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On an Inquiry into the Silk Industry
in India

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REPORT
ON AN INQUIRY INTO
The Silk Industry in India

BY
H. MAXWELL-LEFROY,
Imperial Silk Specialist and
E. C. ANSORGE, I.C.S.

VOLUME III

Appendices to Volume I

BY
H. MAXWELL-LEFROY.



1916

CALCUTTA
SUPERINTENDENT GOVERNMENT PRINTING, INDIA
1917

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APPENDIX I.

GOVERNMENT OF INDIA. FINANCE DEPARTMENT.

[ENCLOSURES TO DESPATCH NO. 291 OF 1915.]

Enclosure No. 1.

Statement showing imports into and exports from India of silk (raw and manufactured) from 1884-85 to 1913-14.

A

SILK RAW (IMPORTS AND RE-EXPORTS).

	IMPORTS.		RE-EXPORTS OF FOREIGN SILK.		NET IMPORTS.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	000's of lbs.	000's of £	000's of lbs.	000's of £	000's of lbs.	000's of £
1884-85	1,832	498	142	30	1,690	468
1889-90	2,360	711	116	23	2,244	688
1894-95	2,494	691	96	17	2,398	674
1899-1900	1,695	384	91	11	1,604	373
1900-01	2,535	678	98	13	2,437	665
1901-02	2,128	540	60	10	2,068	530
1902-03	1,639	368	85	11	1,554	357
1903-04	1,544	395	68	9	1,476	386
1904-05	1,859	489	54	10	1,805	479
1905-06	1,646	475	69	9	1,577	466
1906-07	1,422	379	105	25	1,317	354
1907-08	2,051	654	83	12	1,968	642
1908-09	2,168	679	74	8	2,094	671
1909-10	2,330	651	73	12	2,257	639
1910-11	2,122	568	70	8	2,052	560
1911-12	2,239	706	17	6	2,222	700
1912-13	3,579	1,143	56	8	3,523	1,135
1913-14	2,564	839	21	7	2,543	832

B

SILK RAW (INDIAN)—(EXPORTS).

	EXPORTS.	
	Quantity.	Value.
	Thousands of lbs.	Thousands of £
1884-85	1,567	399
1889-90	2,090	427
1894-95	1,331	335
1899-1900	1,940	466
1900-01	1,604	342
1901-02	1,936	442
1902-03	1,990	437
1903-04	1,862	423
1904-05	1,344	331
1905-06	1,779	376
1906-07	1,943	458
1907-08	1,943	425
1908-09	1,834	360
1909-10	2,076	338
1910-11	1,851	337
1911-12	1,750	303
1912-13	1,678	278
1913-14	1,203	165

TOTAL SILK MANUFACTURES (IMPORTS AND RE-EXPORTS).

(Details of Silk Manufactures will be found in Statements marked C¹, C², and C³.)

	IMPORTS.		RE-EXPORTS.		NET IMPORTS.	
	Value.		Value.		Value.	
	000's of £.		000's of £.		000's of £.	
1884-85	849	21	828			
1889-90	1,185	39	1,146			
1894-95	852	60	792			
1899-1900	753	31	722			
1900-01	1,110	36	1,074			
1901-02	990	45	945			
1902-03	1,088	49	1,039			
1903-04	1,222	47	1,175			
1904-05	1,412	40	1,372			
1905-06	1,268	43	1,225			
1906-07	1,217	45	1,172			
1907-08	1,423	36	1,387			
1908-09	1,521	28	1,493			
1909-10	1,511	30	1,481			
1910-11	1,843	37	1,806			
1911-12	1,769	45	1,724			
1912-13	2,035	55	1,980			
1913-14	2,067	67	2,000			

SILK—PIECE-GOODS.

	IMPORTS.		RE-EXPORTS.		NET IMPORTS.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	000's of yds.	000's of £	000's of yds.	000's of £	000's of yds.	000's of £
1884-85	10,221	747	294	16	9,927	731
1889-90	11,426	949	564	35	10,862	914
1894-95	9,955	624	1,118	56	8,837	568
1899-1900	8,212	440	481	27	7,731	413
1900-01	17,416	782	541	32	16,875	750
1901-02	12,625	579	787	39	11,838	540
1902-03	15,041	741	1,026	45	14,015	696
1903-04	17,872	808	769	40	17,103	768
1904-05	18,886	832	830	37	18,056	795
1905-06	15,525	759	885	41	14,640	718
1906-07	16,403	819	889	41	15,514	778
1907-08	18,657	948	706	35	17,951	913
1908-09	19,726	970	544	26	19,182	944
1909-10	21,664	1,025	567	28	21,097	997
1910-11	24,826	1,193	654	34	24,172	1,159
1911-12	26,496	1,220	754	42	25,742	1,178
1912-13	29,826	1,357	897	50	28,929	1,307
1913-14	27,338	1,279	1,010	58	26,328	1,221

GOODS OF SILK MIXED WITH OTHER MATERIALS.

	IMPORTS.		RE-EXPORTS.		NET IMPORTS.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	000's of yds.	000's of £	000's of yds.	000's of £	000's of yds.	000's of £
1884-85	1,858	96	85	5	1,773	91
1889-90	3,978	223	53	4	3,925	219
1894-95	3,933	197	38	3	3,895	194
1899-1900	3,634	183	70	4	3,564	179
1900-01	3,256	174	57	4	3,199	170
1901-02	4,847	241	127	6	4,720	235
1902-03	3,717	182	91	4	3,626	178
1903-04	4,390	224	113	6	4,277	218
1904-05	5,971	292	56	3	5,915	289
1905-06	4,718	231	50	2	4,668	229
1906-07	4,110	205	72	3	4,038	202
1907-08	5,887	320	20	1	5,867	319
1908-09	5,095	287	26	1	5,069	286
1909-10	4,568	232	30	1	4,538	231
1910-11	7,545	372	20	2	7,525	370
1911-12	4,840	260	28	2	4,812	258
1912-13	7,261	389	65	4	7,196	385
1913-14	8,164	464	144	7	8,020	457

SILK YARN NOILS AND WARPS, THREAD FOR SEWING AND OTHER SORTS.

	IMPORTS.		RE-EXPORTS.		NET IMPORTS.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	000's of lbs.	000's of £	000's of lbs.	000's of £	000's of lbs.	000's of £
1884-85	13	6	..	..	13	6
1889-90	18	13	..	..	18	13
1894-95	65	31	..	..	63	30
1899-1900	479	130	1	..	478	130
1900-01	583	154	1	..	582	154
1901-02	804	170	2	..	802	169
1902-03	908	165	1	..	907	165
1903-04	821	190	3	..	818	189
1904-05	1,033	288	1	..	1,032	288
1905-06	1,051	278	1	..	1,050	278
1906-07	696	193	2	..	694	193
1907-08	423	155	1	..	422	155
1908-09	858	264	4	..	854	263
1909-10	950	254	1	..	949	253
1910-11	951	278	4	..	947	277
1911-12	984	289	4	..	980	288
1912-13	1,213	289	5	..	1,208	288
1913-14	1,227	324	9	..	1,218	322

mois le certificat émanant soit du service des Douanes, soit de celui des contributions indirectes ou diverses constatant, soit la prise en charge dans une filature, soit la réexportation, ou de payer une somme de 50 centimes par kilogramme non apuré.

Le délai fixé pour la décharge de l'acquit-à-caution peut être sur la demande motivée du soumissionnaire, prolongé d'une durée qui ne peut excéder trois mois par décision du Ministre des finances, sur avis conforme du Ministre du commerce.

Dans les villes où l'entrepôt fictif n'est pas autorisé, les cocons pourront être placés en entrepôt réel aux frais des destinataires, jusqu'à la levée des acquits-à-caution applicables à leur transport en filature ou à leur réexportation.

Dans le cas d'envoi au filature l'acquit-à-caution est déchargé sur le vu du certificat de prise en charge du filateur ou de son fondé de pouvoirs, dûment autorisé par le service des Douanes ou des contributions indirectes.

Dans le cas de réexportation l'acquit-à-caution est déchargé sur le vu du certificat du bureau de douane de sortie.

Après décharge de l'acquit-à-caution constant la prise en charge dans une filature il en est envoyé un double au Ministre du commerce en vue de la liquidation des primes dues au filateur qui les a pris en charge.

L'entrée et le transport des échantillons de cocons d'un poids de 4 kilogrammes et au-dessous ne sont soumis à aucune formalité.

Article 19.

Le présent décret est applicable à l'Algérie.

Article 20.

Le Ministre du commerce et de l'industrie et le Ministre des finances sont chargés, chacun en ce qui le concerne, de l'exécution du présent décret, qui sera publié au Journal Officiel et inséré au Bulletin des Lois.

Fait à Rambouillet, le 23 septembre 1909.

A. FAILLIÈRES.

APPENDIX II.

The figures here copied are designed to illustrate the position of Bengal in relation to other countries up to 1915.

Imports to England: (Milburn's Oriental Commerce.)

	lbs.
1749—Turkey	132,894
East India and China	43,876
Italy	36,301
Straits	14,897
Spain and Portugal	2,564
Flanders	1,407
1765—Bengal	80,000
1766—Bengal	196,000
1767-1771—Bengal	327,630 average.
1772-1775—Bengal	187,000 "
1776-1785—Bengal	560,000 "
1776-1785—Turkey	282,000 "

The following is an account of the quantities of raw silk imported into Great Britain from Bengal, China, Turkey, and all other places, in the thirty years, 1773 to 1802 inclusive :—

Year	RAW SILK IMPORTED BY GREAT BRITAIN.				
	Bengal.	China.	Italy and Turkey.	Other parts.	TOTAL.
	lbs.	lbs.	lbs.	lbs.	lbs.
1773	145,777	203,401	187,099	6,190	542,467
1774	213,549	276,781	220,933	2,610	713,873
1775	208,881	167,229	272,782	13,380	662,272
1776	515,913	244,839	515,235	22,048	1,298,035
1777	563,121	221,902	350,640	42,451	1,178,114
1778	602,964	266,678	133,636	12,568	1,015,836
1779	737,560	234,906	850	130,503	1,103,819
1780	235,216	301,300	844	209,557	746,917
1781	785,673	301,301	23,878	288,906	1,399,758
1782	77,610	79,725	37,894	178,084	373,313
1783	611,071	241,107	140,866	129,758	1,122,802
1784	149,394	100,602	262,419	74,688	587,103
1785	324,307	98,920	245,230	25,996	694,453
1786	252,985	59,551	222,175	35,101	569,812
1787	178,180	266,878	185,983	21,583	752,624
1788	305,965	312,182	148,922	23,207	790,276
1789	427,263	257,022	148,582	23,881	856,748
1790	320,826	216,005	194,974	25,953	757,758
1791	373,503	203,539	264,103	38,286	909,433
1792	380,107	104,830	358,500	45,881	889,318
1793	736,081	165,435	110,276	8,216	1,020,008
1794	521,460	99,356	44,911	17,501	683,228
1795	380,352	154,590	80,579	110,995	726,516
1796	347,936	12,968	19,045	107,682	487,631
1797	92,204	78,520	4,058	91,494	266,276
1798	353,394	136,196	..	241,295	730,885
1799	644,819	63,604	11,455	520,594	1,240,472
1800	583,086	92,385	40,239	117,862	833,572
1801	444,862	131,335	62,264	193,503	831,964
1802	244,809	75,588	179,009	193,895	692,801

Watt's Dictionary of the Economic Products of India. Page 195.

Exports from Bengal.

	lbs.		lbs.
1803	405,093	1820	1,071,447
1804	621,710	1821	990,463
1805	835,904	1822	1,042,617
1806	408,523	1823	1,161,186
1807	493,585	1824	931,649
1808	378,498	1825	919,436
1809	162,747	1826	1,237,023
1810	584,718	1827	1,026,039
1811	404,756	1828	1,136,309
1812	982,427	1829	1,387,754
1813	1,084,350	1830	1,186,163
1814	836,966	1831	1,094,877
1815	802,286	1832	956,453
1816	779,764	1833	750,980
1817	502,335	1834	810,641
1818	1,160,976	1835	727,535
1819	751,027		

Quantity of the exports of "raw silk" from India from 1855 to 1891. Watt's Dictionary. Page 196.

Year.	Quantity.	Year.	Quantity.
1855-56	1,148,841	1873-74	2,223,917
1856-57	1,756,778	1874-75	1,656,015
1857-58	1,580,463	1875-76	1,310,569
1858-59	1,217,438	1876-77	1,417,893
1859-60	1,670,698	1877-78	1,512,819
1860-61	1,955,656	1878-79	1,329,599
1861-62	1,101,844	1879-80	1,401,506
1862-63	1,228,684	1880-81	1,302,576
1863-64	1,369,556	1881-82	1,117,026
1864-65	1,582,341	1882-83	1,359,433
1865-66	1,445,153	1883-84	1,602,812
1866-67	2,145,354	1884-85	1,564,901
1867-68	2,226,201	1885-86	1,438,767
1868-69	2,463,937	1886-87	1,583,924
1869-70	2,368,452	1887-88	1,625,177
1870-71	2,131,399	1888-89	2,121,914
1871-72	1,893,322	1889-90	2,089,762
1872-73	2,231,578	1890-91	1,573,214

The following table gives the raw silk (Indian produce) exported from India during the years 1879 to 1891:—

Year.	Silk.	Chasam.	Cocoons.	TOTAL.
	lbs.	lbs.	lbs.	lbs.
1879-80	563,210	788,481	49,815	1,401,506
1880-81	550,665	783,464	18,447	1,302,576
1881-82	339,322	749,121	28,583	1,117,026
1882-83	501,576	834,405	23,452	1,359,433
1883-84	672,710	886,045	44,059	1,602,812
1884-85	531,205	950,983	82,713	1,564,901
1885-86	358,071	1,023,807	56,889	1,438,767
1886-87	449,515	1,020,595	113,814	1,583,924
1887-88	453,568	998,235	173,374	1,625,177
1888-89	433,473	1,313,874	374,567	2,121,914
1889-90	593,425	1,233,494	262,843	2,089,762
1890-91	454,280	983,039	135,895	1,573,214

Imports and exports of raw silk by sea into and from British India. (Department of Statistics, India.)

	Imports of foreign silk.	Re-exports of foreign silk.	Exports of Indian silk.		Imports of foreign silk.	Re-exports of foreign silk.	Exports of Indian silk.
	lbs.	lbs.	lbs.		lbs.	lbs.	lbs.
1850-51 . . .	1,259,974			1883-84 . . .	2,210,893	130,373	1,602,814
1851-52 . . .	1,045,220		Not	1884-85 . . .	1,831,702	142,184	1,567,101
1852-53 . . .	1,041,612		available.	1885-86 . . .	1,732,559	84,457	1,438,767
1853-54 . . .	1,340,690			1886-87 . . .	1,737,891	124,605	1,583,924
1854-55 . . .	1,140,140	Not		1887-88 . . .	2,598,597	109,209	1,625,177
1855-56 . . .	1,392,219	available.	1,148,841	1888-89 . . .	2,045,599	111,832	2,121,912
1856-57 . . .	564,878		1,756,778	1889-90 . . .	2,360,467	116,261	2,089,794
1857-58 . . .	1,438,630		1,580,463	1890-91 . . .	2,406,239	145,298	1,760,611
1858-59 . . .	1,847,643		1,217,438	1891-92 . . .	2,791,069	119,919	1,662,519
1859-60 . . .	1,149,492		1,670,698	1892-93 . . .	2,292,846	109,141	1,820,233
1860-61 . . .	1,478,863		1,955,656	1893-94 . . .	2,947,595	113,069	1,771,085
1861-62 . . .	..		1,101,844	1894-95 . . .	2,494,496	95,542	1,330,727
1862-63 . . .	1,601,366		1,228,684	1895-96 . . .	3,030,546	60,680	1,792,429
1863-64 . . .	1,404,925		1,369,556	1896-97 . . .	2,287,752	88,650	1,494,789
1864-65 . . .	1,276,773		1,582,341	1897-98 . . .	2,049,608	66,654	1,662,030
1865-66 . . .	1,451,822		1,445,153	1898-99 . . .	2,250,866	72,832	1,564,151
1866-67 . . .	1,491,687		2,145,354	1899-1900 . . .	1,694,848	90,795	1,939,716
1867-68 . . .	1,627,996		2,226,201	1900-01 . . .	2,535,377	97,519	1,604,275
1868-69 . . .	1,959,951	58,932	2,405,005	1901-02 . . .	2,128,483	59,941	1,935,761
1869-70 . . .	2,019,974	226,249	2,368,452	1902-03 . . .	1,639,189	85,249	1,989,822
1870-71 . . .	2,328,854	148,760	2,131,399	1903-04 . . .	1,544,315	68,131	1,862,316
1871-72 . . .	1,799,591	94,545	1,893,322	1904-05 . . .	1,858,709	54,522	1,343,683
1872-73 . . .	1,930,910	142,361	2,231,578	1905-06 . . .	1,645,696	69,330	1,779,316
1873-74 . . .	2,282,758	168,313	2,223,917	1906-07 . . .	1,422,467	105,288	1,943,438
1874-75 . . .	2,469,255	74,754	1,656,015	1907-08 . . .	2,050,839	83,333	1,943,126
1875-76 . . .	2,457,244	106,744	1,310,569	1908-09 . . .	2,168,458	74,135	1,833,644
1876-77 . . .	1,461,069	150,597	1,417,893	1909-10 . . .	2,330,185	72,617	2,075,612
1877-78 . . .	2,102,930	145,186	1,512,819	1910-11 . . .	2,121,799	70,280	1,850,551
1878-79 . . .	1,813,993	205,116	1,329,599	1911-12 . . .	2,239,105	17,014	1,749,946
1879-80 . . .	2,005,020	271,698	1,401,506	1912-13 . . .	3,578,837 ⁽¹⁾	56,155	1,677,841
1880-81 . . .	2,511,802	207,030	1,302,576	1913-14 . . .	2,583,720 ⁽²⁾	21,371	1,203,098
1881-82 . . .	1,760,595	157,485	1,117,026	1914-15 . . .	2,303,331	14,305	516,282
1882-83 . . .	2,386,150	163,912	1,359,433				

(¹) + 104,875 lbs. waste.

(²) + 79,072 lbs. "

The supply available for European consumption during recent years was thus stated in bales of 100 lbs. by the *Moniteur des Soies* of Lyons, 25th July 1885 :—

	1854-55.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86. (estimates).	
	Bales.											Maximum.	Minimum.
Italy	92,400	57,100	25,000	40,500	52,500	32,000	68,500	70,000	52,000	73,000	65,000	45,000	40,000
France	44,000	16,000	2,000	19,000	13,500	8,500	9,500	9,500	17,500	14,500	10,000	10,000	8,000
Spain	3,300	2,500	1,500	750	1,100	800	1,500	1,500	2,300	1,750	1,600	500	500
Greece and Asia Minor	6,800	16,000	10,000	6,000	6,000	5,000	5,000	5,000	6,000	12,000	12,000	10,000	8,000
TOTAL BALES	146,300	91,600	38,500	66,250	83,100	46,300	84,500	86,000	77,800	101,250	88,600	65,500	56,500
China	55,000	63,000	65,000	46,000	53,000	55,000	67,000	44,000	47,000	50,000	50,000	45,000	42,000
Canton	19,800	14,000	10,000	12,500	9,000	12,500	5,000	14,500	11,500	16,000	7,000	12,000	12,000
Bengal	11,000	8,492	6,000	5,000	6,000	5,000	4,000	3,000	3,000	3,000	3,000	2,000	2,000
Japan . . . . .	..	14,000	13,000	22,000	22,000	14,000	15,000	15,500	25,000	25,000	20,000	15,000	12,000
TOTAL BALES	85,800	104,492	94,000	85,500	90,000	86,500	91,000	77,000	86,500	94,000	80,000	74,000	68,000
GRAND TOTAL OF BALES	232,100	196,092	132,500	151,750	173,100	132,800	175,500	163,000	164,300	195,250	168,600	139,500	124,500
Price of Twist No. 4	s. d. 15 0	s. d. 15 0	s. d. 28 0	s. d. 17 6	s. d. 15 0	s. d. 15 3	s. d. 13 9	s. d. 17 0	s. d. 14 6	s. d. 16 0	s. d. 13 0	s. d. 12 6	s. d. 12 6

(Encyclopedia Britannica, Vol. XXII, 9th edition.)

Raw Silk : Production

	Average for five years.			1891.	1892.	1893.	1894.	1895.	1896.	1897.
	1876 to 1880.	1881 to 1885.	1886 to 1890.							
France	11,220	13,882	15,224	12,452	14,080	18,744	19,712	17,100	17,248	13,040
Italy	41,800	60,720	72,842	70,620	65,230	87,648	75,878	66,904	67,826	64,152
Spain	1,430	1,892	1,584	1,980	1,584	1,694	1,980	2,200	2,244	1,606
Austria-Hungary ¹ . . . . .	..	3,366	5,830	6,182	4,840	5,346	5,852	6,050	6,468	5,082
Brutia	1,870	3,080	4,092	2,970	4,532	7,216	7,816	6,600	9,130	6,952
Syria and Cyprus	2,456	5,170	6,688	6,380	7,700	11,440	10,252	8,250	9,240	10,780
Salonica and Adrianople	1,782	2,222	2,948	4,180	4,840	5,500	4,070	3,410	3,740	2,530
Bulgaria ² , Servia and other provinces . . . . .	..	..	..	..	..	..	550	792	990	814
Greece and Crete	572	418	462	660	770	990	836	924	880	946
Caucasus				4,180	3,960	4,400	3,850	4,070	5,500	5,280
} Persia ³ and Turkey	6,380	4,510	2,046	..	..	..	..	660	1,056	2,310
} Shanghai ⁴	72,336	53,856	60,676	84,348	89,452	92,730	83,314	93,412	85,470	86,350
} Canton	10,514	19,668	28,096	28,422	32,472	28,292	29,788	34,100	37,202	40,920
} Japan	22,726	29,920	45,232	65,868	62,876	59,070	67,848	75,020	65,978	77,154
} Calcutta and Bombay ⁵	11,704	8,932	9,482	5,038	5,500	6,314	4,378	7,480	5,940	6,402
TOTAL IN BALES OF 100 lb.	194,790	207,636	255,202	291,280	297,836	329,384	316,124	329,032	318,912	324,918
Price per lb. of No. 4 Tsatlee	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
	28 0	17 9	15 0	14 0	13 3	14 9	11 3	10 9	10 9	10 6
Maximum and Minimum ⁶	15 0	13 9	11 6	11 9	12 0	11 3	9 6	9 6	10 3	9 6

¹ Austria-Hungary before 1881 was included with Italy.
² Before 1900 there is no account of silk from Bulgaria.
³ Before 1897 there is no account of exportation from Persia.

and Importation

1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
12,100	12,320	16,192	14,368	12,540	10,428	13,750	13,904	13,310	14,564	14,430
65,824	73,986	69,792	94,380	98,494	77,572	107,800	97,680	104,390	100,040	98,690
1,760	1,716	1,848	1,780	1,716	1,892	1,694	1,716	1,232	1,850	1,650
5,368	6,072	6,888	7,150	6,864	6,050	6,930	7,590	7,524	7,920	7,350
9,064	10,692	8,360	9,196	11,066	11,572	10,934	14,212	12,188	14,630	13,530
10,230	10,032	9,900	9,350	11,880	11,220	10,340	10,780	10,340	11,770	10,780
3,030	4,620	3,300	4,400	4,180	5,456	5,632	6,160	5,654	7,480	6,270
748	924	1,672	2,112	2,860	2,992	3,368	4,180	4,070	4,730	7,750
880	748	1,100	1,320	1,430	1,320	1,430	1,540	1,650	1,672	1,430
5,060	6,820	7,700	9,680	10,230	8,800	7,920	6,380	10,010	10,780	7,920
2,926	[5,412	6,820	5,610	12,100	14,300	9,372	10,120	13,816	13,420	11,570
102,300	120,010	101,772	111,408	79,200	93,368	92,730	88,220	93,764	96,360	124,040
50,490	49,500	44,132	47,124	48,818	47,234	46,948	44,000	43,164	49,500	52,320
68,684	77,924	90,750	99,000	104,940	101,376	128,194	101,618	131,825	139,700	166,540
6,050	7,700	6,160	6,160	6,490	5,390	3,960	6,160	7,150	7,480	5,500
345,114	388,476	406,384	423,058	412,808	398,970	451,000	414,260	460,087	487,696	529,770
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
11 0	14 3	14 3	11 6	10 9	14 0	13 0	13 3	16 0	17 0	11 6
10 0	11 0	11 3	9 6	9 6	12 6	11 6	12 9	13 0	14 0	9 6

* Before 1890 the exportation from Shanghai did not include Tussah.

* From 1905 the exports from India include Cashmere silks coming by Bombay.

* The prices are based upon the Blue Elephant Chop, although quality has deteriorated in the past few years.

THE WORLD'S PRODUCTION.

The following figures illustrate the trend of silk production during recent years: (*Bulletin des Soies et Soieries 1916*). Production of Raw Silk in 1,000's of kilos.

1,000 kilos = 27 maunds.

		1909.	1910.	1911.	1912.	1913.	1914.
I	France	674	318	402	505	350	405
	Italy	4,251	3,947	3,490	4,105	3,540	4,060
	Spain	82	83	88	78	82	73
	Austria Hungary	378	352	350	294	273	302
II	Turkey—Anatolia	665	480	585	383	465	348
	„ Syria and Cyprus	445	540	525	400	490	430
	„ Rest	125	130	160	115	135	110
	„ European *	390	360	375	260	85	60
	Balkans	223	175	170	145	135	175
	Greece and Crete *	60	57	62	50	185	140
	Caucasus	540	520	480	395	385	360
	Turkestan †	340	293	303	258	225	85
III	Persia †	260	245	300	227	210	80
	Shanghai †	5,185	5,193	5,940	6,440	5,765	4,135
	Canton †	2,295	2,637	1,730	2,260	2,750	1,920
	Japan †	8,372	8,935	9,370	10,867	12,120	9,490
	India †	235	230	224	168	113	34
	Indo-China † . . . . .	..	..	16	15	12	16
TOTALS .		24,510	24,495	24,570	26,965	27,320	22,220

* Salomeika transferred from Turkey to Greece in 1913.

† Export, not production.

India is placed as exporting from 1909—1911 an average of 230,000 kilos = 506,000 lbs. but India produced in those years probably about 1,300,000 lbs. of raw silk, of which some 800,000 lbs. was used internally.

(BULLETIN DES SOIES ET SOIERIES No. 2032.)

Silk in 1915.

Figures in 1,000's of kilos.

	Green Cocoons.		Raw Silk.	
	1914.	1915.	1914.	1915.
Western Europe—				
France	5,067	1,727	405	130
Italy	46,668	33,897	4,060	2,878
Spain	980	715	73	50
Austria—				
S. Tyrol	1,648	} 1,200	} 176	} 102
Goritz and Gradisca	380			
Istria	40			
Hungary—				
Hungary	1,390	} 775	} 126	} 65
Croatia and Slavonia	150			
TOTAL	56,321	38,314	4,840	3,225
<i>Levant and Central Asia.</i>				
Turkey in Asia—				
Anatolia	4,050	2,000	345	175
Syria and Cyprus	4,950	4,050	430	350
Other parts	1,300	780	110	65
Turkey in Europe—				
Adrianople	750	350	60	30
Balkans—				
Bulgaria, Serbia and Roumania	2,120	1,200	175	100
Greece, Salonika, Crete	1,690	1,000	140	80
Caucasus	5,240	1,830	360	125
Turkestan and Central Asia—Exports	..	..	85	50
Persia—Exports	..	..	80	40
TOTAL	..	..	1,785	1,015
Far East—				
* China—Shanghai Exports . . . . .	..	..	4,135	5,540
† Canton Exports . . . . .	..	..	1,920	1,960
Japan—Yokohama Exports . . . . .	..	..	9,490	11,250
India—Bengal and Kashmir Exports . . . . .	..	..	34	81
Indo-China Exports . . . . .	..	..	16	14
EAST TOTAL	..	..	15,595	18,845
GRAND TOTALS	..	..	22,220	23,085

* Includes Tussah, etc.

† Includes exports to India.

APPENDIX III.

The following is the letter from the Director of Agriculture, Bengal, proposing the new scheme of using selected rearers in place of completing the scheme for the issue of disease-free seed from nurseries :—

From J. R. Blackwood, Esq., LL.B., I.C.S., Director of Agriculture, Bengal.

Calcutta, the 7th January 1916.

I have the honour now to reply to Government letter No. 657-R. of the 13th May 1913, in which I was requested to work out a complete scheme for eliminating disease from the Bengal silk-worm. To accomplish this, it is proposed to rear all the seed necessary for the province under the supervision of Government officers. In other words, every moth will be subjected to microscopic examination before its eggs are used. With a view to this object, I pointed out that, in order to estimate the amount of seed necessary for the whole province, it was necessary to find out the area under mulberry in the Province. A census of mulberry lands has accordingly been taken of the four districts of Malda, Murshidabad, Rajshahi, and Birbhum and the area has been found to be 18,547 acres. In the rearing districts of Midnapur, Hooghly, Burdwan, Nadia and Bogra, the area is 650 acres. The total area for the province is therefore 19,197 acres. The amount of seed necessary for the province is obtained by the following calculation. From each acre of mulberry 360 kahans of cocoons can be reared. The total annual outturn of cocoons can therefore be put down at 6,910,920 kahans. The quantity of seed needed to supply this amount is one hundredth part of the total, or 69,110 kahans.

2. It is calculated that a central nursery will not be able to supply more than 3,000 kahans of seed cocoons per annum. Supposing it were decided therefore that the entire seed necessary for the whole province should be supplied by Government, 22 central nurseries would be required for the purpose. Since my letter of the 19th June 1912, I have discovered, however, that in France, Italy, Japan and China, Government in no case attempts to supply the entire seed required. The principal quantity is supplied through professional rearers working under Government supervision. Further, it is most important that the existing professional silk-worm rearers should not be ruined by the action of Government. This would be what would happen, if the scheme as originally conceived were carried into effect. I therefore do not propose to open any new nurseries. The new nurseries in Bogra and Malda which we have recently opened were absolutely necessary for reasons other than the mere supply of seed. The Bogra nursery is absolutely necessary for supplying chotapolu seed to the other nurseries, and the Malda nurseries are necessary for the exchange of nistari seed. I have already reported that the system which was in vogue previous to the opening of these nurseries of depending for seed supply on village seed was most unsatisfactory and a very great improvement has been effected by the introduction of the system of interchange of seed between nurseries.

3. We have at present 7 nurseries (excluding Bogra) and I propose to rear about 10,000 kahans of seed cocoons from each nursery with the aid of professional rearers under Government supervision. This means that the Superintendent of each nursery will have to see that about 75 kahans of seed cocoons are given to selected professional rearers for the purpose of selling the next generation for seed only and not for filatures. Each nursery therefore through professional rearers will thus produce about 7,500 kahans annually.

4. It is proposed that the seed reared in the houses of professional rearers should be subjected to the same supervision as that reared in the nurseries. In other words each moth will be examined by the Pasteur system. It is calculated that a selected rearer will be able on the average to rear seed cocoons from 3 kahans of nursery seed and a supervisor will be able to control from

3 to 4 rearers. Twenty-five rearers are therefore needed for each nursery and seven supervisors have to be appointed. An initial expenditure of Rs. 500 will have to be incurred at each nursery for thread nets and about the same amount of recurring expenditure for copper sulphate, sulphur and wire nets.

5. It will be observed that this idea alters fundamentally the basis of the whole scheme. I had doubts from the very beginning of the advisability of Government incurring such an enormous expenditure as is involved in the setting up of 19 (or as it now turns out 22) nurseries. Apart from that altogether, it would be a fatal policy to crush out the professional rearers of seed cocoons. We must rather guide them and prevent them from rearing diseased worms. Another point about the present scheme is that our scheme is already complete as it stands and we don't need to wait for more nurseries.

6. I submit a statement of the capital expenditure already incurred and to be incurred (Statement I) on the existing nurseries. Statement II gives the cost of free quarters required for the sericultural staff. As regards recurring expenditure, Statement III compares the present scale with the scale proposed when the scheme is in final working order. It will be observed that the original estimate has in every case been exceeded. It will be necessary, however, to allow the higher rates of pay, as it will not be possible to obtain satisfactory men otherwise. One factor, however, which has increased the cost is the provision for supervising the work of rearing in the villages. Statement IV shows the cost of disinfecting the houses of professional rearers, supplying them with wire-netting, and supervising the rearing of seed, so as to ensure that it is free from disease. Statement V gives the revenue expected from the scheme when it is in full working order. It will be observed that, as each nursery will not probably produce more than 3,000 kahans of seed per annum, the average revenue to be expected is not likely to be more than Rs. 4,000. The total revenue from this Department will therefore be under Rs. 30,000 per annum, whereas the recurring expenditure will be Rs. 87,918 and the capital cost will be Rs. 2,98,900. If we take 5 per cent. on the capital cost, the total annual loss to Government on the scheme as it now stands will be Rs. 72,863 per annum.

7. I throw out for future consideration the proposal that dairies should be started in conjunction with the Berhampur, Amriti and Bogra nurseries. Apart from the fact that the demand for milk is keen at each of these places and there is a sufficient market near the nursery, a sufficient supply of cow-dung will be of enormous advantage to the mulberry and the agricultural work of the nursery could be managed by the farm staff.

The Director estimates each selected rearer to get 100 kahans per kahan of seed, and to get 100 kahans per ghora. We assume 110 kahans per ghora in 4 bunds and the nurseries would then do each 6,000 kahans; if the rearer can get 100 per ghora, and can do 4 bunds, then the nursery can do the same and we can allow 5,000 kahans as the nursery outturn. In that case the kahan output would be 35,000 kahans.—H. M. L.

I.—Statement of Capital Expenditure.

