability of such measures as regards forests of this character.

"The effects on the soil in forests of this sub-class by recurring fires varies considerably in accordance with the more or less dense cover of grass and herbaceous plants.

"8. Pyinkado and other more valuable trees are all more sensitive than teak to the effects of fire, and protection consequently affects them even more than it does the teak.

"I entirely agree with Mr. Carr that the damage done to young tree-growth resulting from fire cannot be prevented by any other means than fire-protection, while impediments to reproduction and future growth which may be due to fire-protection can be prevented by other means; and I therefore strongly advise the policy of extending fire-protection as far as funds and administrative considerations allow.

"9. In one of the criticisms before me it is asserted that insects are much more numerous in fire-protected forests than in others. This probably is the case, but I doubt whether this does not refer to useful or at least harmless insects only; for previous experience certainly tends to indicate that burned and injured forests are more liable to attack by obnoxious beetles or larvæ. The officer who made the statement in question might perhaps be asked to amplify it."

The letters I have received in reply confirm my conclusion that fire-protection is essential to the growth of sound teak, at all events in the earlier

stages. The report by Mr. Corbett, Deputy Conservator in the Tharrawaddy Division, supplies the most valuable and interesting information. By examination and comparison of similar forests outside, but adjoining, the fire-trace and the nearest area inside the trace, he found that outside fire-traces the number of teak trees under six feet in height is certainly more than double the number inside the fire-trace on an equal area. Inside the fire-trace, however, the plants were almost invariably seedlings, whilst outside about one plant in five was found to be a seedling, the rest, as was shown by the size of their roots, had been burnt back year after year and were in many cases from 20 to 30 years old.

This explains why it was accepted that reproduction was more favourable outside than inside the protected area. Of plants, however, between 6 to 20 feet high, he reports that there were, roughly speaking, about three times as many inside the fire-trace as there were outside; inside the fire-trace the plants were as a rule well grown, whilst outside they had almost invariably been damaged by, or showed signs of the effect of, the fire.

No better proof could be required of the beneficial influence of fire-protection on reproduction and the growth of the young plant. Even at a more advanced stage, the teak is not so unsusceptible to the effects of fire as has been frequently assumed, and observations have tended to prove that dead teak trees of all ages are more frequently found in exposed than in protected forests.

Some interesting experiments have also been made as regards the comparative rate of growth of teak trees in fire-protected and exposed areas in the Tharrawaddy Division in Burma. Thirty-seven trees, measuring between 1' 4" and 2' 4" in girth, growing under protection and an equal number growing in areas exposed to annual conflagration were analysed. The analysis shows a total radial increase for the 37 trees inside the fire-belt of 15.91" during six years, against 10.28" for those outside. The measurements were made on four radii—north, south, east and west—and the average recorded.

In the Rangoon Division similar experiments were made on 30 trees of larger size inside and 30 trees outside the fire-trace. In this instance the growth is only slightly in favour of the former. This is also the case in experiments made in the Southern Circle, Central Provinces. Twenty *Pinus longifolia* of four to eight feet in girth inside the fire-belt showed a radial increase of 26.46" in 15 years, whereas the same number outside gave only 19.67".

As yet these researches have only been made by a few officers who take a special interest in the problem. To be of real value and to carry conviction, they should be undertaken more generally and under the direct supervision of a scientific and experienced officer, more especially in regard to the selection of the trees to be compared. Pressler's borer is a very good instrument for this purpose, but I feel inclined to believe that more can be learned by felling occasionally a limited number of trees of all sizes and by studying their history on the stump.

The subjoined table analyzes the origin of the fires reported :—

PROVINCE.	(C.) FIRES COMMENCING INSIDE THE RESERVE OR FIRE-TRACED AREA.																				TOTAL OF (A), (B) AND (C).					
	(A.) Fires caused by accident or through carelessness in burning fire-lines.		(B.) Fires entering the forests by crossing exterior fire-traces.		By workmen employed in the forests, by purchasers of forest-produce and by gub-cutters, either accidentally or through carelessness.		By villagers, travellers, etc., passing through the forests, either accidentally or through carelessness.		By Railway engines.		By lightning, or by fire-balloons.		BY INTENTIONAL FIRINGS.						Causes unknown.							
	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.	No.	Area burnt, in acres.			No.	Area burnt, in acres.		
Bengal	5	1,368	10	9,389	9	374	13	5,067	...	...	1	20	3	915	11	13,116	9	3,582	23	17,613	5	5,760	61	39,593
N.W. P. and Oudh.	Centra. Circle		5	941	5	1,151	8	1,819	19	4,046	...	...	3	3,889	...	...	...	...	...	...	19	5,682	59	17,523
	Oudh Circle		5	529	31	8,053	2	297	8	82	...	...	7	3,055	1	8	10	28,861	18	26,924	12	2,496	77	38,381
	School Circle		13	927	1	3	1	1	3	69	1	1	7	162	2	65	1	174	3	239	5	918	34	2,349
TOTAL		24	2,397	37	9,207	11	2,117	30	4,197	1	1	10	4,071	7	3,055	3	73	11	24,035	21	27,163	36	9,086	170	58,249	
*Punjab	6	58	19	1,881	16	2,186	36	3,155	...	...	4	51	30	4,851	1	55	3	510	34	5,416	31	812	146	13,559
Lower Burma	Pegu Circle		16	577	15	783	9	2,619	...	...	...	...	...	...	1	304	5	8,755	6	9,059	15	33,328	61	46,366
	Tenasserim Circle		4	104	2	42	13	140	4	432	3	745	26	1,463	
TOTAL		20	681	17	825	22	2,759	4	432	...	...	...	...	...	1	304	5	8,755	6	9,059	18	34,073	67	47,529
Upper Burma	Eastern Circle		4	28	9	11,287	1	960	17	18,182	1	20	...	...	1	260	3	9,600	4	9,860	10	12,083	46	52,413
	Western Circle		6	10,240	3	124,268	4	119,296	13	253,924	
TOTAL		10	10,268	12	135,576	1	960	21	137,478	1	20	...	...	...	1	260	3	9,600	4	9,860	10	12,083	59	306,242
Central Provinces.	Northern Circle		19	19,057	13	6,883	22	51,981	37	61,684	5	676	1	350	4	8,330	3	41	8	3,721	35	19,177	139	162,179
	Southern Circle		9	1,965	6	908	8	6,930	11	14,385	1	360	7	12,900	12	1,819	19	14,619	32	45,695	86	84,860
TOTAL		28	21,022	19	6,799	30	58,911	48	76,069	5	676	1	360	1	350	11	16,130	15	1,860	27	19,340	67	64,873	225	247,039	
Assam	7	1,410	12	2,279	...	...	6	447	...	...	...	...	...	...	...	...	...	...	...	...	4	55	29	4,191
Coorg	4	107	1	8	...	...	...	...	...	...	...	...	...	...	1	15	2	95	3	110	2	15	10	240
Ajmere	1	10	2	163	1	60	1	25	...	...	...	...	...	...	...	...	...	...	...	...	1	125	6	382
Berar	11	846	...	...	14	14,047	1	15	...	...	2	54	...	...	...	1	600	1	600	11	4,360	40	19,922	
Madras	Northern Circle		2	489	2	250	1	400	31	2,783	...	...	12	1,365	8	423	2	...	23	1,788	57	8,178	115	13,898
	Central Circle		1	2	29	3,497	...	...	3	700	...	...	12	2,953	4	605	4	300	20	3,658	141	14,280	194	22,317
	Southern Circle		Details only partially reported.																						128	14,118
TOTAL																						43	50,318			
Bombay	Northern Circle		16	480	73	16,048	7	201	99	13,187	8	1,937	...	...	13	1,352	18	801	29	2,163	873	40,194	605	74,180
	Central Circle		11	955	20	23,951	20	32,030	78	29,455	5	22	1	8	2	50	7	11,152	4	13	13	11,214	135	81,383	233	179,019
	Southern Circle		4	105	113	8,544	2	6	156	7,259	5	139	1	3	8	1,210	11	9,605	30	10,618	261	67,560	561	116,431
	Sindh Circle		4	142	9	155	6	1,024	28	1,146	2	35	20	1,000	2	293	23	1,290	1	183	72	3,975
TOTAL		35	1,682	215	49,698	35	33,261	361	51,647	20	2,103	1	8	23	1,053	29	13,714	33	10,708	64	25,475	770	211,320	1,621	373,504	

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This table is very interesting. It will be seen that 5.78 per cent. of all fires were due to accidents whilst establishing fire-protection, and that 14.08 per cent. crossed the fire-lines after they had been completed. About 80 per cent. of the fires had their origin within fire-traced areas. In 53.88 per cent. of these cases the origin remained undiscovered; in 26.00 per cent. the fires were due to carelessness on the part of villagers and travellers traversing the forests; 6.51 per cent. to the carelessness of people engaged in the extraction of forest produce; 1.26 per cent. of the fires were caused by railway engines, and 0.88 per cent. are ascribed to lightning. Intentional firing was proved in 11.47 per cent. cases. Of these fires, 35.92 per cent. were kindled to obtain new grass, 28.16 per cent. in order to drive game out of cover, and 35.42 per cent. out of malice.

III.—REGULATION OF GRAZING.

The following table shows the area closed against grazing to all animals, and to browsers only:—

PROVINCE.	RESERVED FORESTS.			PROTECTED FORESTS.			UNCLASSIFIED FORESTS.			ALL CLASSES OF FORESTS.		
	Total area.	Area closed to all animals.	Area closed to browsers only.	Total area.	Area closed to all animals.	Area closed to browsers only.	Total area.	Area closed to all animals.	Area closed to browsers only.	Total area.	Area closed to all animals.	Area closed to browsers only.
	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.	Sq. ms.
Andhra Pradesh	5,876	5,217	20	3,373	2,120	11	4,034	1	...	13,238	7,338	31
Bihar and Oudh	3,823	1,774	517	94	17	4	49	1	30	3,959	1,785	551
Bombay	1,631	353	473	2,977	53	71	2,258	23	213	6,316	431	725
Central Provinces	7,250	6,718	7,039	...	...	...	...	...	21	7,250	6,718	7,039
Madras	6,908	5,990	2	...	...	...	...	...	...	6,908	5,990	2
United Provinces	19,358	2,539	6,323	...	...	...	353	...	...	19,610	2,539	6,643
West Bengal	3,631	2,070	998	...	...	...	11,244	...	...	14,925	2,070	998
Assam	238	157	...	650	...	...	...	...	...	888	157	...
Coastal Provinces	139	45	139	...	...	...	10	...	10	149	45	149
Madhya Pradesh	170	115	...	...	...	...	...	...	...	170	115	...
Madras	85	...	...	...	...	...	1,888	...	...	1,953	...	...
United Provinces	4,179	916	147	...	...	...	...	...	...	4,179	916	147
Bengal Presidency	63,137	26,384	15,956	6,999	2,192	98	19,809	25	273	79,996	28,601	16,315
Madras	13,136	Details not available.		...	...	...	6,789	Details not available.		18,907	1,767	19,081
Bombay	13,936			2,025	Details not available.		4			15,015	1,738	6,606
GRAND TOTAL	79,311	...	...	9,024	...	...	25,582	...	...	113,917	32,108	41,001

In the Bengal Presidency the areas closed to all animals and to browsers only have been increased by 522 and 860 square miles, respectively. In Madras and Bombay, however, the areas entirely closed were reduced by 698 and 1,034 square miles; those closed to browsers in Madras only were augmented by the addition of 1,949 square miles.

The following table shows, so far as the information is available, the incidence of grazing in open forests.

PROVINCE.	Circle.	GRAZED ON PAYMENT. NUMBER OF ANIMALS.										GRAZED FREE. NUMBER OF ANIMALS.										
		AT FULL RATES.					AT PRIVILEGED RATES.					BY RIGHT UNDER SETTLEMENT.					DURING PLEASURE OF GOVERNMENT, OR OTHERWISE THAN UNDER SETTLEMENT.					
		Buffaloes.	Cows and Bullocks.	Goats and Sheep.	Camels.	Other animals.	Buffaloes.	Cows and Bullocks.	Goats and Sheep.	Camels.	Other animals.	Buffaloes.	Cows and Bullocks.	Goats and Sheep.	Camels.	Other animals.	Buffaloes.	Cows and Bullocks.	Goats and Sheep.	Camels.	Other animals.	
Bengal . N.-W. P. and Oudh.	...	6,288	17,614	4,214	...	24	8,729	175,151	19,418	...	547	49,041	155,585	49,041	...	...	67	252	76	...	5
	{ Central .	20,258	62,698	2,333	95	340	849	4,165	49,032	...	146	24,610	119,620	28,690	...	803	5,433	34,713	69	...	...
	{ Oudh .	11,695	41,464	3,242	...	94	23,647	144,219	1,714	...	44	1,833	12,220	...	...	...	1,130	5,853	403	...	289
	{ School .	9,653	30,637	11,649	9,891	9,296	1,221	8,393	120	...	...	399	18,331	61,464	...	...	...	1,347	...	...	...
	TOTAL	41,606	134,799	17,224	9,986	9,730	25,717	156,777	50,866	...	190	26,992	150,171	90,154	...	803	6,563	41,913	472	...	289	
Panjab . Burma (Lower)	...	29,142	120,387	401,249	4,824	2,315	14,750	41,536	227,024	207	4,232	142,281	*600,458	483,945	265	10,402	4,372	15,247	4,263	570	30	
	{ Pegu .	872	846	...	...	...	...	...	...	...	...	1,600	120	...	...	...	...	...	...	...	...
	{ Tenasserim .	...	...	...	...	...	...	...	...	...	...	3,531	150	20	...	17	...	...	...	...	...
	TOTAL	872	846	...	...	...	...	...	...	...	5,131	270	20	...	17	...	...	...	...	...
Burma (Upper)	{ Eastern .	...	135	...	...	...	...	...	...	...	...	9,120	...	...	...	...	3,802	88	1	...	468
	{ Western .	40	...	...	...	...	...	...	...	...	...	6,182	...	...	...	...	...	...	...	...	...
	TOTAL	40	135	...	...	...	...	...	...	...	...	15,302	...	...	...	...	3,802	88	1	...	468
Central Prov- inces.	{ Northern .	97,941	520,902	33,396	1	667	6,195	18,038	2,533	...	3	...	...	...	...	...	61,542	270,064	14,904	...	...
	{ Southern	103,102	899,957	167,718	...	130	5	51	23	...	60	...	...	...	...	...	8,175	91,300	7,621	...	...
	TOTAL	201,043	1,408,859	201,114	1	797	6,200	18,089	2,556	...	63	...	...	...	...	...	69,717	361,364	22,525	...	...
Assam . Coorg . Ajmere . Baluchistan Andamans Berar .	...	18,499	6,389	505	...	61	...	...	...	...	...	...	...	...	...	...	72,740	129,348	9,801	...	187
	...	811	6,043	...	...	...	...	...	...	...	...	5,601	...	...	...	...	...	...	...	...	...
	...	231	18,523	185	63	886	881	6,264	...	...	...	722	4,840	...	...	...	438	1,371	...	...	...
TOTAL BENGAL PRESIDENCY.	...	50	2,743	2,695	...	...	...	...	...	...	...	751	16,652	1	224	...	...	...	...	...
	...	111,036	697,243	263,598	47	3,782	4,411	93,120	17	...	...	247	79,551	30	...	...	103	7,470	...	...
	TOTAL	403,663	3,413,578	895,784	14,921	17,595	60,694	430,937	239,879	207	5,032	224,414	1,012,529	639,642	266	11,446	157,802	557,053	37,138	570	979	
Madras Presi- dency.	{ Northern .	Information not available.				
	{ Central .	Information not available.				
	{ Southern	Information not available.				
	TOTAL	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dombay Presi- dency.	{ Northern	1,928	8,947	...	...	...	1,343	5,639	...	...	...	2,571	3,657	...	...	...	54,200	278,884	3,174	...	265
	{ Central .	11,406	86,086	326,713	...	4,797	44,979	418,241	174,593	...	662	...	...	...	...	...	26,766	273,930	640	...	1,328
	{ Southern	5,649	15,206	44,412	...	132	84,675	247,173	57,217	...	102	...	...	...	...	...	24,643	77,443	29	...	3
	{ Sindhi .	53,406	72,226	369,978	9,630	2,429	12,207	24,935	31,614	679	152	4,595	19,400	...	...	585	118	485	465	...	519
	TOTAL	72,389	182,465	741,103	9,630	7,859	143,264	695,983	263,424	679	916	7,666	23,057	...	...	535	105,727	630,742	4,225	...	2,114

Madras gives no information under this head. The Punjab figures show large additions (125,000 buffaloes, 439,000 cattle and 371,000 sheep and goats) owing to the Kangra and Kulu settlements. Making due allowance for this, the Bengal Presidency shows a decrease of 220,000 buffaloes and 300,000 cattle amongst the animals on which grazing fees were realized. In Bombay also a decrease is shown of 437,000 buffaloes, 16,000 cattle and 141,000 sheep and goats.

Though, as will be seen from the following table, a rise took place in the amount realized for grazing in the North-Western Provinces and Oudh, Berar and Madras, a considerable drop took place in the grand total.

Province.	Circle.	Amount realized.	Amount foregone.
		Rs	Rs
Bengal . . . . .	.....	19,208	92,600
North-Western Provinces and Oudh .	Central	19,046	48,400
	Oudh	42,144	22,600
	School.	18,099	10,300
	TOTAL	79,289	81,300
Punjab . . . . .	.....	63,074	2,25,400
Lower Burma	Pegu	972	600
	Tenasserim	...	3,400
	TOTAL	972	4,000
Upper Burma	Eastern	170	9,300
	Western	20	14,400
	TOTAL	190	23,700
Central Provinces	Northern	1,32,355	64,200
	Southern	1,53,661	14,700
	TOTAL	2,86,016	78,900
Assam . . . . .	.....	11,997	71,200
Coorg . . . . .	.....	1,915	6,400
Ajmere . . . . .	.....	1,089	2,500
Baluchistan . . . . .	.....	742	9,900
Andamans . . . . .	.....	...	...
Berar . . . . .	.....	2,14,553	30,500
Total Bengal Presidency . . . . .	.....	6,78,945	6,36,400
" Madras Presidency	Northern	1,27,255	830
	Central	1,78,470	70
	Southern	70,629	800
	TOTAL	3,76,354	1,700
" Bombay Presidency	Northern	6,905	1,90,300
	Central	2,32,462	3,09,000
	Southern	86,254	2,90,600
	Sindh	53,470	83,400
	TOTAL	3,84,091	8,23,300
GRAND TOTAL . . . . .	.....	14,99,390	14,51,400

(a) Does not include fees realized under the commutation system and credited to II (a), the apportionment of which is not practicable

IV.—REPRODUCTION AND SYLVICULTURE.

The following tables show the increase in the areas of plantations, the money spent thereon in the various provinces, and the expenditure on cultural operations :—

PROVINCE.	AREA, IN ACRES.											
	AT COMMENCEMENT OF THE YEAR.			ADDED DURING THE YEAR.			EXCLUDED DURING THE YEAR.			BALANCE AT THE CLOSE OF THE YEAR.		
	Regular Plantations.	Tanngyas.	TOTAL.	Regular Plantations.	Tanngyas.	TOTAL.	Regular Plantations.	Tanngyas.	TOTAL.	Regular Plantations.	Tanngyas.	TOTAL.
Bengal	3,141	...	3,141	37	...	37	...	...	...	8,178	...	3,178
N.-W. P. and Oudh	3,119	...	3,119	...	...	...	...	...	...	3,119	...	3,119
Punjab	496	...	496	265	...	265	65	...	65	696	...	696
Burma (Lower)	4,001	41,372	45,373	25	5,782	5,807	490	...	490	3,536	47,154	50,696
Burma (Upper)	108	687	795	141	236	377	...	68	68	249	855	1,104
Assam	2,540	...	2,540	12	...	12	518	...	518	2,034	...	2,034
Coorg	2,102	(a) 264	2,366	13	132	145	...	...	...	2,115	396	2,511
Ajmere . . . . .	...	...	...	...	...	...	...	...	...	...	...	...
Baluchistan	1,430	...	1,430	4	...	4	1,412	...	1,412	23	...	22
Andamans	81	...	81	6	...	6	...	...	...	87	...	87
TOTAL	17,018	42,323	59,341	503	6,150	6,653	2,485	68	2,553	15,036	48,405	63,441
Barar	655	...	655	...	...	...	...	...	...	655	...	655
Total Bengal Presidency	17,673	42,323	59,996	503	6,150	6,653	2,485	68	2,553	15,691	48,405	64,096
Madras	26,460	...	26,460	8,190	...	8,190	787	...	787	33,863	...	(b)33,863
Bombay	10,557	...	10,557	1,478	...	1,478	623	...	623	11,407	...	11,407
GRAND TOTAL	54,960	42,323	97,013	10,171	6,150	16,321	3,900	68	3,968	60,961	8,405	109,366

(a) Entered as 208 acres in the 1895-96 Review. Difference due to revised figures having been furnished by the Deputy Conservator in the 1896-97 Report.
(b) Includes 10,877 acres of Tanngas.

Bengal	R 579	Coorg	R 2,257
N.-W. P. and Oudh	979	Ajmere . . . . .	...
Punjab	2,513	Baluchistan	1,168
Lower Burma	94,165	Andamans	55
Upper Burma	4,860	Barar . . . . .	...
Central Provinces . . . . .	...	Madras	33,255
Assam	14,830	Bombay	7,285

TOTAL R1,66,946.

Bengal	R 9,017	Coorg	R 576
N.-W. P. and Oudh	4,657	Ajmere	1,013
Punjab	2,362	Baluchistan	152
Lower Burma	10,995	Andamans	74
Upper Burma	350	Barar	1,565
Central Provinces	889	Madras	12,122
Assam	46	Bombay	12,516

TOTAL R56,334.

CHAPTER III. WORKING AND OUTTURN.

The total outturn of all forests under the control of the Forest Department in timber and fuel, bamboos and minor forest produce, with the average outturn per square mile, is exhibited in the following table:—

PROVINCE.	RESERVED FORESTS.			PROTECTED FORESTS.			UNCLASSIFIED FORESTS.			AVERAGE OUTTURN PER SQUARE MILE.								
										RESERVED FORESTS.			PROTECTED FORESTS.			UNCLASSIFIED FORESTS.		
	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.
C. ft.	No.	₹	C. ft.	No.	₹	C. ft.	No.	₹	C. ft.	No.	₹	C. ft.	No.	₹	C. ft.	No.	₹	
	(a)		(a)			(a)			(a)			(a)			(a)			
P. and Oudh	16,385,865	7,613,218	94,833	18,366,277	4,137,329	1,53,567	422,251	6,409,967	5,847	2,373	1,295	15	5,437	1,225	45	104	1,589	1
Burma (Lower)	8,041,135	8,870,299	2,46,567	1,656,975	1,60,877	21,725	1,339	522,795	1,090	2,365	2,582	46	17,616	1,924	230	32	12,158	25
Burma (Upper)	3,888,667	4,67,843	1,34,486	16,696,434	98,731	2,28,157	16,943,837	...	1,24,150	2,313	278	80	5,803	35	80	4,847	...	55
Central Provinces	2,576,196	4,722,605	9,986	16,282,200	17,160,650	28,119	...	...	...	388	712	14	(c)	(c)	(c)	...	...	...
Madras	6,928,278	3,187,115	41,576	10,311,507	12,249,974	2,08,138	(d)	...	...	1,053	4,846	(e)	(e)	(e)	...	...	...	...
Bombay	20,110,170	16,738,732	5,78,346	...	...	...	...	...	...	1,925	854	30	...	...	...	...	...	...
Bihar	1,382,114	1,625,540	4,644	...	...	...	13,923,830	22,514,150	3,61,269	375	441	1	...	...	...	1,238	2,002	32
Assam	247,996	...	3,554	277,021	246,481	13,137	...	...	...	1,041	15	426	379	20	...	...	...	...
Coorg	253,544	17,151	40,713	68	...	104	...	...	...	932	200	641	...	...	...	93	20	64
Madhya Pradesh	4,368	11,278	...	...	...	...	...	...	...	389,005	18	25	...	...	...	389,005	...	18
Andaman	1,448,515	111,884	695	...	...	...	754,918	536,215	1,908	17,041	1,316	8	...	...	...	304	267	1
West Bengal	1,478,391	2,294,756	3,13,051	...	...	...	...	...	...	354	549	74	...	...	...	...	...	...

(a) Excludes removals of timber and fuel by purchasers from lands leased out for cultivation in the Sunderbans, and removals in drift from the Gandak river.
 (b) In addition to the above, it is estimated that 7,280,600 bamboos were removed from the Chanda forests by commuters.
 (c) Chapter IV of the Lower Burma Forest Act and of the Upper Burma Forest Regulation extends protection to certain trees and produce in unoccupied lands generally. The areas of these undemarcated lands to which protection is afforded is not known.
 (d) Excludes outturn from lands given out for cultivation, estimated at 1,224,211 cubic feet.
 (e) Excludes R1,65,350, estimated value of grass and grazing under concessions.
 (f) The forests of the Madras Presidency yielded 14,824,468 cubic feet of timber and fuel, 30,846,894 bamboos, and R9,49,739 worth of minor produce. Dividing these figures by 16,927 square miles of forests under the control of the Forest Department, the average outturn per square mile was 784 cubic feet of timber and fuel, 1,631 bamboos, and R50 worth of minor produce.
 (g) The forests of the Bombay Presidency yielded 54,505,199 cubic feet of timber and fuel, 6,970,103 bamboos and R13,86,484 worth of minor produce. Dividing these figures by 15,015 square miles of forests under the control of the Forest Department, the average outturn per square mile was 3,630 cubic feet of timber and fuel, 457 bamboos and R92 worth of minor produce.

The amounts of forest produce removed by Government agency contrasted with the amounts removed by Purchasers were as follows:—

PROVINCE.	TIMBER.		FUEL.		BAMBOOS.		MINOR PRODUCE (INCLUDING GRASS AND GRAZING).	
	Removed by Government.	Removed by Purchasers.	Removed by Government.	Removed by Purchasers.	Removed by Government.	Removed by Purchasers.	Removed by Government.	Removed by Purchasers.
	C. ft.	C. ft.	C. ft.	C. ft.	No.	No.	₹	₹
Bengal	571,960	(a)4,577,507	212,225	(a)14,247,501	12,075	13,460,839	184	1,20,410
N.-W. P. and Oudh	490,916	2,863,059	1,815,723	2,017,748	140,417	10,138,025	8,932	1,58,082
Punjab	826,287	641,605	2,248,169	1,966,165	455,451	112,133	1,190	1,68,423
Burma (Lower)	2,671,532	7,821,420	7,288	7,906,666	10,600	21,565,250	16	33,085
Burma (Upper)	680,719	12,193,523	660	3,544,077	700	13,856,979	202	2,23,826
Central Provinces	247,130	942,032	907,180	13,608,930	54,904	13,676,841	2,656	4,13,972
Assam	23,484	(b)3,778,845	18,284	(b)5,758,701	3,150	21,894,612	1,540	65,979
Coorg	87,984	244,583	...	175,225	...	229,681	2,398	7,893
Agrore	301	10,386	1,106	226,902	...	17,361	1,162	3,253
Madhya Pradesh	115	1,474	4,601	387,136	...	...	151	1,229
Andamans	218,171	43,332	86,272	4,856	...	68,000	...	934
Total	5,818,599	33,117,766	5,301,458	49,843,907	677,297	95,019,711	18,521	11,97,036
Bihar	...	508,439	...	962,229	...	2,280,824	...	3,09,349
Total Bengal Presidency	5,818,599	33,621,205	5,301,458	50,806,136	677,297	97,300,535	18,521	15,06,385
Madras	449,988	2,107,635	2,450,068	9,467,371	229,852	30,437,257	47,746	8,52,453
Bombay	1,180,846	3,848,702	6,210,963	25,601,850	3,760	6,242,103	1,63,514	6,28,231
GRAND TOTAL	7,449,433	39,577,542	13,962,489	85,875,357	910,909	133,979,895	2,29,781	29,87,069

(a) Excludes removals from lands leased out for cultivation in the Sunderbans, and removals in drift from the Gandak river.
 (b) Excludes outturn from lands leased out for cultivation, estimated at 1,224,211 cubic feet.

These figures compare with those of the previous year as follows :—

	TIMBER.		FUEL.		BAMBOOS.		MINOR PRODUCE (INCLUDING GRASS AND GRAZING).	
	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.
	C. ft.	C. ft.	C. ft.	C. ft.	No.	No.	₹	₹
Government	6,226,099	7,449,433	13,264,220	13,962,469	1,092,111	910,909	1,20,529	2,29,781
Purchasers	40,190,365	39,577,542	90,763,705	85,875,357	129,461,778	133,979,895	33,66,974	29,87,069
Total	46,416,464	47,026,975	109,027,925	99,837,846	130,553,889	134,890,804	34,87,507	32,16,850

(a) Decrease of 4,380 cubic feet, as compared with entry made in the Review for 1895-96, is due to correction reported in the 1896-97 Report from Coorg.

As compared with the year 1895-96, there was an increase of some 600,000 cubic feet in the amount of timber exported, occurring entirely under produce removed by departmental agency, chiefly in Bengal, the Punjab and in Upper Burma. Exports by Government agency from the latter province increased from 372,000 cubic feet in 1895-96 to 680,000 cubic feet in the year under review. Exports of timber by purchasers fell off by 612,000 cubic feet, chiefly in Bengal, Madras and Bombay, the latter province alone showing a decrease under this head of 2,716,000 cubic feet. Against this, the North-Western Provinces and Oudh, Punjab, Upper and Lower Burma, Assam and Coorg show a substantial increase of timber removed by purchasers. Exports of fuel fell off by 9,190,000 cubic feet, chiefly, as might be expected, owing to the unfavourable conditions prevailing in Bombay, where under fuel removed by purchasers there was a fall, compared with the year before, of nearly 10,000,000 cubic feet. The number of bamboos exported rose by 4,300,000, whilst the value of minor forest produce, including grass and grazing, fell by ₹2,70,000, mostly in Madras, where forest produce removed by purchasers shows a falling off of more than 2 lakhs of rupees. The question of the reliability of the figures purporting to show the outturn of the forests in timber and fuel attracted attention, and a proposal was made to abolish Chapter III of the Forest Annual Reports altogether, and to rely entirely on the financial results to exhibit the working of the forests. That considerable difficulty exists in obtaining accurate figures in cases where forest coupes are sold *en bloc* by area is certain. But fairly correct estimates are possible, and it has been decided that it is necessary to place on record the extent to which the forests are being worked so far as this can be done. The attention of all Conservators has been drawn to the matter, and it is hoped that they will find it possible to take steps to render the returns as accurate as possible.

The following gives the principal details of working in the various provinces :—

Bengal.—The following statement gives the total outturn, as compared with that of the previous year :—

	Timber.	Fuel.	Total.	Bamboos.	Grass and minor produce.
	C. ft.	C. ft.	C. ft.	No.	₹
1895-96	*5,557,480	*32,684,959	38,242,439	†20,700,563	†3,28,864
1896-97	*5,396,702	*30,277,691	35,674,393	†18,160,514	†2,52,421
Decrease in 1896-97	160,778	2,407,268	2,568,046	2,540,049	76,443

* Excludes removals from Sundarbans leased lands, and removals in drift from the Gandak river.

† Excludes removals from the forests of Hill Tipperah.