Name of Nursery.	Number of existing houses.	Cost already incurred.	Proposed number of houses to be constructed.	Cost to be incurred.	Existing quantity of mulberry lands.	Cost already incurred.	Proposed area of new mulberry to be extended.	Cost to be incurred for the proposed extension of new mulberry lands.	Value of Khush-mahal land transferred to this department.	Capital cost.	REMARKS.
1	2	3	4	5	6	7	8	9	10	11	12
		Rs.		[Rs.	Bighas.	Rs.	Bighas.	Rs.	Rs.	Rs.	
Berhampur Central Nursery in the Murshidabad District.	Rearing-houses, 7	14,000	Superintendent. Mr. F. C. Choudhary's quarters, 1.	6,680	66	4,620	4	280	8,520		Bought from the Eastern Bengal State Railways during 1909-10.
	Seed-cutting house, 1	1,000									
	Store-house, 1	1,500									
	Dalla chandrakee sheds, 7	1,000									
	Overseers' quarters, 2	500									
	Menials quarters, 4	400									
	Pucca cook-sheds, 2	1,500									
	Pucca Assistant Superintendent's quarters, 1.										
Pucca Overseer's quarters, 1											
TOTAL	19,000	....	6,680	..	4,620	..	280	8,520	40,000		
Kumarpur Central Nursery.	Rearing-houses, 3	8,140	Assistant Superintendent's quarters, 1.	1,900	35	2,450	35	2,450	Rented		
	Seed-cutting houses, 2	3,000	Rearing-houses, 4	8,900							
	Store-houses, 2	3,000									
	Farm Superintendent's quarters, 1	1,600									
	Farm Superintendent's cook-shed, 1	60									
	Overseer's quarters, 1	200									
	Overseer's cook-shed, 1	50									
	TOTAL	16,060	....	10,700	..	2,450	..	2,450	..	31,650	
Chandanpur Central Nursery.	Rearing-houses, 3*	6,200	Rearing-houses, 4	10,080	30	2,100	40	2,800	Rented		* 3 new and 2 old built for hot weather and rainy season hired from Messrs Anderson, Wright & Co.
	Dalla chandrakee sheds, 3	450	Assistant Superintendent's quarters, 1	1,900							
	Farm Superintendent's quarters, 1.	1,800									
	Overseers' quarters, 2	500									
	Menials' quarters, 2	200									
	TOTAL	9,150	11,980	..	2,100	..	2,800	..	26,030	
Piasbari Central Nursery in Malda District.	Rearing-houses 5	12,400	Overseers' quarters, 2	600	57	3,900	13	910	9,000		
	Seed-cutting house, 1	1,300	Rearing-houses, 2	5,600							
	Store-house, 1	1,500									
	Dalla chandrakee shed, 3	450									
	Farm Superintendent's quarters, 1	1,700									
	Overseers' quarters, 3	750									
	Menials' quarters, 3	900									
	Cook-sheds, 3	200									
	Assistant Superintendent's quarters, 1.	1,700									
TOTAL	20,900	....	6,200	..	3,900	..	910	9,000	40,000		

I.—Statement of Capital Expenditure—continued.

Name of Nursery.	Number of existing houses.	Cost already incurred.	Proposed number of houses to be constructed.	Cost to be incurred.	Existing quantity of mulberry lands.	Cost already incurred.	Proposed area of new mulberry to be extended.	Cost to be incurred for the proposed extension of new mulberry lands.	Value of Khasmahal land transferred to this department.	Capital cost.	REMARKS.
1	2	3	4	5	6	7	8	9	10	11	12
		Rs.		Rs.	Bighas.	Rs.	Bighas.	Rs.	Rs.	Rs.	
Ward Central Nursery	Rearing-houses, 4 . . .	11,400	Rearing-houses, 3 . .	7,600	80	4,100	..	..	8,000		
	Seed-cutting house, 1 . .	1,700	Assistant Superintendent's quarters, 1	2,000							
	Store-house, 1	1,800	Overseers' quarters, 2	500							
	Nursery Superintendent's quarters, 1	2,000									
	Overseers' quarters, 2	500									
	Dalla chandrakoo sheds, 2	300									
	Menials' quarters, 1	100									
	TOTAL	17,800	....	10,100	..	4,100	..	..	8,000	40,000	
Ward Central Nursery, Rajshahi District.	Rearing-houses, 6	18,300	Rearing-house, 1	2,700	60	4,200	10	700	Rented		
	Seed-cutting house, 1	1,500	Assistant Superintendent's quarters, 1	2,000							
	Store-house, 1	1,600									
		TOTAL	18,400	4,700	..	4,200	..	700	..	28,000
Ward Nursery	Rearing-houses, 5	8,000	Rearing-houses, 5	9,000	51	3,570	..	..	Rented		
	Overseer's quarters, 1	300	Nursery Superintendent's quarters, 1	2,500							
	Overseer's cook-shed, 1	200	Overseer's quarters, 1	300							
	Dalla chandrakoo shed, 1	160									
	Menials' quarters, 1	150									
		TOTAL	8,800	11,800	..	3,570	24,170
Ward Central Nursery in Birbhum District.	Rearing-houses, 3	5,600	Rearing-houses, 4	10,400	50*	3,570	40	2,800	Rented		* Out of which 20 bighas to be given up being old mulberry land.
	Seed-cutting house, 1	1,000	Assistant Superintendent's quarters, 1	1,800							
	Dalla chandrakoo shed, 1	150									
	Overseers' quarters, 3	780									
	Menials' quarters, 1	100									
		TOTAL	8,230	12,200	..	3,570	..	2,800	..		20,800
	GRAND TOTAL .	1,19,230	....	74,300	..	28,600	..	9,940	25,520	2,56,650	

Statement of capital cost for mulberry plantation incurred and to be incurred.

Name of district.	Name of Nursery.	Cost already incurred.	Cost to be incurred.
		Ra.	Ra.
Murshidabad	Berhampur	4,200	1,050
	Kumarpur	3,000	2,000
	Chandanpur	3,000	2,000
Malda	Piasbari	4,000	4,000
	Amriti	4,000	Nil
Rajshahi	Mirganj	4,000	2,000
Bogra	Bogra	3,000	Nil
Birbhum	Kalitha	3,000	3,000
	TOTAL	28,200 +	14,050
	Add cost of Statement No. I . . . . .	.... -	42,250
	GRAND TOTAL . . . . .	....	2,50,650
			2,98,900

II.—Statement showing the number of quarters to be provided for the whole sericultural staff of Bengal.

Name of Nursery.	Name of Officer.	Pay.	Admissible outlay on quarters.	Number of quarters.	Cost of building allowed by pay of staff.	Approximate estimated amount required.	Annual rent chargeable.
		Ra.	Ra. .		Ra.	Ra.	Ra. A. P
Berhampur	Superintendent Sericulture, Berhampur Central Nursery.	200 to 400	6,680	one	6,680	6,680	400 13 2
Kumarpur	Assistant Farm Superintendent.	50	1,000	one	1,180	1,900	60 0 0
Chandanpur	Assistant Farm Superintendent.	50	1,000	one	1,180	1,900	60 0 0
Kalitha	Assistant Farm Superintendent.	50	1,000	one	1,180	1,800	60 0 0
Amriti	Assistant Farm Superintendent.	50	1,000	one	1,180	2,000	60 0 0
	Overseer	15	300	two	250	500	18 0 0 each.
Piasbari	Do.	15	300	two	300	600	18 0 0 each.
Mirganj	Assistant Farm Superintendent.	50	1,000	one	750	2,000	60 0 0
Bogra	Nursery Superintendent.	75 to 100	1,875	one	1,500	2,500	112 8 0
	Overseer	15	300	one	250	350	18 0 0
	TOTAL				14,450	20,230	

(Included in Statement I showing capital expenditure.)

III.—Statement comparing the present scale and the scale proposed when the scheme is in final working order.

Present scale.	Pay.	Cost.	Proposed scale.	Pay.	Cost per month.	Increase per month.	Decrease per month.
I.—OFFICE OF SUPERINTENDENT OF SERICULTURE.							
	Rs.	Rs. A. P.		Rs.	Rs. A. P.	Rs. A. P.	
1 Head Clerk	50	50 0 0	1 Head Clerk	75	75 0 0	..	..
1 2nd Clerk	30—50	46 5 4	1 2nd clerk	50	50 0 0	..	..
1 clerk	20	20 0 0	1 Typist	30	30 0 0	..	..
1 Duftry	8	8 0 0	1 Duftry	8	8 0 0	..	..
1 Peon	6	6 0 0	2 Peons	9 each	18 0 0	..	..
			1 Watchman	8	8 0 0	..	..
			2 Probationers under training for Assistant Superintendent.	50 each	100 0 0	..	..
TOTAL . . . . .	..	190 5 4	TOTAL . . . . .	..	289 0 0	168 10 8	..
II.—BERHAMPUR CENTRAL NURSERY.							
1 Superintendent	200—10—400	330 0 0	1 Superintendent	200—10—400	330 0 0	..	..
1 Assistant	50	50 0 0	1 Assistant	50	50 0 0	..	..
1 Inspector	30	30 0 0	6 Overseers	15 each	90 0 0	..	..
9 Nursery-men	15 each	135 0 0	7 Supervisors	25—1—40 each	233 0 0	..	..
1 Sericultural teacher	25	25 0 0	1 Sericultural teacher	25	25 0 0	..	..
2 Watchmen	7 each	14 0 0	1 Watchman	8	8 0 0	..	..
			1 Peon	8	8 0 0	..	..
TOTAL . . . . .	..	584 0 0	TOTAL . . . . .	..	744 0 0	160 0 0	..
III.—KUMARPUR CENTRAL NURSERY.							
1 Inspector	30	30 0 0	1 Superintendent	75—5—100	93 12 0	..	..
			1 Assistant Superintendent	50	50 0 0	..	..
			7 Supervisors	25—1—40 each.	233 0 0	..	..
			6 Overseers	15 each	90 0 0	..	..
TOTAL . . . . .	..	30 0 0	TOTAL . . . . .	..	466 12 0	436 12 0	..
IV.—CHANDANPUR CENTRAL NURSERY.							
1 Overseer	50	50 0 0	1 Superintendent	75—5—100	93 12 0	..	..
2 Nursery-men	15 each	30 0 0	1 Assistant Superintendent	50	50 0 0	..	..
			7 Supervisors	25—1—40 each.	233 0 0	..	..
			6 Overseers	15 each	90 0 0	..	..
			1 Watchman	8	8 0 0	..	..
TOTAL . . . . .	..	80 0 0	TOTAL . . . . .	..	474 12 0	394 12 0	..

III.—Statement comparing the present scale and the scale proposed when the scheme is in final working order—contd.

Present scale.	Pay.	Cost.	Proposed scale.	Pay.	Cost per month.	Increase per month.	Decrease per month.
V.—KALITHA CENTRAL NURSERY.							
	Rs.	Rs. A. P.		Rs.	Rs. A. P.	Rs. A. P.	Rs.
1 Assistant Superintendent.	30	30 0 0	1 Superintendent	75—5—100	93 12 0	..	..
1 Overseer	15	15 0 0	1 Assistant Superintendent.	50	50 0 0	..	..
2 Nursery-men . . .	15	15 0 0	7 Supervisors . . .	25—1—40 each	233 0 0	..	..
			6 Overseers	15 each	90 0 0	..	..
TOTAL . . . . .	..	60 0 0	TOTAL . . . . .	..	486 12 0	406 12 0	..
VI.—PIASBARI CENTRAL NURSERY.							
2 Nursery-men . . .	15 each	30 0 0	1 Superintendent	75—5—100	93 12 0	..	..
6 Overseers.	15 each	75 0 0	1 Assistant Superintendent.	50	50 0 0	..	..
			7 Supervisors . . .	25—1—40 each	233 0 0	..	..
			6 Overseers	15 each	90 0 0	..	..
			1 Peon	8	8 0 0	..	..
			1 Watchman	8	8 0 0	..	..
TOTAL . . . . .	..	105 0 0	TOTAL . . . . .	..	482 12 0	377 12 0	..
VII.—AMRITI CENTRAL NURSERY.							
5 Overseers	15 each	75 0 0	1 Superintendent	75—5—100	93 12 0	..	..
			1 Assistant Superintendent.	50	50 0 0	..	..
			7 Supervisors . . .	25—1—40 each	233 0 0	..	..
			6 Overseers	15 each	90 0 0	..	..
			1 Peon	8	8 0 0	..	..
			1 Watchman	8	8 0 0	..	..
TOTAL . . . . .	..	75 0 0	TOTAL . . . . .	..	482 12 0	407 12 0	..
VIII.—MIRGANJ CENTRAL NURSERY.							
1 Superintendent.	110—245	222 8 0	1 Superintendent	110—15—245	222 8 0	..	..
2 Travelling Overseers	25 each	50 0 0	1 Assistant Superintendent.	50	50 0 0	..	..
3 Nursery-men . . .	15 each	45 0 0	7 Supervisors . . .	25—1—40 each	233 0 0	..	..
8 Head rearers . . .	10 each	80 0 0	6 Overseers	15 each	90 0 0	..	..
8 Under-rearers . . .	8 each	64 0 0	1 Peon	8	8 0 0	..	..
1 Peon	8	8 0 0	1 Watchman	8	8 0 0	..	..
TOTAL . . . . .	..	470 8 0	TOTAL . . . . .	..	611 8 0	141 0 0	..

III.—Statement comparing the present scale and the scale proposed when scheme is in final working order—concl'd.

Present scale.	Pay.	Cost.	Proposed scale.	Pay.	Cost per month.	Increase per month.	Decrease per month.
IX.—BOGRA CENTRAL NURSERY.							
	Rs.	Rs. A. P.		Rs.	Rs. A. P.	Rs. A. P.	Rs.
1 Assistant Superintendent.	75	75 0 0	1 Superintendent	75—5—100	93 12 0	..	..
3 Nursery-men	15 each	45 0 0	1 Assistant Superintendent.	50	50 0 0	..	..
			1 Supervisor	25—1—40	25 0 0	..	..
			4 Overseers	15 each.	60 0 0	..	..
			1 Peon	8	8 0 0	..	..
			1 Watchman	8	8 0 0	..	..
TOTAL	..	120 0 0	TOTAL	..	244 12 0	124 12 0	..

Statement of annual average recurring cost of nurseries.

Name of Nursery.	Establishment.	Travelling allowance.	Cultivation.	Repairs.	Disinfection.	Contingent, postage stamps, punkha-puller, cooly hire, etc.	TOTAL.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Berhampur	8,928	500	1,800	400	1,000	500	12,928
Piasbari	5,796	500	1,800	400	1,000	500	9,796
Chandanpur	5,700	200	1,200	400	1,000	500	9,000
Kumarpur	5,604	200	1,200	400	1,000	500	8,904
Bogra	2,940	200	700	400	180	250	4,670
Mirganj	7,332	400	1,600	400	1,000	500	11,232
Kalitha	5,604	200	1,200	400	1,000	500	8,904
Amriti	5,796	400	1,600	400	1,000	500	9,696
Office of Superintendent of Sericulture, Bengal.	3,468	300	..	..	..	1,000	4,768
Superintendent of Sericulture, Bengal's salary.	5,520	2,500	..	..	..	..	8,020
TOTAL	56,688	5,400	10,700	3,200	7,180	4,750	87,918

IV.—Cost for each Central Nursery to disinfect the houses of professional rearers and supervise the rearing of 7,500 kahans of seed.

Name of district.	Name of Nursery.	Cost.	REMARKS.
		Rs.	
Murshidabad	Berhampur	1,000*	To rear 7,500 kahans of seed cocoons by selected professional rearers under the continual supervision of an Assistant Farm Superintendent and seven Supervisors and under the occasional supervision of the Farm Superintendent, 25 rearers may be selected to rear seed for each nursery, of which granting even although 5 men fail to rear seed for such reasons as accidental fire, storm, from want of mulberry or flood, etc., as usual, 20 rearers will be able to raise the 7,500 kahans. The cost for disinfecting 25 rearing-houses during four crops in a year and supplying wire netting and thread nets would be at least per year Rs. 1,000.
	Kumarpur	1,000	
	Chandanpur	1,000	
Malda	Piasbari	1,000	
	Amriti	1,000	
Rajshahi	Mirganj	1,000	
Birbhum	Kalitha	1,000	
Bogra	Bogra	180	The expenditure on Bogra will be incurred for 40 rearers annually for each village rearing-house at Rs. 4-8-0 each. The other nurseries will be supplied with chotapulu seed by the Bogra nursery. The remainder required by the public will be supplied by professional rearers.
	TOTAL	7,180	

* Composed as follows:—

(1) Thread nets Rs. 500.

(2) Copper sulphate and sulphur and wire nets Rs. 500.

V.—Statement of Revenue.

Name of district.	Name of Nursery.	Probable Revenue in 1914-15.	Estimated Revenue when the nurseries are completed.	REMARKS.
Murshidsbad	Berhampur	Ra. 4,000	Ra. 4,000	
	Kumarpur	2,000	4,000	
	Chandanpur	2,000	4,000	
Birbhum	Kalitha	2,000	4,000	
Rajshahi	Mirganj	3,000	4,000	
Maida	Amriti	2,000	4,500	
	Piasbari	3,000	4,500	
	TOTAL .	18,000	29,000	

PROVISIONAL STATEMENT BY MR. MAXWELL-LEFROY FOR THE BENGAL SILK
COMMITTEE MEETING, JANUARY 10TH, 1916.

1. The position at the end of 1915 is as follows :—

(1) Nurseries exist at 7 localities, having a total of 32 rearing houses, and 356 bighas of cultivated mulberry; in 1914-15, these issued 8,142 (produced 10,500) kahans of cocoons, capable of producing 16,000 maunds of green cocoons; there are 19,147 acres of land under mulberry cultivation, giving about 100,000 maunds of green cocoons; therefore the present nurseries now supply some 16 per cent. of the seed required. The nurseries are now short by 17 of their full number of houses; with 49 houses, it is estimated by the Silk Superintendent that 24,000 kahans should be produced, *i.e.*, there should now be 15,700 kahans produced, on the existing houses; on the existing acreage, 356 bighas should give a big bund of 5,696 maunds of leaf, or 19,936 maunds in all in the year: these should yield 11,392 kahans in one bund or 39,872 in all. But 32 rearing houses each with 8 ghoras of worms will not produce one bund of more than 7,680 kahans or 28,160 in all in the year. It appears as if there is a great difference between the actual output and that theoretically possible on the basis of mulberry available or rearing houses available.

At the same time, supposing the houses were fully occupied and the full yield obtained, the possible output from the area of land is as much as would be absorbed now and about half that required for the whole area: Ghose estimates that 69,000 kahans are required for all Bengal: Lafont estimated that a big bund supply of 30,000 kahans and a total of 100,000 for the whole year would be needed: it looks as if better production on the existing nurseries would do a large part of this. The provision of 17 more rearing houses would produce another 4,080 kahans in the big bund or 14,960 more in all in the year: which would be 11,760 in one bund, or 43,120 in all; allowing 20 per cent. for accidents, rejections, etc., deduct 8,600 kahans, giving 34,500 kahans, which is just 50 per cent. of the required total.

The cost of 17 more houses would be over Rs. 42,000 at Rs. 2,500 each (Blackwood's Estimate is Buildings 74,360, Land 9,940 and Cultivation 14,050. Total 98,350; this includes overseers' quarters) and there would be the extra labour, mostly of the cheaper kind.

(2) *Selected rearers.*—The number varies, but it is now 29 and would be in all about 35 to 40, assuming each supervisor (10) to look after 4 selected rearers. Each can turn out 120 kahans seed at a bund, say 360 kahans in all, a total of 10,440 now or 14,400 eventually. The cost of the supervision in all is Rs. 250 per month, or Rs. 3,000 a year, and there is the cost of the wire gauze, disinfecting, etc. At the present time the selected rearers could not produce more than 16 per cent. of the required amount.

(3) The nurseries now produce 10,500 and issue 8,000 kahans, and when fully worked according to the Silk Superintendent should turn out 24,000: there remains 45,000 kahans to be got if the nurseries are completed and work at the Superintendent's estimate or 54,000 if they are not.

It will require then another 83 selected rearers if the nurseries are completed or 111 if they are not, entailing a further 21 or 28 overseers accordingly.

(4) The estimates of the total cost of the nurseries, required to produce 69,000 kahans of seed cocoons, or of nurseries *plus* selected rearers are apparently difficult to prepare; the estimates of the original nurseries, the revised estimate of the Director of Agriculture in 1915, the amended estimate of 1915 vary very much: the original in 1912 was a capital cost of 3,48,000; the revised in 1915, a capital cost of 8,21,964: the amended of 1915, a capital cost of Rs. 3,03,000, allowing for what has been done between 1914 and 1915. I assume the enormous total of 1915 to be based on the present outturn of the nurseries and I consider the present outturn to be very small indeed whereas previous estimates were based on possible outturn.

If the fine cultivation, the pure seed, the good rearing of the nurseries can only produce 8,142 kahans of seed cocoons from 32 houses with 356 bighas of land, then it does not seem likely that any scheme of nurseries will do

much. But I am very strongly of opinion that the nurseries are not being worked to anything like their capacity.

(5) The comparative value of the nursery system and the selected rearer system cannot as yet be estimated, but it is clear that there is an enormous element of risk in the latter system which is absent in the first. The temptation to a selected rearer, able to sell his seed cocoons sometimes at Rs. 1/12, Rs. 2 a kahan, to make 1 maund into 1½ maunds by adding ripe worms ready to spin from a brother's house, is enormous, and to prevent it a supervisor is employed; such a system is doomed to failure unless the supervision is very close and continuous, and the difficulties of ensuring its effectiveness once it becomes a matter of routine will be enormous.

The control over the seed from the nurseries is much greater, the staff are paid salaries and not by results, they have no inducement to bring in and mix inferior stock even if they can do so and the chances of infection occurring in the stock are very much smaller. The rearers stock, however good to start with, has a long period in which to get infected and the risks are considerable, yet that stock goes out as Government seed. The best policy under present circumstances would seem to be—

- (1) Increase the output from the nurseries very much. They should work at the maximum of output. I have the impression that they do a little very well, but they could do much more. There is a great waste of accommodation in the houses in the fly-rooms which might well be rearing rooms with verandah fly rooms, the available leaf is not fully used, the ghoras are not fully used and I would ask if greater output could not be secured.
- (2) Use the available selected rearers, supervising them as closely as possible and estimate from this experience the value of the scheme. Every supervisor should have the full number to look after.
- (3) Appoint no more supervisors but expand, if that is possible, on the nursery staff and increased nursery seed.
- (4) As soon as possible, extend the nurseries by erecting the remaining rearing houses and bringing into cultivation all the possible land.

Staff.—The Committee that met in 1908, recommended a Superintendent of European birth, with A. C. Ghose as Deputy Superintendent. This has never been carried out, and to this must be attributed the present position.

A. C. Ghosh is an energetic man, devoted to the issue of disease-free seed; he does this extremely well and the success of this is due to his energy and carefulness. But he is not able to do more, his view is limited to that one point and to securing that; he is unable to work well with others of equal or greater ability; he has fixed ideas on the question of hybrids, etc., and he is not able to energetically pursue a wide policy.

In this I see the key to the whole position and seeing that the Committee are retaining Grangeon on half pay, his appointment as Deputy Director is indicated; whether he can be got back from France during the war is doubtful, but his return can be prepared for by pressing the policy with regard to hybrids that has been indicated above. The first and most vital thing is to pursue a more active policy, not necessarily spending large sums of money but tackling the whole problem on wider lines and more energetically. Whether this will be done by a European or an Indian is immaterial, but success depends upon it. At the present rate of progress the industry will not recover. The Silk Committee have only a limited power, they advise mainly; the Director cannot devote more time to the question and it turns entirely on the permanent head of the sericultural staff.

2. HYBRIDS AND UNIVOLTINE RACES.

There are available the following races :—

Italian or French, univoltine.

Italian-Japanese, univoltine. •

Borô-polo, univoltine.
 Chota-polo, Multivoltine.
 Nistari, Multivoltine.
 Mysore, Multivoltine.
 Madagascar, Multivoltine from univoltine stock.
 Cleghorn's, Multivoltine from univoltine stock.
 Madagascar by Multivoltiné hybrids.
 Nistari-Univoltine hybrids.
 Mysore-Univoltine hybrids.
 Univoltine-Multivoltine Mongrels.

These are being investigated for—

- (1) Voltine character.
- (2) Colour.
- (3) Cocoon weight.
- (4) Character of silk.

The investigations come mainly under four centres.

Miss Cleghorn.
 Berhampur, Choudhery.
 Berhampur, A. C. Ghose.
 Pusa, M. N. De.

(This is dealt with fully under Hybridisation in Chapter X of Volume I.)

It is necessary at the outset to distinguish two very distinct problems, one the improvement of the existing nistari and chota-polo, the other the substitution of a better yielding race, producing a different quality of cocoon.

For the first there are three distinct problems :—

- (1) The production of a multivoltine hybrid, so like nistari or chota-polo that rearers will take it and get better yields. This must be multivoltine to the extent of at least 80 per cent., the worms must not be zebras or banded, they must not be too large, they must feed on bush mulberry.

By far the most hopeful at present is Miss Cleghorn's race, but all the experiments made so far, by all workers, have been on so small a scale that no information is available as to "outturn." You may get individual cocoons of greater silk content, but till these have been produced on an industrial scale, from at least a few kahans of seed, we cannot really form any opinion as to their merits.

It is extremely important that this should be done soon, and if it could be done this year before October, the results would be available for recommendations to be made.

I am averse to removing any race from the control of its producer till it is tested on a larger scale, and I do not advise taking Miss Cleghorn's away from her control, but she should have the necessary facilities for extending her cultivation and rearing proper broods.

At Berhampur, the best race can be easily grown on a larger scale, and I have suggested this for the Pusa race.

- (2) Selection from pure strains of nistari and chota-polo.

This can be done and is being done constantly and unless selection is going to be done on some new character, *e.g.*, a round-ended cocoon, I see little hope in it. But it could be done without much difficulty.

- (3) Improvement by hill cultivation. Seeing that the biggest *bund* is the November one, it seems likely that seed from worms grown in the hills during the rains will give better cocoons; whether this can be done at Kurseong at all, or whether some other

station would not do better, is doubtful; it is at all events not feasible immediately, but I attach great weight to the formation of a proper hill nursery at a low elevation in a place where the rainfall is not too excessive.

The substitution of a better race of worms altogether is a problem which presents distinct difficulties.

The raw silk produced will be different, will find a separate demand, will be used for distinct purposes. It would be possible now to issue Mysore seed, or univoitine seed, and to get cocoons produced, but if that was done through the existing organisation, it might seriously prejudice the efforts to produce pure seed of existing kinds. It is of no advantage to one rearer to get a crop of nice univoitine cocoons yielding white silk, and requiring only 9 kahans to the seer. There is no market for small lots, the market for large lots has to be found and the silk would be an inferior quality, competing with better qualities of the same kinds. If by any race, it were possible to produce exactly the quality of silk that is used in India as China silk and if this were produced and sold in Indian centres, then a profitable extra brood would be added, but to introduce this will require tact, care and organisation. Were there a European officer in charge, who could leave to the Deputy Superintendent the seed-issue and who could energetically pursue a wider policy, I believe he would be successful in this particular policy.

At the present time it is impossible, the officer is not available and the present seed-issue would be prejudiced if the staff had this to do as well.

3. DISEASE.

Pebrine, grasserie, flacherie, muscardine still exist and are factors in the situation. The first, in spite of nurseries and examination of moths, persists in the nurseries and about 5 per cent. of the moths still have it. There can be no doubt that a careful investigation of pebrine and other diseases would pay, if it were done by a first-rate man. There is no definite information for India as to the length of time the organism remains alive, the best process of disinfection, the treatment of earth floors or thatch roofs; European practice is followed, and this does not necessarily apply to Bengal conditions.

4. THE PLANT.

In the nurseries, bush mulberry is grown, of two kinds, the *deshi* and the "Bombay." I am informed that the latter is an European variety grown as a bush, that it is better than *deshi*, and that it is being planted in the nurseries.

Miss Cleghorn has a mulberry which produces no fruit, only male flowers, of which the leaf is said to last longer and suit the hybrids better. At Ramnugger, the "Bombay" plant is grown as a dwarf standard, from a single stem; at Pusa the *deshi* as a 4-foot standard on a single stem from the bush; the bush yields most per acre say 300 maunds, the standards yield less, say 240 maunds, but of better quality.

These points should be settled definitely and the question of the plant taken into account. If the best plant is a "Bombay" plant grown as a standard, then efforts might be made to get this more generally adopted.

5. THE FUTURE.

If there were a competent Superintendent, completed nurseries, bigger output, a hill nursery, industrial hybrids or ameliorated races, would the industry revive? there are three points in this—

- (1) To some extent the failure is due to the increasing cultivation of other equally profitable crops: where that is the case, there is no reason to interfere.
- (2) Where the industry is still going on and where no substitute exists, there are many who would benefit by pure seed, by full crops, by better crops: those who rear little would rear more: many who

have given it up would return and prosperity would replace depression. Nothing is more astonishing than the enormously increased output of Bengal silk when the East Indian Company improved the reeling, when the East Indian Company benefitted by a tariff at home and the cutting off of European silk, and when in the sixties pebrine enormously reduced the European output; from these I argue that a very much larger output is possible, will come about and will greatly benefit the rearers.

(3) If this occurs, will the output be absorbed?

There are two factors here, the export from India, and the consumption in India.

For the first, increased output means increased use; a limitation in supply means that manufacturers accustomed to Bengal silks go to other qualities, because it is essential that they must get a steady supply; were the supply to multiply ten-fold, the silk would be used on a larger scale, the manufacturer being sure of his supply; where the limit of absorption would be, cannot be decided, but there is ample room for expansion. For internal use, there is a limit under present conditions to the use of the poorer qualities, at present the coarser silks are absorbed, and there is no impetus to reel better, but if the whole demand for coarse silks were satisfied, the reelers would readily produce the qualities for export or that the mills would absorb if they could get a large and steady supply. I have ascertained this from direct enquiry in the weaving mills, and I believe that in this also, increased output means increased demand *at the same price*. It is unlikely that the relative price of Bengals and Italians will alter, but the more Bengals produced the more will be absorbed at the same relative price up to a certain point.

The factor of fixity of price must be realised clearly and there is a perfectly definite ratio between the value of Bengal silk as compared with others, whatever the supply. If absence of disease, better mulberry, better yields will increase the outturn of raw silk, then this will be absorbed at the same relative price and the maximum possible outturn of the areas in which it pays to produce silk, for that price, will probably not be near the amount that will be absorbed.

If better qualities are produced, then every pound produced in Bengal would probably be absorbed at a price much higher than that of the present quality.

There is at present every reason to believe that we are justified in doing all that is possible to revive the industry in districts where no more profitable one has replaced it, and it is probable that a good deal can be done successfully to increase the outturn and the value.

APPENDIX TO NOTE.

The following is the expenditure incurred on the nurseries and the amount realised by the sale of cocoons.

	Recurring.			Non-recurring.			Cocoons sold.			Cocoons' bought.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
1910-11 . . .	14,527	14	4	7,114	7	0	6,649	10	6	51	0	0
1911-12 . . .	21,306	0	3	5,912	15	9	6,831	12	6	97	15	3
1912-13 . . .	30,960	9	5	8,621	0	0	6,025	10	3	21	8	0
1913-14 . . .	51,585	14	4	46,004	5	7	4,982	8	9	183	0	0
1914-15 . . .	65,713	1	9	49,535	4	6	10,889	4	0	14	0	0

In 1914-15, there were produced 10,500 kahans of seed cocoons of which 8,142 were sold, capable of producing some 16 per cent. of the requirements of the area of mulberry. The capital and recurring expenditure needed to secure this is high and the return from an expenditure in 1914-15 of over one lakh of rupees is distinctly small.

APPENDIX IV.

The reports reproduced deal with the question of the economic condition of the rearers affected by the decline of the industry. The first is a letter from the Collector of Murshidabad written in 1912.

From R. C. Hamilton, Esq., I.C.S., Collector of Murshidabad.

Berhampur, October 1912.

It is necessary to consider the interest (a) of rearers, (b) of the "skilled artisans" as they may be called who work in filatures, (c) of Indian filature owners, and (d) of mulberry growers.

(a) It is a well-known fact that the rearers in the course of a few generations have acquired great practical knowledge and skill as to the best methods of rearing silkworms.

The principle that "there is very little that we can teach the cultivator" applies also to rearers, and it would be a great pity, merely for this one accident of spread of disease among silkworms, which by the monopoly proposed, is preventible, to allow all such inherited and acquired skill to go to waste.

(b) It is a further well-known fact that the workers in filatures are a special skilled class of their own. Having acquired within doors sheltered from the sun the delicate touch necessary for handling silk, these people (mostly poor low caste Hindus), have become unsuited for other or for outdoor work and for the hard work of agriculture. The distress into which these comparatively delicately natured artisans have fallen and, unless the industry is saved, will continue to fall, is very acute, and though they are unable to attract Government's attention to their distress, it is none the less very widespread. They are unable to take to agriculture and other employments. For the same reasons as apply to the "rearers" it will be a pity to allow such skill to go to waste.

(c) The views of Indian filature owners are contained in the 1906 report. They apply with still more force now-a-days.

The opinion of such Indian filature owners was so emphatic that disease had caused the industry to die out, that I wonder nothing more was done than to check the disease.

(d) *Mulberry growers.*—Like the rearers and the workers in filatures, the mulberry growers have acquired considerable skill and knowledge as to the best method of growing mulberry plants. We cannot teach them much in that respect, yet, for want of a market for the leaves, they are gradually giving up growing mulberry plants and their skill is going to waste.

Extract from the Imperial Gazetteer of India, Bengal (Midnapore District).