There was thus a large falling off under all heads, due mainly to the unfavourable character of the season. The Local Government remarks—

“The total outturn of timber and fuel was 35,674,390 cubic feet, or 2,563,049 cubic feet less than in the previous year, being an average of 2.6347 cubic feet per square mile. The decrease took place in every kind of forest produce; and was no doubt due to the agricultural depression. The total output of timber was 5,396,702 cubic feet, or 160,778 less than in the previous year. The operations for the supply of sleepers to the Rae Bareilly-Benares railway continued in Singhbhum, where the outturn was 538,973 cubic feet, and Mr. Wild points out that it was only these operations that enabled the Circle to maintain its financial position during the year, which the prevalence of scarcity and drought in the Sundarbans and Chittagong (these being the Divisions which usually yield most profit) would otherwise have endangered. The whole amount of produce removed by departmental agency was 571,960 cubic feet of timber, 212,225 of fuel (mostly for the troops in Darjeeling) and 12,075 bamboos, besides minor produce. The amount of timber removed by purchasers was 4,577,509 cubic feet, or 573,034 cubic feet less than in the previous year. The amount of timber removed from the Sundarbans alone was 690,356 cubic feet less than in the previous year, and in Chittagong it was 119,529 cubic feet less. The yield of fuel also declined from 16,705,959 cubic feet to 14,247,507; here again the largest decrease was in the Sundarbans.”

North-Western Provinces and Oudh.—Compared with that of the previous year, the outturn of the year is shown in the following table:—

Circle.	1896-96.	1896-97.	Difference in 1896-97.
<i>Timber.</i>			
	C. ft.	C. ft.	C. ft.
Central	1,002,000	1,170,000	+168,000
Oudh	1,342,000	1,808,000	+466,000
School	706,000	1,135,000	+429,000
TOTAL	3,050,000	4,113,000	+1,063,000
<i>Firewood.</i>			
	C. ft.	C. ft.	C. ft.
Central	3,397,000	3,202,000	-195,000
Oudh	2,951,000	2,120,000	-831,000
School	2,139,000	1,263,000	-876,000
TOTAL	8,487,000	6,585,000	-1,902,000
<i>Minor produce.</i>			
	R	R	R
Central	2,46,862	1,80,752	-66,110
Oudh	91,378	93,392	+2,014
School	64,178	58,328	-5,852
TOTAL	4,02,418	3,32,470	-69,948

There was a considerable increase in the amount of timber exported, particularly in the Oudh and School Circles. Increased removals by purchasers in all three Circles contributed to this result. The falling off in fuel, bamboos and minor produce is attributed to the unfavourable season and the prevalence of famine. The only increase was in the amount of minor forest produce used by right-holders and free-grantees, which was R17,000 more than in the previous year.

Punjab.—The produce removed from the forests is compared with that removed during 1895-96 in the following statement:—

Agency.	Timber.	Fuel.	Bamboos.	Grass and grazing.	Minor produce.
	C. ft.	C. ft.	No.	R	R
Government agency	826,287	2,249,169	445,451	82	1,108
Purchasers	641,805	1,966,165	112,133	1,80,046	8,377
Free-grantees	47,023	57,063	...	18,184	204
Right-holders	804,806	24,937,880	...	2,54,871	44,931
TOTAL	2,319,721	29,209,277	567,584	4,33,183	54,620
Total for 1895-96	1,922,724	29,653,027	746,642	3,99,931	54,316

The outturn of timber increased by about 4 lakhs of cubic feet, of which 2½ lakhs were due to increased departmental operations, the remainder being due to increased removals by purchasers, and to an increase in the amount of timber granted to right-holders. There was an increase under grass and grazing of Rs33,000, due to increased grants to right-holders. Figures under other heads remained much the same.

Burma.—The outturn of timber and fuel is exhibited and compared with that of the previous year in the following table:—

Class of forest and agency by which produce was removed.	TIMBER.						FUEL.						TOTAL, TIMBER AND FUEL.		
	LOWER BURMA.			UPPER BURMA.			LOWER BURMA.			UPPER BURMA.			Lower Burma.	Upper Burma.	Total.
	Pegu Circle.	Tenasserim Circle.	Total.	Eastern Circle.	Western Circle.	Total.	Pegu Circle.	Tenasserim Circle.	Total.	Eastern Circle.	Western Circle.	Total.			
RESERVED.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.
Government	1,452,894	406,362	1,859,256	257,713	8,519	266,232	...	...	...	561	...	561	1,659,256	266,793	2,126,049
Purchasers	219,291	434,794	654,085	5,163,596	581,191	5,744,787	42,675	...	42,675	285,916	...	285,916	696,760	6,030,703	6,727,463
Free-grantees . . . . .	...	500	500	5,954	...	5,954	...	...	...	665	...	665	500	6,619	7,119
Right-holders	500	3,750	4,250	5,389	236,622	242,011	10,000	5,430	15,430	366,450	16,700	383,150	19,680	625,161	644,841
Total	1,672,685	845,406	2,518,091	5,432,652	826,332	6,258,984	52,675	5,430	58,105	653,592	16,700	670,292	2,576,196	6,929,276	9,505,472
UNRESERVED.															
<i>(Afforded protection under Chapter IV of the Act and of the Regulation.)</i>															
Government	433,417	378,859	812,276	359,633	54,849	414,487	7,288	...	7,288	99	...	99	819,564	414,586	1,234,150
Purchasers	4,295,151	2,872,184	7,167,335	4,929,036	2,119,700	6,448,736	6,027,926	1,836,065	7,863,991	2,595,748	662,413	3,258,161	15,031,326	9,706,897	24,738,223
Free-grantees	100,828	251,847	352,175	65,624	124,400	190,024	28,860	...	28,860	...	...	...	381,035	190,024	571,059
Right-holders . . . . .	...	30,284	30,284	...	...	...	...	...	...	...	...	...	30,284	...	30,284
Total	4,829,398	3,532,674	8,362,070	4,754,298	2,298,949	7,053,247	6,084,074	1,836,065	7,900,139	2,595,847	662,413	3,258,260	16,262,209	10,311,507	26,573,716
GRAND TOTAL IN 1896-97	6,502,081	4,378,080	10,880,161	10,186,950	3,125,281	13,312,231	6,116,749	1,841,495	7,958,244	3,249,439	679,113	3,928,552	18,838,405	17,240,783	36,079,188
GRAND TOTAL IN 1895-96	5,573,683	4,747,090	10,320,773	9,129,452	3,349,045	12,477,497	5,453,018	1,228,714	6,681,732	3,841,569	438,384	4,279,953	17,007,505	16,767,450	33,764,955
Difference in 1896-97	+ 928,398	- 368,010	+ 559,388	+ 1,057,498	- 223,764	+ 834,734	+ 663,731	+ 612,781	+ 1,276,512	- 592,130	+ 240,729	- 351,401	+ 1,830,900	+ 483,333	+ 2,314,233

The total outturn of timber of all kinds from Upper and Lower Burma was 24,192,000 cubic feet, as compared with 22,803,000 cubic feet in the previous year. The amount of teak timber and of other reserved woods, exported for trade purposes, was as follows :—

Circle.	TEAK.		OTHER RESERVED WOODS.	
	By Government Agency.	By Purchasers and licensees.	By Government Agency.	By Purchasers and licensees.
	Tons.	Tons.	Tons.	Tons.
Tenasserim	15,152	14,668	471	10,259
Pegu	35,370	1,219	2,204	31,801
Total Lower Burma	50,522	15,887	2,676	42,060
Eastern	12,269	151,488	8	63
Western	1,189	41,695	...	308
Total Upper Burma	13,458	193,183	8	391
GRAND TOTAL BURMA	63,980	209,070	2,684	42,451

Thus a total of 273,050 tons or 13,652,500 cubic feet of teak, and 45,135 tons or 2,256,750 cubic feet of other reserved woods were exported. The extractions of pyinkado timber in the Tenasserim Circle increased considerably.

The following table shows the number of bamboos, the value of grazing and other minor produce, as compared with the year 1895-96 :—

MINOR FOREST PRODUCE.

Class of forests, and agency by which produce was removed.	BAMBOOS.						GRASS AND GRAZING.						OTHER MINOR PRODUCE.					
	Lower Burma.			Upper Burma.			Lower Burma.			Upper Burma.			Lower Burma.			Upper Burma.		
	Pegu Circle.	Tenasserim Circle.	Total.	Eastern Circle.	Western Circle.	Total.	Pegu Circle.	Tenasserim Circle.	Total.	Eastern Circle.	Western Circle.	Total.	Pegu Circle.	Tenasserim Circle.	Total.	Eastern Circle.	Western Circle.	Total.
RESERVED.	No.	No.	No.	No.	No.	No.	R	R	R	R	R	R	R	R	R	R	R	R
Government	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purchasers	3,857,900	574,900	4,432,800	1,280,960	852,450	1,638,410	972	...	972	170	20	190	2,076	1,884	3,960	1,143	14,659	15,802
Free-grantees	...	...	...	2,500	...	2,500	...	...	...	6,162	...	6,162	...	...	...	56	...	56
Right-holders	138,400	103,405	289,805	415,873	1,135,830	1,851,205	608	3,405	4,018	3,154	14,409	17,556	845	196	1,041	1,156	899	1,793
Total	4,044,300(a)	678,305(b)	4,722,605(c)	1,698,835(d)	1,488,280(e)	3,187,115(f)	1,580	3,405	4,985	9,486	14,422	23,908	2,921	2,080	5,001	2,370	15,238	17,669
UNRESERVED.																		
<i>(Afforded protection under Chapter IV of the Act and of the Regulation.)</i>																		
Government	10,600	...	10,600	700	...	700	..	...	...	...	...	...	16	...	16	247	...	247
Purchasers	14,747,500	2,384,950	17,132,450	6,147,623	6,075,946	12,223,569	...	...	...	...	...	...	13,674	14,429	28,103	86,229	1,21,605	2,07,834
Free-grantees	17,600	...	17,600	25,705	...	25,705	...	...	...	...	...	...	...	...	...	57	...	57
Right-holders	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	14,775,700(g)	2,384,950(h)	17,160,650(i)	6,174,028(j)	6,075,946(k)	12,249,974(l)	...	...	...	...	...	...	13,690	14,429	28,119	86,583	1,21,605	2,08,138
GRAND TOTAL IN 1896-97	18,820,000(m)	3,063,255(n)	21,883,255(o)	7,872,863(p)	7,564,226(q)	15,437,089(r)	1,580	3,405	4,985	9,486	14,422	23,908	16,611	16,509	33,120	88,908	1,36,903	2,23,806
GRAND TOTAL IN 1895-96	17,985,100(s)	3,176,229(t)	21,161,329(u)	13,150,954(v)	7,275,785(w)	20,426,739(x)	23,909	3,798	27,707	7,930	10,519	18,449	17,119	16,179	83,295	1,11,735	1,48,846	2,55,581
Difference in 1896-97	+ 834,900	- 112,974	+ 721,926	- 5,278,091	+ 288,441	- 4,989,650	- 22,829	- 393	- 22,722	+ 1,556	+ 3,908	+ 5,459	- 508	+ 333	- 175	- 22,632	- 6,943	- 29,773

	R		R		R		R
(a) Value	10,149	(g) Value	80,873	(m) Value	41,022	(s) Value	44,988
(b) "	1,795	(h) "	5,963	(n) "	7,758	(t) "	3,350
(c) "	11,944	(i) "	86,836	(o) "	48,780	(u) "	53,338
(d) "	5,385	(j) "	16,361	(p) "	21,626	(v) "	36,789
(e) "	2,294	(k) "	15,051	(q) "	17,345	(w) "	18,485
(f) "	7,659	(l) "	31,312	(r) "	38,971	(x) "	55,224

The chief point to notice is the falling off in the value of minor forest produce in the Eastern Circle of Upper Burma, due to the decreased revenue from caoutchouc owing, it is feared, to the destruction of the trees by overtapping.

Central Provinces.—The Local Government thus summarize the working of the year:—

"The gross outturn in cubic feet of timber and fuel is contrasted with that of the previous year in the following table:—

Year.	TIMBER.		FUEL.	
	Northern Circle.	Southern Circle.	Northern Circle.	Southern Circle.
1895-96	527,889	564,224	5,502,085	7,785,820
1896-97	534,478	783,290	11,051,236	7,741,171
Increase (+) or Decrease (—)	+7,084	+219,066	+5,543,301	—44,649

These figures exclude, as was noticed in last year's Resolution, the timber and fuel removed by commuters in Chanda.

Of the totals given above, 128,601 cubic feet of timber and 4,276,347 cubic feet of fuel are accounted for by the free grants made on account of the general scarcity. If the increase under this head be excluded, the Southern Circle shows an increase of 118,950 cubic feet under "timber" and a decrease of 811,736 cubic feet under "fuel." Part of the increase under "timber" was due to a great development of trade in Sambalpur, where 63,000 cubic feet of sawn timber was removed by purchasers. Other large increases were in Balaghat, Bhandara and Chhindwara. The reduction under "fuel" was common to nearly all districts except Chanda. In the Northern Circle, if the amounts taken as free grants be deducted from the figures of both years, the increases are 2,448 cubic feet under "timber" and 3,674,430 cubic feet under "fuel." The very different results in the two Circles under the head "fuel" are somewhat remarkable. Although the quantity of fuel given free in the Northern Circle was more than three times what it was in the Southern Circle, yet the amount removed by purchasers or departmentally fell by 10 per cent. in the latter Circle, while it rose by nearly 80 per cent. in the former. The Conservator, Northern Circle, would apparently attribute this to the greater severity of the famine in the northern districts, which compelled the people, as he says, to eke out their means by selling forest produce. But this pre-supposes a largely increased demand, which is difficult to account for. An examination of the figures in Form No. 57 shows extraordinary variations between district and district. Thus in Jubbulpore, the amount of fuel removed by purchasers rose from 1,260,059 cubic feet in the previous year to 5,575,542 cubic feet in the year under report, notwithstanding free grants of 606,317 cubic feet against 384,000 cubic feet in the previous year, while in Mandla, an equally distressed district, removals by purchasers fell from 350,787 cubic feet to 244,954 cubic feet, and in Hoshangabad from 406,539 cubic feet to 215,975 cubic feet.

As regards minor produce, the quantity of grass removed, otherwise than under free grants, rose largely in both Circles; but the number of bamboos removed on payment fell in the Northern, while it rose in the Southern Circle."

Assam.—The gross outturn in timber and fuel is given below, and compared with that of the previous year.

Agency by which produce was removed.	1895-96.			1896-97.		
	Timber.	Fuel.	Total.	Timber.	Fuel.	Total.
	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.	C. ft.
Government	73,544	11,739	85,283	23,434	18,284	41,768
Purchasers	2,370,629	646,751	3,017,380	4,538,836	6,222,920	10,761,757
Free-grantees	454,309	9,186,564	9,640,873	653,067	5,074,563	5,727,630
Total	2,898,482	9,345,054	12,743,536	5,215,387	11,315,767	16,531,155

Excluding the outturn of timber and fuel from lands given out for cultivation, which amounted to 1,224,211 cubic feet, the total outturn from Government forest was 15,306,944 cubic feet.

Of this amount, some 14,000,000 cubic feet were exploited from Unclassed forests. The outturn was thus some 7,000,000 cubic feet more than last year, the chief increase being under rough poles in the Garo Hills and under fuel, the outturn of which rose from 5,900,000 cubic feet to 10,800,000 cubic feet. The outturn of tea boxes increased by some 63,000 standing at 447,500 for the year. The outturn of home rubber increased from 714 maunds in 1895-96 to 1,222 maunds, due mainly to the leasing out of the Darrang mahals. Foreign rubber also shows an increase to 2,825 maunds, as compared with 2,520 maunds in 1895-96.