-Midnapore is a heavy criminal district, and has long been notorious for the number of dacoities committed within its borders. These are largely the work of Tuntias, a Mohammanadan caste, whose traditional occupation is the cultivation of the mulberry-tree (tunt) for feeding silkworms. This occupation having become unprofitable, many of them have taken to criminal courses, and are professional thieves and dacoits.

(The Bogra Gazetteer has the same remark.)

Direct enquiry has been made also from the district officers of the four districts, Berhampur (Murshidabad), Malda, Rajshahi and Birbhum; their reports are as follows :—

From L. S. S. O'Malley, Esq., I.C.S., Collector of Rajshahi.

Dated the 26th January 1916.

In this district the decline in the silk industry has led to the silk rearers and reelers taking to other occupations. Most of the expert reelers who used to work in filatures now earn their livelihood as labourers, and the great majority of the cocoon rearers are now cultivating jute and other crops. The latter had already land on which they grew mulberry and for which they paid a high rent, and when cocoon rearing ceased to pay, they substituted other crops for mulberry. So far from their abandonment of their old cultivation being the cause of the downfall of the industry (as has been suggested in the letter of the Imperial Silk Specialist), it is a direct result of its decline. It cannot be said that the substitution of other occupations has led to distress in this district.

From the District Officer of Birbhum.

Dated the 16th February 1916.

It appears from enquiries made that there has been a considerable diminution in the production and in the earnings of men who rear silk worms and reel cocoons. No satisfactory explanation, however, could be obtained except that the quality of the seed generally used by the rearers of silk worms is bad.

2. It also appears that the rearing of silkworms is not so paying now as it used to be. In view, however, of the large demand for silk, the reason for this can only be either foreign competition or circumstances affecting the yield. The defective quality of the seeds may be one of the causes which have reduced the yield.

3. Rearing of silkworms or reeling of cocoons is practised as an additional source of income in this district by the cultivators along with agriculture. It is seldom practised exclusively.

4. There was a silk factory in this district at Ganutiā in thana Labpur under European management. This factory has been closed some years ago. When the factory worked the rearing and reeling of cocoons and cultivation of mulberry plants were both profitable to the people of the village and its vicinity. The majority of the labourers, who found employment in the factory, have left their homes since the winding up of the factory in search of work elsewhere and those that remain in the village are in distress. Rearing of cocoons and cultivation of mulberry were additional sources of income to cultivators and as they have now got to depend entirely on agriculture they have become poorer. The income in the value of agricultural produce has not compensated the loss they have incurred through the diminution of the industry.

5. It does not appear, however, that there has been any appreciable increase in crimes on account of the closing of the factory or the diminution of the silk industry generally.

From J. Johnston, Esq., Collector of Malda.

Dated the 19th February 1916.

There is no doubt that there has been diminution in the production of silk which may be ascribed to the following causes :—

(1) Want of good seed.

- (2) Diseases of silkworms known as *Kalsira*, *Rasha Boka*, *Lalmatha* are now more common.
- (3) Less demand for Bengal silk in Foreign countries and less export in consequence—
 - (a) on account of war,
 - (b) on account of market being taken up by Japanese silk, China silk and other varieties of cheap silk.
- (4) Withdrawal of European capital and abolition of silk factories in Bengal.
- (5) Ignorance of people in scientific methods of rearing and reeling and their consequent failure to compete with foreigners.
- (6) Rise in the wages of labour.

2. It is true that the silk industry has declined to a considerable extent and that some people who used to rear silkworms or reel cocoons before, have taken to agricultural or other means of living. But this is a result of the diminution in the industry of sericulture rather than its cause. It appears, however, that in this district sericulture is practised with very few exceptions not as an independent profession by itself, but as one to supplement the income from agriculture. The diminution in outturn and the falling off in the prices of silk might have caused some people to adopt other means of living, but I do not think that this has led to any serious distress. Rise in the value of agricultural produce does not seem to have induced people concerned with sericulture to adopt the former in preference to the latter.

From W. D. R. Prentice, Esq., I.C.S., Collector of Murshidabad.

Dated the 29th February 1916.

I asked three of the European silk employes in this district for their views on the points raised in Mr. Maxwell Lefroy's letter and also had enquiries made among Indian silk dealers in this neighbourhood, but regret to state that the information supplied after a good deal of delay is of very little value.

2. I gather, however, that the diminution in the earnings of those engaged in the different branches of the silk industry has caused a certain amount of distress, especially among reelers. The women, it is stated, have been more affected than the men, which is not surprising, as the latter can easily earn money elsewhere as labourers. There has, however, been no noticeable increase in crime as the result of this. This indicates that those affected have found some other means of livelihood.

3. The main cause of the decline of the industry is stated to be the importation of cheap silk from abroad and not the increase in the value of agricultural produce, though in some cases this may have taken a factor of secondary importance.

APPENDIX V.

The following papers illustrate the history and present position of Kashmir:—

Extract from Duseigneur Kleber, Le Cocon de Soie (1875.)

CACHEMIRE.

En avril 1860, MM. Orio et Consonno, graineurs italiens, s'embarquent pour l'Inde. Ils arrivent en mai à Calcutta, où, aidés des bons offices du gouvernement anglais, ils peuvent se diriger vers le royaume de Cachemire et procéder à un grainage assez important, 25,000 onces. Ces semences sont emballées dans des caisses entourées d'une épaisse couche de laine et aérées seulement la nuit; elles arrivent en très-bon état en Italie, fin Novembre.

Soumises à l'examen microscopique de MM. Vittadini et Cornalia, ces observateurs les déclarent saines en tous points.

Le Cachemire doit être, pour la température, assimilé aux régions froides de l'Italie; l'incubation s'y fait seulement dans les premiers jours de mai.

La feuille est fournie entière au ver dès le premier âge, non détachée des rameaux, une fois par jour seulement jusqu'au troisième, et l'éducation se continue ainsi à la méthode turque, mais avec une alimentation mesquine. Elle dure quarante jours, et le ver file son cocon sur l'édifice d'un mètre de haut, constitué par les rameaux entassés.

Le cocon Cachemire (figure 179) a la plus grande analogie de forme et de grosseur avec les races d'Albanie et Montenegro, mais il est loin d'avoir leur solidité de coque.

Il a fallu au fleur généralement 16 à 18 kil. de cocons pour un de soie.

L'on a dit, à l'époque, le maharadj s'opposait à une nouvelle expédition de graineurs dans ses États. Je crois que l'obstacle vrai est dans l'insuccès de la première.

CACHEMIRE.

Cocons de graine docteur Orio.

Format ovale, allongé, moyen.

Un bout en pointe.

Grain fin.

Coque faible.

Blanc et jaune ordinaire.

Diamètres 340-170 mm.

Decreusage 23—25 pour cent.

Frisons 30—32 pour cent.

Cocons doubles.

Rente 16—18.

Peu de duvet.

Extract from Sir Walter Lawrence's " Valley of Kashmir."

The history of sericulture in Kashmir has been fitful and desultory. The silk industry is of ancient standing, for Mirza Haidar in his history (A. D. 1536), alludes to the abundance of mulberry trees in Kashmir, and to the fact that the people would not allow the leaves to be used for any purpose other than that of food for silk worms. It is said by the people that sericulture existed in the times of King Zain-ul-Ab-ul-din, that it had fallen into disuse in the Pathan times, and that the Pathans restored the industry. In later times the important date is the year 1869, when Maharaja Ranbir Singh,

an enthusiast in new industries, revived the silk production on a large scale. No expense was spared, and 127 fine rearing houses were built in all parts of the Valley. Reeling appliances and machinery were imported from Europe, and a large Department was formed for the purpose of developing a business in silk. It is easy to be wise after the event, but the idea suggests itself that the system of revival was not wise. A guild of silk rearers known as *Kirm Kash* (literally worm-killers) was created, and these men were given certain privileges, such as exemption from forced labour. They were also allowed to annex the houses of villagers for silk-breeding purposes, and they were further appointed as informers regarding damage done to mulberry trees. In a short time the name *Kirm Kash* became hateful to the villagers, and there is no doubt that the silk-rearers abused their position and oppressed the people. The whole business was too official, and the general public looked upon it with hatred or disgust. Next it may be said that the revival was too ambitious. The cost of buildings and plant was enormous, and the rearing-houses being scattered in all parts of the Valley could not be properly supervised. Unfortunately there was no one possessing any technical knowledge to supervise, and though great improvements were made in reeling there was no man in Kashmir, who could avert the calamity, which befell the industry in 1878, when nearly the whole of the silk-worms were carried off by disease. Every credit is due to Babu Nilamber Mukerji, the Chief Justice of Kashmir, for his efforts, and his success in improving the reeling of silk is attested by the favourable reports received from Europe, all speaking highly of the quality of the fibre. The industry lingered on until 1882, and from that time to 1890, the State left it to the silk-rearers. The quantity of seed rapidly diminished, and sericulture was virtually at an end. The fine buildings had fallen down and out of the 127 houses built in 1869, only two remain, one at Ragnathpura and the other at Cherpur. It is generally understood that the disease which proved so fatal was brought into Kashmir with the imported seeds of highly domesticated, though superior, foreign cocoons, from Europe, China and Japan. The rearers declare that the Japan seeds were the cause of the calamity. In 1889, on the advice of Sir Edward Buck, C.S.I., Secretary to the Government of India, it was decided to follow the example set by Bengal, and to adopt the Pasteur system of microscopical examination. The services of a trained Bengali were obtained, and a Kashmiri was deputed to Bengal to learn the system of microscopical examination. Good seed was imported from Italy and France, and an excellent crop of cocoons was obtained. In 1891, the success achieved was nullified by the neglect of the subordinates, who were unfortunately left in charge at a critical time, and progress was temporarily arrested. The operations from 1889 to the beginning of 1894 were under the charge of Babu Rishibar Mukerji, the Chief Justice of Kashmir, a brother of Babu Nilamber Mukerji. Though I was associated with him in the work, he deserves all the credit for having achieved the chief object of securing healthy local seed. This year, 1894, while imported seeds have in many cases bred diseased worms, the worms from our examined seeds have done splendidly, and there is no disease among them. Owing to financial reasons, at the beginning of 1894, Babu Rishibar Mukerji's connection with sericulture terminated, and I was placed in charge. My object since I was associated with sericulture in 1889, has been to avoid expense and to limit our efforts to obtaining healthy seed. Knowing that the Kotahar Valley contained a number of old silk-rearers, I have this year given all our seed to the Kotahar people. Supervision is thus rendered possible. I have further raised the price paid by the State for cocoons so as to give some profit to the rearers. Our expenditure has been covered by our income, and unless some unforeseen calamity occurs, we shall have seed sufficient to supply all the old silk-rearers in 1895.

* * * * *

Everywhere I find the villagers eager to take up sericulture as a cottage industry and from all parts of the Valley, men have this year implored me to give them seed.

* * * * *

It is impossible to exaggerate the potentialities of silk in Kashmir, but I am certain that these potentialities will never be realised while the industry remains in the hands of the State.

REPORT OF THE KASHMIR SERICULTURE DEPARTMENT FOR SAMBAT
1972 (1915-16).

It is gratifying to note that in spite of all the difficulties which the Department has had to face the year under report has been more prosperous than any one expected it to be, and the prices realized reached a record height. For the first three months of the year, the market was quiet with prices ruling just about at the same low level to which they had fallen at the end of 1914. In July, however, a marked change became apparent. It was realized that silk was required for a multitude of articles which could not be in any way regarded as luxuries and there was no general falling off in the demand for silk as prophesied by the pessimists. Moreover, cocoon crops had been decreased all round and simultaneously America was enjoying unbounded prosperity and was easily capable of absorbing more than all the remaining silk which was not wanted by Europe.

The sudden revival of the silk market and the rapid advance in prices both for silk and cocoons may specially be attributed to the following reasons.

- (a) Shortage of the European crops.
- (b) Heavy purchases by America.
- (c) The lightness of available stock in Europe during the year.
- (d) The persistent rise in Foreign Exchange.
- (e) Stoppage of arrivals from Central Asia.
- (f) Serious floods in Canton destroying one of its crops.
- (g) High sea-freightage, insurance and war risks.
- (h) Sinking of a steamer with 2,000 bales of silk on board.
- (i) Closure of the Dardanelles.
- (j) Stoppage of arrivals to Europe from Syria owing to Turkey being involved in the conflict.

It is interesting to note the effect of the war on other silk producing countries and the measures adopted by the various Governments to cope with the situation. The silk industry received a hearty and liberal support in Japan, where, to save it from the effects of the war and in order to afford relief to the people engaged, it was decided to form a Company under the name of the "Imperial Silk Yarn Company" with a capital of about £714,600 of which £510,400 were contributed by the Government. This subsidized Company conducts the purchases and sales of silk with a view to maintaining a standard price for raw silk on the market. It did not end here, but to provide livelihood to the mountain people of the country, on completion of public improvements on which these people were engaged, Silk Culture was introduced in several Provinces. A Mulberry Farm was laid out in the Imperial Palace Grounds to supply leaves to the Imperial Silk Breeding Rooms, where Her Imperial Majesty The Empress of Japan attended to the rearing of silk-worms.

In Bulgaria, the Government encouraged the extension of the mulberry plantation by the gratuitous distribution of seed amongst the land-holders and peasantry. Instructions in the art of silk-worm rearing were given in all Agricultural schools throughout the Kingdom.

In Spain to create an interest in and develop the long decadent silk industry there, the Government formed and sanctioned a legislation which included a Government grant of about £30,000 a year for the support of experimental stations, free distribution of silk-worms' eggs and premiums to Sericulturists and spinners of raw silk. In Columbia a law has been made providing for State encouragement of the cultivation of mulberry trees, the

rearing of silkworms and the reeling of silk. A provision has been made for the appropriation of sum of about £2,000 annually from the National Treasury to be distributed amongst the various Departments of Republic and to be used for the foundation and maintenance of schools of Sericulture, the purchase of reeling machines, the payment of premiums to producers of silk and cultivators of mulberry trees. Silk reeling machines imported from abroad have been exempted from import duty for a period of 10 years.

Highest price and offer for Kashmir silk.

The highest price which the Kashmir silk fetched (through Messrs. Durant Bevan & Co.) was 58 francs per kilo and the highest offer which has been accepted, but not realized as yet (through Messrs. Cox & Co.) was 67 francs per kilo, which at the present high rate of exchange is equivalent to approximately 18s. 6d. and 21 shillings per pound respectively. This offer of 21 shillings per pound is record for Kashmir.

Demand and sales of silk in India and Siam.

The great activity which characterized the silk market in Europe, also resulted in a keen demand which simultaneously sprung up for raw silk in different parts of India and Siam. Orders for different qualities began to pour in, to execute which, I have been compelled to work the three existing old filatures by night as well as day. I much regret to say that owing to the new filatures not being ready I have had in some cases to refuse orders because I was unable to guarantee to supply the goods in the time stipulated.

In last year's report I mentioned that I had every hope of establishing a connection with the Siamese silk market, and I am glad to say that we have been fairly successful in this matter. In the first instance a sample consignment consisting of 400 lbs. of No. 3 Silk was sent to the firm of Messrs. L. T. Leonowens & Co., Bangkok, who had been recommended to me by Mr. Sykes, the Accountant General. This lot only realized about Rs. 6-4 per pound net, a very low price but better than Rs. 5 which I had been offered in India. A second consignment of 1,335 lbs. realized about Rs. 7 per pound and a third consignment of 2,667 lbs. has been sent for which the firm think they will obtain even a better price.

Some of the same quality as supplied to Siam was also sold in India at prices from Rs. 5 to Rs. 7 per pound. I hope I shall be able to realize better prices as soon as this quality is better known.

This same quality was also supplied to Messrs. Singha & Brothers, who are experimenting with the weaving at the factory. The quality of the cloth appears very good and I understand the firm are having no difficulty in disposing of it in India.

A consignment of 40 bales of No. 1 Silk consisting of 4,920 lbs. of 9/11 denier and 1,640 lbs. of 11/13 denier was sold at the factory at Rs. 12-12 and Rs. 12-8 per pound net respectively.

Two consignments of 22 and 4 bales of waste chassam were sold for Rs. 1-15 per pound f.o.r. Calcutta, and 24 bales of waste godder were sold for Rs. 1-3 per pound f.o.r. Bombay.

Sales of silk in Europe.

569 bales of No. 1 silk were sold in Europe at an average price of 12s. 8d. and the number of bales of waste silk was 123.

Consignment of America.

A small sample consignment of 6 bales of No. 1 Silk consisting of 900 lbs. has been sent to America through Messrs. Cox & Co., I am expecting a report on this lot shortly.

Reeling.

The factory reeled silk for 294 days (a record) working 218,233 basins and the average labour employed daily was 1,623. Female labour has been maintained for the sorting of cocoons.

One of the chief events of the year was the working of the filatures throughout the winter, which this year was unusually mild. The silk reeled during this period was of a coarse size.

I am glad to report that the quality of the Kashmir silk has improved. Our brokers Messrs. Durant Bevan & Co., write as follows:—

“The silk we are now receiving shows an immense improvement. Your silk is splendid and we are proud to have the selling of it.”

This speaks for itself but personally I am not altogether satisfied with the quality we are turning out and I hope when the new filatures are at work we shall be able to show a still further improvement and set at rest the doubt as to whether the Reeling Department can be made to pay.

Outturn of silk waste.

Statement “B” will show in detail the outturn of silk and waste during the last three years.

Rearing.

The rearing operations were again carried on, on the same lines as in the preceding year. We distributed 37,610 ounces of seed which produced 33,860 maunds of cocoons which was not a satisfactory return. I can only attribute this to the following reasons:—

- (a) Non-hatchment of a large portion of some of the Italian seed and also one kind of French. These two varieties were delayed in transit from Europe and arrived here rather late.
- (b) A certain amount of a local seed started hatching out in the boats whilst in transit from the hibernation rooms to the various distributing centres. The consequence was that some of the small worms, got crushed when being carried by the rearers to their homes or were affected by the sudden drop in temperature which occurred at the time of distribution.
- (c) Unfavourable weather, when the worms had reached the fourth moult; frequent dust storms almost every afternoon about 4 P.M.
- (d) Damage done to the cocoons by rats in the rearers' houses on account of unusual delay in the importation of cocoons. This was owing to the outbreak of cholera, when the rearers were prohibited by the medical authorities from bringing their crop to Srinagar.

The rearing operations in Skardu were altogether a failure. The quantity of seed distributed was 14 ounces, which only produced 1 maund 24 seers of very inferior cocoons. It has now been decided to discontinue the rearing in this district.

The following table will show the result for the last three years:—

Year.	Number of rearers.	Seed issued in ounces.	Maundage of cocoons.	Produce per oz. of seed.	Amount paid to rearers.
				Seers.	Rs.
1970 (1913-14)	47,501	36,735½	37,021½	41	5,61,212
1971 (1914-15)	48,936	36,738½	33,672½	38½	4,92,512
1972 (1915-16)	51,076	37,610	33,862	36	4,95,129

Local seed.

The quantity produced was 7,352½ ounces as against 4,400 last year. The accommodation at the silk factory being inadequate as only approximately 4,500 ozs. could be produced there so it was found necessary to occupy the Gupkar Distillery as well, which was kindly lent me by the Customs Department as well and 3,182 ounces were produced there and 4,170½ ounces at the silk factory. This seed was distributed this year and the results will be dealt with in the next report.

Finances.

The profit and loss sheets will be submitted by the Accountant-General in the due course. The receipts during the year from the sale proceeds of silk and cocoons amounted to over 20 lakhs. (The profit is estimated at 9½ lakhs, probably more.)

High freightage and shipping difficulties.

The steamer freightage, insurance and war risks were extremely high and the shipment of our stock, on account of steamers being requisitioned by the Government of India, was very difficult. In this respect my thanks are due to Messrs. Cox & Co., for their co-operation and the keen interest they evinced in making timely arrangements to ship our silk and cocoons and it is due to their foresight and precaution that we have been able to export our output without delay.

* * * * *

M. L. McNAMARA,
*Director of Sericulture,
Kashmir State.*

Statement B follows. A statement of the proposed staff is appended, as a guide to the duties of the staff of such a filature and the number of the staff.

STATEMENT B.

Average outturn of silk and waste from cocoons reeled during the last 3 years, Sericulture Department, Kashmir.

YEAR.	Cocoons reeled.	SILK PRODUCED.		PRODUCE PER MAUND OF COCOONS.	
		Silk No. 1.	Inferior silk and waste.	Silk No. 1.	Inferior silk and waste.
		<i>Mds. Sr. ch.</i>	<i>lbs. oz. dr.</i>	<i>lbs. oz. dr.</i>	<i>lbs. oz. dr.</i>
1970 (1913-14)	16,391 0 0	94,978 1 0	73,850 4 0	5 13 ½	4 8 0
1971 (1914-15)	7,822 32 2	53,596 12 5	24,726 14 6	6 13 9	3 2 9
1972 (1915-16)	19,003 5 8½	96,879 1 3	73,042 8 8	6 6 8	3 33 7

Extract from the Budget Statement of the Director of Sericulture, Kashmir, Srinagar.

PROPOSED SCALE.

No.	Designation.	Rate of pay.
		Rs.
1	Director	800
1	Assistant Director	500

PROPOSED SCALE—*contd.*

No.	Designation.	Rate of pay.
		Rs
7	Sericulture Assistants (Rs. 150—25—175—50—400)	2,800
11	Indian Assistants, 6 @ Rs. 200, 3 @ Rs. 150 and 2 @ Rs. 100 per mensem	1,850
1	Superintendent (Rs. 100—25—200)	200
1	English Clerk	45
1	Ditto	30
1	Ditto	20
1	Vernacular Clerk	20
1	Ditto	15
1	Wood Accountant	20
1	Godown Clerk	45
3	Cocoon Clerks	15
2	Silk Clerks	15
1	Cashier	70
1	Record Keeper	20
1	Receiver and Despatcher	15
1	Typist and Copyist	15
12	Inspectors Rs. 30—5—50	50
14	Sub-Inspectors	15
12	Time-Keepers	10
12	Assistant Time-Keepers	8
70	Sentries	8
3	Chowkidars	6
6	Peons	8
1	Havaldar Jamadar	15
6	Workmen	7
4	Cocoon Weighers	8
70	Nigranis (Supervisors)	8
6	Balers	7
10	Silk Sorters	8
10	Silk Testers	8
6	Blacksmiths @ Rs. 20	20
8	Carpenters, 1 @ Rs. 25, 1 @ Rs. 20 and 6 @ Rs. 15 per mensem	135
2	Masons 1 @ Rs. 25 and 1 @ Rs. 20	45
40	Sweepers, 1 @ Rs. 8 and 39 @ Rs. 7 per mensem	281
1	Foreman	35
1	Fitter	30
12	Boilermen	8
5	Pump and Hydrant operators, 1 @ Rs. 14, 2 @ Rs. 9 and 2 @ Rs. 8	48
36	Seed Examiners, 3 @ Rs. 15 and 33 @ Rs. 9	342
1	Sanitary Darogha	20
2	Malis	8

Rules and Regulations regarding Protection of Mulberry trees.

1. All cutting of mulberry trees, or branches thereof, is a criminal offence, unless done under the authority of the Inspector of Mulberry Culture.
2. Zamindars are responsible for the mulberry trees, standing in their land. If any one else damages them, the Zamindars should at once report the matter to the Inspector, or to the Lambardar.
3. The Lambardars are similarly responsible for all the mulberry trees in the village; and the Chowkidar is responsible for reporting to the Lambardar all cases of damage to such trees.
4. Holders of previous permits, to cut mulberry trees, were warned on the 10th of Magh 1962, that all wood held by them, under those permits, should be consumed within six months from that date; mulberry wood afterwards found in possession of any person, without the permission of the Inspector, will be deemed to be held in contravention of these Rules.
5. Lopping of mulberry trees for fodder, without proper authority, will be treated as an offence, when it can be proved.
6. The Zamindars are not allowed to use mulberry wood for ploughs, etc., but can obtain other wood for such purposes, from the State Forests.
7. The silk rearers, similarly, are not allowed to use any mulberry wood for heating of the rearing-houses.
8. The sale of mulberry wood, excepting to the Sericulture Department, is absolutely prohibited.
9. All fallen mulberry wood or trees, cut under proper authority, will be collected at suitable places, and disposed of under orders of the Inspector of Mulberry Culture.
10. The rules for the preservation and conservation of mulberry trees, have already been issued in Circular No. 7, sanctioned under Resolution No. 15, dated 24th February 1894, but it appears that the rules are not properly observed. Cases have frequently come to notice, in which officials of the different departments of the State, have cut mulberry trees, and when called for an explanation, have stated that they have done so, as a past practice, and no action was ever taken against them, for any such offence. It is considered, therefore, necessary, that all officials may once for all be informed, that they are, equally with the general public, forbidden to cut any mulberry trees, contrary to these rules, and it is hereby notified that any person, whether any official or not, who in future infringes these rules, will be liable to punishment, and that the rules will be strictly enforced.
11. If at any time, the cutting of the mulberry trees, appears inevitable, for some State purposes, the Inspector of Mulberry Culture, should be previously informed, and the wood should, at once, be made over to him, unless required for the use of the department concerned, in which case the previous permission of the Inspector should be obtained.
12. Mulberry wood should not be supplied to the *paraos*, except on special occasions, such as journeys of *Deodhi Khas*, and Viceregal and other very large camps, and only then, if sufficient wood is not obtainable from other sources. When mulberry wood is supplied, the arrangements should be made through the Inspector of Mulberry Culture, who should receive as much previous notice, as is possible, and the wood should be transported under passes given by him. It should be accounted for to his satisfaction.
13. The rate of payment for mulberry wood, at *paraos*, is 2 Kharwars per rupee to be realised in cash; in the case of persons, not entitled to free fuel; in other cases, the Inspector can take a book credit in his accounts for the wood used.
14. Mulberry trees in cantonments, will be under the control of the General Officer Commanding, provided that the wood must be used only within cantonment limits.
15. No mulberry wood, if in possession of any State Department, (including the Public Works Department), can be shifted from one place to another place, without previous notice to the Inspector.

16. In urgent cases, (e.g., a mulberry tree falling into a canal), trees may be cut, by order of the Sub-Divisional Officer of Public Works Department, without previous reference to the Inspector, who should, however, be informed immediately, through the Divisional Engineer.

Any mulberry wood, so cut by the Department, from trees growing within Public Works Department boundaries, may be used for departmental purposes, if required, but only with the previous permission of the Inspector, which will not be withheld, without good reasons being given.

17. All departments should be requested, to inform the Inspector, of any mulberry wood, now in their possession, and should be asked in future to refrain from acquiring such wood, and from moving it from place to place, without previous intimation to the Inspector, and his concurrence. The Inspector is ordered to treat as contraband any wood dealt with otherwise than according to the above rules; the Inspector will detain it (any expenditure involved by such detention being borne by the Department concerned), and will communicate with the Head of the Department. If he is unable to dispose of the case, in consultation with the Head of the Department concerned, he should report the matter to the Settlement Commissioner, for the orders of the higher authorities.

18. The Inspector has authority to examine the Patwaris' records, for the purposes of his work.

The following rules regulate the possession of cocoons, etc. :—

Rules regarding unauthorized possession of cocoons, etc., sanctioned by the Durbar and published in State Gazette, No. 27, dated 14th October 1907.

Whereas it is expedient to provide a law against the unauthorized sale or possession of silk cocoons and seed and the unauthorized possession or receiving of raw Kashmir silk, it is hereby enacted as follows :—

- (1) This Regulation shall be called the Kashmir Silk Protection Regulation of 1906 (1906-07) and shall extend to the whole of the Jammu and Kashmir State.
- (2) The words (1) "kirm kash," (2) silk seed, (3) silk cocoons and raw Kashmir silk shall have the meanings ordinarily attached to these terms in the Jammu and Kashmir State.
- (3) Any "kirm kash" employed by the Sericulture Department, Kashmir, who disposes of by sale or otherwise in favour of any person, except the Director of Sericulture, Kashmir, or such persons as may be appointed by the said Director in this behalf, any silk cocoons reared by him and in his possession or any silk seed given to him for rearing by the said Director, or who willfully neglects to deliver up the full quantity of silk cocoons reared by him; or to make over, if required to do so, any silk seed in his possession to the said Director of Sericulture or the persons appointed by him in his behalf shall, on conviction, be liable to imprisonment of either description for a term which may extend to three years or to fine or to both.
- (4) Any person who, without any authority from the Director of Sericulture in this behalf, receives in any manner whatsoever, any silk cocoon or silk seed from any *Kirm Kash* or is found in possession of any silk cocoon or seed otherwise than under the authority of the Director of Sericulture or other person or persons duly authorized by him in this behalf, shall be dealt with as if he had dishonestly received stolen property knowing or having reason to believe the same to be such, and shall be liable to be prosecuted under section 311, Ranbir Dand Bidhi.
- (5) Any person who receives or is found in possession of raw silk manufactured from cocoons reared under the authority of the

Kashmir Sericulture Department otherwise than with the permission or under the authority of the Director or other person duly authorized by him in this behalf shall, on conviction, be liable to imprisonment of either description for a term which may extend to 3 years or to fine or to both.

- (6) Offences under this Regulation' shall be triable by the ordinary Criminal Courts of the State in accordance with the Criminal Law and procedure of the State in force at the time.

Explanation.—Raw silk includes waste silk.

APPENDIX.

Statement showing Silk, waste and Cocoons produced in Kashmir during the last ten years.

	1963 (1906-06)	1964 (1906-07)	1965 (1907-08)	1966 (1908-09)	1967 (1909-10)	1968 (1910-11)	1969 (1911-12)	1970 (1912-13)	1971 (1913-14)	1972 (1914-15)
	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>	<i>Lbs. oz. dr.</i>
SILK	115,748 5 0	132,760 4 0	129,045 0 0	184,221 2 0	168,167 10 0	215,748 13 0	181,055 9 0	94,978 1 0	53,506 12 5	96,879 1 3
Waste	74,988 10 0	98,179 4 0	71,461 0 0	95,902 7 0	97,606 11 0	125,248 9 0	129,968 14 0	78,850 4 0	24,726 14 5	73,042 8 8
	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>	<i>Mds. Sr. Ch.</i>
COCOONS	21,409 0 0	28,421 0 0	23,490 0 0	26,428 0 0	40,407 0 0	37,565 0 0	37,487 0 0	97,921 20 0	23,872 20 0	32,861 0 0

M. L. McNAMARA,

Director of Sericulture,
Kashmir State.

APPENDIX VI.

The following reports deal with the industry in the Gangaw Sub-division of Pakokku, in Pyinmana (Yamethin), in the Southern Shan States and in Toungoo:—

Note on the Silkworm breeding Industry in the Gangaw Sub-division; prepared by Mr. E. F. A. Hay, Assistant Conservator of Forests.

1. The Taungthas and Shonshis, the latter a local race of Chins, allied to the Hakas, who have emigrated to and permanently settled in the Upper Myittha valley, are those who chiefly concern themselves in the cultivation of the silkworm, though certain Yaw villagers are said to go in for it to a small extent.

There seems to be no doubt that on the whole the Industry is not so widespread as it was. This state of things may be assigned to several causes, but chiefly to slackness, though in at least one case the influence of an unusually orthodox pongyi has caused one village to give up the business (Thanbaya).

Some villages evidently take it up for a period and then drop it.

2. The following list of villages is probably fairly exhaustive and, if made worth while, the industry could very easily be widely spread in this valley.

(Silkworm breeding is about to be introduced into the Haka-Chin Hills, the mulberry foodplant being introduced from Shonshi.)

(a) Villages producing silk.

Shonshi (Chin) 100—200 houses cultivate the insect during the rains, a few throughout the year.

Wekchiba (Chin) some few houses throughout the year.

Wetthet (Taungtha) a few houses cultivate it the whole year, sometimes many houses take it up.

(b) Villages formerly cultivating the insect, and probably spasmodically in the future.

Tanbingon (Taungtha).

Tawyaung (Taungtha).

Hingokkon (Taungtha).

Thanbaya (Taungtha).

(c) Villages said to cultivate the insect.

Zahaw (Yaw).

Lonbaw (Yaw).

Lonchon (Chin).

Kyaw (Yaw).

Mauklin (Yaw).

Zibya (Yaw).

Taungbyin (Yaw).

Magyikin (Yaw).

Shonshi is undoubtedly the most important village from the point of view of silk production, and to Shonshi come buyers.

A rough estimate of the monthly output of silk by one silkworm breeding house would be 5 to 7 ticals, worth Rs. 20 per visa.

3. *The food-plant.*—The food tree (*Burmese posa*) is a mulberry, almost certainly *Morus indica*, though I was unable to obtain any satisfactory description of the flower and most villagers seemed doubtful of there being one. Probably about one in ten trees only produce flowers. The fruit, like a small English mulberry, is at present on the trees (April 28th).

There are two varieties of the tree, which appear to differ only in the size of the leaf. (Possibly they are two species, in which case the larger is probably *M. Lavigata*.) The larger leaved variety is called in Burma *hmunma*, the smaller *hmunngale*. The tree seems to reach a maximum height of about 15'.

Green leaves can be got all the year round as new leaves take the place of those picked for use.

The mulberry is grown only in the villages, though it is also rarely found wild in the jungle. The leaves of both the wild and cultivated trees occasionally form an ingredient of curry. The fruits are sometimes eaten by children. The tree is propagated by cuttings in the rains. This tree forms the entire food of the worms.

4. *The silk moth.*—There are two varieties of silkworms, the one producing white, the other yellow silk. Both are equally valuable. The larvæ of these two varieties are indistinguishable in the early stages of growth but later the larva of the former is said to be greenish and to bear lines on the body, and that of the latter to be yellowish and without lines. Both varieties of moth are identical.

The duration of the various stages in the life-history are roughly as follows:—

The egg stage (burmese *U*) about 8 days

The larval stage (bur. *pogaung*) about 30 days.

The pupal stage (bur. *po on*) about 15 days (a mean of very varying estimates).

The imâgines (burmese *leikpya*) are thrown away as soon as egg laying is completed.

During its whole life, the cultivation of the insect is carried on entirely indoors. The eggs are laid on a bit of cloth, and, on hatching, the tiny larvæ are transferred to a basket-work tray and mulberry leaves (sliced small, at first) introduced.

A cover of cloth is kept stretched over the tray. As soon as the cocoons are completely spun, they are put out in the sun to dry and are then placed in hot water.

Death of the pupæ results, and the silk is easily wound off the cocoon. The dead pupæ are occasionally eaten. In order that the life-cycle may be continued, a stock (burmese *myo*) is kept and these pupæ are allowed to hatch out. Such cocoons, after emergence of the moth become useless and are thrown away, without the silk being removed.

The moths have completely lost the power of flight (pointing to long established domestication) and after copulation of the sexes, the females deposit their eggs on a piece of cloth provided for them. The moths are then thrown away.

The silkworm is never found wild and no explanation was advanced to account for its original appearance in this neighbourhood.

The life-cycle continues throughout the year.

5. *Diseases, etc.*—The animal is subject to no disease, but the larvæ are kept covered over with a cloth, as a protection from the bites of ants and flies. The larvæ are also, to some extent, susceptible to the malignant influences of wizards and to the effluvium of frying fish.

Silk in Yamethin.

The Divisional Forest Officer, Pyinmaña, reports :—

- (1) In this division sericulture is at present practised in the Yonbin and Minbyin Reserves at the following Villages :—

		Household.
Yonbin Reserve	{ Swedawmyaung	22
	{ Chaungzu	2
	{ Thayetchaung	1
Minbyin Reserve	{ Dalangyun	3
	{ Sanwingyin	3

- (2) The silkworms are fed almost entirely on mulberry, but sometimes on "Mahlaing" (*Morus Lævigata*).
- (3) A rough estimate of the annual yield of silk per household is 8 viss, and the price varies from Rs. 15 to Rs. 20 per viss; the silk weavers, however, do not trust entirely to sericulture for a living but engage also in cultivation.
- (4) Every silk weaver in this division is an immigrant from the Magwe District. None of the local people go in for sericulture, but I think they would if they were encouraged.
- (5) The only places where mulberry plantations are formed are on the flat sandy banks of the creeks, where generally one finds only "Kaing" grass, so they do not interfere in the slightest with silviculture. These flat sandy localities abound along every large creek in this division and I see no reason why they should not all be used for mulberry plantations. If villagers were allowed to form mulberry plantations along all these creeks and were generously treated as regards rent and taxation I should not be at all surprised if it resulted in a considerable expansion in sericulture in this division, especially in the Yonbin, Minbyin, and Palwe Reserves.

Southern Shan States.—The following is from A. E. Ross, Esq., Deputy Conservator of Forests :—

I have the honour to inform you that as far as I have been able to discover, sericulture is only practised to a very small extent in the Laklai Circle of Mongsit State and by seven Shan householders in two villages in the Laika State and by a few villagers of the Loi Ai and Loilong States living near the Paunglaung River, on the borders of Burma, where I am informed the breeders are chiefly Burmans or Yabeins and treat the silk worms and cocoons in the same way as the Yabeins of the Pyinmana Sub-division, regarding which a Monograph was I believe printed some years ago. These Paunglaung villagers grow small mulberry trees called "Posabin" within easy reach of their villages yearly and collect the leaves daily for the silk worms which are bred in large trays containing cold cooked rice to which the plague of flies ('Polaungs,' 'Pyoks,' etc.) have no access. It is on account of these flies, I am told, that the people are unable to breed silk worms on the mulberry saplings in their plantations in the Paunglaung. These villagers get their cocoons from Konhla a village in Pangmi State, where the mulberry tree grows well and where the specially bad flies found in the Paunglaung do not give trouble. Konhla is at least 2,000 feet higher than the Paunglaung villages.

The first batch of eggs is hatched between February and March when the mulberry saplings come into full leaf. The silk produced is mainly yellow and of a shade like "tassar" and used to be sold in the bazaars at Rs. 15 to 20 a viss and is mainly exported to weaving centres in the Yawngwe Lake Valley and to Pindaya.

2. In the Yawngwe State silk weaving is an important industry and is carried on to fairly large extent, but practically all the silk used by the weavers is brought up from Burma and through Kengtung from the French

Laos country. Sericulture is not practised in the Yawnghwe Valley principally on the ground that the people are Buddhists and are opposed to taking life. Mr. Browne, Adviser to the Yawnghwe Sawbwa, is of opinion, however, that the 'Inthas,' who form a fairly large percentage of the population of the Yawnghwe State and who eat beef and catch fish would probably take to sericulture if they could be shown that there was money in the undertaking, and provided a species of silk worm could be bred on the Willow (probably *Salix tetrasperma*) growing in the swamps near the Lake villages, on land unsuitable for paddy cultivation. Mr. Browne is growing willows planted close together (6 to 9 inches apart) on such land for twigs for basket making, and would be glad to experiment with silk worms if he could be supplied with species which are most likely to be successfully bred on the Willow.

3. Mr. Browne informs me that outside the Yawnghwe Lake area which is chiefly populated by Inthas, who are mostly cultivators and fishermen the people who would probably take up sericulture in the Yawnghwe State are certain Chinamen and Karen Christians; and that the two persons most likely to take it up are U Set Cho, the leading Chinese merchant at Fort Stedman and Yawnghwe and Maung Kazin, Deputy Inspector of Schools. Both the above are said to have taken up land for agricultural purposes in the Yawnghwe State and might be induced to take up sericulture, and grow mulberry trees in plantations.

4. Having regard to the facts that the mulberry tree is not commonly found in the forests of this division, which are usually remote from villages, and is only found cultivated near villages here and there and that the people are generally bigoted Buddhists opposed to taking life, the Forest Department could do little to advance sericulture in the Southern Shan States. As Mr. Browne, Adviser to the Yawnghwe Sawbwa, has expressed a desire to experiment with silk worms likely to be successfully bred on the willow, I would suggest that the Imperial Silk Specialist may kindly be asked to send Mr. Browne suitable seed, if available, direct. At the lower elevations in the Yawnghwe State away from the Lake area, I am of opinion that the mulberry could successfully be grown, and Mr. Browne might be able to have experiments carried out under his supervision by the two men mentioned in my paragraph 3 above.

5. The practice of sericulture is unknown in Kengtung State but much raw silk is produced in Siam and among the Laos to the East of the Mekong. Most of the better quality silk sold in the Kengtung Bazaar is believed to come from China and from the Lao country.

6. I regret that I have as yet received no report from the Assistant Superintendent, North Eastern, regarding the silk growing in Laika and Mongsit States, as he has not yet had time to visit the villages where it may be carried on, but it is believed that the industry has almost died out. Formerly the eggs were brought through Kengtung from China and possibly from the Lao country and grown on the Mulberry in small plantations near 3 or 4 of the villages in the Laklai Circle of Mongsit State, but the number of people engaged in it was small and none of them made it their sole occupation. The silk used to be dyed sometimes with indigo and sometimes with saffron.

7. If it is desired to encourage sericulture in the Southern Shan States I would suggest that the Superintendent and Political Officer may kindly be asked to assist. The Forest Officer may not deal with the villager except through the Political Officer and Shan Chief and the forests where silk worms might be grown are for the most part not easily accessible and are usually some distance from villages.

Toungoo.—Silk is produced in villages in the hills East and West of Yedashe in this district; the following extracts from a report by the Assistant Botanist describe the industry:—

1. *Silk in the Leiktho Township.*—This tract is situated about 20 miles to the East and North-East of Yedashe, a small station on the railway line

about midway between Rangoon and Mandalay. Its surface consists, for the greater part, of high hills with narrow, devious valleys between them. Every part is covered with forest of giant bamboos and tall evergreen trees. Palms, climbers, and herbaceous shrubs abound in the dense and tangled undergrowth. The virgin forest is still extensive, though generations of Karens have annually felled patches of it for rice cultivation. These clearings, known as Yas, are, in Leiktho, small in extent. Their average size is about 5 acres; frequently, however, they are only 2 acres, but sometimes extend to 8 or 10. Small sized Yas are, however, those that are the most commonly met with. These Yas are cut in rotation, with the period of rotation, varying from 6 to 10 years; and, even though virgin forest be felled, the clearings are abandoned after one year's cropping. Generally speaking, in a locality, like Leiktho, which enjoys an abundance of rain in the year, the rapidity of the growth of secondary forest speedily restores protection and fertility to areas that have been clear-felled for a season; so that, with practically little denudation of the soil, they are maintained in condition fit for crops by the long periods of rest they enjoy under cover of the new and fast-growing forest.

* * * * *

When, at the commencement of the rains, the Yas are cleared and sown with rice, a few mulberry cuttings, too, are put down. The cuttings strike root and the resultant plants are left to themselves until the beginning of October, when sericulture on the Yas is taken in hand. Silkworm eggs (seed) are then purchased from those who might have them to spare among the Karens, or from traders who hawk them about in the season. No system seems to be followed beyond feeding the worms once they hatch out. Almost every family raises at least a viss or two of silk in the year, and, from one to six broods are grown in the season,—October to May. This is the best season in Leiktho; the rains are said to be damp and unhealthy and the brief hot weather, likewise, injurious. When the Yas are abandoned at the end of the rice season, the mulberry bushes, too, are abandoned; but, fresh cuttings, taken from them, are set out on the Yas of the ensuing season. The mulberry grown is the common white var-variety *Morus alba*, var. *indica*, Linn. and the silkworm itself is a greyish-white creature which is probably a species of *Bombyx*. With a view to establish the identity of the species, I brought away several cocoons from Leiktho which have been made over to the Assistant Entomologist. Mr. Shroff is also engaged in rearing a very large brood of young caterpillars that hatched out from eggs brought in by me from the Ayodaung village (Yabein Tract). There seem to be two varieties of the worm, distinguished by white and yellow cocoons. The Leiktho cocoons are small and ill-shaped, doubtless, due to the under-feeding of the worms and the general absence of care in their breeding. The cocoons, with the chrysalises inside them, are thrown into pots of water and boiled. Whilst boiling, the silk is unravelled and spun on to a wire spindle by means of an iron-handled bamboo wheel. From this, when dry, the silk is reeled on to cross-beamed bamboo spindles. The silk produced is seldom sold, but is locally used chiefly for the weaving of the bright coloured strips that form the centres of the longyis or tamains of the women. These strips are about $1\frac{1}{2}$ yards in length and from 18 to 20 inches wide each. Besides this, the silk is made up into bags, belts, coats and trousers. The coat-and-trouser silk is usually white, but that for the other garments and articles is variously coloured.

At the time of my visit (last week of April) silkworms were being raised for seed only in one house in the Kntaington village. The only tray I saw there was a common sagaw (sieve) made of bamboo. It was about $2\frac{1}{2}$ feet in diameter with a 2 inch high border running around it. The worms in it were said to have been 20 days old at the time I saw them. They were then about one inch in length and otherwise puny for their age. There were thousands of them in the tray in which they were huddled together many layers thick. They were fed only twice a day, though the flourishing mulberry bushes in the garden were capable of furnishing crops of leaves sufficient to feed them at least four times daily. The cloth with which the tray was covered was one of the filthiest I had seen, it was intended to keep off the

myriads of flies that buzzed around the wretched worms! If this culture be taken as typical of the treatment which is generally accorded to silkworms in the township, it is no wonder that the cocoons are small and the silk itself somewhat poor and flimsy. But such as it is, I was told that the worms mature for silk in a moth from hatching out and that the silk itself, in the raw state, is worth from Rs. 12 to Rs. 15 per viss.

2. *The Yabein Tract.*—This tract lies to the west of Yedashe, about 30 miles beyond the railway line. It is a dreary country of moist, malarious, ever-green forest mingled with tall teak trees and large bamboos. It is much cut up by narrow streams that wind in and out at the foot of the hills. The road I took crossed the Lonyanchaung at least about a dozen times in a distance of only 8 miles. The mulberry, which is of the same species as that which is grown in Leiktho, is raised in little patches, of a few square feet each, on the silt of the river bank (Swa River) above flood-level. At the commencement of the rains cuttings from 6 to 12 inches, or thereabouts, in length are made from branches which are as thick as a lead pencil. These cuttings are set out in the silt at a slant of about 30 degrees with the horizontal. The cuttings are 2 to 3 feet apart. No attention is said to be given to the plants which readily shoot up in the moist earth. The plantations furnish leaf for feeding almost at once and last from 2 to 3 or 4 years, after which, they are abandoned for fresh ones. The arts of coppicing, pollarding, and pruning are unknown. Seed is purchased at the commencement of the season (first week of June) from traders, usually from Letpwegyi or Letpwegale, on the Myohla side, who hawk them about the villages of the Southern Swa Tract (Yabein Tract). Almost every village in this tract engages in the production of silk, and nearly every villager understands the raising of the mulberry and the rearing of the silkworm. Seed is purchased at the rate of 10 discs per rupee. A disc of seed is said to be the product of 17 fecundated female moths, which, on separation from the males, are placed, for a night, on soft paper within 3-inch-wide circlets of palmyra leaf-blades. The minute eggs are yellow in colour and are closely packed on the surface of the paper. The eggs turn dark grey before hatching out. The worms emerge in 8 or 10 days after the eggs have been laid. They are then little brownish creatures that swarm in the trays in which they are placed. The breeding trays in the Ayodaung village are 3 feet in diameter, neatly made, with a 3-inch-high rim running around them. They are circular in shape, like common sagaws, and are made of closely-woven bamboo slips. A rupee's worth of eggs is said to be sufficient to stock five of these trays which, if properly tended, are said to yield not less than half a viss of silk, worth from Rs. 9 to Rs. 10. When the worms hatch out, they are fed, for the first 5 days, upon the softest and youngest mulberry leaves. At the end of this period, they moult for the first time, after which they are fed upon mature leaves. The worms are said to moult five times in the 21 days of their larval stage. They increase in size with every moult and are fed from 4 to 5 times daily. The trays are cleaned out during the moults, when no food is either given or taken, no feeding, too, is done at night. The cocoons are spun on the 22nd day, and the moths emerge on the 8th, 9th or 10th day from spinning them. When the worms turn yellow after the last moult and show symptoms of restlessness, they are transferred from the breeding to the spinning trays. These trays are about 6 feet in diameter, with open-work bottoms to admit the air. Inside them, and coiled edgeways over the inner surfaces, are placed very long open-work ribbons of bamboo; and it is between the helix-like coils of these ribbons that the worms are placed to spin. The cocoons are said to be spun in a night. The moths, which are white, are not very active; the males are smaller than the females and seek the latter directly they emerge. The couples are mated only for a day, when, the males being thrown away, the females are placed within the circlets of leaf to lay. The eggs, too, are said to be laid in a night after which the moths are thrown away. Swa silk, then, is produced in from 40 to 41 days from the date of the laying of the egg—

In the egg	8 to 10 days.
In the larval stage	21 days.
In the cocoon	8 to 10 days.

During the breeding of the worms, the Yabeins give them every attention. They feed them from four to five times a day, the breeding-trays are large and airy, there is no crowding, and the trays are protected from dust and insects by being carefully covered over with cloth. The cloth is still far from clean, but it is an improvement upon the rag of the Karen. Moreover, though, like the Karen, the Yabein, too, has no special building to breed the worms in, the trays are suspended by string from the roof, or are placed upon bamboo racks that hang down from the rafters of the dwelling house. Ants are prevented from crawling down into the trays by the points of suspension of the racks being smeared over with crude earth-oil or other oily substance. No silkworm diseases are known in the tract. The separation of the silk from the cocoon is done on the Po-danyin, a rude hollowed-cut wooden wheel with a long handle attached to one side of it. To this wheel the silk is reeled from the cocoons which, as in Leiktho, are steeped in pots of boiling water. It is then reeled again on to the Po-yahat, which is a curious spindle consisting of 8 spokes and 4 bars. Swa silk is said to be better than any other, excepting only Pong-loung silk. The cocoons, which are both white and yellow, are about an-inch-and-a-half long; they are evenly formed, oval in shape, and are full of silk of much softness and strength. Swa silk always sells at from Rs. 2 to Rs. 5 per viss more than any other silk in the district. Of late, the Yabeins have, I hear, taken to Ya-cutting on a large scale, to the neglect of the silk industry, to a great extent. In Ayodaung, for instance, only 5 out of the 19 families and, in the neighbouring village of Thagyi-bauk, only 4 out of the 12, engage in the raising of silk at present. This circumstance is regrettable.

3. *Karenchaung and Nagyat*.—The mulberry is grown in both these villages, in the former as a hedge-plant, in the latter as silkworm fodder. In both places the plant flourishes as it seldom does elsewhere in the low-country; in both silk, too, it is said, used to be raised on a large scale in former times. The cause, or causes, of the decadence of the industry is unknown to the natives there. In the Nagyat village I saw at least one good plantation of mulberry trees, from ten to fifteen feet in height, which, though much neglected, are still well preserved. Enquiry here revealed the fact that, until Cholera decimated the population a few years ago, silk was one of its chief industries. At present, there are only three families who engage in it to any extent, though the profits are said to be remarkably good. In Nagyat, silk is raised throughout the rainy and cold weathers. The mulberry and silk are the same as those that are raised in Leiktho and the Swa tract. The silk produced is said to fetch Rs. 14 to Rs. 16 per viss, as raw silk; but when woven, fetches a better price. It is usually woven into women's longyis. These tameins, as they are called, are each $3\frac{1}{2}$ cubits long and 20 inches wide. It is said that as many as 9 such tameins can be woven from a single viss of silk. The tameins sell at from Rs. 3 to Rs. 5 each, so that, the produce of a single viss of silk sells at from Rs. 27 to Rs. 45.

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Suggestions for Improvement and Extension.

1. *In the Leiktho Township*.—The Leiktho Karens, large numbers of whom I addressed through their elders and headmen as well as through Fathers Conti and Pacati (Roman Catholic Priests of the Italian Mission to the Karens), expressed much willingness to engage in the production of silk on a large and systematic scale, provided the Government undertook to help them in the industry. The question as to whether, in their backward condition, the Karens would take to Sericulture in preference to Ya-cutting, is one which time alone can answer. To endeavour to make a whole tribe to unlearn practices which to it are like instincts, will necessarily be fraught with very great difficulty. The task of improvement would appear, at the start, to be beset with obstacles peculiar to the Karen. The prodigality of Nature in the region he inhabits—the ease with which, with little labour and less care, crops can be raised to meet his requirements—has made of the Karen a lazy

man. When he has cleared a patch of forest and sown it with grain-crops, he seems to feel that he has fulfilled his every expectation and whole duty in life! His love of ease, indolence, ignorance, and natural distrust of things, however good, that are new, but, above all, his happy contentment of mind, will be extremely hard to wean him from. But he is naturally intelligent, quick of imitation, and has shown himself able to discern and appreciate things that are likely to prove to his benefit. For instance, when the coffee industry on the Leiktho hills, which was started by the Priests some years ago, began to flourish and yield good returns, the Karens readily took to it and opened out several plantations of their own which thrived exceedingly until destroyed by the Blight.

* * * * *

As regards silk, I desire to point out that the advantages of Leiktho for the extension of the industry appear to me to be the following:—

- (1) The knowledge, though indifferent, which the Karen already possesses in the raising of the mulberry and of the silkworm.
- (2) The presence of extensive areas of suitable land for the establishment of permanent mulberry plantations.
- (3) The complete naturalization of the *Morus indica* in Leiktho.
- (4) The climate of the locality which is favourable for Sericulture.

In the presence of these facts, I would recommend:—

- (1) The establishment of carefully-laid-out plantations of mulberry in at least six of the more important silk-growing villages. These plantations should be permanent estates, to be conserved and managed, like Communal Forests, for the common benefit of each village-community. They should aim at the production of the largest trees that would be capable of yielding regular crops of leaf to meet every important requirement of sericulture. The areas of these plantations will, of course, depend upon the total average number of individuals who would be found in each village or group of villages prepared to undertake systematic sericulture, subject to the control of expert supervision.
- (2) The establishment, in suitable localities, *e.g.*, Shwenangyi, of model silk farms or depôts for the production and distribution of good, healthy seed; the demonstration of improved methods of breeding, and of reeling, spinning, and the other processes involved in the production of raw silk of good quality. The depôts should also, as far as possible, experiment with new varieties of silkworm; and small areas near them set apart for the experimental cultivation of other varieties of the mulberry, because, of all the facts connected with the industry, we are at present least certain as to whether the worm and plant now raised in Leiktho are, economically, those that are the most suited to the locality.
- (3) The necessity for the services of a trained Forester and of an expert Sericulturist are, of course, indicated in the suggestions I have made above; for, I am inclined to the belief that, without some assurance that so important a matter had been consigned to the immediate control of competent persons, it would be futile to attempt its serious undertaking.
- (4) It is also imperative that a suitable market be secured for the product directly it is available; otherwise, its economic production is likely to suffer, particularly in its continuity.

2. *In the Yabein Tract.*—Though he produces one of the finest of Burmese silks, the Yabein, in his methods, leaves much to be desired. He is,

after all, only a little better than the Karen; his silk is still coarse and wanting in gloss; the breeding-trays are still housed in the dwelling-hut; the machinery used is of the rudest description; there are no permanent mulberry plantations, so that, leaf-production is still a precarious matter. In these circumstances, I would recommend:—

- (1) The placing of the Swa silk-tract, too, under expert surveillance.
- (2) The encouragement of the production of silk and the discouragement of Ya-cutting in the tract.
- (3) The opening out of the permanent mulberry plantations and their conservation and management, as suggested for Shwenangyi.

The work of the experts in the Swa tract would take the shape of over-seeing and advice rather than of direct help in the industry; sympathetic aid and guidance, it is, that appear to be indicated in the Yabein tract; therefore, I find insufficient reason as to why the two experts recommended for Shwenangyi should not also suffice for the Yabein tract.

3. *In the Low Country.*—Though the natural facilities for the expansion of Sericulture in parts of the low country seem to be good the possibility for its immediate extension appear to be both poor and remote. As has been already stated, the mulberry flourishes at Karenchaung and Nagyat. Both these villages are situated on the left bank of the Sittang river. They have mixed populations of Burmese, Karens, and Shans. In both Nagyat and Swa it is the Burmese that raise silk, though the chief objection raised by them elsewhere in the low country is said to arise from religious scruples against the taking of life by the Buddhist. This refers to the boiling of the cocoons for the reeling of the silk, whilst the chrysalides are still enclosed in them. As the objection is based on religious belief and as there seems to be no method now known by which the silk could be reeled without destroying the chrysalides the prospect of the expansion of sericulture in the low country is, as I have said, very problematical."

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V.—ORISSA AND MADRAS COAST NORTH.

Orissa Division of Bihar and Orissa—

Cuttack	M. 11-2 E. T. W.
Balasore	11-2. (T). W.
Angul	10-3 (T).
Puri	11-2. (T). W.
Sambalpur	10-3. T. W.
Orissa States	10-3 E. T. W.

Madras Coast North—

Ganjam	(T) W.
Ganjam Agency	(T).
Vizagapatam	(T).
Vizagapatam Agency	(T).
Godavari	(T) W.
Godavari Agency	(T).
Kistna	(T).
Guntur	(T).
Nellore	(T).

VI.—BIHAR AND UNITED PROVINCES EAST.

Patna Division—

Patna	(T).
Gya	(T). W.
Shahabad	(T).

Tirhut Division—

Saran	M. 2-3 10-11 E. (T).
Chumparan	S. M. M. 2-3 10-11 E. (T).
Muzaffarpur	M. 2-3 10-11 (T).
Darbhanga	M. 2-3 10-11 E. (T).

Bhagalpur Division—

Monghyr	(T).
Bhagalpur	(T) W.
Purneah	S. M. 2-3 (T).
Sonthal Pergunnahs	H. T. W.
Darjeeling	H.

Lucknow (Division)

Unao	M. 2-3 E.
Rae Bareilly	M. 2-3.
Sitapur	M. 2-3.
Hardoi	M. 2-3 E.
Kheri	M. 2-3.

Benares (Division)

Ghazipur	2-3 W.
Ballia	2-3.
Jaunpur	2-3.
Mirzapur	2-3 T.

Gorakhpur (Division)

Basti	2-3 E.
Azamgarh	2-3 W.

Allahabad (Division)

Fatehpur	M. E.
Cawnpore	
Farukhabad	W.
Etawah	
Hamirpur	
Banda	

Fyzabad (Division)

Gonda	M.
Bahraich	
Sultanpur	
Partabgarh	M. E.
Bara Banki	W.
Pilibhit	2-3.
Shahjahanpur	2-3 (Eri).

VII.—UNITED PROVINCES WEST AND PUNJAB EAST AND NORTH.

<i>Meerut (Division)—</i>		
Dehra Dun	S. M. M. 3-4-7-11 E. (T).	
Saharanpur	M. 2-3.	
Muzaffarnagar.		
Bulandshahr.		
<i>(Kumaun Division)—</i>		
Garhwal	H. M. 4-9 (T).	
Almorah	H. M. 4-9 (T).	
Naini Tal	H. M. 4-9 (T).	
<i>(Rohilkhand Division)—</i>		
Bareilly	M. 2-3 E.	
Bijnor	2-3.	
Moradabad	M. 2-3 E.	
Bidaun.		
<i>Agra Division—</i>		
Muttra.		
Aligarh.		
Mainpur.		
Etah.		
Jalaun.		
Jhansi	(T).	
Rampur State.		
Tehri Garhwal State.		
<i>Delhi Division—</i>		
Hissar	M.	
Rohtak.		
Gurgaon.		
Delhi	W.	
Karnal.]		
Ambala	M. S. 2-3 E.	
Simla	H. M. 6-7-8-9 E. (T).	
<i>Jullundur Division—</i>		
Kangra	M. S. 4-5-6-7-8-9 E. (T).	
Hoshiarpur	M. S. 2-3-4 E. (T).	
Jullundur	M. 2-3-4 W.	
Ludhiana	M. S. 2-3-4 E. W.	
Ferozepore	M. S.	
<i>Lahore Division—</i>		
Lahore	M. S. 2-3 E. W.	
Amritsar	M. S. 2-3-4 E. W.	
Gurdaspur	S. M. M. S. 2-3-4 E. (T).	
Sialkot	S. M. M. S. 2-3-4 (T).	
Gujranwala	M. 2-3-4 E.	
<i>Rawalpindi Division—</i>		
Gujrat	M. S. E.	
Jhelum	M. S. E.	
Rawalpindi	M. 3-4 E.	
Attock	M. S. 3-4.	
<i>Native States—</i>		
Loharu.		
Dujana.		
Pataudi.		
Kalsia	M. E.	
Nahan.		
<i>Simla Hill States—</i>		
Jubbal.		
Bushahr.		
Keonthal.		
Baghal.		
Bilaspur.		
Nalagarh.		
Minor Hill States.		

VII.—UNITED PROVINCES WEST AND PUNJAB EAST AND NORTH—*contd.**Other Native States—*

Mandi	M. E.
Suket.	
Kapurthala.	
Malerkotla.	
Chamba.	

Phulkian States—

Patiala	M. 3 E.
Jhind.	
Nabha.	

VIII.—KASHMIR STATE.

Jammu H. S. M. M. S. (2) 3-4 (T).

Jammu.
 Jasrota.
 Udhampur.
 Riasi.
 Mirpur.
 Bhadarwah Jagir.
 Punch Ilqa.

<i>Kashmir</i>	S.
Kashmir North	S. 5-6-7.
Kashmir South	S. 5-6-7.
Muzaffarabad.	

Frontier—

Laddakh.
 Gilgit.
 Frontier Ilqas.

IX.—NORTH-WEST DRY AREA.

Multan.	
Muzaffargarh.	
Dera Ghazi Khan.	
Shahpur	M. S. 2-3-4 E.
Mianwali.	
Bhawalpur State.	
Montgomery	M. E.
Lyallpur	M. E.
Jhang.	

North-West Frontier Province—

Hazara.	
Peshawar	M. 3-4.
Kohat	M. 3-4 E.
Bannu.	
Dera Ismail Khan.	
Malakand Agency.	
Khyber Agency.	
Kurram Agency.	
Tochi Agency.	
Wana Agency.	

Sind—

Hyderabad.
 Karachi.
 Larkana.
 Sukkur.
 Thar and Parkar.
 Upper Sind Frontier.

States—

Khairpur State.	
Bikanir.	
Jaisalmer.	
Marwar	M. J.
Ajmere.	
Merwara.	

X.—BALUCHISTAN.

Quetta-Pishin.
Loralai.
Zhub.
Bolan.
Chagai.
Sibi.

States—

Kalat M. 6-7 E.
Sarawan.
Jhalawan.
Kachhi.
Dombki Kaheri country.
Makran.
Kharan.
Las Bela.

XI.—RAJPUTANA AND AJMER-MERWARA.

*Rajputana.**Eastern Division—*

Alwar E.
Bharatpur.
Bundi.
Dholpur.
Jaipur.
Jhalawar.
Karsuli.
Kishangarh.
Kotah.
Lawa.
Shahpura.
Tonk.

Southern Division—

Banswara.
Dungarpur.
Kushalgarh.
Mewar.
Partabgarh.
Sirohi.

*Rajputana East and Central India West.**Central India—*

Indore M. E.
Gwalior M. E.
Bhopawar.
Malwa.
Bhopal M. E.

XII.—GUJARAT.

Ahmadabad W.
Broach.
Kaira.
Panch Mahals.
Surat W.
Cambay State.
Cutch.
Kathiawar Eri.
Mahi Kantha Agency.
Palanpur Agency.
Rewa Kantha Agency.
Surat Agency.

Baroda—

Baroda M. E. Eri.
Kadi.
Navsari M. E. Eri.
Amreli.

XIII.—CENTRAL INDIA EAST, CENTRAL PROVINCES, CHOTA NAGPUR.

<i>Jubbulpore Division</i>	10-2.
Saugor	7-10 W.
Damoh	7-10
Jubbulpore	7-10 W.
Mandla	7-10.
Seoni	7-10 (T).
<i>Nerbudda Division.</i>	10-2.
Narsinghpur	(T).
Hoshangabad	7-10 (T).
Nimar	(T) W.
Betul	(T) W.
Chhindwara	M. 3-4 6-11 E. (T).
<i>Nagpur Division</i>	10-2.
Wardha	W.
Nagpur	W.
Chanda	6-11 T. W.
Bhandara	(T) W.
Balaghat	(T) W.
<i>Chhattisgarh Division</i>	10-2.
Raipur	6-11 T. W.
Bilaspur	6-11 T. W.
Drug	(T).
<i>Berar</i>	10-2.
Amraoti	M. W.
Akola.	
Buldana.	
Yeotmal.	
<i>Feudatory States—</i>	
Makrai.	
Bastar	(T) W.
Kanker.	
Nandgaon.	
Khairagarh.	
Chhuikhadan.	
Kawardha.	
Sakti.	W.
Raigarh	W.
Sarangarh	W.
Chang Bhakar.	
Korea.	
Surguja.	
Udaipur	(T).
Jashpur.	
Bundelkhand	(T).
Baghelkhand.	(T).
<i>Chota Nagpur Division—</i>	
Hazaribagh	H. 6-1 T.
Ranchi	H. 10-2 5-6 T.
Palamau	H. 6-1 T.
Manbhum	H. 6-1 T.
Singhbhum	H. 6-1 T.
Chota Nagpur States	(T).

XIV.—DECCAN.

<i>Bombay, Central Division—</i>	
Ahmadnagar	M. 7-2 E.
Khandesh East	M. 7-2 E.
Khandesh West	M. 7-2 E.
Nasik	M. 7-2 E. W.
Poona	M. 7-2 E. W.
Satara	10-2 (T).
Sholapur	7-2.
Belgaum	M. 7-3 E. (T).
Bijapur	7-2.
Dharwar	M. 7-3 E. (T).

XIV.—DECCAN—contd.

Bombay, Central Division—contd.

Akalkot State.
 Bhor.
 Surgana
 Kolhapur.
 Southern Maharashtra Jaghira.
 Savanur.
 Khandesh Agency.
 Bijapur Agency.
 Kolhapur Agency.
 Satara Agency.

Hyderabad-Deccan—

Hyderabad City.
 Atraf-i-Balda.

Warangal—

Karimnagar.
 Adilabad.

Medak—

Nizamabad.
 Mahbubnagar.
 Nalgonda.

Aurangabad—

Bhir.
 Nander.
 Parbhani.

Gulbarga—

Osmanabad.
 Raichur.
 Bidar.

*Mysore.**Eastern Division—*

Bangalore	M. S.p.	1-12.
Kolar	M. S.p.	1-12.
Tumkur	M. S.p.	1-12.
Mysore	M. S.p.	1-12.
Chitaldrug.		

Western Division—

Hassan.
 Kadur.
 Shimoga.

Coorg—

Mercara	11-12.
Virarajendrapet	?

Madras—

Bellary	6-2.
Kurnool.	
Anantapur.	
Cuddapah	9-2.
Sandur State.	
Banganapalle State	E.

XV.—MALABAR AND KONKAN.

Travancore	M. E.
S. Canara	11-2 E. (T).
Anjengo	11-2.
Malabar	11-2 (T).
Cochin.	
Bombay City.	
Thana	11-2.
Colaba	11-2.
Ratnagiri	11-2.
Canara	11-2 (T).
Janjira State.	
Jawahar State.	
Savantvadi State,	

APPENDIX VIII.

CLIMATE TABLES.

In the following pages figures are given which represent the climate for each month for a number of localities arranged in the order of natural divisions as listed in Appendix VII. After the District, the elevation in feet is given. The first line represents mean maximum temperature for each month from January to December, the second represents mean minimum, the third represents mean humidity at 8 A.M. and the fourth wet bulb for the mean of the day. The figures are copied from Memoirs of the Indian Meteorological Department No. XXII, Part III (1914), or obtained from Dr. G.T. Walker, Director General of Observatories, and have been added to and brought up to date by Dr. Simpson. Figures in italics indicate unsuitable conditions.