Coorg.—The outturn of all the forest produce for the past two years compares as follows :—

Agency of work.	Timber, in C. ft.		Sandalwood, in tons.		Fuel, in C. ft.		Bamboos, No.		Grass and grazing, value.		Other forest produce, including cardamoms.	
	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.
Government	62,944	87,753	75	111	—	—	—	—	—	—	596	244
Purchasers	394,565	244,583	—	—	216,700	171,225	381,583	229,681	—	—	867	893
Free-grantees	—	—	—	—	—	—	—	—	2,616	2,154	12,145	6,935
Right-holders	7,281	21,125	—	—	—	—	8,747	16,800	6,400	6,400	—	—

* The figure, viz. 399,046 cubic feet, shown last year under timber by purchasers, erroneously included 4,386 cubic feet of sandalwood, which has been deducted. Entry of 4,386 cubic feet in paragraph 8 of last year's report under "Sandalwood by purchasers" and also in Form No. 57 under "Miscellaneous by purchasers protected forests," is a mistake and is omitted in this report, as no sandalwood is removed from protected forests by purchasers.

The outturn of all kinds of forest produce decreased considerably, and 134,000 cubic feet of timber remained undisposed of in the forests. The plague in Bombay affected adversely the sales of sandalwood, of which only 58 tons were sold. The cardamom crop was almost an entire failure, and only Rs. 990 were realized under this head, against Rs. 12,840 last year.

Ajmere.—The outturn of the year compared with that of 1895-96 was as follows :—

Agency by which produce was removed.	Timber and Fuel.		Other produce.		Difference.	
	1895-96.	1896-97.	1895-96.	1896-97.	Timber and Fuel.	Other produce.
	C. ft.	C. ft.	Rs.	Rs.	C. ft.	Rs.
Government	533	1,497	919	1,162	+874	+243
Purchasers	235,887	237,288	4,915	3,613	+1,401	-1,302
Free-grantees	860	400	1,668	2,591	-460	+923
Right-holders	7,445	15,445	74,080	34,779	+8,000	-39,301
TOTAL	244,725	254,540	81,582	42,145	+9,815	-39,437

There was thus an increase in timber and fuel exported by purchasers, and a considerable falling off in the value of minor forest produce given to right-holders. Owing to the abundance of grass on village areas, the quantity removed from the forests by right-holders was much less than in the previous year.

Baluchistan.—The following statement shows the outturn of the year as compared with 1895-96 in timber and fuel :—

Class of forests.	Timber.		Fuel.	
	1895-96.	1896-97.	1895-96.	1896-97.
	C. ft.	C. ft.	C. ft.	C. ft.
Reserved	679	271	3,202	4,097
Unclassed	2,163	1,365	443,336	387,640
TOTAL	2,841	1,636	446,538	391,737

The outturn of timber and fuel from State and Unclassed forests thus amounted to 893,373 cubic feet, as against 449,379 cubic feet in the previous year. The value of minor forest produce amounted to Rs. 11,296, as against Rs. 10,051 in 1895-96.

Andamans.—The outturn of timber and fuel, compared with that of the previous year, was as follows :—

	1895-96. c. ft.	1896-97. c. ft.
<i>Timber</i> —		
Removed by the Forest Department	229,583	218,171
" " purchasers	38,150	43,332
TOTAL	267,733	261,503

	1895-96. c.ft.	1896-97. c.ft.
Poles, Bullies, etc.—		
Removed by District Officers	24,767	24,524
" on free-grants	37,500	37,500
TOTAL	62,267	62,024
Fuel—		
Removed by the Forest Department . . . . .	...	86,272
" " purchasers	3,955	4,856
" " District Officers	1,581,425	1,458,778
" on free-grants	330,000	330,000
TOTAL	1,915,380	1,879,906

The demand for padouk timber in England and America remained dull throughout the year, and the only consignment of the wood sent to London consisted of 20 padouk squares, 927 cubic feet. Sales in London amounted to 52,755 cubic feet, and some 20,000 cubic feet of chuglam and koko were also disposed of. Local sales of padouk amounted to 47,729 cubic feet.

Benar.—The sales outturn of 1895-96 and 1896-97 are compared as follows:—

DESCRIPTION OF PRODUCE.	1895-96.	1896-97.	1896-97.	
			Increase.	Decrease.
Timber c.ft.	459,930	503,439	43,509	...
Fuel c.ft.	983,466	962,229	...	21,237
Bamboos No. in 100's	24,946	22,808	...	2,138
Grass value R	36,799	73,955	37,156	...
Grazing value R	2,11,952	2,14,610	2,658	...
Miscellaneous { II-c.—Fruits, dye-stuffs, lac. III.—Waif-wood } value R	35,540	20,784	...	14,756
V.—Other sources } value R	216	241	25	...
Gross revenue per square mile R	4,687	4,498	...	189
Net revenue per square mile "	119	119	...	...
	64	58	...	6

The Conservator remarks—

"The export of timber was stimulated by the specially low rates conceded in the Melghat to help the Kurkus and others who earn a livelihood by cutting and exporting. The fall in fuel was due to the concession made of free headloads in Wun and to reduced sales owing to the fall in the demand for fuel for cotton presses. Grass was sold in enormous quantities owing to the failure in the ordinary fodder crops. Minor products fell off partly because the hilda and lac crops failed, but mainly because all the mohwa and most of the mango crop and sendi leaves, etc., were given free to aid the poor."

Madras.—The total outturn of the year in timber and other produce compares with that of the previous year as follows:—

Agency by which produce was removed.	Timber (in cubic feet) including sandal-wood.		Fuel (in cubic feet).		Bamboos (in number).		Minor produce (gross value in rupees).	
	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.
By Government	423,476	449,988	2,897,561	2,450,068	57,067	229,852	16,959	47,746
By purchasers (including confiscations).	2,409,066	2,107,635	10,829,705	9,467,371	33,611,403	30,437,257	*1,060,371	*852,453
By free-grants	70,678	82,951	12,074	7,212	57,349	157,961	2,099	1,773
By right-holders	3,826	1,702	45	257,541	...	21,114	457	40,767
Total	2,907,046	2,642,276	13,739,385	12,182,192	33,725,819	30,846,684	1,079,886	942,739
Increase or decrease in 1896-97 as compared with 1895-96.	...	-264,770	...	-1,557,193	...	-2,879,135	...	-137,147
Percentage of increase or decrease over the previous year's total.	...	-9.1	...	-11.3	...	-8.5	...	-12.7

* Includes grazing fees.

There was a falling off under all heads due to the unfavourable season and the prevailing distress. Owing to increased sales by departmental agency and to a considerably increased revenue from grazing and from the sales of lands given out for cultivation, the fall in the outturn was not followed by a fall in receipts, which rose by R21,000. The prevailing scarcity

restricted the demands of purchasers. The removal of grass under free-grants greatly increased, owing to the reserve being thrown open in places where scarcity was felt.

Bombay.—The following table sets forth the yield in detail by Circles :—

Circle.	Agency by which material was removed.	MATERIAL REMOVED.					AVERAGE OUTPUT PER SQUARE MILE OF ARE FORESTS.		
		Timber.	Fuel.	Total wood.	Bamboos.	Minor produce.	Timber and fuel.	Bamboos.	Minor produce.
		C. ft.	C. ft.	C. ft.	No.	Rs.	C. ft.	No.	Rs.
Northern Circle.	Government	117,977	117,578	235,555	1,522	---	---	---	---
	Purchasers	2,068,094	2,052,239	5,106,333	*1,741,034	9,555	---	---	---
	Free-grants	9,730	500,000	5,570	11,835	2,930	---	---	---
	Right-holders	---	1,023,548	1,023,548	52,040	6,160	---	---	---
	Total	2,195,751	4,865,365	6,821,112	*1,811,461	18,675	14,234	11,114	111
Central Circle.	Government	294,830	2,503,614	2,798,444	---	20,570	---	---	---
	Purchasers	751,105	1,161,251	1,912,356	1,079,529	4,02,738	---	---	---
	Free-grants	28,595	39,365	67,960	2,600	---	---	---	---
	Right-holders	2,687	4,222,495	4,225,182	20,000	2,11,835	---	---	---
	Total	1,047,217	7,926,765	8,973,942	1,102,129	7,35,143	1,410	173	115
Southern Circle.	Government	1796,188	3,511,570	4,307,758	2,178	76,299	---	---	---
	Purchasers	671,728	3,680,828	4,352,556	53,416,570	30,172	---	---	---
	Free-grants	67,345	1,168	58,513	22,550	6	---	---	---
	Right-holders	---	---	---	---	---	---	---	---
	Total	11,525,239	7,393,584	8,918,823	2,441,298	1,06,477	1,689	652	20
Sind Circle.	Government	1,643	78,203	79,846	---	292	---	---	---
	Purchasers	255,775	17,521,534	17,777,309	---	5,610	---	---	---
	Free-grants	10,337	7,088	18,025	---	87	---	---	---
	Right-holders	---	171,281	171,281	---	900	---	---	---
	Total	268,355	17,778,106	18,146,451	---	26,879	16,994	---	25
All Circles combined.	Government	1,180,568	6,210,963	7,391,531	3,790	97,151	---	---	---
	Purchasers	3,948,702	25,671,850	29,620,552	8,212,103	4,68,675	---	---	---
	Free-grants	104,677	547,641	652,318	36,985	3,023	---	---	---
	Right-holders	2,687	5,423,322	5,426,009	72,040	2,18,925	---	---	---
	Grand Total for 1894-97.	5,136,662	37,783,778	42,920,338	6,354,898	8,87,174	2,993	443	61
Grand Total for 1896-96.	7,872,898	49,560,780	57,433,678	7,617,956	10,83,216	4,022	535	76	
Decrease in 1896-97.	2,736,236	11,777,008	14,513,340	1,263,058	1,96,042	1,029	92	15	

* Besides 5,073 cart-loads and 4,263 head-loads of bamboos.

† These averages are per square mile of the total forest area of the Northern Circle excluding the leased forests of the Dangs.

‡ Besides Khandia, etc., of wood-wood.

§ Besides 68 cart-loads of dry bamboos.

|| Besides 11,654,381 cubic feet of timber and fuel, 515,216 bamboos, and minor produce of the value of Rs17,327 removed under privileges.

The Bombay Government in their review of the Forest Administration remark—

"The operations of the Department have in every Circle been seriously hampered by the misfortunes of a year of famine and plague. Slackness of business in the areas of scarcity reduced the demand both for timber and firewood, and where the effects of famine were not felt, the plague with its inevitable restrictions checked exploitation. In the Northern Circle in Thana the material as it stood in 242 coupes was sold, but the rate realized fell by over 20 per cent.—from Rs6-4 to Rs2-7 per acre; departmental workings were maintained at their normal activity, but in Panch Mahals the agricultural depot system proved a failure, and in Surat two lakhs of bamboos sold from the Dáng forests were left unremoved. In the Central Circle attempts made to introduce the Thana system of selling the material as it stood in coupes were unsuccessful; the removal of produce by purchasers decreased by more than one-half, and while the amount of timber and firewood exploited departmentally increased, the price obtained fell 38 per cent. In the Southern Circle the uniform decrease in output calls for no further explanation. In Sindh the coupe contract system was successfully prosecuted, and the rate per acre obtained rose from Rs6 to Rs8, but there was a material decline in sales to purchasers other than the contractors."

CHAPTER IV.

FINANCIAL RESULTS.

The gross revenue realized during the financial year amounted to R1,78,56,000, whilst the surplus was R78,11,000. Notwithstanding the unfavourable condition of the year, the gross revenue realized was higher than it has ever been before, and the surplus has only once been exceeded—in 1893-94, when it reached the sum of R83,72,000. The provinces affected by plague and famine naturally show a large falling off in revenue, as in Bombay, Central Provinces, and North-Western Provinces and Oudh. Against this, the provinces of Bengal, Burma and Madras show a large increase in both revenue and surplus. The principal variations in revenue and surplus, as compared with the previous year, were—

	Revenue.	Surplus.
	R	R
Bengal	+4,52,000	+2,28,000
North-Western Provinces and Oudh	-1,56,000	-1,20,000
Punjab	+93,000	+48,000
Lower Burma	+4,03,000	+2,58,000
Upper Burma	+2,79,000	+2,29,000
Central Provinces	-2,23,000	-2,21,000
Andamans	+2,30,000	+15,000
Madras	+1,92,000	+1,04,000
Bombay	-5,04,000	-5,14,000

The following table gives the revenue and surplus realized in each province compared with the average of the preceding five years, as well as the proportion of surplus to gross revenue, and the net revenue realized per square mile of forest :—

PROVINCE.	REVENUE.		SURPLUS.		DEFICIT.		Proportion of Surplus to gross Revenue.	Net Revenue per square mile of land under control of Forest Department.
	1898-97.	Average for preceding 5 years.	1898-97.	Average for preceding 5 years.	1898-97.	Average for preceding 5 years.		
	R	R	R	R	R	R	Per cent.	R
Imperial	4,100	4,455	...	...	74,860	79,396	...	...
Bengal	13,70,850	8,10,085	6,80,810	3,95,677	...	...	49.6	51.2
North Western Provinces and Oudh	14,44,820	16,70,701	5,88,480	7,24,913	...	...	37.2	136.0
Punjab	11,07,720	9,58,587	3,84,420	2,91,884	...	...	34.7	56.2
Burma (Lower)	33,18,270	33,23,917	23,14,980	19,70,721	...	...	60.6	319.5
Burma (Upper)	25,60,680	20,28,708	19,85,150	15,83,290	...	...	75.6	284.2
Central Provinces	7,73,320	11,46,160	...	2,42,979	1,77,670	...	...	...
Assam	4,36,440	4,13,516	1,54,430	1,41,923	...	...	35.4	10.3
Coorg	93,000	1,65,133	21,370	81,369	...	...	22.9	24.0
Ajmere	12,370	15,558	...	455	9,640	...	...	...
Baluchistan	15,460	18,320	...	...	14,310	28,185	...	...
Andamans	3,62,370	2,64,254	45,770	88,160	...	...	12.6	23.4
Forest School	2,850	2,571	...	...	64,530	56,270	...	...
Forest Surveys (Imperial)	400	321	...	...	31,570	27,025	...	...
TOTAL	1,20,02,650	1,08,22,286	57,02,830	52,85,495	...	...	47.5	75.2
Benar	5,17,820	4,78,549	2,75,950	2,42,750	...	...	53.3	60.0
Total Bengal Presidency	1,25,20,470	1,13,00,835	59,78,780	55,23,245	...	...	47.7	74.7
" Madras "	23,03,330	18,44,641	7,69,030	4,74,768	...	...	33.4	40.7
" Bombay "	30,32,710	35,27,049	10,63,550	15,40,114	...	...	35.1	70.8
GRAND TOTAL	1,78,56,510	1,66,72,525	78,11,360	75,43,125	...	...	43.7	68.6

The figures for the quinquennial periods since 1871-72 are given below :—

Quinquennial periods.	Gross Revenue.	Expenditure.	Proportion of Expenditure to gross Revenue.
	₹	₹	Per cent.
1871-72 to 1875-76	63,21,499	42,19,379	67
1876-77 to 1880-81	68,59,663	47,30,178	69
1881-82 to 1885-86	1,02,04,364	64,95,993	64
1886-87 to 1890-91	1,34,43,186	78,21,872	58
1891-92 to 1895-96	1,66,72,525	91,29,400	55

The proportion of expenditure to gross revenue for the five years 1891-92 to 1895-96 was 55, as compared with 54 for the period 1890-91 to 1894-95.

The estimated value of forest produce given away free or at reduced rates to right-holders and free-grantees is shown in the following table :—

PROVINCE.	Timber.	Fuel.	Bamboos.	Minor produce.	Grass and Grazing.	Total.
	₹	₹	₹	₹	₹	₹
Bengal	9,200	84,850	6,750	32,400	92,600	2,25,300
North-Western Provinces and Oudh.	1,07,100	98,700	900	10,800	91,600	2,49,100
Punjab	69,800	3,13,300	...	45,100	2,73,000	7,01,200
Burma (Lower)	17,500	200	900	1,000	4,000	23,600
Burma (Upper)	90,400	28,300	1,64,000	33,800	1,01,700	4,18,200
Central Provinces	12,400	25,400	19,300	68,600	96,400	2,22,100
Assam	48,900	79,000	7,000	2,27,000	71,400	4,33,300
Coorg	3,300	...	100	...	6,400	9,800
Ajmere	300	200	...	...	36,500	37,000
Baluchistan	6	...	...	25	9,869	9,900
Andamans	9,300	71,500	300	1,700	...	82,800
Beras	76,700	54,000	31,500	37,500	1,65,300	3,55,000
Madras	7,100	5,300	1,100	40,800	1,700	56,000
Bombay	26,100	2,34,900	3,100	42,800	6,16,300	9,23,200
TOTAL	4,78,106	9,35,150	2,24,950	5,41,525	15,66,769	37,46,500

The gross revenue realized being ₹1,78,56,000, it follows that more than 17 per cent. of the total outturn of the forests was given away free of charge.