In some cases a fourth line is added which is the wet bulb mean. Dr. Walker, suggested that instead of using the factor maximum humidity as an index of suitability (85×85 being near the limit at which worms will grow), the wet-bulb figure alone should be used.

Examining districts in which we know the behaviour of silk worms, whenever the wet-bulb 8 A.M. mean is here over 75° , the conditions are unsuitable on account of excessive humidity and temperature.

There are three conditions in which sericulture is impossible :—

- (1) Mean maximum for the month 100° F. or over,
- (2) Mean minimum 50° F. or under, and
- (3) Mean wet-bulb 75° F. or over.

Whether a mean humidity under 50 per cent. without the temperature being over 100° is also a limiting condition is not clear, but it probably is.

It is a distinctly limiting factor that in wet areas trays must be used and the cost of these will knock out silk unless at least two broods are got, preferably more. This does not apply to dry areas in which a brood can be got without trays and so one brood alone pays.

This must be kept clearly in mind in all districts, where say the rains are cool and allow of sericulture. If this period will not allow of several broods it is probably of little use.

So too rain on leaf is a bad factor and continued feeding of wet leaf will lead to disaster.

For very many districts, nothing but a definite experiment will tell and it will be well to systematically test all areas. Do it by—

- (1) selecting best time,
- (2) „ place with population,
- (3) planting mulberry,
- (4) erecting small house or renting one,
- (5) putting a fieldman there to rear, employing a family on wages for it,
- (6) getting broods of the proper race and either selling them or having them reeled elsewhere,
- (7) discussing results with local officers and finding out weak spots.

I.—LOWER BURMA.

Arakan Division—Akyab 20'.

81	85	89	92	91	86	85	85	86	87	85	81
59	61	69	76	78	78	77	77	78	77	71	63
89	84	84	81	84	93	94	94	93	91	90	90
63	65	71	77	79	78	78	78	78	77	73	67

Pegu Division—Rangoon 18'.

89	93	96	98	92	86	85	85	86	87	87	87
65	67	71	76	77	77	76	76	76	76	73	67
82	84	85	80	86	92	93	93	92	90	86	83
67	69	72	76	77	77	77	77	77	77	74	69

Irrawady Division—Bassein 27'.

86	90	94	96	92	86	85	85	86	87	86	84
63	66	71	76	77	77	76	76	76	76	72	65
88	87	85	79	85	92	93	94	93	93	87	86
66	68	73	76	77	77	77	77	77	77	75	70

Tenaasserim Division—Mergui 65'.

88	89	91	92	89	86	85	85	85	87	87	87
68	70	73	74	74	74	73	93	73	73	70	67
82	85	83	82	88	92	93	93	93	89	82	77
71	74	76	77	77	75	75	75	75	75	74	71

II.—UPPER BURMA

Magwe Division—Thayetmyo 121'.

86	92	99	103	99	91	89	89	90	90	88	84
54	57	66	76	78	77	76	76	76	74	67	58
76	66	60	62	71	83	85	86	85	85	80	79
62	63	71	76	78	77	78	77	77	77	72	66

Minbu 165'.

85	91	99	103	99	92	91	90	90	91	87	83
57	61	69	77	79	78	77	77	77	75	69	61
75	65	57	62	72	83	84	85	86	84	79	78

Mandalay Division—Mandalay 250'.

84	90	98	102	100	95	95	93	93	92	87	83
56	60	68	78	79	79	79	78	77	75	68	59
83	69	54	56	69	76	75	79	83	83	85	86

Bhamo—361'.

76	81	88	93	94	90	88	88	90	88	81	75
49	53	60	67	72	75	75	75	75	70	60	51
95	89	81	76	80	90	93	93	91	89	91	94

Mitkyina 458'.

74	78	85	89	92	88	87	87	90	86	80	75
49	54	61	67	73	75	76	76	76	71	61	52
90	86	79	76	78	90	91	91	90	89	86	89

Sagaing Division—Monywa 280'.

82	87	96	101	100	93	95	93	92	90	85	80
57	60	67	75	79	79	79	78	78	75	67	59
86	74	59	59	69	81	80	83	87	89	88	89
67	69	72	76	77	77	77	77	77	77	74	70

Meiktila Division—Yamethin 657'.

86	91	98	101	97	91	90	89	91	91	87	84
56	60	69	76	77	75	75	75	75	74	67	58
80	71	62	65	75	83	85	87	88	87	85	85

Northern Shan States—Lashio 2,820'.

75	79	86	90	88	85	83	83	84	83	78	74
46	49	56	63	67	70	70	69	68	64	55	48
91	82	70	69	81	87	89	91	92	93	93	94

Kindat—377'.

76	82	91	96	95	90	88	87	88	87	81	76
53	54	60	67	74	76	77	76	75	72	64	56
96	94	86	80	83	90	91	92	92	92	94	96

III.—ASSAM.

Surma Valley—Silchar 104'.

78	81	86	88	89	89	90	89	90	89	85	80
52	55	63	69	73	76	77	77	76	72	63	55
91	86	81	83	85	89	90	91	90	89	87	90
59	61	67	72	75	78	79	78	78	75	68	61

Chandkhira.

78	81	88	89	90	89	89	90	90	87	84	80
49	52	57	66	69	74	75	75	75	70	60	50
94	93	87	86	84	89	91	91	90	92	95	96

Hailakandi 75'.

77	79	86	87	90	89	90	89	90	88	85	80
51	52	60	68	72	75	76	76	76	71	62	53
94	90	87	88	87	90	90	91	91	93	93	92

Srimangal 38'.

80	83	89	91	91	90	90	90	91	89	86	81
49	52	61	69	72	75	77	76	76	71	59	50
91	87	83	86	85	88	87	86	87	86	88	90

III.—ASSAM—contd.

Hill Districts—Shillong 4,920'.

61	62	70	74	74	74	76	75	75	72	67	62
39	42	51	57	59	63	64	63	62	55	46	39
70	68	52	61	72	83	87	87	85	79	75	70

Rain— 0.44, 0.81, 1.90, 4.31, 9.78, 16.18, 13.4, 13, 13.4, 6, 1.09, 0.29 = TOTAL 80.60

Assam Valley—Dibrugarh 353'.

71	72	78	79	84	87	87	87	87	85	79	73
49	54	60	65	71	74	75	76	75	69	60	50
96	92	86	89	89	92	93	93	92	89	89	95

Jorhat 284'.

72	74	80	82	86	90	90	89	89	87	81	75
49	52	59	66	71	76	77	76	76	70	60	50
95	94	86	87	86	86	89	90	90	90	94	95

Gauhati 196'.

74	78	85	87	88	89	90	90	90	87	82	75
50	52	59	67	72	76	78	78	77	71	61	51
96	89	79	82	86	89	88	88	88	89	93	97

Panerihat.

74	75	82	83	85	87	89	88	89	87	82	76
46	48	55	64	69	74	75	75	74	67	57	48
95	89	81	86	91	93	95	95	95	93	93	92

IV.—BENGAL.

Burdwan Division—Burdwan 99'.

79	83	93	100	98	94	90	89	90	89	84	79
55	59	68	75	77	79	79	79	79	75	64	56
75	71	67	72	77	87	87	88	86	81	75	73
58	61	68	74	77	79	79	79	79	75	66	59

Midnapur 149'.

81	85	95	101	100	94	90	90	90	89	85	80
56	61	69	76	78	79	79	78	78	73	63	55
71	68	67	69	74	82	86	87	86	79	71	68

Presidency Division—Jessore 30'.

77	82	92	97	95	91	89	89	89	88	83	77
53	57	68	75	77	79	79	79	78	74	64	55
86	81	80	81	83	88	89	90	89	85	83	84
59	61	70	76	78	80	80	80	79	76	67	60

Berhampur 67'.

77	81	92	99	97	92	89	89	89	88	82	77
53	56	66	74	76	78	79	79	79	74	64	55
86	80	70	74	81	87	91	91	89	85	84	84
58	59	67	73	77	79	80	79	79	75	67	59

Rain— .5, .93, 1.02, 1.60, 5.16, 9.50, 10.68, 11.92, 10.27, 3.59, .45, .1 = TOTAL 55.72

Rajshahi Division—Dinajpur 123'.

75	79	89	95	92	89	89	89	89	87	83	77
49	52	61	70	74	77	79	79	77	72	61	51
88	80	67	72	79	89	90	90	89	85	83	87

Jalpaiguri 283' S.M.

73	76	85	89	89	88	88	88	88	86	82	76
51	53	60	68	72	76	77	77	76	70	61	53
91	85	76	75	83	89	91	92	90	87	84	87

Bogra 75'.

76	80	90	96	92	89	89	89	89	87	83	77
52	54	63	72	74	77	79	79	78	73	63	54
84	78	73	77	81	87	88	88	87	84	83	83

IV.—BENGAL—*contd.*

Dacca Division—Mymensingh 63'.

75	79	87	91	89	87	87	87	88	87	82	77
53	56	64	72	74	77	78	78	78	74	64	55
90	83	79	81	84	89	90	90	90	87	87	90

Chittagong Division—Chittagong 87'.

78	82	87	89	89	87	86	86	87	87	83	78
55	59	67	73	75	77	77	76	76	73	65	58
88	83	82	80	81	86	88	88	88	89	88	89
61	64	71	76	77	78	78	78	78	76	70	63

Dam Dim S.M.

81	81	86	89	91	91	91	91	92	91	87	85
44	46	53	64	70	73	75	75	74	65	53	43
96	93	88	86	89	94	95	95	94	90	93	95

Kalchini S.M.

75	76	84	87	89	88	89	89	89	88	84	78
46	49	55	65	70	74	75	75	74	66	56	47
80	77	74	78	82	87	87	87	86	81	75	73

Nagrakata S.M.

74	77	84	88	88	88	89	88	90	89	84	78
52	54	59	66	70	74	75	75	74	67	59	52
81	75	72	73	83	89	90	89	86	80	73	73

Noakhali 43'.

78	81	86	89	89	87	86	85	87	86	83	78
53	57	67	74	76	77	77	77	77	73	63	55
89	85	84	81	83	88	90	90	89	88	87	88

Cooch Behar 156'. (15 years figures).

73	77	84	88	88	88	89	89	88	87	81	76
52	54	61	69	73	76	78	78	77	72	61	53
92	87	79	80	85	90	90	90	90	85	85	90

Hill Tipperah—Comilla 36'. (28 years figures).

78	82	89	92	91	88	87	87	88	88	84	79
53	57	67	73	75	77	77	77	77	73	64	55
87	84	84	82	84	88	89	89	89	86	85	86

Sikkim—Pedong.

56	59	69	73	73	75	75	74	74	71	65	59
43	43	51	56	59	64	66	65	63	57	49	45
77	73	68	73	81	89	91	91	88	82	74	74 10A.M.

V.—ORISSA AND MADRAS COAST NORTH.

Orissa Division—Cuttack 80'.

84	89	97	102	101	96	90	89	90	90	85	82
60	65	73	78	80	80	79	78	78	75	66	59
81	80	78	74	73	78	82	83	83	80	78	77
63	66	73	77	79	79	78	78	78	75	68	62

Sambalpur 486'.

82	87	96	104	107	98	87	87	89	89	84	80
55	60	67	75	81	81	77	77	77	72	61	54
73	66	55	50	50	69	85	85	82	77	74	74
61	63	68	72	76	78	77	78	78	74	66	60

Angul 455'.

82	87	95	101	104	95	88	87	89	89	85	79
56	61	67	74	79	79	77	77	77	71	60	55
80	76	67	67	67	78	85	86	86	79	73	79

Ganjam—Gopalpur 33'.

80	83	87	88	90	90	87	87	88	88	83	80
62	67	73	77	80	80	79	79	78	74	66	61
80	78	78	82	82	83	84	85	85	82	78	77

V.—ORISSA AND MADRAS COAST NORTH—*contd.*

Vizagapatam—Waltair 226'.

81	84	87	89	92	91	89	89	89	88	84	81
68	71	75	78	81	80	79	78	78	76	72	68
72	73	73	71	71	73	78	79	79	72	63	62
67	70	74	77	79	79	77	77	78	75	70	66

Godavari—Cocanada 26'.

82	86	92	96	100	97	91	89	90	88	83	81
66	70	74	79	82	81	79	78	78	76	71	66
77	77	77	76	73	74	80	83	82	79	74	73
67	71	74	77	80	78	77	77	77	75	71	67

Nellore 66'

86	90	95	100	105	102	97	96	95	91	86	84
67	69	73	77	82	82	80	79	78	76	71	68
87	85	81	74	63	60	66	70	74	80	83	85

VI.—BIHAR AND UNITED PROVINCES, EAST.

Patna 183'.

73	78	90	100	100	96	91	89	90	89	82	74
51	54	64	73	78	80	80	79	79	73	61	52
78	69	52	51	64	77	86	87	83	74	71	75
55	57	63	69	75	79	80	79	79	72	63	56

Gya 372'.

75	81	93	103	105	100	92	90	91	90	83	76
51	56	66	75	80	81	79	78	78	71	59	51
75	69	55	51	58	73	83	86	82	73	71	72
55	57	64	71	75	79	79	79	78	72	62	56

Tirhut Division—Darbhanga 165'.

73	77	88	96	96	92	89	89	89	87	82	75
51	53	62	71	76	79	80	79	79	73	61	53
88	79	63	65	72	83	88	89	87	83	83	87
57	58	64	71	76	79	80	80	79	74	65	58

Bhagalpur Division—Purneah 124'.

74	79	90	97	95	92	90	89	89	88	82	76
48	51	60	70	74	77	79	79	77	71	51	49
91	84	68	68	77	87	90	91	90	88	89	91
55	57	64	71	75	79	80	80	79	74	64	57

Naya Dumka 489'.

75	80	91	100	99	94	89	88	89	88	82	76
51	56	65	74	77	78	78	77	77	71	60	51
75	65	50	52	67	80	87	88	85	78	74	73

Gorakhpur Division—Gorakhpur 257'.

73	77	90	100	101	97	91	90	90	89	82	74
49	52	62	72	77	79	79	79	78	70	58	50
82	72	57	53	63	78	87	88	84	77	76	81
54	56	64	69	74	79	80	79	78	71	62	55

Benares 267'.

74	79	92	103	105	101	92	90	91	90	83	75
48	52	61	72	79	82	80	79	77	68	55	48
83	75	56	47	52	68	83	87	84	74	75	81
53	55	62	67	72	77	79	79	78	70	60	54

Bahraich 407'.

72	76	88	99	103	99	92	90	91	91	83	75
47	50	59	69	77	80	79	78	77	68	57	48
87	77	62	51	59	74	85	87	82	76	77	82

Allahabad 309'.

74	79	92	103	107	103	93	90	91	91	83	76
48	52	62	72	80	83	80	79	77	67	55	48
79	68	47	36	42	60	81	86	81	68	69	77
54	56	61	67	72	77	79	79	78	69	60	54

VI.—BIHAR AND UNITED PROVINCES, EAST—contd.

Lucknow 368'.

73	78	91	102	105	101	93	90	92	91	84	76
47	51	60	71	78	81	79	79	76	66	53	46
81	69	51	39	46	65	82	87	81	70	72	79
53	55	61	67	72	77	79	79	77	69	59	54

VII.—UNITED PROVINCES WEST AND PUNJAB EAST AND NORTH MEERUT DIVISION—MEERUT 733'.

70	74	86	98	103	101	93	91	92	91	82	73
45	48	57	67	75	81	79	78	75	63	51	45
78	71	57	42	42	58	77	82	77	67	69	75
50	52	60	65	70	75	78	77	75	65	56	51

Dehra Dun 2,233'.

66	69	79	90	95	94	86	84	85	83	75	69
45	47	55	63	70	75	74	73	70	61	52	46
78	72	58	46	45	64	85	91	83	68	71	74
48	49	55	60	65	71	74	74	71	62	55	49

Kumaun—Mukteswar 7,592'.

50	50	60	69	75	75	70	69	69	67	60	54
35	35	43	50	55	58	58	58	55	50	43	38
55	59	46	40	48	69	91	94	83	56	47	43
35	36	41	46	52	58	60	60	57	49	41	36

Rohilkhand—Bareilly 568'.

70	75	87	99	103	100	92	90	91	89	82	73
46	50	59	69	76	80	79	78	76	65	53	46
83	75	60	47	49	67	84	88	82	76	76	81
52	54	62	67	72	77	79	78	77	68	58	52

Agra—556'.

73	78	90	101	107	104	94	91	93	93	85	75
49	52	63	73	81	85	81	79	77	68	57	49
71	63	48	36	38	54	77	81	74	57	57	67
53	54	61	66	71	77	79	79	76	67	58	53

Jhansi 824'.

76	81	93	103	108	104	92	89	91	93	86	78
51	56	66	77	84	85	79	77	76	70	59	52
65	56	43	35	38	56	79	83	77	56	52	59
53	54	62	66	71	76	77	77	75	68	58	53

Kumaon Division—Pithoragarh 5,363'.

60	60	70	79	81	82	79	77	77	74	68	65
41	42	50	58	60	65	66	65	63	55	47	43
67	60	51	41	50	68	85	86	81	65	60	60 10 A. M.
43	43	50	55	58	64	68	67	65	57	49	45

Delhi 718'.

70	75	86	99	105	104	94	92	93	92	83	73
48	51	62	73	80	84	81	80	77	68	57	49
68	63	51	39	39	53	74	79	71	52	54	63
51	53	61	66	71	76	79	78	75	67	57	51

Ludhiana 812'.

66	71	83	96	104	105	97	94	94	92	81	70
44	48	57	67	76	81	80	79	75	63	52	44
82	76	62	46	39	50	73	80	76	61	64	75
49	51	59	65	70	75	79	78	75	65	56	50

Sialkot 830'.

66	69	81	94	103	106	98	94	95	93	81	70
43	46	55	66	75	81	80	78	74	63	50	43
81	77	68	51	41	50	71	79	72	60	66	75
49	51	59	64	69	75	79	78	75	65	55	50

VII.—UNITED PROVINCES WEST AND PUNJAB EAST AND NORTH MEERUT DIVISION—MEERUT 733'—*contd.*

Lahore 702'.

68	72	84	97	105	107	101	98	98	95	84	73
41	45	55	65	73	80	80	79	73	60	48	41
85	79	66	50	41	50	70	75	70	61	71	82
49	51	58	65	69	75	79	79	75	65	56	49

Rawalpindi 1,674'.

62	65	75	87	98	103	97	94	93	89	78	67
38	41	51	59	69	75	77	75	69	57	44	37
82	79	70	56	42	44	69	78	69	58	64	74
45	46	55	61	67	73	77	77	71	61	51	45

Phulkian State—Patiala 818'.

68	71	83	94	103	103	95	92	93	91	82	71
43	47	57	67	77	81	79	79	75	63	52	44
79	75	63	47	44	57	78	83	76	64	65	78

Simla 7,232'.

46	46	55	65	73	74	69	67	66	63	56	50
35	35	44	51	58	61	60	59	57	51	45	39
53	56	45	40	44	61	86	91	77	48	41	41
35	35	41	47	52	58	61	61	57	47	41	36

Murree 6,333'.

46	47	57	67	76	82	77	74	73	69	61	52
34	34	42	51	59	64	62	61	59	53	45	39
62	64	56	48	41	49	76	83	66	43	38	48
34	35	41	48	53	59	63	63	58	49	41	36

Sarain—(Simla Hill States) 7,200'.

45	45	53	64	72	75	72	70	69	65	58	51
27	27	33	42	49	56	59	58	52	42	35	30
85	85	68	52	48	58	79	83	75	67	63	78

Chakrata 7,072'.

51	51	61	69	74	74	70	69	69	67	61	55
36	36	44	52	57	60	60	60	57	51	44	39
59	63	54	46	48	67	89	93	84	60	51	49
35	36	43	48	52	59	62	62	59	50	43	38

Ranikhet 6,069'.

54	55	65	74	79	79	74	72	72	69	62	57
40	41	49	57	61	63	63	62	60	54	47	43
62	65	56	46	50	69	87	90	82	67	63	58
40	41	47	52	56	62	65	64	61	53	47	42

VIII.—KASHMIR STATE.

Srinagar—Total Rain 27-65 inches—5,204'.

41	43	56	67	76	82	85	85	79	70	61	48
27	28	37	45	52	58	64	63	54	41	32	28
89	88	88	85	83	82	84	85	86	86	87	88
31	33	43	52	59	65	69	69	62	51	42	35

Gilgit—4,890'.

46	51	62	71	83	92	96	95	87	75	63	49
32	37	45	53	60	67	72	72	64	53	43	34
65	55	48	51	47	40	44	47	49	47	46	59

The figures given for Srinagar represent fairly the conditions in the outer valleys, Gilgit for the remote valleys. Srinagar is typical of that large area that produces one crop, it contrasts with places in the outer valley.

IX.—NORTH WEST DRY AREA.

Multan 426'.

70	74	86	98	107	108	104	101	101	96	85	73
43	47	58	68	78	84	84	83	77	65	53	45
71	65	58	47	42	50	63	68	65	56	60	69
49	51	60	67	73	78	80	80	77	67	57	50

IX.—NORTH WEST DRY AREA—contd.

Peshawar 1,113'.

63	66	75	85	98	106	103	99	96	88	77	67
40	43	52	60	70	77	79	78	71	58	46	39
72	72	71	61	43	41	61	70	64	59	66	70
44	47	55	61	66	71	76	77	71	60	52	46

Dera Ismail Khan—590'.

69	72	82	93	104	108	103	101	100	94	83	72
40	44	55	65	75	81	82	81	75	61	48	41
71	69	65	56	48	55	70	75	69	59	66	72
46	48	57	63	69	75	79	79	74	63	53	47

Sind—Jacobabad 186'.

73	78	91	100	112	114	108	105	104	99	88	77
43	48	60	70	78	84	85	82	76	63	52	44
64	56	45	41	42	55	65	72	71	56	57	66
49	51	60	66	72	78	81	80	76	65	57	51

Bikaner 771'.

71	76	89	100	107	107	101	97	98	96	85	75
49	52	64	75	83	85	83	81	79	71	59	50
56	52	43	38	44	54	65	69	65	48	49	54
48	51	61	67	72	75	76	75	75	68	56	50

Ajmer 1,611'.

73	77	89	98	104	101	92	88	90	92	84	76
46	50	60	72	80	82	78	76	74	64	52	47
71	62	49	39	44	61	79	83	76	60	63	72
51	52	60	66	71	75	76	75	73	65	56	53

Jodhpur 780'.

76	80	91	101	107	105	98	93	95	97	90	80
50	53	63	73	80	83	81	78	75	67	59	53
46	42	33	29	42	57	70	76	69	43	38	44

Udaipur 1,925'.—Aravalli Hills.

76	79	89	98	103	98	99	85	88	92	85	78
47	51	60	71	79	79	76	74	71	64	54	49
54	49	45	38	43	63	76	78	73	55	53	57
51	53	60	66	72	75	74	73	71	64	58	53

X.—BALUCHISTAN.

Quetta 5,502'.

51	53	64	74	83	91	93	91	86	75	66	57
29	31	39	46	52	59	65	61	49	39	33	29
82	75	63	51	44	46	55	56	47	44	55	77
34	36	43	49	54	59	63	61	53	45	40	36

Kalat—6,630'.

51	53	63	74	84	91	93	91	85	75	67	57
21	24	32	37	43	48	53	49	38	30	27	24
71	69	64	49	44	34	40	41	40	38	51	64

Chaman 4,311'.

53	57	63	77	91	100	100	98	89	80	67	55
36	38	43	54	64	72	75	71	60	53	43	37
71	65	58	50	35	34	30	31	30	33	45	65

XI.—RAJPUTANA, EAST AND CENTRAL INDIA WEST.

Jaipur—1431'.

74	78	89	100	107	104	95	91	94	95	87	77
48	51	61	71	78	82	79	76	73	65	56	49
62	53	42	33	37	53	74	79	70	49	51	58
51	52	58	63	69	75	77	76	73	64	57	52

XI.—RAJPUTANA, EAST AND CENTRAL INDIA WEST—contd.

Indore 1,823'.

79	83	92	100	103	95	85	83	85	89	84	80
50	52	60	70	76	76	73	71	70	63	54	50
61	49	40	39	51	72	86	89	85	62	55	59
54	53	58	62	67	73	73	72	71	65	57	53

Neemuch 1,626'.

77	81	91	100	104	99	88	85	88	91	85	79
49	52	61	71	77	78	74	73	71	64	55	49
56	47	38	37	49	69	83	86	80	51	48	55
51	52	59	63	67	72	73	73	72	75	55	51

XII.—GUJARAT AND KATHIAWAR.

Surat 39'.

87	90	96	100	98	93	87	87	89	94	91	88
57	59	66	73	78	80	78	77	76	71	63	58
64	62	61	64	67	77	85	85	82	70	60	61
61	61	67	71	76	77	77	76	76	73	66	62

Bhuj—334'.—Cutch.

80	84	93	100	101	97	91	89	92	96	90	82
54	57	65	71	77	80	78	76	75	71	63	56
60	61	60	59	66	74	81	83	78	62	58	57
55	57	64	69	74	77	76	75	74	69	60	56

Dwarka—37'.—Kathiawar.

77	78	81	85	88	89	87	85	85	87	87	81
59	62	70	76	80	82	81	78	77	75	68	61
69	70	75	80	81	80	83	86	83	78	71	67

Veraval 18'.—Kathiawar.

81	81	86	86	86	86	84	82	84	89	89	84
59	61	65	72	78	81	80	78	76	72	67	62
53	57	64	74	82	84	88	89	86	86	54	51

Rajkot 429'. Kathiawar (Inland).

83	87	95	102	105	100	91	89	92	96	91	85
51	54	62	69	75	78	76	75	72	68	60	53
52	56	62	64	68	74	83	84	81	66	50	49
54	56	63	66	73	75	75	74	74	69	59	55

Ahmadabad 163'.—Gujarat.

84	87	97	105	108	101	93	90	92	97	93	86
57	59	67	75	79	81	79	77	76	72	65	59
47	45	43	47	58	68	81	83	78	56	46	47

XIII.—CENTRAL INDIA, EAST, CENTRAL PROVINCES, BERAR, CHOTA NAGPUR.

Nowgong 754'. Central India, East.

74	79	92	102	107	103	91	88	90	90	82	75
47	51	61	71	80	83	79	77	75	65	53	47
76	65	49	37	35	57	81	87	83	69	70	74
53	55	61	67	71	77	78	77	76	67	57	53

Nagpur 1,017'.

84	89	98	105	109	99	88	87	89	90	85	82
56	60	67	76	82	79	75	75	74	68	60	54
60	50	39	35	32	64	83	85	81	64	59	60
58	59	63	67	70	75	75	75	74	68	61	57

Amraoti 1,215'.

85	90	98	105	108	98	88	86	88	91	87	83
58	62	69	76	80	77	74	73	72	68	62	57
51	46	39	35	40	69	84	87	83	58	49	52
59	60	64	67	70	74	74	73	73	68	62	58

XIII.—CENTRAL INDIA, EAST, CENTRAL PROVINCES, BERAR, CHOTA NAAGPUR—contd.

Akola 925'.

86	91	99	106	108	99	89	87	89	92	88	84
54	57	66	75	81	78	74	73	73	66	57	52
54	43	33	30	39	66	79	82	80	62	56	57
58	58	62	66	71	75	75	74	74	68	61	57

Saugor 1,807'. Central Province, North.

77	81	91	101	105	99	86	84	86	88	82	77
52	55	65	73	79	78	74	73	71	66	58	53
55	47	36	30	33	61	85	88	82	56	49	54
53	55	60	64	68	73	74	74	73	66	58	53

Seoni 2,033'.—(Mahadeo Hills).

79	84	93	101	104	95	84	83	85	87	82	78
51	55	63	71	77	75	73	72	71	64	55	50
65	57	43	36	33	63	86	88	83	63	60	64
55	57	61	65	68	72	73	72	71	66	58	54

Hazaribagh 2,007'. Total Rain 51-88.

73	77	88	97	99	93	85	84	85	84	78	72
51	54	63	72	76	76	74	73	72	67	58	51
63	56	41	36	46	68	84	87	83	68	61	62
52	53	59	63	69	73	74	74	73	66	58	52

Raipur 970'.

82	87	96	103	107	98	87	86	88	88	83	79
55	60	68	77	82	79	75	75	75	69	60	54
64	55	42	37	35	64	86	89	84	73	65	65
58	60	64	68	71	75	75	75	75	70	63	57

Jubbulpur 1,327'.

77	82	92	101	106	98	87	85	87	87	82	77
48	52	61	70	79	79	75	74	73	64	53	46
75	65	47	35	32	61	86	89	85	75	73	75
55	56	61	65	69	74	75	75	74	67	58	53

Pachmarhi 3,528'. (Mahadeo Hills).

72	75	84	92	96	87	77	75	77	79	74	71
47	51	60	69	75	72	68	67	66	59	51	46
61	50	36	30	35	69	90	92	84	57	55	62
51	51	56	60	64	69	69	68	67	61	53	50

Hoshangabad 1,006'.

80	85	95	104	107	99	88	85	87	90	84	79
52	55	64	73	80	80	75	74	73	66	57	52
65	55	44	37	39	66	87	90	86	71	65	67
56	57	62	66	71	76	76	75	75	69	60	56

Sutna (Central India East) 1,041'.

75	79	91	101	106	100	88	86	88	88	81	75
48	52	61	72	80	82	77	76	75	66	54	47
71	59	41	28	30	55	82	87	82	68	64	68
52	53	59	63	68	74	76	76	75	67	57	52

Khandwa (Satpura Hills) 1,044'.

84	89	97	105	107	98	88	86	88	92	87	83
52	56	65	75	81	79	75	74	73	66	56	51
55	43	34	29	42	66	80	84	82	61	55	57
56	57	61	66	71	75	75	74	73	67	60	56

Pendra 2,040' (Maikal Range).

76	78	87	96	102	95	85	83	85	85	79	75
51	54	62	71	79	77	73	73	71	65	55	50
64	56	42	30	31	60	85	87	83	64	56	61

XIII.—CENTRAL INDIA, EAST, CENTRAL PROVINCES, BERAR, CHOTA NAGPUR—*concl'd.*

Chanda 634'. (South Central Provinces.)

85	91	100	106	110	99	89	87	89	90	85	83
55	59	67	76	82	80	76	75	74	68	58	52
70	58	44	41	37	62	79	82	82	73	71	73
60	62	66	70	72	76	75	75	75	72	64	59

Chaibasa 733'.

80	84	95	103	104	97	89	89	89	89	84	79
53	57	64	74	78	77	77	77	76	70	59	51
85	76	63	61	64	78	81	86	86	82	82	86

Ranchi 2,128'.

74	77	87	96	99	92	84	83	84	83	78	73
51	55	63	72	75	75	73	73	72	66	58	51
65	60	45	42	51	72	88	89	84	70	63	64

Purulia 816'.

77	81	93	102	102	97	90	89	89	89	84	78
54	58	66	74	77	79	77	77	76	70	61	53
73	65	55	54	68	79	88	90	88	78	70	69

Jagdalpur 1,813'—Bastar State—6 years.

81	86	94	99	101	92	84	83	85	85	81	79
52	58	66	73	77	75	72	72	72	67	59	52
81	72	61	57	58	71	84	86	85	81	81	82

XIV.—THE DECCAN.

Poona 1,846'.

86	91	97	101	100	90	83	82	84	89	87	85
54	56	63	69	72	73	71	70	69	66	59	54
59	51	41	41	54	72	82	84	81	71	61	58
58	59	62	66	69	72	71	70	70	67	62	58

Ahmadnagar 2,154'.

85	88	95	100	101	92	85	85	86	89	85	83
52	55	63	70	72	72	71	69	68	65	57	52
57	50	46	47	53	74	80	80	80	62	56	58

Sholapur 1,590'.

88	93	100	104	105	95	89	89	88	90	88	85
59	62	69	75	77	74	72	71	71	68	62	58
47	38	33	37	45	67	74	76	77	61	51	49
59	60	64	67	69	71	71	71	71	68	63	59

Bijapur 1,948'.

86	91	97	101	101	92	87	87	87	89	86	85
60	64	70	75	74	72	71	70	70	68	61	57
65	53	50	54	61	76	80	81	81	70	65	67

Belgaum 2,562'.

83	88	94	96	93	81	76	76	79	83	82	82
58	59	64	67	68	68	67	66	65	65	61	58
59	48	46	58	69	86	93	92	89	78	62	58
59	60	63	68	70	70	69	68	68	67	63	59

Malegaon 1,430'—Khandesh.

86	90	97	103	105	96	88	87	88	91	87	85
52	55	63	71	75	75	73	72	70	66	57	52
53	46	42	42	49	68	76	77	76	60	51	53
56	58	62	64	70	73	72	71	71	67	60	56

Aurangabad, North East, 1,905'.

85	89	96	102	104	95	87	85	86	90	87	84
55	58	66	73	75	73	71	69	69	66	59	55
48	38	32	29	41	69	81	83	78	55	48	50

XIV.—THE DECCAN—contd.

Bidar (Centre) 2,165'.

83	88	95	99	100	93	86	84	84	86	83	81
61	64	71	75	77	72	68	67	67	67	63	61
63	58	51	52	54	78	86	86	83	70	63	62

Raichur (South-West) 1,311'.

87	92	99	102	103	95	90	89	88	90	87	85
65	68	74	79	79	75	73	73	72	72	67	63
62	53	47	51	53	69	75	76	78	67	64	64

Hanamkonda 877'—Warrangal (North East).

86	90	97	102	105	98	89	88	88	90	86	83
63	66	72	77	82	80	76	75	75	71	64	61
72	67	63	62	48	59	73	75	77	69	63	65

Bellary 1,475'.

88	94	101	104	103	95	91	91	91	90	87	86
62	66	72	77	78	76	75	74	73	71	66	61
64	54	47	50	53	62	66	68	70	67	55	66
62	64	67	71	72	72	71	71	71	70	66	63

Cuddapah 433'.

89	95	102	105	106	100	96	94	93	93	89	87
65	69	75	81	83	81	78	77	76	74	69	65
75	67	58	56	54	61	67	71	74	73	75	77

Khamamett (East Hyderabad) 373'.

87	93	97	102	107	97	91	88	89	90	87	85
63	69	73	78	83	80	77	76	75	73	65	59
81	80	76	71	59	69	77	84	85	81	80	78

Bangalore 3,021'.

81	86	91	93	92	85	82	82	82	82	80	79
57	60	65	69	69	67	66	66	65	65	62	59
79	71	64	71	75	80	85	85	86	82	78	79
60	61	63	68	69	68	67	68	68	67	64	61

Rain— ·18, ·29, ·64, 1·29, 4·53, 3·02, 4·30, 6·07, 7·10, 6·43, 2·31, 0·41. = (TOTAL) 36·57

Mysore (South) 2,518'.

84	89	94	95	92	85	82	83	84	84	83	82
60	63	67	70	70	68	67	67	66	67	64	60
73	69	69	74	76	80	82	82	82	83	77	75
62	63	65	69	70	69	68	68	68	68	65	63

Rain— ·13, ·13, ·42, 2·33, 5·40, 2·40, 2·32, 3·12, 4·03, 6·86, 2·01, 0·48 = (TOTAL) 29·63

Chitaldrug (North-East) 2,405'.

85	89	95	97	94	86	82	82	83	85	83	82
62	66	70	73	71	70	69	68	67	68	64	61
62	53	60	61	71	79	83	83	82	76	69	67
61	62	65	69	70	70	69	69	69	68	64	61

Hassan (South-West) 3,149'.

82	87	91	92	89	81	77	79	81	82	80	80
55	58	62	67	67	66	65	65	64	64	60	56
74	69	65	70	75	83	86	85	83	82	76	76
59	61	62	67	69	67	67	67	67	67	63	60

Mercara—3,781'. (Coorg.)

78	81	85	84	80	73	69	70	72	76	76	75
57	59	62	64	65	63	62	62	62	62	60	58
79	73	69	79	86	94	96	96	93	89	83	83
58	60	63	67	67	65	64	64	64	65	62	60

Mercara is in Western Wet area ; the Eastern area is much less wet.

XV.—SOUTH-WESTERN WET AREA.

Ratnagiri 110'.

87	86	87	90	91	87	84	84	84	88	91	89
66	67	72	77	80	77	76	75	75	74	70	67
63	65	69	70	69	83	87	88	87	78	58	56
67	69	73	76	77	77	76	76	75	75	71	68

Karwar 44'.

86	86	87	89	90	85	83	82	83	85	88	88
66	67	72	77	80	76	75	75	74	74	69	66
81	83	82	78	77	84	86	87	89	89	81	76
68	70	73	77	78	76	75	75	75	75	72	69

Cochin 9'.

89	90	91	92	90	85	84	84	85	87	88	89
72	74	77	78	77	75	74	74	75	75	74	73
73	75	77	77	81	87	88	86	85	84	80	74
72	74	77	78	78	76	75	75	75	76	75	73

Mangalore 65'.

89	89	89	92	92	85	84	83	84	86	88	89
69	71	74	78	79	74	73	74	73	74	73	70
66	72	73	69	73	86	88	89	87	83	73	67
69	71	76	78	77	76	75	75	74	75	74	70

Trivendrum 198'.

84	85	87	88	86	83	82	82	83	83	83	83
73	74	77	78	78	76	75	75	75	75	74	73
77	77	76	79	81	87	87	85	83	84	83	79

XVII.—MADRAS SOUTH-EAST.

Madras 22'.

85	87	90	93	99	99	96	94	93	89	85	83
68	69	72	77	81	81	79	77	77	75	72	70
84	83	79	75	65	62	69	76	78	83	83	83
70	71	75	78	79	78	77	77	77	76	74	71

Vellore 707'.

85	89	94	99	100	97	94	93	91	89	85	82
65	67	70	77	79	79	77	76	76	73	69	65
85	82	76	73	65	63	67	71	73	81	84	86

Salem 913'.

89	94	99	101	99	95	93	92	91	90	87	86
64	66	71	76	76	75	73	73	72	71	69	65
77	75	72	73	73	75	79	80	80	81	78	77
68	69	73	76	76	75	74	74	74	74	71	69

Coimbatore 1,341'.

87	92	96	97	95	90	88	88	89	88	86	85
64	66	70	73	73	72	71	71	71	71	69	66
84	82	79	81	81	81	83	84	84	86	85	83
65	66	70	73	73	71	71	71	71	71	70	67

Trichinopoly 255'.

87	92	98	101	102	99	97	97	95	91	87	85
67	69	73	78	79	79	78	77	76	74	72	69
79	78	73	69	66	62	63	68	72	80	79	77
69	70	73	76	76	75	74	74	74	75	73	70

Negapatam 31'.

82	85	89	93	98	98	96	94	93	89	85	82
71	73	76	79	80	79	78	77	77	76	74	72
81	78	75	74	68	64	66	71	74	81	82	82
71	71	75	78	78	76	76	76	76	76	74	72

XVII.—MADRAS SOUTH-EAST—*contd.*

Pudukottai 318'.

87	91	96	99	101	99	96	95	91	91	87	86
68	69	73	73	79	78	77	76	76	74	72	69
83	81	75	75	69	64	68	71	68	81	80	77
70	72	73	77	78	76	75	75	74	75	72	70

Madura 447'.

87	92	97	99	100	98	97	96	95	91	87	86
69	70	73	77	78	77	76	76	75	74	72	70
77	76	74	71	67	64	64	67	69	76	77	75
69	70	73	75	75	75	74	74	74	74	73	71

Kodaikanal 7,688'.

63	65	69	69	69	65	63	63	63	63	61	62
47	48	51	54	55	54	53	52	52	51	49	48
58	56	47	59	67	75	81	80	78	84	80	62
47	48	50	53	55	54	53	54	54	53	51	48

Ootacamund 7,327'.

65	67	69	71	70	64	62	63	64	64	63	64
43	44	48	52	53	52	52	52	51	51	48	44
56	51	47	54	63	78	86	87	83	78	75	59
46	47	49	53	55	54	53	54	54	53	51	48

Periyakulam—below Kodaikanal—944'.

87	92	95	97	97	94	93	94	93	89	86	85
65	66	69	73	73	73	72	71	72	71	69	66
78	71	66	68	69	67	66	67	69	78	79	77
67	68	70	73	73	72	71	71	72	72	71	68

Wellington 6,200'.

68	71	74	76	76	73	71	71	71	69	67	67
45	47	52	56	58	58	58	57	56	55	52	48
66	66	58	65	63	70	72	72	73	78	77	71
50	51	54	58	59	59	58	58	58	58	56	52

Port Blair 58' Andamans—

86	88	91	92	89	86	85	85	85	87	87	86
76	75	76	79	79	78	77	77	77	77	77	77
81	84	84	83	86	88	87	88	90	89	85	81
75	75	77	79	79	78	77	77	77	78	77	76

APPENDIX IX.

RELIGION TABLES.

The following tables show the numbers of Hindus, Mohammadans, Buddhists, Christians, Animists in each district and state in India. They are from the Census tables of 1911.

BURMA.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Musalman.	Buddhist.	Christian.	Animist.
<i>Provincial Total</i>	12,115,217	389,679	420,777	10,384,579	210,081	701,473
<i>Arakan Division</i>	839,896	15,997	186,323	661,248	1,167	75,075
Akyab	529,943	14,454	178,381	302,527	605	33,896
Northern Arakan	22,234	567	44	1,795	7	19,821
Kyaukpyu	184,916	590	3,641	165,864	95	14,726
Sandoway	102,803	386	4,257	91,062	460	6,632
<i>Pegu Division</i>	2,073,737	212,395	85,718	1,688,181	55,030	28,963
City of Rangoon	293,316	108,350	54,634	97,467	23,044	7,217
Hanthawaddy	539,109	57,137	16,307	447,638	12,647	4,675
Tharrawaddy	433,320	7,406	3,857	413,584	6,052	2,376
Pegu	429,121	34,350	7,384	369,612	12,316	5,391
Prome	378,871	5,152	3,536	359,880	971	9,304
<i>Irrawaddy Division</i>	1,869,485	42,106	28,271	1,712,939	74,134	11,668
Bassein	440,988	11,822	8,107	391,027	27,927	2,049
Honzalia	532,357	6,600	4,857	509,310	10,285	1,466
Myaungmya	334,852	6,128	7,103	300,515	18,157	2,922
Ma-ubin	305,073	5,392	4,864	282,669	10,474	1,651
Pyapon	256,215	12,164	3,540	229,418	7,291	3,580
<i>Tenasserim Division</i>	1,420,294	59,372	51,277	1,204,599	50,822	63,187
Toungoo	351,076	14,220	6,369	274,870	33,138	22,355
Salween	46,608	274	408	20,474	384	25,068
Thaton	416,975	16,805	10,221	380,244	3,738	5,958
Amherst	367,918	23,864	22,893	309,904	6,824	4,338
Tavoy	135,293	842	1,564	129,505	1,999	1,380
Mergui	111,424	3,367	9,822	89,602	4,539	4,088
<i>Magwe Division</i>	1,239,032	8,639	5,736	1,197,596	1,508	24,823
Thayetmyo	248,275	2,186	2,164	228,058	592	15,232
Pakokku	409,909	1,170	894	404,037	284	3,472
Minbu	263,939	2,651	1,061	253,927	150	5,758
Magwe	316,909	2,632	1,617	311,574	482	361

BURMA—contd.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Musalman.	Buddhists.	Christian.	Animist.
<i>Mandalay Division</i>	832,969	27,849	27,354	647,543	9,503	118,132
Mandalay	340,770	16,071	20,845	294,904	6,571	1,497
Bhamo	107,811	1,652	2,242	53,490	1,785	47,722
Myitkyina	85,577	6,192	1,906	30,171	566	46,050
Katha	198,193	1,429	1,156	189,134	383	6,089
Ruby Mines	100,618	2,505	1,205	79,844	198	16,774
<i>Sagaing Division</i>	1,155,271	6,631	11,103	1,128,941	4,229	4,007
Shwebo	356,363	2,305	6,328	344,852	2,746	111
Sagaing	312,111	1,772	2,815	306,416	1,013	95
Lower Chindwin	316,175	784	876	313,839	297	82
Upper Chindwin	170,622	1,770	1,086	163,834	173	3,719
<i>Meiktila Division</i>	1,170,572	9,299	21,793	1,132,818	3,487	2,758
Kyaukse	141,426	815	4,954	134,928	679	25
Meiktila	279,822	2,931	4,253	271,774	678	95
Yamethin	307,419	3,766	11,057	288,047	1,813	2,452
Myingyan	441,905	1,787	1,529	438,069	317	186
<i>Specially administered territories</i>	1,504,961	7,391	3,202	1,110,714	10,401	372,860
Northern Shan States	458,952	2,607	1,241	335,436	348	119,320
Southern Shan States	900,202	3,282	1,800	775,156	9,818	110,131
Pakokku Hill territory	26,251	151	8	35	4	26,051
Chin Hills	119,556	1,351	153	87	231	117,358

ASSAM.

District or State.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
<i>Assam</i>	7,059,857	3,838,769	1,901,032	66,562	1,239,280
(1) <i>British territory</i>	6,713,635	3,637,400	1,886,528	66,430	1,109,187
<i>Surma Valley and Hill Districts</i>	3,446,030	1,436,234	1,522,988	39,719	446,049
Cachar	497,463	320,104	156,096	1,181	19,996
Sylhet	2,472,671	1,098,950	1,364,739	1,512	7,275
Khasi and Jaintia Hills	235,069	9,454	1,528	31,257	192,453
Naga Hills	149,623	4,213	318	3,308	141,740
Lushai Hills	91,204	3,513	307	2,461	84,585

ASSAM—*contd.*

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
<i>Assam Valley Districts</i>	3,287,605	2,201,166	363,540	26,711	663,138
Goalpara	600,643	334,720	211,562	5,252	47,339
Kamrup	667,828	459,227	64,627	2,535	140,576
Darrang	377,314	245,341	20,305	1,913	108,731
Nowgong	303,596	177,795	15,689	1,373	108,067
Sibsagar	690,299	595,266	29,718	5,410	57,580
Lakhimpur	468,989	367,990	13,419	4,789	76,701
Garo Hills	158,936	20,827	8,220	5,439	124,144
(2) Manipur State	346,222	201,369	14,504	132	130,093

BENGAL.

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
<i>Bengal</i>	46,305,642	20,945,379	24,237,228	129,746	730,780
<i>British Territory.</i>	45,483,077	20,377,793	23,989,719	129,518	730,182
<i>Burdwan Division</i>	8,467,314	6,971,160	1,138,052	13,782	342,604
Burdwan	1,538,371	1,220,551	290,381	3,820	23,383
Birbhum	935,473	657,053	222,787	813	54,592
Bankura	1,138,670	990,161	51,707	1,012	95,777
Midnapore	2,821,201	2,477,272	193,569	4,166	145,437
Hooghly	1,090,097	883,840	184,009	851	21,288
Howrah	943,502	742,283	195,599	3,120	2,127
<i>Presidency Division</i>	9,445,321	4,761,764	4,571,400	68,088	32,084
24-Parganas	2,434,104	1,525,886	879,547	16,027	11,811
Calcutta	896,067	604,853	241,587	39,551	56
Nadia	1,617,846	642,061	963,119	9,132	2,861
Murshidabad	1,372,274	643,291	713,162	413	14,419
Jessore	1,758,264	667,936	1,087,554	1,272	1,475
Khulna	1,366,766	677,147	686,441	1,693	1,462
<i>Rajshahi Division</i>	10,138,302	3,602,148	6,177,481	17,167	282,770
Rajshahi	1,480,587	315,640	1,148,314	323	16,195
Dinajpur	1,687,863	759,309	824,345	1,964	102,031

BENGAL—contd.

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
Jalpaiguri	902,660	547,327	237,456	5,501	104,005
Darjeeling	265,550	189,617	9,450	7,689	10,778
Rangpur	2,385,330	803,784	1,569,090	599	10,421
Bogra	983,567	166,696	810,352	161	6,154
Pabna	1,428,586	354,254	1,073,078	500	406
Malda	1,004,159	465,521	505,396	430	32,780
<i>Dacca Division</i>	12,037,649	3,708,377	8,252,611	27,726	39,003
Dacca	2,900,402	1,052,256	1,893,470	13,194	1,039
Mymensingh	4,526,422	1,161,585	3,324,146	2,181	37,962
Faridpur	2,121,914	774,979	1,341,090	5,810	..
Backergunge	2,428,911	719,557	1,693,905	6,541	2
<i>Chittagong Division</i>	5,394,491	1,334,344	3,850,175	2,755	33,721
Tippera	2,430,138	672,670	1,755,400	410	..
Noakhali	1,302,090	300,246	1,000,653	743	..
Chittagong	1,508,433	347,189	1,089,024	1,430	577
Chittagong Hill Tracts	153,830	14,239	5,098	172	33,144
<i>(2) Feudatory States</i>	822,565	567,586	247,509	228	598
Cooch Behar	592,952	409,485	182,556	90	190
Hill Tippera	229,613	158,101	64,953	138	408
<i>Sikkim</i>	87,920	53,675	44	285	..
British subjects in French Chandernagore	9,628	7,892	1,632	287	1

BIHAR AND ORISSA.

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
<i>Bihar and Orissa</i>	38,435,293	31,753,698	3,683,438	288,265	2,720,288
Patna	1,609,631	1,436,135	170,383	2,585	..
Gaya	2,159,498	1,936,836	221,943	349	44
Shahabad	1,865,660	1,730,589	131,180	700	1,618
Saran	2,289,778	2,025,474	263,741	437	..
Champanan	1,908,385	1,619,463	286,098	2,775	..
Muzaffarpur	2,845,514	2,493,784	350,820	893	..
Darbhanga	2,929,682	2,560,165	368,611	766	..

BIHAR AND ORISSA—contd.

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
Monghyr	2,132,893	1,923,008	200,339	1,806	7,510
Bhagalpur	2,139,318	1,899,672	215,705	1,102	22,215
Purnea	1,989,637	1,126,843	831,227	500	29,971
Sonthal Pergannahs	1,882,973	964,529	176,614	10,163	731,328
Cuttack	2,109,139	2,043,091	63,386	2,406	2
Balasore	1,055,568	1,014,349	30,974	1,458	8,768
Angul	199,451	141,176	335	69	57,788
Puri	1,023,402	1,002,493	19,348	1,281	..
Sambalpur	744,193	702,483	3,546	2,793	34,925
Hazaribagh	1,288,609	1,066,084	133,328	1,786	86,706
Ranchi	1,387,518	550,715	51,158	177,473	607,820
Palamau	687,267	586,918	57,669	7,783	34,883
Manbhum	1,547,576	1,249,967	82,776	4,500	209,956
Singhbhum	694,394	291,461	7,671	8,200	386,992
Orissa Feudatory States	3,796,563	3,303,492	14,970	38,422	437,702
Chota Nagpur Feudatory States	148,646	84,961	1,607	18	62,060

UNITED PROVINCES.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Arya.	Jain.	Musalman.	Christian.
United Provinces	48,014,080	40,705,353	131,638	75,735	6,904,731	179,694
Meerut	1,519,364	1,124,867	11,797	16,935	344,888	18,142
Dehra Dun	205,075	169,614	1,144	320	27,794	5,036
Saharanpur	986,359	638,354	6,841	4,451	329,094	5,548
Muzaffarnagar	808,360	559,793	6,224	8,163	231,873	2,583
Bulandshahr	1,123,792	886,219	17,371	1,351	208,367	10,111
Aligarh	1,165,680	991,634	15,874	2,831	143,314	11,947
Agra	1,021,847	885,841	2,788	11,210	114,555	7,229
Muttra	656,310	584,647	2,313	1,457	61,759	5,992
Farrukhabad	900,022	788,623	4,016	500	104,293	2,548
Mainpuri	797,624	741,028	4,923	4,605	44,477	2,395

UNITED PROVINCES—*contd.*

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Arya.	Jain.	Musalman.	Christian.
Etawah	760,121	707,354	4,474	1,933	45,628	693
Etah	871,997	760,288	4,536	4,292	91,399	11,077
Allahabad	1,467,136	1,260,092	592	637	197,621	7,055
Fatehpur	676,939	597,966	442	81	78,308	142
Cawnpore	1,142,286	1,029,563	2,551	423	104,001	5,224
Jhansi	680,688	629,671	238	11,369	34,169	3,970
Jalaun	404,775	376,750	110	266	27,408	195
Hamirpur	465,223	434,024	266	85	30,455	363
Banda	657,237	619,300	357	300	37,068	198
Benares	897,035	796,925	637	301	96,867	1,930
Ghazipur	839,725	762,435	155	1	76,561	568
Ballia	845,418	791,535	149	..	52,877	1,008
Jaunpur	1,156,254	1,053,003	1,803	12	101,296	117
Mirzapur	1,071,046	1,001,022	522	131	68,507	735
Gorakhpur	3,201,180	2,875,402	1,091	57	322,946	1,608
Basti	1,830,421	1,525,385	286	2	304,676	69
Azamgarh	1,492,818	1,304,582	1,135	..	186,843	143
(Rohilkhand)						
Bareilly	1,094,663	801,502	3,832	3	276,230	12,591
Bijnor	806,202	508,805	12,394	925	280,501	3,315
Moradabad	1,262,933	784,550	6,985	785	453,269	17,023
Bidaun	1,053,328	859,688	5,631	197	176,376	11,298
Shahjahanpur	945,775	801,274	1,301	27	139,159	3,954
Pilibhit	487,617	397,774	1,465	3	86,274	2,085
(Kumaun)						
Garhwal	480,167	475,533	110	37	3,614	845
Almora	525,104	518,166	186	..	3,546	2,910
Naini Tal	323,519	247,545	1,159	20	71,883	2,413
Lucknow	764,411	592,260	1,013	536	160,697	8,660
Unao	910,915	834,067	669	7	76,033	123
Rae Bareilly	1,016,864	928,787	169	32	87,566	219
Sitapur	1,138,996	965,752	595	254	171,779	569
Hardoi	1,121,248	999,236	1,260	16	119,540	1,111
Kheri	959,208	819,128	676	11	138,281	1,011
Pyzabad	1,154,109	1,023,556	347	45	127,954	1,911

UNITED PROVINCES—*concl.*

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Arya.	Jain.	Musalman.	Christian.
Gonda	1,412,212	1,184,607	129	2	226,907	501
Bahraich	1,047,677	844,815	122	117	201,460	348
Sultanpur	1,048,524	931,850	202	14	116,320	134
Partabgarh	899,973	806,129	73	81	93,613	72
Bara Banki	1,083,867	902,297	192	602	180,537	221

PUNJAB.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Sikh.	Jain.	Musalman.	Christian.
<i>Punjab</i>	24,187,750	8,773,621	2,883,729	46,775	12,275,477	199,751
<i>Delhi Division</i>	4,176,236	2,849,557	150,691	27,045	1,129,601	19,151
Hissar	804,889	541,720	38,508	5,767	218,600	273
Rohtak	541,489	450,549	161	4,369	86,076	334
Gurgaon	643,177	421,885	342	2,921	217,237	782
Delhi	657,604	469,561	2,985	7,539	171,745	5,693
Karnal	799,787	556,203	13,531	4,213	224,920	920
Ambala	689,970	390,592	94,471	2,187	205,203	7,483
Simla	39,320	29,047	693	49	5,820	3,666
<i>Jullundur Division</i>	3,967,724	1,894,378	781,836	5,171	1,272,311	9,998
Kangra	770,386	725,156	1,910	81	38,859	386
Hoshiarpur	918,569	498,642	134,146	908	281,805	2,978
Jullundur	801,920	265,378	176,227	842	357,051	2,404
Ludhiana	517,192	131,370	207,942	1,849	176,043	888
Ferozepore	959,657	273,832	262,511	1,401	418,553	3,342
<i>Lahore Division</i>	4,656,629	1,131,734	733,536	5,577	2,670,600	114,744
Lahore	1,036,158	217,609	169,008	1,139	626,271	21,781
Amritsar	880,728	211,708	253,941	1,386	408,882	4,763
Gurdaspur	836,771	284,017	121,078	73	408,216	23,365
Sialkot	979,553	242,325	81,761	2,029	604,801	48,620
Gujranwala	923,419	176,075	107,748	950	622,430	16,215
<i>Rawalpindi Division</i>	3,353,052	260,902	166,219	1,284	2,905,680	18,831
Gujrat	745,634	49,430	44,693	48	650,893	570
Shahpur	687,366	72,695	33,456	5	572,565	8,616

PUNJAB—contd.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Sikh.	Jain.	Musalman.	Christian.
Jhelum	511,575	34,261	24,436	163	452,260	450
Rawalpindi	547,827	48,449	31,839	1,028	458,101	8,320
Attock	519,273	19,741	26,914	9	471,890	707
Mianwali	341,377	36,326	4,881	31	299,971	108
<i>Multan Division</i>	3,821,315	546,247	261,522	560	2,977,520	35,382
Montgomery	535,299	66,803	68,175	13	399,723	581
Lyallpur	857,711	154,603	146,870	125	524,288	32,023
Jhang	515,526	73,426	19,427	4	422,468	201
Multan	814,871	126,603	19,881	394	665,488	2,441
Muzaffargarh	569,461	68,158	6,322	1	494,915	60
Dera Ghazi Khan	499,860	56,485	1,042	23	442,234	76
<i>Native States.</i>	4,212,794	2,090,803	789,925	7,138	1,319,756	1,645
Loharu	18,597	16,178	..	18	2,401	..
Dujana	25,485	20,161	..	..	5,324	..
Pataudi	19,543	16,114	..	82	3,338	9
Kalsia	55,909	30,640	6,258	160	18,820	31
Nahian	138,520	130,276	2,142	49	6,016	37
<i>Simla Hill States</i>	404,343	386,953	2,911	172	11,374	224
Jubbah	24,620	24,434	..	..	186	..
Bashahr	93,203	89,936	28	..	509	42
Keonthal	46,224	44,565	84	..	1,484	91
Baghal	26,008	25,702	13	..	273	3
Bilaspur	93,107	91,540	150	..	1,406	11
Nalagarh	49,230	41,848	1,146	172	6,040	24
Minor Hill States	71,951	68,928	1,490	..	1,476	53
Mandi	181,110	178,115	26	2	2,799	4
Suket	54,928	54,268	71	..	587	2
Kapurthala	268,133	61,426	54,275	205	152,117	107
Malerkotla	71,144	22,902	21,018	1,268	25,942	14
Faridkot	130,294	37,377	55,397	409	37,105	6
Chamba	135,873	126,269	141	5	8,750	81
<i>Phulkian States.</i>						
Patiala	1,407,659	563,940	532,292	3,282	307,384	739
Jind	271,728	210,222	22,566	1,233	37,520	187
Nabha	248,887	126,414	76,198	238	46,032	5
Bahawalpur	780,641	109,548	16,630	15	654,247	109

JAMMU AND KASHMIR STATE.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu* Brahmanic.	Hindu Arya.	Sikh.	Buddhist.	Musalman.
<i>Jammu District</i>	326,691	195,470	604	3,156	..	126,659
<i>Jasrota District</i>	151,802	116,267	72	108	11	35,174
<i>Udhampur District</i>	251,725	130,748	17	128	439	84,390
<i>Riasi</i>	206,809	80,886	11	487	..	125,424
<i>Mirpur.</i>	324,933	57,187	225	3,156	..	264,347
<i>Bhadarwah Jagir</i>	37,512	22,931	..	..	1	14,580
<i>Punch Ilaga</i>	334,393	21,967	54	9,624	1	302,719
<i>Kashmir Province</i>	1,295,201	62,368	45	14,772	3	1,217,768
<i>Kashmir North</i>	460,786	9,917	5	4,575	2	446,248
<i>Kashmir South</i>	639,210	47,754	40	2,586	..	588,641
<i>Muzaffarabad District</i>	195,205	4,697	..	7,611	1	182,879
<i>Frontier</i>	265,060	1,518	19	122	36,057	227,259
<i>Laddakh District</i>	186,656	407	18	41	36,067	150,070
<i>Gilgit</i>	23,969	816	..	57	..	23,075
<i>Frontier Ilagas</i>	54,435	295	1	24	..	54,114

NORTH-WEST FRONTIER PROVINCE.

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Sikh.	Christian.
<i>North-West Frontier Province</i>	2,210,471	122,628	2,049,599	31,459	6,718
<i>Hazara</i>	603,028	24,389	572,972	5,489	178
<i>Peshawar</i>	865,009	35,367	807,788	16,196	5,604
<i>Kohat</i>	222,690	10,848	208,868	2,739	222
<i>Bannu</i>	250,086	20,721	225,374	3,746	245
<i>Dera Ismail Khan</i>	256,120	28,617	224,992	2,175	336
<i>Malakhand Agency</i>	4,435	1,763	1,849	732	91
<i>Khyber</i>	1,672	56	1,560	47	9
<i>Kurram</i>	2,967	554	2,288	114	11
<i>Tochi</i>	1,879	219	1,516	132	12
<i>Wano</i>	1,986	52	1,924	..	10

BALUCHISTAN.

DISTRICT OR STATE.	RELIGION.			
	TOTAL.	Hindu.	Musalman.	Christian.
<i>Baluchistan</i>	834,703	37,802	782,648	5,085
<i>Districts</i>	414,412	25,764	377,356	5,030
Quetta-Peshin	127,648	13,244	106,702	4,564
Loralai	80,769	2,958	76,755	71
Zhob	70,366	1,348	68,088	168
Bolan	2,096	523	1,422	26
Chagai	16,344	376	15,916	9
Sibi	117,189	7,315	108,473	192
<i>Administered Area</i>	82,423	6,944	74,078	192
<i>Mari-Bugti country</i>	34,766	371	34,395	..
States	420,291	11,838	405,292	55

RAJPUTANA AND AJMER-MERWARA.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
<i>Rajputana</i>	10,530,432	8,752,045	332,397	985,825	4,256	444,702
<i>Western Division</i>	2,846,847	2,346,648	157,950	279,573	591	53,115
Bikaner	700,983	575,699	24,858	91,929	151	..
Jaisalmer	88,311	60,951	1,102	22,099	..	4,158
Marwar	2,057,553	1,709,998	131,990	165,545	440	48,967
<i>Southern Division</i>	1,892,267	1,351,874	98,429	68,859	1,043	371,669
Banswara	165,463	60,339	4,396	4,886	..	95,834
Dungarpur	159,192	72,681	5,510	6,703	2	74,281
Kushalgarh	22,005	3,694	513	697	..	17,100
Mewar	1,293,776	1,021,906	66,704	45,752	237	159,094
Partabgarh	62,704	33,848	4,318	3,581	..	20,929
Sirohi	189,127	159,406	16,988	7,240	804	4,431
<i>Eastern Division</i>	5,791,318	5,053,523	76,018	637,303	2,622	19,918
Alwar	791,688	588,230	4,111	199,149	92	31
Bharatpur	558,785	452,730	2,720	102,449	566	..
Bundi	218,730	196,919	6,614	10,656	..	4,532
Dholpur	263,188	242,734	2,031	18,262	41	..

RAJPUTANA AND AJMER-MERWARA—contd.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
Jaipur	2,636,647	2,398,880	38,408	195,760	1,326	1,779
Jhalawar	96,271	84,585	2,488	8,625	26	420
Karauli	146,587	137,989	394	8,160	28	8
Kishangarh	87,191	76,642	3,176	6,785	23	535
Kotah	639,089	584,137	6,412	44,569	507	3,075
Lawa (Estate)	2,564	2,282	142	139	..	..
Shahpura	47,397	41,249	1,619	2,407	1	1,952
Tonk	303,181	247,146	7,903	40,432	12	7,586
Ajmer Merwara	601,395	388,552	20,302	81,035	5,432	3,979
Ajmer	380,384	296,076	14,313	60,465	4,910	2,678
Merwara	121,011	92,476	5,989	20,570	522	1,301

CENTRAL INDIA.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
Central India	9,356,980	8,262,638	87,471	511,200	9,358	483,394
Gwalior Residency	3,090,798	2,839,443	37,488	168,786	1,670	42,523
Indore Residency	979,360	848,014	10,397	78,839	4,824	36,092
Baghelkhand Agency	1,772,574	1,727,163	700	40,596	163	3,915
Bhopal Agency	1,050,735	884,144	6,425	100,674	331	58,775
Bhopawar Agency	698,455	369,897	8,682	32,674	1,084	285,941
Bundelkhand Agency	1,375,317	1,286,654	12,886	46,997	812	27,859
Malwa Agency	389,741	307,323	10,893	42,634	474	28,289

CENTRAL PROVINCES.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
Central Provinces and Berar	16,033,310	12,807,874	71,417	585,029	73,401	2,490,355
Jubbulpore Division	2,421,064	1,743,762	32,702	101,952	9,844	530,920

CENTRAL PROVINCES—contd.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
Saugor	541,410	471,650	16,713	25,835	1,454	24,924
Damoh	333,047	303,189	7,270	11,002	437	11,115
Jubbulpore	745,892	598,960	6,233	41,339	6,880	91,543
Mandla	405,234	155,008	730	6,342	871	242,261
Seoni	395,481	214,957	1,756	17,434	202	161,077
<i>Nerbudda Division</i>	2,081,477	1,568,491	9,098	95,378	7,463	400,134
Narsinghpur	325,877	278,048	2,288	11,707	471	32,992
Hoshangabad	457,395	382,775	1,784	20,799	1,807	49,015
Nimar	391,071	340,030	1,664	38,428	3,793	6,803
Betul	390,386	259,318	1,360	7,849	547	121,175
Chhindwara	516,948	308,320	2,002	16,595	755	189,249
<i>Nagpur Division</i>	3,109,838	2,637,913	7,422	91,453	7,832	364,175
Wardha	459,796	391,063	2,488	18,174	178	47,831
Nagpur	809,901	725,399	3,040	38,434	6,245	36,003
Chanda	677,544	539,713	708	12,172	541	124,356
Bhandara	773,677	685,342	625	14,707	538	72,424
Balaghat	388,920	296,396	561	7,966	330	83,561
<i>Chhattisgarh Division</i>	3,246,767	2,878,211	2,136	37,461	6,735	321,831
Raipur	1,324,856	1,126,497	977	16,515	3,365	177,300
Bilaspur	1,146,223	1,077,338	366	13,964	2,011	52,425
Drug	775,688	674,376	793	6,982	1,359	92,108
Berar	3,057,162	2,668,109	18,900	238,665	2,823	127,861
Amraoti	875,904	738,294	5,254	73,311	1,489	57,191
Akola	788,863	711,025	5,844	70,148	666	934
Buldana	669,182	608,609	4,459	55,257	378	382
Yeotmal	723,213	610,181	3,343	39,949	290	69,354
<i>Feudatory States</i>	2,117,002	1,311,388	1,159	20,120	38,704	745,434
Makrai	15,021	10,036	67	829	..	4,089
Bastar	433,310	141,987	52	1,646	1,277	288,323
Kanker	127,014	57,065	71	636	10	69,232
Nandgaon	167,362	138,738	541	2,149	154	25,763
Khairagarh	155,471	144,249	217	2,249	252	8,487
Chhuikhadan	31,150	25,564	115	903	10	4,558
Kawardha	77,654	60,040	63	1,517	28	16,000
Sakti	34,547	29,293	..	352	14	4,882
Raigarh	218,860	199,035	13	1,376	51	18,210

CENTRAL PROVINCES—concl'd.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
Sarangarh	102,071	99,494	7	356	16	2,197
Chang Bhakar	24,321	11,446	..	60	..	12,915
Korea	62,107	21,387	..	540	4	40,176
Surguja	428,703	267,193	13	5,576	..	155,921
Udaipur	64,853	16,397	..	285	8	48,163
Jashpur	174,458	89,414	..	1,646	36,880	46,518

BOMBAY.