The following statement shows the revenue and expenditure under the various heads, with the proportion of the gross receipts expended :—

		Amount.		
		₹		
Gross Receipts	(a) Wood	1,34,19,420		
	(b) Minor forest produce	14,01,590		
	(c) Forest stamps and commutation fees for forest produce	5,63,460		
	(d) Grazing	15,99,840		
	(e) Revenue from forests not managed by Government	8,87,900		
	(f) Miscellaneous	4,84,300		
TOTAL REVENUE		1,78,56,510	Proportion of Expenditure to gross Revenue.	
		Amount.	Per cent.	
		₹		
Expenditure	A Recurring	(i) Superior Staff	21,62,860	12.11
		(ii) Exchange compensation allowance	1,82,180	1.02
		(iii) Subordinate Staff (including Rangers, Foresters and Guards),	14,49,314	8.12
		(iv) Office Establishments (including Contingencies).	8,08,500	4.53
		(1) Extraction	29,76,020	16.67
		(2) Roads and Buildings	4,77,400	2.67
		(3) Fire-protection	3,09,340	1.73
		(4) Cultural operations	3,79,870	2.13
	(b) Working	(5) Live-stock, stores and plant.	2,40,230	1.34
		(6) Working-plans*	87,930	0.38
		(7) Rent for leased forests	1,41,510	0.79
		(8) Miscellaneous	95,080	0.53
		(c) Expenditure on realization of revenue from forests not managed by Government.	10,180	0.06
		(d) Forest Science and Education (including all "A" and "B" charges of Forest School).	83,746	0.47
Total		93,83,960	52.55	
B Extraordinary .	(e) Forest Settlement	64,990	0.36	
	(f) Forest Surveys	4,76,480	2.67	
	(g) Forest demarcation	1,19,720	0.67	
TOTAL		6,61,190	3.70	
GRAND TOTAL EXPENDITURE		1,00,45,150	56.25	
Net Revenue		78,11,330	43.75	

*Exclusive of "B" charges.

The details of financial results in the various provinces were as follows; the figures are throughout those for the Forest year:—

Bengal.—The surplus realized was Rs.42,000, which is nearly 2 lakhs more than has ever been before realized. This favourable result was due to the supply of sleepers to the Rae Bareilly-Benares railway, and can scarcely be expected to occur again for some time. Receipts under fuel, bamboos and minor forest-produce fell off considerably, whilst there was a rise under grazing, fodder, and miscellaneous sources of revenue. The surplus was largest in the Sundarbans Division (Rs.4,09,000), but owing to the prevalence of famine it was less by some Rs.50,000 than in the previous year.

North-Western Provinces and Oudh.—The Local Government remark—

“The financial results of the year were—

	R
Receipts	13,86,409
	R
Expenditure—	
A.—Conservancy and works	4,74,159
B.—Establishments	3,99,894
	8,74,053
Surplus	5,12,356

These figures compare, Circle by Circle, with the figures of 1895-96 and with the averages of the three previous forest years (1893-94—1895-96) as follows:—

Circle.	RECEIPTS.			EXPENDITURE.			SURPLUS.		
	Average of three forest years 1893-94 to 1895-96.	Forest year, 1895-96.	Forest year, 1896-97.	Average of three forest years, 1893-94 to 1895-96.	Forest year, 1895-96.	Forest year, 1896-97.	Average of three forest years, 1893-94 to 1895-96.	Forest year, 1895-96.	Forest year, 1896-97.
	R	R	R	R	R	R	R	R	R
Central	5,89,967	5,87,242	4,49,098	3,32,346	3,20,670	3,03,462	2,56,621	2,46,572	1,45,636
Oudh	5,94,858	4,98,648	4,80,589	3,17,079	3,01,372	2,64,194	2,77,779	1,97,376	2,16,395
School	4,04,613	4,00,972	4,56,723	3,02,475	3,09,926	3,06,397	1,02,143	91,046	1,50,325
Total for the Province.	15,89,443	14,66,862	13,86,409	9,52,900	9,31,868	8,74,053	6,36,543	5,34,994	5,12,356

There was thus a falling off in the gross receipts, as compared with the previous year, of Rs.40,453, and of Rs.2,03,034 as compared with the average of the triennial period preceding. On the other hand, the expenditure for the year under review was Rs.7,815 less than in the previous year, and Rs.78,847 less than that shown by the average of the triennial period.

The principal falling off in receipts occurred in the Central Circle under the heads of bamboos and dry timber. The expenditure in the Oudh Circle was Rs.7,078 less than in the previous year, whilst in the Central and School Circles it decreased by Rs.17,208 and Rs.3,529, respectively. The School Circle yielded a large surplus, exceeding the surplus of the previous year by more than half a lakh of rupees, and this without regard to an excess outstanding balance in its favour at the close of the year of Rs.1,18,107. The increased receipts in this Circle were due to large sales of sleepers to railways, of standing trees to contractors, and of fuel to the Commissariat Department. The revenue in the Jaunpur Division was the highest on record, and being mainly derived from deodar timber, or from trees sold before the scarcity set in, was fortunately not much affected by subsequent events.”

Punjab.—The financial results are summarized by the Local Government as follows:—

“There was an increase of Rs.43,371 in the gross revenues of the year, which amounted to Rs.10,66,458, as compared with Rs.10,18,087 in the previous year. This improvement was, however, more than counterbalanced by an increase of Rs.64,239 in expenditure, the surplus thus being reduced from Rs.3,36,702 to Rs.2,20,834. The proportion in which the revenue of the Department was derived from the several sources in the two years is noted below:—

Year.	Timber.	Fuel.	Grass and grazing.	Other items.
	Per cent.	Per cent.	Per cent.	Per cent.
1895-96	33	37	20	10
1896-97	46	28	17	9

The increase in expenditure was mainly due to timber operations in the hills. Though the surplus shown above is less than in 1895-96, it appears from paragraph 62 of the report that the value of stock at depôts increased considerably, and if it were taken into account the balance in favour of the year would be R5,81,336, as compared with R2,88,245 in the previous year."

The following shows the financial results, under the three heads of work, for the three years 1894-96 :—

	1894-95.		1895-96.		1896-97.	
	Surplus.	Deficit.	Surplus.	Deficit.	Surplus.	Deficit.
	R	R	R	R	R	R
Departmental timber operations	3,12,568	...	2,56,226	...	2,92,715	...
Other revenue	1,96,027	...	2,43,251	...	2,18,136	...
Expenditure . . . . .	...	1,64,763	...	1,62,775	...	1,90,017
TOTAL	3,43,832	...	3,36,702	...	3,20,834	...

The proportion of gross revenue spent on protection and improvement was 18 per cent., as compared with 15 per cent. during the previous year.

Burma.—The financial results compared with those of 1895-96 were as follows :—

FOREST YEAR.	CIRCLE.	Receipts.	Charges.	Surplus.	Proportion of surplus to gross Revenue.
		R	R	R	Per cent.
1896-97	Pegu	19,53,955	8,28,510	11,25,445	57.6
	Tenasserim	20,52,402	5,95,244	14,57,158	71.4
	Total, Lower Burma	40,36,357	14,23,754	26,12,603	64.7
	Eastern	20,19,414	3,99,538	16,19,876	80.2
	Western	6,94,076	2,58,162	3,45,914	57.3
	Total, Upper Burma	26,23,490	6,57,700	19,65,790	74.9
	Grand Total, Burma, 1896-97	66,59,847	20,81,454	45,78,393	68.7
	" " " 1895-96	55,90,376	19,13,138	36,77,238	65.7
	Difference in 1896-97	+ 10,69,471	+ 1,68,316	+ 9,01,155	+ 84.3
	1895-96	Pegu	18,25,506	8,20,758	10,04,748	55.0
Tenasserim		19,92,762	6,88,656	13,04,106	65.4
Total, Lower Burma		38,18,268	15,09,414	23,08,854	60.5
Eastern		19,50,257	3,76,769	15,73,488	80.7
Western		6,10,423	2,48,763	3,61,660	59.2
Total, Upper Burma		25,60,680	6,25,532	19,35,148	75.6
Grand Total, Burma, 1896-97		63,78,948	21,34,946	42,44,002	66.5
" " " 1895-96		56,95,823	18,74,941	38,20,882	67.0
Difference in 1896-97		+ 6,83,125	+ 2,60,005	+ 4,23,120	+ 61.9
Average for the five years ending 1895-96.		Lower Burma	29,85,562	11,40,865	18,45,177	61.8
	Upper Burma	22,45,537	5,45,699	16,99,838	75.7
	Total Burma	52,31,099	16,86,564	35,45,015	67.8

The following statement shows the various heads under which the revenue was realized :—

	1895-96.	1896-97.	Increase or Decrease.	
	R	R	R	
<i>Lower Burma.</i>				
From timber and other produce removed from the forests by Government agency.	18,57,735	25,90,958	+7,33,223	
From timber and other produce removed from the forests by consumers and purchasers.	Timber	8,52,118	7,13,793	-1,38,325
	Firewood and charcoal	43,097	49,466	+ 6,369
	Bamboos	74,753	67,306	- 7,447
	Grazing and fodder grass	909	972	+ 63
	Other minor produce	12,762	12,494	- 268
Confiscated drift and waif wood	1,81,118	2,25,072	+ 43,954	
Duty on foreign timber and other produce	2,41,091	3,23,580	+ 85,489	
Miscellaneous	49,404	49,716	+ 312	
Total, Lower Burma	33,12,987	40,36,357	+7,23,370	
<i>Upper Burma.</i>				
From timber and other produce removed from the forests by Government agency.	1,45,052	2,47,670	+1,02,618	
From timber and other produce removed from the forests by consumers and purchasers.	Timber	17,05,905	20,29,327	+3,23,422
	Firewood and charcoal	43,715	36,911	- 6,804
	Bamboos	64,167	45,709	- 18,458
	Grazing and fodder grass	21	190	+ 169
	Other minor produce	2,34,976	2,13,113	- 21,863
Confiscated drift and waif wood	43,867	23,285	- 20,582	
Duty on foreign timber and other produce . . . . .	.....	.....	.....
Miscellaneous	39,686	27,285	- 12,401	
Total, Upper Burma	22,77,389	26,23,490	+3,46,101	

The Local Government remark :—

"The increase in Lower Burma was chiefly due to the high prices obtained from the sale of teak at Government auctions. The increase in Upper Burma was due to the larger extraction of timber by the Bombay-Burma Trading Corporation from the Pynmana forests, the revenue realized under this head being nearly four lakhs in excess of the estimate."

The demand for Burmese teak continued, and there was a considerable advance on the high prices of the previous year. The average value per ton of teak exported from Moulmein and Rangoon rose to R83, against R74 in the previous year.

Central Provinces.—The Local Government thus explain the position—

"The following table compares the receipts and expenditure of the past two years—

	1895-96.	1896-97.
	R	R
<i>Receipts.</i>		
Southern Circle	4,92,118	4,42,107
Northern	4,28,214	3,20,193
TOTAL	9,20,332	7,62,300

		1895-96	1896-97.
<i>Expenditure.</i>		R	R
Southern Circle		4,72,720	4,59,757
Northern „		3,86,401	4,03,741
	TOTAL	8,59,127	8,63,498
<i>Surplus, or Deficit.</i>			
Southern Circle		+19,392	-17,650
Northern „		+41,843	-83,548
	TOTAL	+61,235	-1,01,198

This is the first time in the history of the province that the Forest Department has shown a deficit, but in the circumstances no other result was to be expected. All the causes which in the previous year combined to produce a fall in the revenue were present during the year under report in an aggravated form. Private forests were worked at very low rates, and large concessions were made from Government reserves, while the deficient rainfall of the year acted directly on the forest receipts in various ways, as for instance in causing the total destruction of the valuable *gandhri* grass crop in Bilaspur.

The Government forests are, however, maintained primarily for the protection and benefit of agriculture, and in a year of famine they fulfil one of the principal objects of their existence in affording sustenance to men and cattle. The loss which they have sustained in the last two years must be looked upon as their contribution to famine relief. The value of the free grants is put at Rs. 1,52,089 in the Northern Circle against Rs. 1,01,387 in the preceding year. From paragraph 85 of the Southern Circle Report, which, however, is not quite clear on the point, it appears that the value of free grants in that Circle amounted to Rs. 70,042.

But for these free grants, then, there would have been a surplus of about 1½ lakhs, and if the capital expenditure, calculated in the same way as was done in paragraph 12 of last year's Resolution, be also deducted, the account will stand as follows:—

Receipts	R	7,62,300
Value of free grants		2,22,131
	TOTAL	9,84,431
Current expenditure		7,74,906
	Surplus	2,09,525
Percentage on gross earnings		21.3

Establishment charges have risen from Rs. 12,717 in the previous year to Rs. 35,245 during the year under report, the increase being principally in the Northern Circle, where the expenditure on account of compensation for dearth of grain was very much higher than in the Southern Circle. There was also a slight increase in the Southern Circle in the cost of the subordinate establishment; but the additional subordinate establishment, sanctioned last year by the Secretary of State, could not be appointed all at once, and most of the increase will appear in the accounts of the current year.

The districts which show the worst results financially are:—

	<i>Deficit.</i>
	R
Sangor	96,217
Balaghat	34,866
Damoh	18,628
Jubbulpore	14,622
Hoshangabad	12,355

These are all districts which suffered severely from famine."

Assam.—The following are the figures showing the financial results for the past five years:—

Year.	Receipts.	Expenditure.	Surplus.	Proportion of surplus to receipts.
	R	R	R	R
1892-93	4,20,930	2,76,948	1,43,982	34.2
1893-94	4,92,811	2,65,421	2,27,390	46.1
1894-95	4,44,706	2,81,652	1,63,054	36.7
1895-96	4,04,482	2,89,323	1,15,159	28.6
1896-97	4,40,936	2,82,191	1,58,745	36.0

The following table shows the revenue under main heads for the three years 1894-95—1896-97 :—

Budget heads.	1894-95.	1895-96.	1896-97.	Difference of last two years.
	R	R	R	R
I.—Timber and other produce removed from forests by Government agency	15,163	7,548	32,214	+24,666
II.—Timber and other produce removed from the forests by consumers or purchasers. { Traders	2,07,460	2,71,490	2,81,417	—10,073
{ Waste lands	80,897	80,061	86,683	+27,622
III.—Drift and waif wood and confiscated forest-produce	8,014	5,788	5,237	—551
IV.—Revenue from forests not managed by Government	30,977	32,887	35,311	+2,424
V.—Miscellaneous	4,216	47,708	40,074	—7,634
Total	4,44,706	4,04,482	4,40,936	+36,454

The main increase was under timber removed from waste lands given out for cultivation, a source of revenue which is naturally very fluctuating.

Coorg.—The following shows the financial results of the year :—

Period.	Receipts.	Charges.	Surplus.	Proportion of surplus to gross receipts.
	R	R	R	Per cent.
1896-97	84,014	77,203	6,811	8.10
1895-96	1,45,120	73,624	71,496	49.26
Difference in 1896-97	—61,106	+3,579	—64,685	—41.16

Ajmera.—The Chief Commissioner remarks :—

"Rupees twelve thousand, five hundred and thirty-two were realized, against an expenditure of R21,014, or a deficit of R3,482 on the year's working. Corresponding figures for the previous four years are given in the subjoined table :—

	1892-93.	1893-94.	1894-95.	1895-96.	1896-97.
	R	R	R	R	R
Receipts	16,909	14,343	12,887	15,380	12,532
Expenditure	18,771	15,696	14,794	16,467	21,014
Deficit	1,862	1,353	1,907	1,087	8,482

The revenue for 1896-97 was much below the average of the last four years, and compared with that of the preceding year is less by R2,848. This was mainly under fire-wood and charcoal, grazing and fodder-grass. The falling off in grass and grazing is due to an abundance of fodder. These receipts are highest during a period of scarcity due to deficient rainfall. In regard to fuel, the Extra-Assistant Conservator explains that large advances received from the fuel contractors were credited in the previous year, while the produce had to be supplied during the year under review."

Baluchistan.—The following, extracted from the review of the Forest Report by the Agent to the Governor-General of Baluchistan, explains the financial position :—

"The following table shows at a glance the financial results of the past year in comparison with those of the two years preceding :—

Year.	Revenue.	Expenditure.	Deficit.
	R	R	R
1894-95	15,191	44,548	29,357
1895-96	14,751	36,382	21,631
1896-97	15,942	28,478	12,536

The results of the year under report are better than was anticipated, and reflect credit on the Forest officer. The decrease of R9,095 in the deficit as compared with 1895-96, and R16,821 as compared with 1894-95, is encouraging."

In the Zhob valley an expenditure of R980 was incurred on forest conservancy, whilst the revenue realized, almost entirely royalty on wood, amounted to R4,142.

Andamans.—The following shows the financial results of working the forests for the years 1895-96 and 1896-97 :—

Year.	Receipts.	Charges.	Surplus.	Proportion of surplus to gross revenue.
	R	R	R	Per cent.
1896-97	2,55,444	1,61,009	94,435	36.9
1895-96	3,32,174	3,31,640	50,534	13.2
Difference in 1896-97	-1,26,730	-1,70,631	+43,901	+23.7

The large falling off in receipts is due to the payment for large consignments of timber sent to England being made during the year 1895-96; but a largely decreased expenditure enabled the department to show an increased surplus of nearly R44,000. The price of padouk remained low in London, the best price realized being 3s. 1d. per cubic foot.

Bejar.—The financial results of the four years 1893-94 to 1896-97 have been as follows :—

Year.	Receipts.	Charges.	Surplus.
	R	R	R
1893-94	4,79,475	2,64,318	2,15,157
1894-95	4,66,014	2,49,118	2,16,826
1895-96	4,95,899	2,27,862	2,68,037
1896-97	4,96,717	2,54,696	2,42,021

Notwithstanding famine and distress, the receipts were slightly more than in the previous year, chiefly due to a large increase of R37,000 in the sales of grass, nearly all other heads showing a decrease. The expenditure rose by R27,000, mainly owing to the introduction of a new system of paying remuneration to village officers on forest collections which involved the payment of considerable arrears in some divisions.

Madras.—The Madras Government summarize the results as follows :—

“The financial result of the year's working is compared with that of the previous year in the following statement :—

	Receipts.	Charges.	Surplus or Deficit.	Proportion of surplus to gross revenue.
	R	R	R	Per cent.
<i>1895-96.</i>				
Northern Circle	7,23,859	3,33,677	+3,39,982	47
Central "	9,39,733	5,60,995	+3,78,738	40
Southern "	5,04,088	5,24,116	-20,078	...
TOTAL	21,67,680	14,68,988	+6,98,642	32
<i>1896-97.</i>				
Northern Circle	5,97,422	4,65,280	+1,32,142	22
Central "	9,48,547	5,84,782	+3,63,765	38
Southern "	6,42,948	5,37,815	+1,05,133	16
TOTAL	21,88,917	15,87,877	+6,01,040	27
<i>Increase or Decrease in 1896-97.</i>				
Northern Circle	-1,26,437	+81,403	-2,07,840	...
Central "	+8,814	+23,787	-14,973	...
Southern "	+1,38,910	+13,699	+1,25,211	...
TOTAL	+21,287	+1,18,839	-97,602	...
Average for the four years ending 30th June 1896	19,34,302	14,08,318	5,25,984	27

The surplus of revenue over charges was Rs. 31,040, i. e., about one lakh less than the surplus in the previous year. In so far as the decrease has to be ascribed to the free concessions made in the affected districts of the Northern Circle, the result must be considered very satisfactory."

Bombay.—The Bombay Government in their review of forest administration for the year say—

"The financial results of the year under review and of the preceding year are compared in the following statement :—

Circle.	Receipts.		Expenditure.		Net Revenue.		Increase or decrease in net revenue in 1896-97.
	1895-96.	1896-97.	1895-96.	1896-97.	1895-96.	1896-97.	
	R	R	R	R	R	R	R
Northern	7,83,283	5,33,437	2,97,437	3,19,881	4,85,846	2,63,556	—2,22,290
Central	7,59,605	7,04,365	5,27,207	6,93,400	2,32,398	10,965	—2,21,434
Southern	14,98,084	14,40,798	8,54,353	8,76,557	6,43,731	6,64,241	—79,490
Sindh	4,65,745	3,12,297	3,24,807	1,34,209	2,30,938	1,78,088	—52,850
TOTAL	35,06,717	30,40,897	19,13,804	20,24,047	15,92,913	10,16,850	—5,76,063

The decrease in the total net revenue amounted to five and three-quarter lakhs. The principal causes have been sufficiently explained above (famine and plague); subsidiary causes were: in the Central Circle, increase of expenditure on establishments as compensation for famine prices, and special provision of work as a form of famine relief; and in Sindh the impossibility of effecting recoveries from contractors within the year. On the other hand, receipts in the Southern Circle were swelled by the reduction of outstandings of the previous year. In Sindh the cessation of the departmental operations reduced the expenditure by a lakh and a half."

CHAPTER V.

I.—ESTABLISHMENT.

Of the 19 Conservators 14 remained on duty throughout the year. The sanctioned strength of the Deputy and Assistant Conservators stood at 174, of whom 159 remained on duty throughout the year. Mr. McDonell continued to be in charge of the forests of the Kashmir State, and Mr. Slade remained on deputation in Siam. The Government of India arranged to further assist the authorities of the latter country in their efforts to form a reliable Forest Department, and the services of four more officers were lent to them. At the present time there are five officers of the Indian Forest Department whose services have thus been lent to Siam.

The scheme under which 43 appointments are to be transferred from the Imperial to the Provincial Service continued to receive attention, and at the close of the year 12 posts had been so transferred. At the present moment, September 1898, the number of posts which have been transferred is 14. The number of posts in the Provincial Service stood during the year at 193, of which 87 were filled by permanent occupants.

The chief event of the year under this head, however, was the sanction given by the Secretary of State to the reorganization of the Subordinate Forest establishment, a scheme which had been under consideration for 10 years. Under this scheme the prospects of the subordinate staff have been much improved; 1,133 new permanent posts have been created, and a total expenditure of Rs. 11,90,052 (as against Rs. 7,69,978) per annum has been sanctioned. The question of the reorganization of the clerical staff still remains to be dealt with, and the difficulty of the present Forest Office establishment to deal with the ever increasing work, and the poor prospects of the men employed, forms the subject of complaint in many Forest Circles.

The conduct of the Subordinate Forest establishment is on the whole well reported on, and it is satisfactory to record that in both Circles of the Central Provinces, the bad state of discipline in which was remarked on last year, much improvement has taken place. In Madras and Bombay matters still appear unsatisfactory in this respect, and in the latter presidency no less than 116 subordinates were dismissed for misconduct. The reorganization of the service, and the better prospects ensured thereby, will, it is trusted, tend to improve the conduct of the subordinate staff.

II.—EXPERIMENTS.

The plantations of *Robinia pseudo-acacia*, referred to in the Review for the year 1895-96, continued to thrive. The young trees are doing excellently at Simla and in the Rawalpindi, Jhelum and Chamba Divisions, as well as in Baluchistan, the dry climate of which appears to suit the tree. Experiments made with *Robinia* at Chakrata were, however, unsuccessful. Experimental plantations of *Albizia zophanta* have been carried out with success at moderate elevations in the Panjab, and this tree, with the *Robinia*, is likely to prove of great value for the reboisement of bare stony slopes. At Ranikhet, in the North-Western Provinces, a plantation of *Eucalyptus* has been placed under treatment as coppice for the supply of fuel, and it is likely that this quick-growing tree may, in good soil, prove of the highest use for this purpose. The

sugar maple introduced into Kulu is reported to be thriving, as are also the orchards of sweet chestnuts which have been formed in Bashahr. In Madras, as usual, a number of experiments with exotics were carried out, but the year was a very unfavourable one. *Acacia decurrens* is doing well on the Nilgiris; attempts to raise the plantation of mahogany trees (*Swietenia macrophylla*) have been made in many places, and the tree is said to be growing well in Ganjam, Chingleput, and in the Alagar valley of Madura. In many other places the attempts have been unsuccessful, and the tree has suffered much from the attacks of a borer. In Bengal the *Alnus nepalensis* has proved of great value in planting up a landslip which is now covered with seedlings of this tree, and further damage from which, it is hoped, has by this means been averted. It would be interesting to try this tree, as well as the *Robinia*, on the shifting hills of the Hoshiarpur chos. In Burma, experiments were made in ree planting; those at Toungoo and at Prome were a failure, but in the Eastern Circle the young plants are, as a rule, doing well.

The distillation of resin at Dehra Dun may now be said to have passed the experimental stage, and to have proved a distinct commercial success. About 1,000 maunds of crude resin were collected during the year, the trees tapped yielding an average of 10 seers each during a period of 14 months. The bulk of the crude resin is taken to Dehra Dun, where it is manufactured into colophony and turpentine, and it has been found that for each maund of resin so treated a profit of R2 can be made. Two thousand six hundred and seventy-six maunds of crude resin yielded 1,993 maunds of colophony and 4,807 gallons of turpentine. Arrangements were commenced to start similar works in the forests of the Naini Tal Division, and 450 maunds of resin were collected. So far as the figures are available, it appears that the yield of resin from the Ranikhet pines is considerably less than that of the Jaunsar pines. Further information is, however, required on this point.

The quantity of colophony and turpentine consumed in India is very large, and becomes greater year by year. The following extract from a note by the Reporter on Economic Products may in this connection be here reproduced :—

“The point regarding which my opinion is asked appears to be the present industries and possible future industries that use or may use up resin, colophony, and turpentine. As I was in some doubt on certain points, I addressed the Chamber of Commerce and the Government Medical Stores Department.

“The chief industries for which colophony and turpentine are required are—

1st—Soap-making.

2nd—Paper-making.

3rd—Lac manufacture.

4th—Minor industries, such as tinsmiths, paint and varnish makers, etc.

5th—Medicine (turpentine).

“*Soap*.—During a conversation I had the other day with the Manager of the Meerut Soap Company, he led me to understand that their consumption of colophony was a yearly expanding one, and that at present they required about 600 casks.

“*Paper*.—The Chamber of Commerce, Bengal, say that the four local paper mills are estimated to use up about 8,000 cwt.

“*Lac*.—The lac industry takes another 8,000 cwt. or so.

“The amount used up by the minor industries I have no means of estimating.

“*Turpentine*.—Some conception of the quantity of turpentine required by India may be obtained from the fact that the Government Medical Stores import about 2,000 lbs. annually.

“*Trade Returns*.—The following table may be given from the returns of foreign trade

to show the total imports. It reveals the fact that for some years past the trade has been expanding and very considerably exceeds the amount adduced in the above abstract:—

Years.	Bengal.		Bombay.		Sindh.		Madras.		Burma.		Total quantity.		Total value.	
	Cwt.	R.	Cwt.	R.	Cwt.	R.	Cwt.	R.	Cwt.	R.	Cwt.	R.	Cwt.	R.
1877-78	11,295	49,018	1,557	7,563	12	60	390	2,014	111	709	13,365	59,364		
1892-93	21,719	90,512	8,027	33,765	572	2,681	931	4,736	326	2,220	31,575	1,33,914		
1893-94	35,285	1,55,535	14,929	68,877	671	2,779	3,097	15,410	325	1,973	54,307	2,44,574		
1894-95	33,728	1,66,496	7,031	33,561	197	875	2,372	14,388	118	564	43,946	2,15,882		
1895-96	36,620	2,15,813	9,266	47,597	1,054	5,383	3,988	21,433	293	1,587	51,221	2,91,813		
1896-97	31,168	1,94,554	12,482	64,906	1,020	5,430	2,740	14,689	470	2,341	47,880	2,81,930		

“The imports of resin in 1877-78 were valued at Rs59,364 and last year at Rs2,81,930.

“There would seem no reason why India should import any resin, colophony or turpentine. The Agricultural Ledger No. 14 of 1896 shows that the Indian article (examined by Professor Armstrong) was ‘of the highest quality, equal to the best French, and would form a most valuable article of commerce.’ The regular supply of that product would no doubt benefit very greatly the existing industries of India and would possibly lead to the establishment of others.

“I therefore concur with the Inspector-General of Forests in the desirability of Government pioneering in this matter.”

The attention of all Conservators in whose Circles pine forests are present is, therefore, called to this important question.

The most considerable endeavour which has hitherto been made in India to form plantations of the rubber tree (*Ficus elastica*) is in Assam, where the Charduar plantation, now covering an area of 1,659 acres, has been successfully constituted; an area of 12 acres was newly planted up during the year. Attempts to propagate this tree are also being made in Madras, where the plants put down in Mañantoddy and at Kuppadi are doing well; in Burma, trees have been planted out with some success in the Tharrawaddy forest garden at Kimpadi and at Palon. It is interesting to note that efforts are being made to establish plantations of this tree in Egypt, and the Indian Forest Department has been glad to supply seed to the authorities there for this purpose. The subject being of considerable general interest, the following note by Mr. D. P. Copeland, Deputy Conservator of Forests, showing how rubber trees are grown in Assam, may well be placed on record:—

“The Indian rubber-fig or caoutchouc tree is indigenous to Assam, where it is found a dominant tree in the evergreen forests. It requires an exceedingly damp atmosphere, and the best natural rubber trees are met with in the forests at the foot of the hills, or on the hills themselves up to an elevation of 2,500 feet.

In its natural state, the rubber tree starts from seed dropped by birds in the forks of other trees, often 20 or 30 feet or even more from the ground, where it germinates, and the young plant remains an epiphyte for years until its aerial roots touch the ground; as soon as this takes place, the little epiphyte changes rapidly into a vigorous tree, throwing out numerous aerial roots which gradually envelope the tree on which it first began life and often kill it out.

Having started life so high up, it soon throws out branches which overtop the surrounding trees, and the numerous aerial roots, which fall from these and establish connection with the ground, in a few years enable it to dominate the forest growth around it.

The seed of this tree is contained in fig-shaped fruit, about 75 seeds being found in one good sound fig. The fruit first begins to form on the trees in March and ripens from May onward to December. On some trees the whole crop ripens and falls off by June, but, as a rule, the rubber tree has fruit on it from April right up to December, the figs forming, ripening and falling off the whole of the rains.

After collection the figs have to be carefully dried and mixed with pounded charcoal, which preserves the seed for several months.

In the Charduar rubber plantation nursery, for a seed bed $40' \times 3\frac{1}{2}'$, two to three seers of pulverized rubber seed, 10 seers ash and 20 seers of vegetable loam or good soil, is well mixed in a half cask and spread evenly over the bed, and then lightly tamped down and watered. Such a bed should yield, with good germination, 2,000 seedlings and should be sufficient for putting out 100 acres of rubber, planted $70' \times 35'$. The beds must be well-raised and drained, the soil being prepared in the same way as for vegetable or flower seed. If sown in boxes, these should be put under the eaves of a house; if in beds, light removable shades must be put up to keep off the direct rays of the sun. The shades should be removed during rainy or cloudy weather and at night.

Light sandy loam is most suitable for seed beds; if the soil is stiff, charcoal dust should be mixed with it to make it porous and prevent caking. The bed or boxes must never be allowed to get dry.