DISTRICT OR STATE.	RELIGION.						
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.	Jain.	Zorastrian.
<i>Bombay Presidency including Native States and Agencies and Aden.</i>	27,084,317	20,977,303	4,901,916	245,657	320,234	489,952	83,595
Bombay City	979,445	664,042	179,346	57,355	6	20,460	50,931
<i>Northern Division</i>	3,685,368	3,117,263	342,696	76,529	66,115	59,900	21,582
Ahmadabad	827,809	693,155	92,018	4,056	687	35,899	1,639
Broach	306,717	192,935	67,752	1,102	38,860	3,053	2,770
Kaira	691,744	598,164	63,280	23,592	7	6,609	81
Panch Mahals	322,695	274,339	22,273	1,852	22,475	1,542	204
Surat	654,109	571,745	55,394	1,185	4,051	9,821	11,783
Thana	882,309	786,925	41,979	44,742	35	2,985	5,105
<i>Central Division</i>	6,387,064	5,798,828	387,509	48,194	95,321	70,600	4,904
Ahmadnagar	945,305	855,676	47,959	24,936	1,200	15,284	222
East Khandesh	1,034,886	902,131	99,521	1,420	21,993	9,361	371
West Khandesh	580,723	474,200	31,323	629	70,542	3,796	233
Nasik	905,030	843,705	47,705	3,253	1,486	7,902	840
Poona	1,071,512	991,725	48,936	14,936	75	11,731	2,695
Satara	1,081,278	1,028,176	36,688	1,295	1	14,883	209
Sholapur	768,330	703,215	55,377	1,725	24	7,643	334
<i>Southern Division</i>	5,061,150	4,502,708	457,997	37,543	42	59,756	768
Bolgaum	943,820	817,797	77,075	7,185	..	41,533	159
Bijapur	862,973	757,542	101,069	1,098	..	3,235	28
Dharwar	1,020,005	872,885	136,943	5,445	3	10,413	218

BOMBAY—contd.

DISTRICT OR STATE.	RELIGION.						
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.	Jain.	Zoroastrian.
Kanara	430,548	383,624	28,731	16,843	..	1,251	14
Kolaba	594,166	560,266	23,876	1,258	2	1,411	303
Ratnagiri	1,203,638	1,110,594	85,303	5,714	37	1,913	46
Sind	3,513,435	837,426	2,639,929	10,911	8,869	1,349	2,411
Hyderabad	1,037,144	245,941	781,219	1,130	5,432	171	96
Karachi	521,721	111,521	396,334	9,013	30	650	2,202
Larkana	660,879	101,651	557,517	72	15	1	6
Sukkur	573,913	155,031	414,671	585	30	3	96
Thar and Parkar	456,771	196,787	254,218	80	3,362	524	6
Upper Sind Frontier	263,007	26,495	235,970	31	..	..	5
Native States and Agencies	7,411,675	6,054,992	877,431	12,411	149,879	277,643	2,585
Gujarat Group	4,882,801	3,921,788	558,026	3,378	149,524	213,004	2,417
Cambay	72,656	59,568	9,715	195	1	3,056	121
Cutch	513,429	295,436	126,133	63	..	65,298	80
Kathiawar	2,496,057	2,051,035	326,569	991	..	108,340	924
Mahi Kantha Agency	412,631	379,253	18,779	779	4,211	9,595	12
Palanpur Agency	515,092	442,938	45,157	211	1,589	24,992	173
Rewa Kantha Agency	665,099	491,456	26,912	1,081	143,653	1,522	476
Surat Agency	207,837	202,108	4,761	58	70	201	631
Konkan Group	359,476	331,552	20,847	5,843	..	533	65
Janjira	[88,747	73,256	14,769	5	..	91	..
Jawhar	[53,489	52,945	445	23	..	13	63
Sanvantvadi	217,240	205,351	5,633	5,815	..	439	2
Deccan Group	397,478	375,755	19,525	54	..	1,820	64
Akalkot	89,082	76,112	12,434	2	..	528	6
Bhor	144,601	142,213	1,648	37	..	449	8
Khandesh Agency	23,624	22,736	880	..	..	..	8
Satara Agency	124,991	119,828	4,307	15	..	827	..
Surgana	15,180	14,866	256	..	..	16	42
Karnatak Group	1,548,132	1,386,471	96,206	3,130	..	62,286	39
Bijapur Agency	78,643	73,617	4,742	12	..	272	..
Kolhapur	833,441	758,891	33,330	2,405	..	38,794	21
Southern Maratha Jagire	618,189	541,530	52,686	707	..	23,198	18
Savanur	17,909	12,433	5,448	6	..	22	..
Khairpur	223,788	39,426	182,827	6	355	..	..
Aden	46,165	2,044	37,098	2,714	2	235	364

MYSORE.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Musalman.	Jain.	Christian.	Animist.
<i>Mysore State including Civil and Military Station, Bangalore.</i>	5,908,193	5,340,908	314,494	17,630	59,844	72,196
<i>Eastern Division</i>	4,269,986	3,950,805	223,107	11,178	28,529	46,695
Bangalore City	88,651	72,632	10,587	446	4,238	705
Bangalore District.	759,522	691,148	48,391	2,571	5,807	11,567
Kolar Gold Fields City	48,635	35,395	3,103	..	9,660	6
Kolar District	731,518	671,187	47,972	1,815	3,253	7,281
Tumkur District	735,346	683,971	35,218	3,323	1,631	11,199
Mysore City	71,306	55,926	12,825	318	2,152	17
Mysore District	1,270,765	1,225,397	37,796	1,830	1,543	4,184
Chitaldrug District	564,243	524,169	27,215	875	245	11,736
<i>Western Division</i>	1,435,373	1,324,557	68,601	6,132	10,885	25,154
Hasan District	580,200	551,669	17,773	1,792	3,828	5,128
Kadur District	338,457	309,827	16,580	1,331	4,542	6,377
Shimoga District	516,716	483,261	34,248	3,009	2,515	13,649
Civil and Military Station, Bangalore	100,834	56,546	22,786	320	20,430	347

BARODA.

DISTRICT OR STATE.	RELIGION.						
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.	Parsi.
<i>Baroda State</i>	2,032,798	1,697,146	43,462	160,887	7,203	115,411	7,955
Baroda Division	587,555	493,908	8,005	48,982	6,039	30,317	109
Kadi	832,162	752,157	26,963	52,587	348	1	77
Navsari	335,467	217,195	2,772	23,207	60	84,894	7,179
Amreli	178,269	155,670	3,514	16,905	8	..	29

HYDERABAD-DECCAN.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
<i>Hyderabad State</i>	13,374,676	11,626,146	21,026	1,380,990	54,296	285,722
Hyderabad City	500,623	262,131	379	219,896	16,240	41
Atraf-i-balda	520,159	455,203	110	59,342	1,291	4,067
Warangal Division	2,657,477	2,323,038	226	126,270	12,593	194,583

HYDERABAD-DECCAN—concl'd.

DISTRICT OR STATE.	RELIGION.					
	TOTAL.	Hindu.	Jain.	Musalman.	Christian.	Animist.
Warangal	905,414	723,884	35	60,079	11,979	110,021
Karimnagar	1,131,637	1,074,654	64	46,523	586	9,598
Adilabad	620,426	524,500	127	29,668	28	65,964
<i>Medak Division</i>	3,046,705	2,753,155	142	220,428	13,940	58,365
Medak	687,137	615,552	120	65,084	2,203	4,016
Nizamabad	568,009	523,159	18	41,951	720	1,820
Mahbubnagar	747,178	672,750	..	59,521	451	14,392
Nalgonda	1,044,381	941,694	4	53,872	10,566	38,137
<i>Aurangabad Division</i>	2,976,541	2,627,633	13,490	308,012	6,849	18,108
Aurangabad	869,787	734,252	5,496	111,449	6,369	11,794
Bhir	622,531	566,054	3,389	51,900	2	835
Nander	704,549	627,652	940	72,189	69	2,336
Parbhani	779,674	699,675	3,665	72,474	409	3,143
<i>Gulbarga Division</i>	3,673,171	3,204,986	6,679	447,042	3,383	10,558
Gulbarga	1,150,983	970,405	1,613	169,326	1,044	8,442
Osmanabad	635,977	572,433	3,429	59,448	252	306
Raichur	996,684	900,417	707	93,478	1,711	268
Bidar	889,527	761,731	930	124,790	376	1,542

COORG.

TOWNS.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
Mercara	6,269	4,389	1,312	535	6
Virarajendrapot	3,712	1,827	1,396	423	2
Coorg (Province)	174,976	138,922	13,143	3,553	19,227

COCHIN STATE.

TALUKS.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
<i>Cochin State</i>	918,110	615,708	63,822	233,092	4,177
Kansyannur Taluk	264,828	144,927	15,715	102,834	159

COCHIN STATE—contd.

TALUKS.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
Cranganur Taluk	33,193	23,104	8,376	1,713	..
Mukundapuram Taluk	193,930	126,978	9,791	55,990	1,061
Triohur Taluk	169,756	119,033	5,618	44,775	323
Talapilli Taluk	165,114	124,918	17,052	22,927	216
Chittur Taluk	91,289	76,748	7,270	4,853	2,418

TRAVANCORE STATE.

DISTRICTS.	RELIGION.				
	Total.	Hindu.	Musalman.	Christian.	Animist.
Travancore State	3,428,975	2,282,617	226,617	903,868	15,773
Padmanabhapuram	430,087	296,420	14,851	116,778	2,038
Trivandrum	557,865	423,909	51,197	77,305	5,438
Quilon	1,233,360	877,605	89,750	262,446	3,543
Kottayam	1,139,101	640,983	67,061	428,706	2,298
Devikulam	68,562	43,700	3,758	18,633	2,456

MADRAS.

DISTRICT OR STATE.	RELIGION.				
	Total.	Hindu.	Musalman.	Christian.	Animist.
Madras Presidency	41,870,160	37,230,034	2,764,467	1,208,515	638,466
Ganjam	1,870,826	1,810,132	5,425	2,367	52,902
Agency, Ganjam	350,466	127,495	61	1,896	221,014
Vizagapatam	2,169,670	2,141,249	21,781	4,983	1,627
Agency, Vizagapatam	1,020,151	763,976	2,094	9,753	244,328
Godavari	1,445,957	1,412,861	24,447	8,240	308
Agency, Godavari	206,902	182,451	2,580	1,616	20,255
Kistna	1,997,535	1,875,458	70,733	49,863	1,449
Guntur	1,697,551	1,447,410	117,272	123,707	9,069
Nellore	1,328,152	1,136,263	81,799	44,298	65,780

MADRAS—contd.

DISTRICT OR STATE.	RELIGION.				
	TOTAL.	Hindu.	Musalman.	Christian.	Animist.
Cuddapah	893,998	769,061	99,116	22,408	3,385
Kurnool	935,199	770,172	120,770	42,068	2,124
Bellary	969,436	869,755	93,691	4,481	354
Anantapur	963,223	876,471	80,048	3,638	2,599
Madras	518,660	415,910	59,169	41,814	..
Chingleput	1,406,008	1,342,378	31,604	30,377	1,223
Chittoor	1,238,742	1,166,447	59,183	4,558	8,547
North Arcot	1,960,960	1,801,355	117,909	32,822	..
Salem	1,766,680	1,708,241	43,424	15,003	..
Coimbatore	2,116,564	2,051,778	43,100	19,550	2,099
South Arcot	2,362,566	2,223,171	66,986	67,436	..
Tanjore	2,362,689	2,141,196	131,042	89,814	..
Trichinopoly	2,107,029	1,953,852	65,753	87,353	..
Madura	1,932,832	1,795,753	76,558	60,510	..
Ramnad	1,658,453	1,461,531	120,220	76,677	..
Tinnevelly	1,790,619	1,509,224	105,474	175,889	..
Nilgiris	118,618	93,914	5,877	17,343	1,400
Malabar	3,015,119	2,008,082	953,381	53,015	..
Anjengo	5,572	1,591	221	3,760	..
South Canara	1,195,227	949,427	140,700	96,029	..
<i>Feudatory States</i>	4,64,756	423,430	24,059	17,249	3
Pudukkottai	411,886	382,044	13,445	16,393	..
Banganapalle	39,344	30,501	8,054	785	3
Sandur	13,526	10,885	2,560	71	..

APPENDIX X.

OCCUPATION FIGURES.

The tables below enumerate the number of persons recorded in the Census of 1911 as engaged in Raising Small Animals, Silk Spinners and Weavers. The first table is a summary of the provinces to which are added two columns, the second and fourth, into which are put figures estimated as actuals: the letter T. prefixed in column two means they are Tasar rearers. In column one in summary table, the figures are often misleading: Mysore records 508 rearers when there are probably 70,000 actually, who were classed as agriculturists: and in such cases the figures in column one are omitted in the Total Column.

The second and fourth are added as estimates of the real numbers engaged.

PROVINCE.	SUMMARY.				
	Raising of small animals.	Rearers.	Silk spinners and weavers.	Add.	Total.
Burma	1,459	..	18,617	..	20,176
Assam	135	39,000	1,717	40,000	80,717
Bengal	42,659	T-5,000	48,783	40,000	136,442
Bihar and Orissa	563	T-65,000	8,438	20,000	94,001
United Provinces	843	T-2,000	15,885	..	17,885
Punjab	44	400	13,884	..	14,084
Kashmir	752	80,000	5,724	4,000 in filature	89,724
North-West Frontier	18	..	373	..	373
Rajputana	26	..	24	..	24
Central Provinces	115	T-8,000	18,903	40,000	64,903
Bombay	247	..	44,137	..	44,137
Mysore	508	70,000	2,478	10,000	82,478
Hyderabad	18	..	1,901	..	1,901
Baroda	11	..	1,191	..	1,191
Travancore	3	..	..	..	..
Madras	327	30,000	74,773	..	75,100
TOTAL	47,668	307,400	286,678	154,000	775,746

BURMA.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (poultry, bees, silkworms, etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.
Burma	1,459	18,621	132,737
Arakan Division	480	3,176
Akyab	477	2,101
Northern Arakan
Kyaukpya	3	918
Sandoway	157

BURMA—contd.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (poultry, bees, silkworms, etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.
<i>Pegu Division</i>	949	2,760	6,988
City of Rangoon	23	..	23
Hanthawaddy	471	7	2,274
Tharrawaddy	1	..	629
Pegu	329	..	614
Prome	125	2,753	3,448
<i>Irrawaddy Division</i>	..	644	4,010
Bassein	..	2	805
Henzada	..	640	1,598
Myaungmya	..	2	687
Ma-ubin	..	..	522
Pyapon	..	..	398
<i>Tenasserim Division</i>	78	2,289	9,315
Toungoo	60	39	1,141
Salween	..	..	29
Thaton	18	..	2,620
Amherst	..	6	2,490
Tavoy	..	2,244	2,922
Mergui	..	..	113
<i>Magwe Division</i>	4	324	22,614
Thayetmyo	..	..	1,477
Pakokku	1	20	15,829
Minbu	..	301	3,832
Magwe	3	3	1,476
<i>Mandalay Division</i>	420	9,903	6,358
Mandalay (including City)	420	9,903	5,152
Mandalay City	420	3,562	4,825
Bhamo	..	..	445
Myitkyina	..	..	118
Katha	..	..	207
Ruby Mines	..	..	436
<i>Sagaing Division</i>	3	1,012	20,464
Shwebo	..	515	2,163
Sagaing	..	497	4,609
Lower Chindwin	..	..	12,977
Upper Chindwin	3	..	715

BURMA—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (poultry, bees, silkworms, etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.
<i>Meiktila Division</i>	5	964	12,724
Kyaukse . . . . .	..	788	730
Meiktila . . . . .	..	..	3,695
Yamethin	5	100	1,192
Myingyan . . . . .	..	76	7,107
<i>Specially Administered Territories</i> . . . . .	..	245	47,088
Northern Shan States . . . . .	..	187	1,977
Southern Shan States . . . . .	..	58	45,111
Chin Hills . . . . .	..	..	..

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Labourers.
Provincial Total	13,866	2,211
Burma Proper	7,799	2,028
<i>Specially Administered Territories</i>	6,067	183

ASSAM.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (birds, bees, silkworms, etc.).	Cotton spinning, sizing and weaving.	Silk spinners and weavers: Total.
<i>Assam</i>	135	56,295	1,717
(1) <i>British Territory</i>	127	13,195	1,131
<i>Surma Valley and Hill Districts</i>	114	9,713	2
Cachar . . . . .	..	1,517	..
Sylhet	20	7,369	..
Khasi and Jaintia Hills	47	777	2
Naga Hills	41	50	..
Lushai Hills	6	..	..
<i>Assam Valley Districts</i>	13	3,472	1,129
Goalpara . . . . .	..	606	1
Kamrup	2	2,300	887

ASSAM—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (birds, bees, silk-worms, etc.).	Cotton spinning, sizing and weaving.	Silk spinners and weavers : Total.
Darrang . . . . .	..	152	1
Nowgong . . . . .	..	254	229
Sibsagar	7	71	11
Lakhimpur	4	53	..
Garó Hills . . . . .	..	36	..
(2) Manipur State	8	43,110	586

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Agricultural labourers.	Rent payers.
Provincial Total	252	12,002
British Territory	252	9,431
Manipur State . . . . .	..	2,661

Assam has 4,250 families who rear Mulberry silk.

Do.	15,000	do.	do.	Muga.
Do.	20,000	do.	do.	Eri.

BENGAL.

DISTRICT.	Birds, bees and cocoon rearers.			Silk spinners and weavers.		
	1911.	1901.	1891.	1911.	1901.	1891.
Burdwan . . . . .	..	..	4	849	367	991
Birbhum	3	390	8,524	3,098	2,355	649
Bankura	372	418	878	4,800	2,683	2,191
Midnapur	20	16	3,624	806	2,634	3,770
Hooghly	52	..	83	100	1,294	1,145
Howrah	11	2	13	3	14	100
24 Parganas	2	..	5	258	25	..
Calcutta . . . . .	..	..	..	29	408	74

BENGAL—contd.

District.	Birds, bees and cocoon rears.			Silk spinners and weavers.		
	1911.	1901.	1891.	1911.	1901.	1891.
Nadia	26	26	7	351	99	98
Murshidabad	6,803	10,761	31,698	27,338	30,854	23,444
Jessore	1	..	..	14	22	..
Khulna . . . . .	..	..	..	..	..	..
Rajshahi	766	7,435	8,793	3,127	7,927	5,419
Dinajpur . . . . .	..	13	19	..	..	..
Jalpaiguri	1	..	..	..	..	..
Darjeeling . . . . .	..	..	..	..	..	..
Rangpur . . . . .	..	..	..	..	..	..
Bogra . . . . .	..	..	1	42	..	..
Pabna . . . . .	..	10	..	2	..	..
Malda	34,598	35,893	38,433	7,950	7,576	4,463
Dacca . . . . .	..	..	..	4	..	..
Backergung . . . . .	..	..	..	12	..	..
Faridpur . . . . .	..	..	..	..	..	..
Mymensingh . . . . .	..	..	..	..	..	..

District or State.	Occupation.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Bengal	4,59,903	42,659	48,783
(1) British Territory	4,58,762	42,655	48,783
Burdwan Division	1,14,071	458	9,656
Burdwan	13,905	..	849
Birbhum	10,779	3	3,098
Bankura	20,328	372	4,800
Midnapore	39,975	20	806
Hooghly	19,060	52	100
Howrah	10,024	11	3
Presidency Division	92,529	6,832	27,990
24 Parganas	11,295	2	258
Calcutta	793	..	29
Nadia	19,860	26	351
Murshidabad	16,497	6,803	27,338

BENGAL—concl.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.)	Silk spinners and weavers.
Jessore	31,182	1	14
Khulna	12,902	..	..
<i>Rajshahi Division</i>	58,683	35,365	11,121
Rajshahi	2,555	766	3,127
Dinajpur	5,891	..	..
Jalpaiguri	4,738	1	..
Darjeeling	565	..	..
Rangpur	787	..	..
Bogra	2,514	..	42
Pabna	29,762	..	2
Malda	11,871	34,598	7,950
<i>Dacca Division</i>	1,25,238	..	16
Dacca	44,442	..	4
Backergunge	21,809	..	12
Faridpur	33,132	..	..
Mymensingh	25,855	..	..
(2) <i>Feudatory States</i>	1,141	4	..
Cooch Bihar	728	4	..
<i>Sikkim</i>	69	1	..

DISTRICT OR STATE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Agricultural labourers.
British Territory	28,044	828
Feudatory States	453	..
Cities . . . . .	..	..

BIHAR AND ORISSA.

B²

DISTRICT OR STATE.	Silk rearers and gatherers.			Silk weavers, twisters, etc.		
	1911.	1901.	1891.	1911.	1901.	1891.
Patna	10	..	..	..	7	3
Gya	2	..	..	353	2	37

BIHAR AND ORISSA—*contd.*

DISTRICT OR STATE.	Silk rearers and gatherers.			Silk weavers, twisters, etc.		
	1911.	1901.	1891.	1911.	1901.	1891.
Shahabad	61	..	..	..	3	3
Saran	258	..	..	..	1	5
Champanan	7	..	..	..	4	..
Muzaffarpur . . . . .	..	..	..	..	..	..
Darbhanga . . . . .	..	..	..	..	10	..
Monghyr	2	..	38	..	25	..
Bhagalpur	1	..	..	5,518	925	458
Purnea . . . . .	..	..	..	5	3	..
Sonthal Pergannahs	6	31	30	151	87	131
Cuttack	7	1	..	247	1,233	274
Balasore . . . . .	..	..	..	28	112	100
Angul . . . . .	..	..	1	..	..	..
Puri	135	..	8	184	366	274
Sambalpur	2	..	..	..	..	..
Hazaribagh . . . . .	..	..	..	220	325	8
Ranchi . . . . .	..	110	..	..	85	56
Palameu . . . . .	..	..	..	16	425	..
Singhbhum . . . . .	..	..	..	..	48	358
Manbhum . . . . .	..	..	..	141	89	391
Orissa Feudatory States	71	40	53	1,575	1,657	2,974
Chota Nagpur States . . . . .	..	107	..	..	..	..

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning sizing and weaving.	Raising of small animals (birds, bees, silk worms, etc.).	Silk spinners and weavers.
<i>Bihar and Orissa</i>	393,297	563	8,438
<i>Patna Division</i>	61,004	73	353
Patna	15,548	10	..
Gaya	29,317	2	353
Shahabad	16,139	61	..
<i>Tirhut Division</i>	25,059	266	..
Saran	6,759	258	..
Champanan	1,366	7	..
Muzaffarpur	3,980	..	..
Darbhanga	12,954	1	..
<i>Bhagalpur Division</i>	40,986	9	5,674
Monghyr	10,836	2	..
Bhagalpur	6,871	1	5,518
Purnea	11,510	..	5

BIHAR AND ORISSA—*concl'd.*

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Sonthal Pergannahs	11,769	6	151
Orissa Division	119,232	144	459
Cuttack	51,643	7	247
Balasore	13,022	..	28
Angul	6,142	..	..
Puri	15,544	135	184
Sambalpur	32,881	2	..
Chota Nagpur Division	30,955	..	377
Hazaribagh	4,187	..	220
Ranchi	14,290	..	..
Palamau	6,070	..	16
Manbhum	3,348	..	141
Singhbhum	3,060	..	..
Orissa Feudatory State	114,917	71	1,575
Chota Nagpur	1,144	..	..

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Farm servants, etc.
Bihar and Orissa	61,019	3,891
British Territory	49,315	2,663
Feudatory States	11,704	1,228

UNITED PROVINCES.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
United Provinces	853,133	939	16,044
Meerut	42,237	..	..
Dehra Dun	334	24	..
Saharanpur	38,223	129	11
Muzaffarnagar	25,490	..	..
Bulandshahr	30,940	64	..
Aligarh	32,845	42	9

UNITED PROVINCES—*contd.*

DISTRICT OR STATE,	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
<i>Agra</i>	22,347	..	87
<i>Muttra</i>	10,486	5	..
<i>Farrukhabad</i>	17,335	1	33
<i>Mainpuri</i>	12,518	1	..
<i>Etawah</i>	15,409	..	..
<i>Etah</i>	15,992	..	..
<i>Rohilkhand—</i>			
<i>Bareilly</i>	35,944	..	5
<i>Bijnor</i>	59,301	25	8
<i>Budaun</i>	24,485	..	..
<i>Moradabad</i>	51,168	..	4
<i>Shahjehanpur</i>	18,171	4	..
<i>Pilibhit</i>	10,321	..	..
<i>Allahabad</i>	15,946	6	..
<i>Cawnpore</i>	19,299	..	..
<i>Fatehpur</i>	7,587	..	..
<i>Banda</i>	11,467	..	..
<i>Hamirpur</i>	12,835	1	..
<i>Jhansi</i>	20,142	1	2
<i>Jalaun</i>	11,180	7	..
<i>Benares</i>	21,470	8	15,044
<i>Mirzapur</i>	7,550	64	..
<i>Jaunpur</i>	15,279	51	..
<i>Ghazipur</i>	9,867	..	..
<i>Ballia</i>	15,889	..	..
<i>Gorakhpur</i>	8,331	..	15
<i>Basti</i>	14,306	..	..
<i>Azamgarh</i>	35,859	..	448
<i>Kumaun—</i>			
<i>Naini Tal</i>	3,861	29	..
<i>Almora</i>	8	1	203
<i>Garhwal</i>	55	..	..
<i>Lucknow</i>	4,226	2	138
<i>Unao</i>	9,523	22	5
<i>Rai Bareilly</i>	10,605	6	..
<i>Sitapur</i>	27,098	18	..

UNITED PROVINCES—concl'd.

DISTRICT OR STATE	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Hardoi	14,542	..	2
Kheri	8,649	213	..
Fyzabad	21,468	..	..
Gonda	5,050	..	1
Bahraich	1,795	..	5
Sultanpur	5,992	..	..
Partabgarh	9,046	..	..
Bara Banki	26,825	120	24
<i>Native States—</i>			
Rampur	13,078	58	..
Tehri-Garhwal	759	..	..

PROVINCE	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Farm servants and field labourers.
United Provinces	34,260	1,673
British Territory	32,899	1,673
Native States	1,361	..

PUNJAB.

DISTRICT OR STATE	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Punjab	883,156	22	13,584
Delhi Division	97,710	..	870
Hissar	11,144	..	..
Rohtak	16,222	..	..
Gurgaon	16,146	..	2
Delhi	12,993	..	850
Karnal	14,103	..	..
Ambala	26,751	..	18
Simla	351	..	..

PUNJAB—contd.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.)	Silk spinners and weavers.
<i>Jullundur Division</i>	169,659	..	1,761
Kangra	14,103	..	..
Hoshiarpur	66,140	..	..
Jullundur	47,149	..	1,760
Ludhiana	18,926	..	1
Ferozepore	23,341	..	..
<i>Lahore Division</i>	218,770	9	5,876
Lahore	36,032	6	492
Amritsar	39,332	..	3,867
Gurdaspur	39,614	3	211
Sialkot	62,918	..	5
Gujranwala	40,874	..	1,301
<i>Rawalpindi Division</i>	148,257	..	68
Gujrat	38,638	..	..
Shahpur	32,292	..	22
Jhelum	23,213	..	39
Rawalpindi	12,841	..	1
Attock	27,079	..	6
Mianwali	14,194	..	..
<i>Multan Division</i>	155,220	10	4,727
Montgomery	21,466	2	384
Lyallpur	27,308	..	1
Jhang	31,655	..	387
Multan	38,553	8	3,922
Muzaffargarh	20,849	..	22
Dera Ghazi Khan	15,389	..	11
<i>Native States</i>	93,540	3	282
Kalsia	2,671	..	..
Nahan	571	..	2
Mandi	1,259	..	15
Suket	297	..	..
Kapurthala	10,014	..	237
Simla Hill States	3,883	..	..
<i>Phulkian States—</i>			
Patiala	35,707	3	27
Jind	5,826	..	..
Nabha	6,427	..	..

PUNJAB—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Bahawalpur	20,820	..	1
Malerkotla	1,743	..	..
Feridkot	2,153	..	..
Chamba	550	..	..

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Rent payers and field labourers.
Punjab	9,411	2,273
British Territory	7,794	1,895
Native States	1,617	578

JAMMU AND KASHMIR STATE.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
<i>Jammu Province</i> (10,000 rearers)	28,660	4	475
Jammu District	11,244	..	332
Jasrota „	4,634	..	1
Udhampur „	1,426	4	31
Riasi „	1,109	..	26
Mirpur „	8,477	..	12
Bhadarwah Jagir	174	..	..
Punch Ilaga	1,596	..	73
<i>Kashmir</i> (80,000 rearers)	31,845	748	4,981
Kashmir, North	8,912	251	1,917
Kashmir, South	24,065	497	3,063
Muzaffarabad District	868	..	1
Frontier	697	..	268
Laddakh District	653	..	268
Gilgit	12	..	..
Frontier Ilagas	14	..	..

JAMMU AND KASHMIR STATE—*concl.*

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Agricultural labourers.
Jammu Province	5,374	28
Kashmir	4,929	68
Frontier Districts	463	5

NORTH-WEST FRONTIER PROVINCE.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
North-West Frontier Province	34,599	18	373
Hazara	12,431	11	4
Peshawar	16,919	3	341
Kohat	1,373	..	28
Bannu	1,308	..	..
Dera Ismail Khan	2,567	4	..
Trans-Frontier Posts	1	..	..

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Farm servants and field labourers.
North-West Frontier Province	900	13

BALUCHISTAN.

DISTRICT OR STATE.	Raising of small animals (birds, bees, silkworms, etc.).	Cotton spinning sizing and weaving.	Silk spinners and weavers.
Baluchistan	1,203	6
Quetta-Peshin
Loralai
Zhob	1	..
Chagai
Sibi	5	..
Kalat	1,162	6
Las Bela	35	..

RAJPUTANA AND AJMER-MERWARA.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Rajputana	306,939	26	24
Alwar	25,927	..	..
Banswara	2,054	..	..
Bharatpur	13,317	..	11
Bikaner	6,042	..	..
Bundi	4,812	..	7
Dholpur	4,609	..	..
Dungarpur	1,914	..	..
Jaipur	111,796	3	..
Jaisalmer	7,251	..	..
Jhalawar	1,354	..	..
Karauli	4,590	..	..
Kishangarh	3,672	..	..
Kotah	14,993	..	..
Kushalgarh	2	..	..
Lawa	143	..	..
Marwar	60,773	..	..
Mewar	32,162	23	..
Partabgarh	258	..	..
Shahpura	981	..	..
Sirohi	2,983	..	..
Tonk	7,306	..	..
Ajmer	7,032	..	..
Merwara	2,106	..	..

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS—COTTON SPINNING, SIZING AND WEAVING.			
	Rent receivers.	Rent payers.	Unpaid helpers.	Paid field labourers and farm servants.
Rajputana	394	8,212	2,080	1,158
Ajmer Merwara	10	215	43	48

CENTRAL INDIA.

PROVINCE.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
				Rent payers.	Farm servants and field labourers.
Central India Agency	89	551	106,726	1,544	1,895

CENTRAL PROVINCES.

DISTRICT OR STATE.	OCCUPATION.						
	Raising of small animals (birds, bees, silkworms, etc.).	Cotton weavers.	Cotton and silk weavers.	Total silk spinners and weavers.	Silk spinners.	Silk weavers.	Tassar weavers (whether combined or not combined with silk or cotton weaving).
<i>Central Provinces and Berar</i>	115	308,614	2,076	18,903	4,239	10,496	4,168
<i>Jubbulpur Division</i>	34	29,207	83	335	33	265	37
Saugor	25	6,948	14	85	32	53	..
Damoh	..	2,837	..	..	..	..	..
Jubbulpore	8	8,414	65	241	..	208	33
Mandla	1	4,603	4	9	1	4	4
Seoni	..	6,405	..	..	..	..	..
<i>Nerbudda Division</i>	9	35,291	517	890	276	546	68
Narsinghpur	..	4,964	..	1	..	..	1
Hoshangabad	8	8,072	..	1	..	..	1
Nimar	1	6,466	517	837	261	541	35
Betul	..	6,856	..	40	4	5	31
Chhindwara	..	8,933	..	11	11	..	..
<i>Nagpur Division</i>	43	124,399	1,469	12,714	2,622	9,436	656
Wardha	..	5,978	..	228	..	228	..
Nagpur	..	42,352	1,276	7,587	784	6,311	492
Chanda	39	31,627	..	330	246	..	84
Bhandara	4	31,904	..	4,403	1,517	2,886	..
Balaghat	..	12,538	193	166	75	11	80
<i>Chhattisgarh Division</i>	16	54,423	2	3,838	900	13	2,925
Raipur	15	26,215	..	790	269	..	521
Bilaspur	1	12,639	2	3,045	631	10	2,404
Drug	..	15,569	..	3	..	3	..
Berar	7	19,151	5	382	309	71	2
Amraoti	5	7,121	..	340	305	35	..
Akola	2	6,211	..	36	..	36	..

CENTRAL PROVINCES—concl'd.