This should be done exactly in the same way as for vegetable or flower seed which requires transplanting after germination. The figs are broken between the hands. As the seed is very minute, the particles of the fruit are left with the seed and sown with it, no attempt being made to clean or separate the pulverized figs. In order to distribute these minute seeds evenly over the seed beds, or boxes, a certain quantity of ash and soil is mixed with them.

Germination takes place from the end of April to the end of the rains. Seed sown between October and January, requires daily watering and screening from the sun, and will not germinate before the end of April or the beginning of May, but seed sown any time during the rains will germinate in a few days (from five days to a fortnight). It follows that the best time for sowing seed is during the rains—that is from June to September.

The embryo appears on the germination of the seed as a seedling having a pair of opposite cotyledons with an entire margin destitute of incisions or appendage of any kind, with the exception of the notched or emarginate apex, oval in general outline, green in colour and of a glassy smoothness. The second pair of leaves show a tendency to the alternate arrangement on the stem but appear at the same time. Their shape and venation are very different from those of the primary leaves, for they have a central midrib and a distinctly coarsely-crenated margin. The third pair of leaves do not appear simultaneously, and are distinctly alternate with a marked reddish colour; after this the plant is easily recognized.

When the seedlings are one to two inches high in the seed beds or boxes, they should, be transplanted into nursery beds, and put out in lines about a foot from each other. The nursery beds should be well raised and drained, but the soil need not be so carefully prepared as for the seed beds. Here the plants are kept till the following rains, when they are dug up and taken to stockaded nurseries in the forest, and put out $5' \times 5'$ on raised well-drained beds, where they remain for two years till they are required for planting operations.

Almost every animal will eat the young rubber plants; it is, therefore, impossible to plant out small seedlings in the forest owing to the destruction by wild elephants and game, unless each individual plant is carefully fenced in. As this is too costly, and the rubber after it is 1—2 feet in height is very hardy and can be transplanted, with ordinary care, at any time of the year (the best time in Assam is between May and July), the seedlings are kept in stockaded nurseries in the forest where planting operations are to take place, and remain there till they are 10 or 12 feet high, that is, about three years after germination, when they are dug out and the roots are cut back 18 inches right around the plant and planted on the mounds in the forests.

In artificial planting it is found that the rubber grows best on mounds. Lines are cut through the forest 20 feet wide and 70 feet apart from centre to centre; in these lines 15 feet stakes are put up 35 feet apart. Round each stake a mound is thrown up four feet high. The base of the mound is about ten feet in diameter and they taper to four feet on the top; on this mound the rubber tree is planted, care being taken that the roots are carefully spread out before they are covered up with earth. To prevent animals pulling the plants, and wind blowing them down, they are tied to the stakes.

The rubber tree can readily be propagated from cuttings, if only perfectly ripe young branches or shoots are used, but the tree raised from cuttings does not appear to throw out aerial roots, and, as the future yield of the tree probably depends on its aerial root system, it is questionable whether trees raised from cuttings ought to be used except where required only as a shade-giver, such as in an avenue. In the Charduar rubber plantation, propagation by cuttings was given up very early, that is about 1876, the plantation having been commenced in 1873.

Cuttings.

The best time to take cuttings is May and June.

The rubber grows equally well on high land or low land, in forest land or grass land, so long as it is planted on a mound and its roots are not exposed to the sun. It is a surface feeder,

General.

but, as soon as its roots appear above ground, they must be covered with fresh earth until such time as the tree has formed a sufficient leaf canopy to protect itself."

In Madras considerable attention has been paid to the cultivation of another rubber-yielding tree, the *ceara*. The plants put out in Ganjam in 1895-96 are doing well, also those in North and South Malabar. Three hundred and nine trees were tapped, but the average yield per tree was only 1 oz. of rubber. Twenty-one trees of *Ficus elastica* tapped in the Charduar plantation in Assam yielded an average of 1 seer of rubber each. The subject of extending the plantations of this tree has lately been fully considered, and it has been decided to at once start experiments on a fairly large scale in the Mount Stuart forests in North Coimbatore.

Experiments to extend the area under lac by artificial cultivation were made at Rampur in Dehra Dun, and in the Central Provinces, but owing to the dryness of the season no great measure of success was attained. In Berar, where this question has attracted considerable attention, further experiments were postponed until a more favourable season. The fact, however, that the Rewah State in Central India has been remarkably successful in the exploitation of lac, gives ground for believing that the business can be much expanded in the Northern Circle of the Central Provinces.

The question of the possibility of preparing extracts of barks, etc., containing tannin, and the saving in the expense of carriage which might be thus effected, continued to attract attention. Arrangements were made and a series of experiments were set in hand in order to ascertain the kinds of trees, the extracts of the bark, fruit, etc., of which were likely to prove most valuable as tanning agents. The results attained up to date show at least that we have in our Indian forests a very large quantity of material rich in tannin which, could it but be placed on the market at a reasonable price, could not fail to prove the subject of a most important and lucrative trade. The experiments which are being made are being carried out, first, in order to ascertain the kinds of material likely to prove most valuable, and, in the second place, to find out the most convenient and economical form in which they can be presented to the consumer.

III.—EXPORTS OF FOREST-PRODUCE.

The following table gives the amounts and value of various articles exported from India during the year :—

ARTICLES OF FOREST-PRODUCE.	QUANTITY, IN TONS OF 20 CWT.; IN THE CASE OF TEAK, CUBIC TONS.		VALUATION AT PORT OF SHIPMENT IN 1896-97.	
	Average of five years 1891-92 to 1895-96.	In 1896-97.	Total.	Per ton.
Caoutchouc	453	311	8,98,488	R 2,889
Lac—				
Button	1,420	1,401	18,95,911	1,353
Shell	6,005	8,786	1,19,35,957	1,358
Stick and other kinds	85	135	1,66,750	1,235
Lac-dye	8	...	...	...
Sandal-wood, ebony and other ornamental woods	Information	not available	5,91,886	...
Cutch and gambier	9,522	6,104	23,99,533	393
Myrabolams	44,120	44,968	36,14,315	80
Teak	54,503	64,221	68,64,829	107
Cardamoms	120	29	1,15,581	3,985
Total in 1896-97 . . . . .	...	...	2,84,83,250	...
" 1895-96 . . . . .	...	...	3,50,15,022	...
Decrease in 1896-97 . . . . .	...	...	65,31,772	...

The value of exports from the country thus fell off by no less than R65,32,000 as compared with that of the previous year, due almost entirely to the disastrous effects of the plague and famine. The chief articles which show a falling off are caoutchouc (R93,000), button lac (R17,33,000), shell-lac (R26,95,000), sandal-wood, etc. (R3,45,000), cutch and gambier (R14,00,000), and myrabolams (R4,00,000).

With regard to the exports of teak timber, the following note by the Bombay-Burma Trading Corporation may be quoted with advantage :—

"Prices in the Europe market were well maintained throughout the year, cargo timber (square) selling at about £12 to £12 10s., whilst the price of Europe planks, ordinary market specifications, advanced from £11 10s. to fully £13 10s. per ton of 30 cubic feet.

Consumption continued at the rate of nearly 70,000 tons per annum, so that, in spite of continuously heavy shipments from Burma as well as from Siam, there has been no increase in the stocks in all the principal distributing centres.

Combined with an unusually heavy demand for ship-building, specially naval constructions for the British as well as Foreign Governments, there has been an increased demand for rolling stock construction, resulting in the total consumption being considerably in excess of the average of previous years.

Siam has again contributed nearly 20,000 tons of the imports into Europe markets. The floating season, 1896-97, has been productive of nearly 60,000 logs against 65,000 in the preceding season."

IV.—TECHNICAL EDUCATION AND RECRUITMENT.

Eight young Forest officers, having completed their course of training at Cooper's Hill College, came to India towards the end of 1896 and were posted—

- 1 to Bengal,
- 2 to the North-Western Provinces and Oudh,
- 2 to Burma,
- 2 to the Central Provinces,
- 1 to Assam.

Six officers were selected by competition in England to undergo the Cooper's Hill course, which continues to be under the professional guidance of Dr. Schlich, late Inspector-General of Forests to the Government of India. At the Dehra Dun Forest School, which is the training ground for Rangers and officers of the Provincial Service, the course of training remained practically unchanged. At a meeting of the Board of Control held at Dehra in March 1897, however, it was decided that it would be very desirable to insist that candidates for the School should undergo a course of practical training in the forests before being admitted to the School. It has since been decided by the Government of India that it will be sufficient if this course of training lasts for 3½ months, and both stipendiary and private students will in future be obliged to undergo it. It will also be a great advantage if Native States will arrange that students under deputation to the School should have a similar course of practical training, either in the forests of the State deputing them or in adjacent Government forests. The number of students sent from Native States to be trained at the Dehra Forest School is steadily increasing, and during the year 1896-97 no less than 11 such students attended the School. This is very satisfactory, and shows that the rulers of Native States are gradually realizing the importance of managing their forests under correct principles, and the necessity of obtaining properly trained subordinates in order to do so.

The Directorship of the School was held for 11 months of the year by Mr. J. W. Oliver, who relieved Mr. Gamble on the latter proceeding on furlough on the 1st August. Mr. Gleadow continued to act as Deputy Director. The other members of the School staff were Messrs. Osmaston, Gradon and Rogers, Instructors, and Babu Kanji Lal, Vernacular Instructor. The staff was also assisted by the Director, Botanical Department, Northern India, the Assistant Agricultural Chemist, the Deputy Superintendent of the Indian Museum, and the officers of the School Circle. The number of students attending the School fell to 75, as against 83 in the previous year and 106 in the year 1894-95, a result owing, it is thought, to the greater caution with which stipends were granted during the year. It is believed, however, that under the better prospects which the recently sanctioned reorganization of the Provincial Service has given, the number of students who will come to the School at their own expense will gradually increase.

V.—FOREST ADMINISTRATION IN NATIVE STATES.

Copies of their Forest Administration reports have been received from Kashmir, Mysore, Jeypur, and Jodhpur. The administration of the forests in Kashmir remained in the charge of Mr. McDonell. There are now in this State 1,834 square miles under forest management, of which 440 square miles are estimated to contain deodar. The deodar-bearing localities are well

known, and it is unlikely that the deodar area under the Forest Department can be much increased. About half the forest area on the books of the Department has been wholly or partially demarcated, but much remains to be done. Excellent results attended the efforts to prevent fires, only 9,500 acres being burnt over. The financial results of the year's working were very satisfactory, there being a surplus of R6,60,000, which is R2,74,000 more than in the previous year. The principal work remaining in Kashmir is the completion of the demarcation and survey of the forests, and the framing of organized plans for working them, under which the annual outturn which may be removed without danger will be ascertained and not be allowed to be exceeded.

In Mysore there are 1,370 square miles of State forests and 363 square miles of reserves. Considerable attention is being paid to settlement and demarcation work, and large additions to reserves may shortly be expected. A start has been made in the preparation of working-plans, by the framing of a scheme for the Muthodi State forest which was nearing completion at the close of the year. Rupees 11,000 were expended on buildings and only R560 on roads and bridges, to the construction of which perhaps more attention might with advantage be given. Attention was paid to the general protection of the forests, and 313 cases of breaches of forest rules were prosecuted before the Courts. Fire-protection was also successful on the whole, 94 per cent. of the area attempted to be protected having been saved from fire. The financial results fell off and showed a decrease of R3,29,000, due to the non-disposal of a large quantity of sandalwood.

In Jeypur, considerable attention was paid to forest conservancy, and the State forests now cover an area of 180,000 acres, the net income from which was R17,000. It is, however, said by the Superintendent that this area is quite inadequate to meet the forest requirements of the State, that fuel is becoming dearer, and that cowdung, which ought to be used as manure, is used as firewood. This being the case, it is hoped that it will be found possible to set aside further areas as permanent forest estates. The preparation of working-plans for the existing forests is also greatly to be desired. It is noticed with regret that an experiment for the propagation of the lac insect, which promised to be highly successful, was put a stop to, owing to the fear that the trees would be rendered leafless and that there would be no shelter left in the forests for game. This fear is groundless, for the lac only flourishes on certain kinds of trees, and there would always remain numerous other kinds to afford ample shelter for animals.

In Jodhpur the area of forests managed as such is 193,000 acres, and the report shows that good attention has been paid to the protection of this area from injury by the hand of man, cattle and fires. It is noticed with much satisfaction that protection from fire was highly successful, and that out of 188,000 acres placed under protection only 1,596 acres were burnt. Financial results were bad owing to the prevailing scarcity, the surplus realized being only R3,175. In 1891-92 the surplus was R14,779, and with better times it is certain that the revenue will again rise to, if not surpass, the figures of former years.

Summary of the Revenue and Expenditure

BUDGET HEADS.	BENGAL PRESIDENCY (BRITISH)										
	Im- perial.	Bengal.	North- Western Prov- inces and Oudh.	Punjab.	Burma (Lower).	Burma (Upper).	Central Provinces.	Assam.	Coorg.	Ajmere.	Balu- chistan.
REVENUE.											
I.—Timber and other produce removed from the forests by Government agency.	...	5,19,990	4,47,630	7,11,740	24,06,010	1,43,460	66,760	34,010	55,290	1,080	3,530
II.—Timber and other produce removed from the forests by consumers or purchasers.	4,100	8,08,160	9,25,750	3,14,420	8,38,850	23,61,650	6,79,200	3,20,000	36,680	10,780	1,180
III.—Drift and waif wood and confiscated forest produce.	...	7,920	9,680	49,550	2,14,030	25,550	2,310	4,990	...	30	10
IV.—Revenue from forests not managed by Government.	...	...	15,840	2,210	3,09,920	...	...	36,210	...	...	10,350
V.—Miscellaneous	...	34,780	45,920	29,800	49,460	30,020	25,050	41,230	1,030	480	300
Total Revenue	4,100	13,70,850	14,44,820	11,07,720	38,13,270	25,60,680	7,73,320	4,36,440	93,000	12,370	15,460
EXPENDITURE.											
A.—CONSERVANCY AND WORKS.											
I.—Timber and other produce removed from the forests by Government agency.	710	2,37,530	2,22,320	2,74,580	6,03,370	53,900	28,870	4,030	12,620	320	660
II.—Timber and other produce removed from the forests by consumers or purchasers.	...	56,720	33,210	3,170	14,300	5,450	1,16,540	27,500	...	110	...
III.—Drift and waif wood and confiscated forest produce.	...	1,870	6,820	11,000	72,010	15,990	40	50	...	...	...
IV.—Revenue from forests not managed by Government.	...	...	3,920	...	4,390	...	...	...	...	...	1,370
V.—Rent of leased forests, and payments to shareholders in forests managed by Government.	...	...	13,050	37,370	...	...	...	11,010	...	3,090	...
VI.—Live-stock, stores, tools and plant	...	19,310	20,800	3,440	85,090	38,400	13,850	11,710	2,980	230	160
VII.—Communications and buildings	...	50,640	92,510	45,170	51,020	36,030	20,470	20,680	7,230	450	600
VIII.—Demarcation, improvement and extension of forests.	210	35,760	1,06,250	34,910	2,65,870	71,200	2,40,760	31,240	11,330	2,130	2,010
IX.—Miscellaneous	...	1,620	11,090	820	6,220	4,550	4,400	1,740	1,270	160	20
Total A.—Conservancy and Works	920	4,03,450	5,09,970	4,10,960	10,57,770	2,25,520	4,24,930	1,07,960	35,330	6,490	5,320
B.—ESTABLISHMENTS.											
I.—Salaries	62,970	2,33,210	3,29,480	2,44,750	3,75,530	3,66,630	4,41,120	1,43,240	29,000	13,560	20,670
II.—Travelling allowances	11,830	37,610	41,760	40,970	47,390	52,020	41,030	20,860	5,480	1,230	3,050
III.—Contingencies	3,240	15,770	25,190	26,620	22,600	11,310	43,910	9,950	1,720	730	730
Total B.—Establishments	78,040	2,86,590	3,96,370	3,12,340	4,45,520	4,00,010	5,26,060	1,74,050	36,200	15,520	24,450
Grand Total of Expenditure	78,960	6,90,040	9,06,340	7,23,300	15,03,290	6,25,530	9,50,990	2,82,010	71,630	22,010	29,770
SURPLUS	...	6,80,810	5,38,480	3,84,420	23,14,980	19,35,150	...	1,54,430	21,370	...	...
DEFICIT	74,860	...	...	...	...	...	1,77,670	...	...	9,640	14,310

* Includes salary of the Inspector-General, and Assistant

X I.

/ the Forest Department in India for the Financial year 1896-97.

TERRITORIES).			Total Bengal Presidency (British Territories).	Madras.	Bombay.	Total British Provinces.	Berar.	GRAND TOTAL.	BUDGET HEADS.
Andamans.	Forest School.	Forest Surveys (Imperial).							
R	B	R	R	B	B	R	R	R	REVENUE.
3,57,560	...	...	47,47,060	8,98,420	11,69,700	63,15,180	...	63,15,180	I.—Timber and other produce removed from the forests by Government agency.
4,050	...	...	63,04,820	17,63,300	17,70,930	98,44,050	5,12,350	1,03,56,900	II.—Timber and other produce removed from the forests by consumers and purchasers.
...	...	...	3,14,070	10,450	5,490	3,30,010	230	3,30,240	III.—Drift and waif wood and confiscated forest produce.
...	...	...	3,74,530	...	13,370	3,87,900	...	3,87,900	IV.—Revenue from forests not managed by Government.
760	2,850	400	2,62,170	1,26,160	78,220	4,61,550	4,740	4,66,290	V.—Miscellaneous.
3,62,370	2,850	400	1,20,02,650	23,03,330	80,32,710	1,78,88,690	5,17,820	1,78,56,510	Total Revenue.
EXPENDITURE.									
A.—CONSERVANCY AND WORKS.									
2,64,700	...	...	17,08,610	2,01,960	5,15,720	24,26,290	...	24,26,290	I.—Timber and other produce removed from the forests by Government agency.
220	...	...	2,57,720	97,780	43,700	3,99,200	40,230	4,39,430	II.—Timber and other produce removed from the forests by consumers or purchasers.
...	...	...	1,07,730	2,270	250	1,10,300	...	1,10,300	III.—Drift and waif wood and confiscated forest produce.
...	...	...	10,130	...	...	10,180	...	10,180	IV.—Revenue from forests not managed by Government.
...	...	...	65,020	17,440	43,490	1,25,950	15,560	1,41,510	V.—Rent of leased forests and payments to shareholders in forests managed by Government.
22,800	180	2,500	1,71,450	43,810	21,350	2,36,610	3,800	2,40,410	VI.—Live-stock, stores, tools and plant.
3,930	280	...	3,29,010	93,800	34,550	4,57,360	20,320	4,77,680	VII.—Communications and buildings.
160	...	4,960	8,06,790	8,09,400	2,75,640	13,91,830	26,500	14,18,330	VIII.—Demarcation, improvement and extension of forests.
4,400	3,280	20	39,680	16,050	41,860	97,590	770	98,360	IX.—Miscellaneous.
2,96,900	3,740	7,460	84,96,240	7,82,510	9,76,560	52,55,310	1,07,180	53,62,490	Total A.—Conservancy and Works.
B.—ESTABLISHMENTS.									
17,760	56,160	18,310	23,22,440	5,91,530	8,31,870	37,45,340	1,08,100	38,53,440	I.—Salaries.
2,100	4,680	...	3,10,010	1,15,790	1,17,940	5,43,740	15,140	5,58,880	II.—Travelling allowances.
440	2,800	6,180	1,71,130	44,470	43,290	2,58,390	11,450	2,70,340	III.—Contingencies.
20,300	63,640	24,490	28,08,580	7,51,790	9,92,600	45,47,970	1,34,690	46,82,660	Total B.—Establishments.
3,16,600	67,380	31,970	62,99,820	15,84,300	19,69,160	98,03,280	2,41,870	1,00,45,150	Grand Total of Expenditure
45,770	...	...	57,02,830	7,69,030	10,63,550	75,35,410	2,75,950	78,11,360	SURPLUS.
...	64,530	31,570	...	...	...	...	...	...	DEFICIT.

Inspector-General of Forests and their establishments and contingencies.

APPENDIX II—continued.

EXPENDITURE.

INCS.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.	1893-94.	1894-95.	1895-96.	1896-97.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
at*	57,150	79,216	81,210	48,239	44,004	98,069	53,958	73,310	65,291	77,635	87,263	88,366	93,306	68,245	86,299	78,626	88,198	81,311	85,414	65,783	1,07,470	80,340	84,950	80,410	73,960
Western roads and	1,00,777	1,39,274	1,01,361	1,42,676	2,14,497	2,82,913	3,38,875	2,75,748	3,36,381	3,94,612	3,82,183	3,87,813	4,11,915	3,70,399	4,22,781	3,90,389	3,76,270	3,88,150	4,14,004	4,22,930	3,81,610	2,04,040	3,97,880	4,66,070	6,90,040
(Lower)	11,74,686	11,90,794	10,61,302	7,36,979	8,81,363	7,28,926	8,08,977	7,16,594	6,79,574	8,16,212	6,29,025	10,41,885	10,20,101	9,74,519	9,19,580	8,30,749	8,44,544	8,68,151	9,19,165	9,58,211	9,28,540	9,63,629	9,36,310	9,42,969	9,06,340
(Upper)	8,90,389	6,11,556	6,58,983	5,56,911	5,26,659	5,20,631	5,23,554	4,80,676	4,95,368	5,16,269	5,60,750	6,53,146	5,58,070	6,75,483	7,16,510	6,77,912	5,93,885	6,45,855	6,53,041	6,40,275	6,56,270	6,36,430	7,22,120	6,78,420	7,23,360
Prov.	2,50,578	2,85,539	2,94,449	3,73,327	2,90,295	3,82,694	3,93,758	5,22,574	4,95,512	4,87,013	4,12,247	4,36,058	4,95,821	4,45,432	4,99,293	5,52,939	6,68,697	6,96,445	7,25,554	8,02,915	8,51,400	9,32,190	9,76,060	9,52,340	9,50,990
Schools	29,479	45,252	37,999	40,168	33,692	36,268	34,329	55,165	56,487	58,796	64,770	75,023	76,951	65,690	74,088	72,629	80,175	72,420	65,818	86,860	73,090	86,890	86,140	85,840	71,630
Surveys (arial)	59,556	78,090	59,930	58,929	60,165	60,325	46,878	40,335	42,489	41,665	30,940	19,823	19,180	23,948	32,838	22,164	21,143	24,324	26,832	22,160	27,900	29,840	29,950	31,970	
Ins.	1,896	1,307	1,096	2,180	2,306	1,840	12,161	22,760	37,085	25,769	62,679	57,295	94,975	1,30,062	1,79,909	2,31,219	2,44,550	1,22,780	1,02,020	2,16,600	28,614	45,252	37,999	40,168	33,692
Total	28,61,728	29,05,523	30,52,589	28,63,632	31,43,279	30,04,442	30,82,949	30,78,691	30,47,824	33,35,871	33,01,740	41,67,252	41,50,563	40,79,137	41,14,548	41,31,532	50,04,844	49,79,615	47,47,954	52,09,608	53,86,020	55,33,010	56,26,470	56,42,330	62,70,060
(British)	5,48,748	4,74,920	5,95,941	5,92,089	6,35,560	5,65,624	4,95,914	5,48,527	5,19,270	6,08,419	6,45,262	7,86,733	8,98,505	9,37,972	11,53,122	11,29,212	12,20,794	11,61,237	12,46,913	12,24,254	13,30,390	12,62,770	13,83,350	14,45,610	15,34,300
Surveys (British)	41,36,505	41,02,037	44,85,205	42,49,812	46,22,818	44,47,782	45,83,786	47,04,207	47,24,441	56,08,471	57,25,362	65,18,157	68,25,791	68,56,570	72,20,580	72,04,750	79,19,600	78,11,543	78,64,764	84,65,319	88,21,380	90,22,720	90,69,740	90,46,330	97,73,510
Ins.	33,631	36,350	91,389	91,449	94,652	1,09,968	1,07,350	1,10,506	1,28,969	1,52,965	1,55,054	1,56,779	1,52,649	1,59,242	1,71,704	1,83,765	1,70,212	1,76,549	1,68,921	1,98,266	2,29,230	2,54,250	2,51,640	2,45,510	2,41,870
Surveys (Ins.)	...	...	...	...	...	...	...	...	...	...	...	15,043	34,804	42,940	45,472	42,098	23,955	6,484	...	...	...	...	...	...	...
Total	42,22,136	41,88,367	45,76,594	43,41,311	47,17,470	45,57,760	46,91,136	48,14,713	48,69,825	57,79,138	58,92,878	67,06,890	70,26,510	70,74,551	74,55,592	74,43,366	81,23,761	80,12,518	80,63,125	86,94,182	89,06,230	93,40,700	93,73,290	93,33,610	1,00,45,150

* Includes pay of Inspector-General of Forests, central home charges, and undistributable and petty local items.

STATEMENT II—concluded.

SURPLUS.

Provinces.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.	1893-94.	1894-95.	1895-96.	1896-97.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Al	-64,376	-77,961	-80,066	-46,774	-41,514	38,873	-47,240	-56,596	-46,404	-50,228	-56,536	-65,359	-69,732	-73,537	-82,113	-73,770	-82,182	-70,552	-79,044	-59,100	-1,02,030	-78,160	-79,970	-77,720	-74,660
Al	49,075	40,092	84,571	55,598	7,904	1,63,315	77,352	1,78,776	2,25,959	2,39,122	3,11,776	3,06,521	1,59,237	2,27,033	2,30,853	2,67,426	3,00,037	3,70,568	3,13,388	3,66,623	3,63,270	3,97,570	3,98,280	4,52,640	6,80,810
North-Western Provinces and Al	7,64,419	7,41,883	3,02,056	5,27,377	2,89,309	4,74,182	3,16,778	3,23,372	2,82,654	1,49,882	1,74,378	5,69,498	5,52,218	4,86,976	6,53,976	4,16,706	6,18,258	7,51,008	7,18,694	7,73,303	7,24,000	7,46,940	7,21,940	6,58,480	5,38,480
Al	-2,37,374	1,20,983	1,75,891	3,52,920	73,095	1,63,083	-22,935	1,09,143	1,76,310	1,72,039	2,05,959	2,57,031	1,81,282	1,74,938	4,10,767	1,09,024	4,51,883	2,75,858	1,81,329	3,70,799	1,56,300	2,76,870	3,10,310	3,36,080	3,84,420
Al (Lower)	4,90,810	5,92,817	4,11,255	9,63,361	5,45,854	7,44,851	4,19,160	4,20,700	8,04,045	10,81,580	12,74,041	12,91,451	4,56,749	8,72,907	9,22,837	11,88,203	13,77,361	18,01,872	15,91,791	15,32,998	22,20,120	21,47,710	18,95,970	20,56,810	23,14,980
Al (Upper)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,05,886	1,75,724	7,94,799	15,32,270	13,41,982	9,53,441	16,34,880	17,74,860	16,22,820	17,05,420	19,35,150
Al Provinces	2,31,095	2,82,428	3,66,489	3,52,849	3,71,031	3,61,876	4,59,104	4,84,150	3,54,827	6,75,871	5,65,400	5,58,711	5,21,381	5,91,462	4,58,117	5,40,430	5,11,708	4,59,736	4,77,907	5,65,985	3,79,450	2,02,290	32,570	44,600	-1,77,670
Al	...	...	5,582	-1,527	-8,952	33,173	35,751	31,506	26,272	603	67,782	11,889	-17,285	-14,838	-278	40,420	93,977	1,22,369	42,941	68,604	1,18,760	2,20,280	1,63,080	1,38,890	1,54,430
Al	54,946	64,332	20,016	67,202	42,285	64,747	17,191	46,621	31,270	40,608	78,252	12,799	36,282	23,696	25,203	54,399	56,008	20,833	69,743	96,037	1,07,590	86,900	66,910	49,410	21,270
Al	-13,030	-17,628	-15,079	-26,936	-21,555	-11,924	-12,204	-11,889	-11,299	-9,889	-4,158	-6,376	-5,860	-6,772	-9,470	-4,604	-2,102	-1,109	2,546	5,813	-110	-1,280	-2,060	-80	-9,640
Al (Special)	...	59,556	-78,090	-58,909	-58,929	-60,165	-60,262	-46,840	-40,063	-42,489	-41,247	-30,804	-19,589	-18,678	-28,107	-32,828	-21,849	-20,968	-22,220	-26,625	-21,640	-27,660	-29,760	-29,440	-31,570
Al (School)	...	...	...	...	...	...	...	...	...	...	...	...	-22,495	-23,968	-30,416	-32,362	-32,512	-28,409	-34,007	-42,559	-48,420	-63,540	-63,190	-63,640	-64,530
Al (Mans)	4,966	4,181	5,516	5,363	3,372	205	5,564	-4,740	25,574	46,101	69,018	12,601	-547	-13,091	6,101	41,383	48,780	67,220	28,274	92,429	1,29,280	1,97,240	-8,250	30,100	15,770
Total	12,80,558	16,92,044	11,98,111	21,90,614	12,01,850	19,72,013	11,88,259	15,35,203	18,09,045	23,03,250	26,49,565	29,17,856	17,93,641	22,25,828	26,63,268	26,88,162	41,14,766	52,74,196	46,32,720	46,96,743	56,61,510	58,79,950	50,28,650	53,01,540	57,17,140
Al	46,442	1,38,733	-81,540	85,834	-42,987	-15,314	1,10,874	77,641	2,17,610	2,03,489	2,61,090	1,66,971	2,70,411	2,90,678	93,789	2,45,708	2,94,212	3,96,890	5,48,495	3,69,962	2,46,820	5,84,410	5,07,680	6,04,660	7,09,030
Al	4,21,374	4,66,495	8,87,376	4,54,531	3,87,679	3,83,812	1,76,971	4,47,723	3,55,460	6,58,036	8,11,583	9,38,928	9,98,119	15,26,825	10,79,766	10,88,572	11,56,228	13,67,005	14,18,333	13,53,192	13,64,580	17,22,410	16,82,110	15,78,280	10,63,550
Al (British)	17,48,374	22,97,272	15,09,977	27,30,979	15,46,542	23,40,511	14,76,104	20,60,567	28,82,115	31,65,675	37,22,238	40,23,755	30,60,171	40,13,331	23,36,913	40,22,432	55,65,206	70,37,591	65,99,549	64,19,897	72,72,010	81,80,770	72,18,440	75,44,780	75,49,720
Al (British)	1,72,932	1,76,906	1,69,285	1,41,282	1,58,420	1,69,268	1,81,254	1,96,994	1,37,588	80,526	1,36,960	1,51,439	1,44,536	1,36,609	1,54,552	2,22,682	2,37,765	2,63,992	3,18,188	3,12,819	2,01,790	2,28,550	2,21,760	2,48,880	2,75,660
Al (Special)	...	...	...	...	...	...	...	...	...	...	...	-15,043	-33,870	-42,309	-44,821	-41,502	-23,055	-6,464	...	...	...	...	...	...	...
Al (Mans)	...	...	...	...	...	...	...	...	-2,040	934	-6,923	-12,159	-7,177	-837	-3,755	-3,890	-10,326	-4,065	-13,726	-3,888	-36,590	-43,000	-24,610	-26,840	-14,340
Total	19,21,306	24,74,178	16,73,262	28,72,262	17,04,062	25,09,779	16,57,458	22,57,501	25,17,063	32,47,135	38,52,375	41,47,002	31,63,660	41,30,794	39,42,991	41,09,922	57,68,690	72,91,054	69,04,010	67,22,991	74,38,110	83,72,306	71,15,394	75,07,766	78,17,140