DISTRICT OR STATE.	OCCUPATION.						
	Raising of small animals (birds, bees, silkworms, etc.).	Cotton weavers.	Cotton and silk weavers.	Silk spinners and weavers.	Silk spinners.	Silk weavers.	Tassar weavers (whether combined or not combined with silk or cotton weaving).
Buldana	2,480	5	1	1	..	..
Yeotmal	4,333	..	5	3	..	2
Feudatory States	6	46,143	..	744	99	165	480
Makrai	186	..	..	..	..	..
Bastar	10,769	..	98	..	..	98
Kanker	6	2,946	..	1	..	..	1
Nandgaon	5,852	..	..	..	..	..
Khairagarh	2,712	..	5	..	..	5
Chhuikhadan	917	..	..	..	..	..
Kawardha	1,005	..	..	..	..	..
Sakti	189	..	121	..	..	121
Raigarh	4,210	..	397	..	162	235
Sarangarh	1,802	..	116	99	..	17
Chang Bhakar	405	..	..	..	..	..
Korea	500	..	3	..	..	3
Surguja	7,382	..	3	..	3	..
Udaipur	2,150	..	..	..	..	..
Jashpur	5,118	..	..	..	..	..

DISTRICT OR STATE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Agricultural labourers.
Central Provinces and Berar	21,496	2,350
Central Provinces, British District and Berar	16,416	2,233
Central Provinces, British Districts	15,977	1,820
Berar	439	413
Feudatory States	5,080	117

BOMBAY.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (birds, bees, silkworms, etc.).	Cotton spinning, sizing and weaving.	Silk spinners and weavers.
<i>Bombay Presidency, including Native States and Agencies</i>	247	786,702	44,137
Bombay City . . . . .	..	171,175	77
<i>Northern Division</i>	88	130,861	20,755
Ahmadabad	54	81,729	7,336
Broach . . . . .	..	7,281	83
Kaira	32	13,894	60
Panch Mahals . . . . .	..	582	29
Surat	2	14,013	13,209
Thana . . . . .	..	13,362	38
<i>Central Division</i> . . . . .	..	148,585	5,776
Ahmadnagar . . . . .	..	21,093	786
Khandesh, East . . . . .	..	24,728	164
Khandesh, West . . . . .	..	8,603	124
Nasik . . . . .	..	28,210	2,839
Poona . . . . .	..	11,936	1,231
Satara . . . . .	..	12,288	304
Sholapur . . . . .	..	41,727	328
<i>Southern Division</i>	96	123,660	11,120
Belgaum	4	23,624	993
Bijapur	19	38,285	5,061
Dharwar	73	49,000	4,997
Kanara . . . . .	..	249	3
Kolaba . . . . .	..	1,028	14
Ratnagiri . . . . .	..	11,474	52
<i>Sind</i> . . . . .	..	39,933	966
Hyderabad . . . . .	..	14,681	220
Karachi . . . . .	..	3,343	128
Larkana . . . . .	..	2,087	9
Sukkur . . . . .	..	10,696	509
Thar and Parkar . . . . .	..	7,931	..
Upper Sind Frontier . . . . .	..	1,195	..
<i>Native States and Agencies</i>	63	172,184	5,543
<i>Gujarat Group</i>	60	115,659	1,960
Cambay . . . . .	..	5,609	161
Cutch	13	15,716	519
Kathiawar	3	73,493	1,159
Mahi Kantha Agency . . . . .	..	7,705	55
Palanpur Agency	44	9,196	36
Rewa Kantha Agency . . . . .	..	3,779	30
Surat Agency . . . . .	..	261	..
<i>Konkan Group</i> . . . . .	..	1,909	..
Janjira . . . . .	..	470	..
Jawhar . . . . .	..	..	..

BOMBAY—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Raising of small animals (birds, bees, silk worms, etc.).	Cotton spinning, sizing and weaving.	Silk spinners and weavers.
Savantvadi	1,439	..
Deccan Group	3	6,011	103
Akalkot	4,399	15
Bhor	3	68	2
Khandesh Agency	43	..
Satara Agency	1,481	86
Surgana
Karnatak Group	44,782	3,476
Bijapur Agency	205	..
Kolhapur	9,047	236
Southern Maratha Jagirs	35,204	3,240
Savanur	326	..
Khairpur	3,823	4
Adon	804	..

PROVINCE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Farm servants and field labourers.
Bombay Presidency, including Native States and Agencies	4,104	1,661
Northern Division	635	500
Central Division	444	70
Southern Division	1,700	444
Sind	746	87
Native States and Agencies	578	551
Gujarat Group	325	404
Konkan Group	1	3
Deccan Group	41	6
Karnatak Group	184	48
Khairpur	27	..

MYSORE.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Mysore State, including Civil and Military Station, Bangalore	33,673	508	2,478
Mysore State, excluding Civil and Military Station, Bangalore	33,642	497	2,475
Eastern Division	30,908	494	2,262

MYSORE—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Bangalore City	1,441	..	696
Bangalore District	6,650	223	468
Kolar Gold Fields, City . . . . .	..	..	1
Kolar District	5,728	67	764
Tumkur District	4,650	5	118
Mysore City	5	..	..
Mysore District	5,362	199	33
Chitaldrug District	7,072	..	182
Western Division	2,734	3	213
Hassan District	1,897	..	29
Kadur District	561	..	172
Shimoga District	276	3	12

DISTRICT OR STATE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Farm servants, etc.
Mysore State, including Civil and Military Station, Bangalore	7,145	73
Mysore State, excluding Civil and Military Station, Bangalore	7,144	73
Eastern Division	5,867	60
Western Division	1,277	13

HYDERABAD.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Hyderabad State	302,745	18	1,901
Hyderabad City	3,223	..	352
Atraf-i-Balda	14,121	..	..
Warangal Division	96,005	..	6
Warangal	25,776	..	..

HYDERABAD—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
Karimnagar	56,874	..	6
Adilabad	13,555	..	..
Medak Division	84,570	11	703
Medak	18,212	11	259
Nizamabad	16,969	..	119
Mahbubnagar	9,450	..	120
Nalgonda	39,939	..	205
Aurangabad Division	46,284	..	747
Aurangabad	8,087	..	698
Bhir	11,101	..	..
Nander	15,214	..	1
Parbhani	11,882	..	48
Gulbarga Division	58,542	7	93
Gulbarga	16,745	..	..
Osmanabad	3,968	..	86
Raichur	18,021	7	..
Bidar	19,808	..	7

STATE.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
	Rent payers.	Farm servants and field labourers.
Hyderabad State	1,904	1,418

BARODA.

District.	OCCUPATION.				
	Raising of small animals (birds, bees, silkworms, etc.).	Cotton spinning, sizing and weaving.	Silk spinners and weavers.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
				Rent payers.	Farm servants and field labourers.
Baroda State	11	33,802	1,191	204	253
Baroda Division (ex-city) . . . . .	..	2,726	4	115	185
Baroda City . . . . .	..	2,399	56	..	..
Kadi Division	1	19,386	1,131	28	52
Navsari Division	10	4,671	..	9	..
Amreli Division . . . . .	..	4,620	..	52	16

COCHIN STATE.

STATE.	OCCUPATION.		
	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.
Cochin State	171	..	6,626

COORG.

PROVINCE.	OCCUPATION.		
	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.
Coorg	1	261

TRAVANCORE STATE.

District.	OCCUPATION.				
	Raising of small animals (birds, bees, silkworms etc.).	Silk spinners and weavers.	Cotton spinning, sizing and weaving.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS.	
				Rent-payers.	Agricultural labourers.
Travancore State	3	..	35,112	499	647
Padmanabhapuram Division . . . . .	..	..	11,425	..	..
Trivandrum Division . . . . .	..	..	11,119	..	..
Quilon	3	..	9,370	..	..
Kottayam . . . . .	..	..	3,196	..	..
Devikulam . . . . .	..	..	2	..	..

MADRAS.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silk worms, etc.).	Silk spinners and weavers.
<i>Madras Presidency</i>	1,118,628	327	74,773
Ganjam	40,643	..	1,399
Agency Ganjam	12,590	..	..
Vizagapatam	61,228	..	6,086
Agency Vizagapatam	14,875	3	30
Godavari	45,479	..	366
Agency Godavari	1,346	..	..
Kistna	42,065	..	216
Guntur	72,279	..	46
Nellore	51,456	..	7
Cuddapah	45,087	..	566
Kurnool	27,717	..	2,152
Bellary	35,470	..	4,731
Anantapur	31,640	..	..
Madras	22,338	3	999
Chingleput	45,979	..	9,545
Chittoor	34,958	10	578
North Arcot	62,187	34	6,454
Salem	72,808	11	6,451
Coimbatore	70,520	88	77
South Arcot	39,285	1	1,879
Tanjore	41,989	10	22,444
Trichinopoly	42,403	124	5,499
Madura	52,377	33	4,820
Ramnad	45,902	2	186
Tinnevely	51,469	7	231
Nilgiris	32	..	..
Malabar	42,808	..	2
Anjengo	39	..	..

MADRAS—concl'd.

DISTRICT OR STATE.	OCCUPATION.		
	Cotton spinning, sizing and weaving.	Raising of small animals (birds, bees, silkworms, etc.).	Silk spinners and weavers.
South Canara	7,927	1	..
Feudatory States	3,738	..	9
Pudukkottai	1,375	..	9
Banganapalle	2,359	..	..
Sandur	4	..	..
Cities	96,111	7	26,482
Bellary	891	..	112
Calicut	1,804	..	..
Coimbatore	8,105	..	8
Conjeeveram	7,327	..	8,519
Cuddalore	3,616	..	114
Kumbakonam	3,701	..	4,751
Madras	22,338	3	999
Madura	27,515	4	4,778
Negapatam	298	..	6
Salem	14,802	..	1,344
Tanjore	2,023	..	2,106
Trichinopoly	2,166	..	3,745

PRESIDENCY.	SUBSIDIARY OCCUPATION OF AGRICULTURISTS.—WEAVERS AND MILL-HANDS.		
	Rent payers-cultivating land-owners.	Rent payers-cultivating tenants.	Agricultural labourers.
Madras	20,347	5,821	6,703
British Territory	19,907	5,798	6,498
Feudatory States	440	23	205

OCCUPATION BY RELIGION.

The figures are abstracted from the Census tables for 1911. They are of value as a guide to the community section most interested in the Silk Industry.

BURMA.

OCCUPATION.	TOTAL.	Hindus.	Musalmans.	Buddhists.	Christians.	Animists.
Raising of small animals (birds, bees, silk-worms, etc.).	1,459	2	123	1,314	1	19
Silk spinners and weavers	18,621	48	77	18,486	3	7

ASSAM.

OCCUPATION.	TOTAL.	Hindus.	Musalmans.	Christians.	Animists.
Raising of small animals (birds, bees, silk-worms, etc.) .	135	15	25	4	91
Silk spinners and weavers	1,717	1,509	23	..	180

BENGAL.

OCCUPATION.	TOTAL.	Hindus.	Musalmans.	Christians.	Animists.
Raising of small animals (birds, bees, silk-worms, etc.) .	42,659	16,030	26,608	20	1
Silk spinners and weavers	48,783	23,916	24,757	23	86

BIHAR AND ORISSA.

OCCUPATION.	TOTAL.	Hindus.	Musalmans.	Christians.	Animists.
Raising of small animals (birds, bees, silk-worms, etc.) .	563	492	64	1	6
Silk spinners and weavers	8,438	4,158	4,261	..	19

UNITED PROVINCES.

OCCUPATION.	TOTAL.	Hindus.	Aryas.	Musalmans.	Christians.
Raising of small animals (birds, bees, silk-worms, etc.) .	939	453	..	485	1
Silk spinners and weavers	16,044	2,015	3	14,021	..

PUNJAB.

OCCUPATION.	TOTAL.	Hindus.	Sikhs.	Jains.	Musalmans.	Christians.
Raising of small animals (birds, bees, silk-worms, etc.).	22	6	2	..	14	..
Silk spinners and weavers	13,584	3,675	292	2	9,600	..

JAMMU AND KASHMIR STATE.

OCCUPATION.	TOTAL.	Hindus.	Aryas.	Sikhs.	Musalmans.
Raising of small animals (birds, bees, silkworms, etc.) .	752	11	..	1	740
Silk spinners and weavers	5,724	933	3	18	4,758

BALUCHISTAN.

OCCUPATION.	TOTAL.	Hindus.	Musalmans.
Raising of small animals (birds, bees, silkworms, etc.) . . . . .	..	..	..
Silk spinners and weavers	6	5	1

CENTRAL INDIA.

OCCUPATION.	TOTAL.	Hindus.	Jains.	Musulmans.	Animists.
Raising of small animals (birds, bees, silkworms, etc.) .	89	86	..	2	1
Silk spinners and weavers	551	451	12	88	..

CENTRAL PROVINCE.

OCCUPATION.	TOTAL.	Hindus.	Musulmans.	Christians.	Animists.
Raising of small animals (birds, bees, silk worms, etc.).	115	60	40	..	15
Silk spinners and weavers	18,903	18,503	386	11	3
Silk spinners	4,239	4,092	136	11	..
Silk weavers	10,496	10,286	210	..	..
Tassar weavers (whether combined or not combined with silk and cotton weaving).	4,168	4,125	40	..	3

BARODA.

OCCUPATION.	TOTAL.	Hindus.	Jains.	Musulmans.
Raising of small animals (birds, bees, silk-worms, etc.)	11	10	..	1
Silk spinners and weavers	1,135	807	143	185

HYDERABAD.

OCCUPATION.	TOTAL.	Hindus.	Jains.	Musalmans.	Animists.
Raising of small animals (birds, bees, silkworms, etc.)	18	11	..	..	7
Silk spinners and weavers	1,901	1,573	6	312	7

COCHIN STATE.

OCCUPATION.	TOTAL.	Hindus.	Christians.
Raising of small animals (birds, bees, silk-worms, etc.)	171	2	169
Silk spinners and weavers	..	..	..

BOMBAY, MADRAS, RAJPUTANA AND AJMER-MERWARA, NORTH-WEST FRONTIER PROVINCE,
COORG, MYSORE AND TRAVANCORE STATE.

OCCUPATION BY RELIGION.

Not given.

APPENDIX XI.

SUMMARY OF EXPERIMENTS.

ASSAM, MANIPUR.

*Note on Silk Industry, by Colonel Shakespear, Political Agent,
1st August 1916.*

Silkworms were formerly grown in six villages, in each of which there were three or more Panjis, each of whom had to give annually 1st quality—"Muga"—16 tolas, 2nd quality—"Langyar"—20 tolas, 3rd quality—"Pangang"—40 tolas—(chassam).

In return they were exempted from *begar* for the three months when the worms lived and no other village might do silk. They reared univoltine races. The family that grew silk wove the thread also. The industry is now dying out and the imported silk is being used.

It is asserted that Manipuris were carried off into Burma and started the industry there. (See "Silk in Burma" by J. P. Hardiman.)

The Manipur Silk Company, was started by Anderson Wright & Co., but it failed owing to the following causes:—

- (1) Experiments had not been made yet. The climate is very variable (and the mulberry would not grow well in water logged soil in wet weather).
- (2) Only one caste will do it, *i.e.*, Lois, the others who did it were people in debt or hard up.
- (3) Initial cost is heavy. Each rearer had to have much help, a house, cattle, etc.
- (4) Risks of disease, etc.

The industry was handed over to Manipur Government in 1912.

Note on its results by Mr. Blachie.

29/3-77 oz. Italian-Japanese gave 10 maunds, 32 seers green.

20/4-60 oz. Italian-Japanese gave 4 maunds.

27/4-40 oz. Nistari gave 3 maunds.

24/5-40 oz. Nistari gave 10 maunds to date.

(2 oz. gave 1 maund, 16 seers.)

These results are not at all promising.

ASSAM, KHASI HILLS.

From the Annual Reports of the Agricultural Department.

The Director of Land Records and Agriculture was sent to Kashmir in 1903. In 1904 an experiment was made with two ounces of European seed in Shillong and 2 in Kohima. The outturn is not known but the green cocoons were valued at Rs. 80 per maund. The experiment was repeated at Shillong in 1905. Several Khasis took seed. The total yield of green cocoons at the farm amounted to 1 maund 14 seers, the Khasis obtained an outturn of 26 seers. In 1906 the leaf suffered from frost and 27 seers of cocoons were produced. An attempt was made to get Khasis to grow mulberry. (An account of the progress to date and of the chances of sericulture in Assam will be found in Agricultural Journal, India, II, Part 1, January 1907). In 1907 local as well as imported seed was used. Ten and a half seers of cocoons were produced. No Khasis would do sericulture. In 1908 Khasis again took an interest in the subject of silkworm rearing. Thirty-two seers of cocoons were got from $\frac{3}{4}$ ounce of seed. In 1909, $\frac{1}{2}$ ounce of seed gave 21 seers and 2 chittacks of cocoons. In 1910, $1\frac{3}{4}$ ounces of seed gave 1 maund and 18 seers of

cocoons. In 1911, $\frac{1}{2}$ (? $2\frac{1}{2}$) ounces of Italian seed gave 2 maunds, 11 seers and 12 chittacks of green cocoons and $1\frac{1}{2}$ ounces of Var seed gave 1 maund, 37 seers and 10 chittacks of green cocoons. In 1912 the Sericultural operations were transferred to the rearing-house of the Roman Catholic Mission, Shillong. An outturn of 3 maunds and 3 seers of green cocoons was obtained from $2\frac{1}{2}$ ounces of seed. In 1913 the rearing was commenced with six ounces of Var seed but all failed. In 1914 four ounces of seed was used; the outturn has not been stated. In 1915 four ounces of eggs were reared and they produced $3\frac{1}{2}$ maunds of green cocoons.

The outturn per oz. is usually not given. Good cocoons can be got if—

- (1) hatching is regulated,
- (2) there is leaf,
- (3) rats are kept down.

SHILLONG.

The Khasi Hill experiments have gone on for 10 years and show that good quality of cocoons can be grown, that locally produced seed is free of disease and that, with present results, the Khasis will not touch it.

The site is an absolutely unsuitable one in my opinion, the rearing house is not a good one, the leaf is poor, and the whole course of the experiments has been bad. What could be done with a proper plantation, proper seed and incubation, two or three broods a year and good rearing has yet to be seen. Above all, one wants to try industrial rearing without nets and trays.

The experiments show again the futility of isolated experiments done without real expert advice.

In 1834 or 1835 Mr. Scott introduced reelers, reels and plants of the *Morus alba* from Rungpore to Darrang and started a filature. The experiments failed for want of European supervision and on account of the death of Mr. Scott. (*Geoghegan.*)

HILL TIPPERAH.

From A. Chaudhury, Esq., Officer-in-charge, Agriculture Department, Agartala.

Dated the 29th July 1916.

The experiments in growing mulberry and rearing cocoons were fairly successful in the Kasipur Farm and the silk produced was fairly good and obtained good price in the market. But the business could not be run on commercial basis and the local people could not be induced to take to the Industry and expert opinion obtained indicated that silk might thrive only as a minor cottage industry. The expenditure grew disproportionate to the success achieved and the experiments were accordingly given up. Mulberry is still growing on the Farm-lands. But no use is being made of the crops.

NEPAL.

From Lieutenant-Colonel S. F. Bayley, Resident in Nepal, Nepal.

Dated the 2nd August 1916.

His Excellency the Prime Minister of Nepal, has, while thanking the Government of India for their offer of help and advice replied that there is no intention at present of starting any silk industry in Nepal, nor has he any information available which could usefully be conveyed to Mr. H. Maxwell Lefroy. An attempt at introducing sericulture was started some years ago at Birgunj near Raxaul but as it failed to show or give hope of good results it was soon abandoned and no details are now on record concerning it.

BIHAR AND ORISSA.

In Cuttack, Sericultural experiments have been carried out from 1877 to 1882 at Government expense under the supervision of the Executive Engineer. Rs. 3,065 were spent and the outturn was as follows:—

Silk	6 seers	15 chittacks	} Value Rs. 318-11-6
Chasam	20 "	14 "	
Cocoons	1 seer	0 chittack	

The number of trees planted was 16,016.

LIOTARD.

In 1867 mulberry worms were grown at Biheea in Shahabad. Mulberry grew well. Bengal multivoltine species were grown but failed because (1) difficulty of getting good seed and (2) mortality in the worms.

GEOGHEGAN.

UNITED PROVINCES.

Dr. Bonavia in Oudh 1861-63.

He distributed China mulberry cuttings in Oudh freely and plants grew well. Silk produced in 1862 was equal to the best China silk.

In Fyzabad an experiment with Kashmir silkworms was made, but the worms deteriorated in the succeeding generations. (Probably from disease.) In Sitapur, the China Nistari worm, Deshi Bengal Chotopolo worm, freshly imported Kashmir worm, were tried. High hopes of success were raised but the experiments died "after the personal example of its zealous promoters was removed from their eyes."

Dr. Bonavia concluded that the Kashmir silkworm could produce good silk in Lucknow.

"The Oudh experiments were a failure, partly because they were not conducted continuously on one centrally directed plan, and partly "because of the disease then not being understood.

(Monograph on Silk Fabrics in North-Western Provinces and Oudh.)

The Kashmir worm must have been that indigenous to Kashmir and not the present imported variety.

DEHRA DUN.

In 1871 Captain Murray started with multivoltine and univoltine species in Dehra Dun. He planted mulberry trees, but afterwards he relinquished the business. In 1872 Mr. H. G. Ross, Superintendent of the Dun took it over. In 1875 he got four seers of silk to the maund of his cocoons. The silk was white. In 1877 he started again and the silk was good. In 1878 the operations were still more successful. He reared Kashmir, Japan and acclimatised Japan seeds, and 44 lbs. of silk was reeled off. In 1879 there was failure, which is due to eggs hatching prematurely. In 1880 Mr. Lepper of Lister & Co. came and started operations and the estimated outturn was about 30 maunds of cocoons. In 1881 a grant of land 3,472 acres in extent was assigned to Messrs. Lister & Co. at Majri in the Eastern Dun. The net result of the operations was a produce of 12 maunds, 24 seers raised by villagers and 8 maunds and 13 chittacks, by Messrs. Lister & Co. In 1882 more trees were planted and the price paid for green cocoons was reduced from Rs. 40 a maund to Rs. 20 a maund. In 1884, 15½ ounces of seed gave 13 maunds and 18 seers of cocoons. *They now took to rearing in large houses.* Twenty-seven houses were built each 100 feet x 20 to 24 feet. From 1884 to 1890, six to seven lakhs were spent extravagantly. Filatures were erected. The sum of Rs. 36,000 was spent in one year. At length in 1896, Mr. Pink

resumed charge and started to get tenants to rear silk worms. In 1899, 80 tenants were rearing worms. The position was more hopeful now than before. Two and four maunds of raw silk and 5 maunds of chassam were sold. In 1902 the scheme was wound up and the land was resumed by Government. The land is now being worked as a zemindari.

In February 1916 I saw Mr. MacMullen, employed on the Lister Grant 1888-89. Good results were obtained one year when they had fresh French and Smyrna seed. They took seed from their moths and sent it to Mussoorie. Next year all failed from pebfine.

Ultimate failure was due to—

- (1) Ignorance.
- (2) Insufficient leaf.
- (3) Leaf budding late and rearing going on to the end of April.
- (4) No nets or cleaning.
- (5) 12 oz. seed in one house 100 feet × 20 feet, where only 4 oz. should have been done.
- (6) Want of labour. They had had villages but when they started these big houses, they hired labour, paharis from Mussoorie.

He thinks the silk practically stopped in 1890. Cost of staff, etc., in one year was Rs. 36,000. There were 1,000 acres in trees planted in tall grass which was cut down every year and left there. There were constant fires in this grass.

KALAKANKAR.

Raja Rampal Singh grew silk at Kalakankar. He reared *Deshi* Bengal-Chotapolo, Nistari and Eri. No results are given. Apparently they were going on in 1899 too. Pandit Darshan Lal Dube reports that the operations gave a profit of 12 per cent. and ceased on the death of Rajah Rampal Singh.

Extract from the Partabgarh District Gazetteer:—

The manufacture of silk in this district is of considerable interest. It was initiated in 1896 by Raja Rampal Singh, who in that year started a factory at Kalakankar, while a second was subsequently opened at Dharupur. A full account of the experiment up to 1899 may be found in the "Monograph on Silk Fabrics." Both the (Bengal; *Bombyx fortunatus*) and the Madras (*Bombyx croesi*) silk worms were imported, and also the eri (*Attacus ricini*) worms from Assam, and no further innovations have been made in this direction. The first two varieties are fed on the leaves of the mulberry, and the last on the castor-oil plant. From these two classes two different kinds of silk are manufactured. The eri silk, though of great strength and durability, does not command a ready sale in these provinces, and further the local weavers are incapable of turning material equal to that of Assam. Consequently the manufacture is only conducted on a very small scale. The outturn of mulberry silk, on the other hand, has considerably increased, and the reeled silk finds a ready sale at Benares, fetching from Rs. 12-8 to Rs. 15-8 per seer, which yields an average profit of Rs. 3 per seer. Most of the silk is sold in this form, but a certain amount of silk fabric is made on the estate. The workmen have been efficiently trained, and the industry also affords a means of subsistence to many boys and old women who are employed in spinning the silk from the eri cocoons and the waste mulberry silk. In order to increase the outturn, the Raja has laid down several plantations of mulberry trees. Two varieties are cultivated: *Morus niara*, the mulberry of these provinces, which grows into a tree of considerable size, and is planted in rows with a distance of some 30 feet from centre to centre, thus permitting the intervening land to be cultivated, and the *Morus alba*, a small shrub from Bengal, which requires constant attention and will only grow on good soil. The Raja allows tenants

to hold the land for the cultivation rent-free, paying for the leaves of the mulberry and permitting the tenant to retain for himself any other crops that may be raised; but the system has not as yet acquired popularity. There are now rearing-stations for silkworms at Jajupur near Kalakankar, Rampur, Dharupur and a neighbouring village, Purahasi.

PUNJAB.

Umballa, 1836.—In 1836 mulberry trees were planted which throve well. Worms reared were healthy. When Dr. Gordon left the place no one took any interest.

Ludhiana, 1836.—In 1836 Sir Claude Wade started experiments but he was transferred from Ludhiana and no one started after him.

Mandi, 1848-49.—In 1848-49 silkworms were introduced in this State and they throve perfectly.

Hoshiarpur, 1852.—Colonel Abbott commenced operations in 1852. He got a seer and a quarter of seed and the outturn was 56 seers of cocoons. The undertaking was given up on account of Colonel Abbott's departure for England.

Soojanpur, Pathankot, 1855-58.—There was a colony of Musalman rearers.

Gurdaspur, 1854.—Jaffer Ali commenced in 1854 and continued to 1864 at least.

Rawalpindi, 1858.—Experiments were made in a village Saiudpoor. Five or six seers of raw silk was obtained every year for several years.

Lahore, 1853-56.—Large experiments have been made in Lahore, first with Bengal multivoltine, then Kashmir worms. They all failed owing to bad feeding and dry heat. Eight hundred lbs. of cocoons gave 80 lbs. raw silk.

Amritsar, 1859-60.—Acclimatised, Kashmir, Bokhara seeds were reared, and they got mixed. The results are not given. The experiment was continued from 1861 to 1864. There was a total failure one year. In 1864 there were 8 to 10 maunds of cocoons.

Peshawar, 1863-64.—A silk experiment was made at Peshawar in 1863-64. 185 tolas of eggs were distributed at three places. Twelve seers of seed cocoons were set apart and yielded 115 tolas of eggs. The total quantity of raw silk was 25 lbs. and refuse, etc., 60 lbs. A big scheme was put up with the intention of using 635 tolas of seed. The Company was formed and it paid 42 per cent. to the shareholders. The Manager went home and all ceased.

Googaria (Montgomery), 1863.—A trial was made in Googaria in 1863. Five tolas of eggs were used. They yielded 9,709 cocoons weighing 1,524 tolas. The cocoons were very good.

Shahpoor, 1864.—An experiment was made at Shahpoor in 1864. 17 tolas of eggs were used which gave 78 lbs. dried cocoons and 10 lbs. seed cocoons or say 400 lbs. green cocoons. 16 lbs. reeled silk sold for Rs. 117-0-0.

In all these experiments there are these points :—

- (1) Inexperienced officers (European) did them. They learnt a little and were transferred.
- (2) Eggs were from varied sources and were often mixed.
- (3) Hatching was long continued.
- (4) Methods of rearing were very odd.

But good cocoons were produced. (Geoghegan.)

A very detailed account of the experiments made in Gurdaspur, Kangra and neighbouring districts between 1865 and 1882 will be found in Liotard—

Silk in India. The conclusion will be found in Hailey's Monograph of the Silk Industry in the Punjab, (1899).

In 1865, Mr. Montgomery reared silkworms in Kangra and planted Chinese and Philippine mulberry as the local variety did not suit the worms. He eventually got cocoons valued in London at Rs. 300 a maund of dried cocoons. In 1872 Mr. Halsey commenced in Amritsar and from 24 oz. seed obtained 79 lbs. cocoons per ounce. In Gurdaspur, the already existing rearings increased from five to fifty and Jaffer Ali was increasing his operations. Mr. Halsey also started in Gurdaspur: the Punjab Government sanctioned a grant of Rs. 1,000 for prizes to be given at an exhibition, which took place first in 1876. (These were not only shows but sales, the cocoons being then sold. Nearly the whole output probably was sold then.) Full details of subsequent progress will be found in Liotard. In 1877 a show was also held at Nurpur in Kangra, a great deal of China mulberry was planted out in both districts and there was an extension of sericulture.

In 1879, Mr. Halsey died and Mr. Keighly of Messrs. Lister & Co. tried to take over the former's interests. In 1880 exhibitions were held in Kangra and in Gurdaspur, a sum of Rs. 1,250 was spent in Kangra and Rs. 960 in Gurdaspur on prizes, etc.

In 1881, a joint show was held and Gurdaspur exhibited 309 maunds 15 seers cocoons from 98 seers seed, Kangra 37 maunds 27 seers from 9 seers 8 chittacks. The former is at 8 lbs. dry cocoons per oz. the latter 10 lbs. These figures are less than those obtained at present.

In 1882, Gurdaspur showed 230 maunds, Kangra 40, Amritsar 6, Sialkot and Hoshiarpur less than 1 each. Disease had appeared seriously and was affecting the worms. Pebrine had not then been recognised in India and the issue of disease-free seed had not begun.

In 1883, Captain Bartlett, who had a filature in Kangra, died and the immediate market for cocoons came to an end. The disease continued, the number of exhibitors to the exhibitions diminished and in 1890, the exhibitions ceased. Messrs. Lister & Co. had leased the trees from the district authorities and had done a great deal to induce cultivators to take up the industry; but finding the cocoon supply lessening, and that disease was spreading from the villagers' worms to those hatched from imported seed, they made the fatal mistake. They built large rearing houses at Gurdaspur, Gulpur and Sujampur in order to rear the worms properly. In 1892, Messrs. Lister & Co. closed their rearing houses and concentrated entirely on their effort at Dehra Dun. The Kangra industry gradually died out, and in 1898-99, the rearing was almost at an end in Gurdaspur.

These experiments led eventually to the condition of the industry as it now is and the chief organiser is Khan Bahadur Ghulam Sadiq of Amritsar. This is dealt with under the Punjab in Chapter V of Volume I.

Reading the accounts of the Punjab and Kangra industry one can realise what can be done by personal influence and organised effort directed to the people themselves; and had it been that the question of pebrine was understood, the industry in these districts might have grown to very large proportions. The essentials of success clearly are a market for cocoons, an organisation to distribute seed and encourage tree planting, and public recognition and encouragement of the industry in the form of the exhibition and the prizes.

A SHORT NOTE ON THE SERICULTURAL OPERATIONS IN PATIALA STATE.

It would perhaps be interesting to give a short account of attempts at rearing silk cocoons in the State prior to the creation of a regular Sericulture Department.

There are no definite records to show the results of experiments made from time to time but from the information available it might be stated that before the year 1912 the State had been approached by General Booth Tucker of the Salvation Army regarding the leasing out of mulberry trees in the State, particularly in Pail Tahsil, to the Salvation Army for their Sericulture propaganda. A lease was subsequently granted by the State to the Salvation Army for a period of two years. At the expiry of this period the State decided to start a Sericulture Department of their own and experiments were made by the Forest Officers of the State on a small scale by rearing some silkworms (*Bombyx Mori*). Attempt was also made to produce silkworm seed locally but as was inevitable this attempt proved a failure.

His Highness the Maharaja Sahib Bahadur, most keen and interested as he is in the development of the resources of his State and to encourage profitable industries, took up in right earnest at this stage the question of starting Sericulture in his State and decided to send to Europe a suitable person with some practical knowledge to receive proper training in various branches of this industry, with a view to start and organise a proper Sericulture Department on his return. L. Wazir Chand, who had received practical training in Jammu Sericulture Department of the Kashmir State and had done some experimental work in the Alwar State also was selected for the purpose and deputed for a course of two years' study in France. He returned to the State in January 1914 and was appointed the Director of Sericulture Department and with his appointment started the proper organization of a regular Sericulture Department.

In the beginning of 1914 Sadar Wazir Chand made an experiment with one ounce of eggs which he had brought out with him from France, reared these at his residential quarters and obtained 16 seers of cocoons.

In the month of May of the same year, 123 ounces of eggs were ordered out from France from the following firms:—

(a) Laurent de L'arbonsset	60 ozs.
(b) Leon Delonca	69 "
(c) M. Galford	3 "

but only 74 ozs. were received. The rest were interrupted at Marseilles on account of War and perished there. These 74 ozs. were taken to Chail Hill station for hybernation during the winter months and fared well. 5 ozs. out of these perished and the remaining 69 ounces were reared in the spring 1915 as under:—

10 ounces by the Director of Sericulture at his residential quarters.

44 ounces by the Zamindars in the Pail Tahsil.

55 ounces by the Zamindars in the Sirhind Tahsil.

Total yield from these 69 ounces was 18 maunds of "green" cocoons giving an average of 10 seers 7 chittacks per ounce of eggs. Four of the rearers obtained exceptionally good results. Their average yield of cocoons per ounce was over a maund which is very encouraging indeed. The results of the majority of the rest were poor which was naturally due to the fact that they were not yet experienced enough in the rearing operation as also to insufficient attention and care on their part.

The produce of cocoons of 1914 (16 seers) was got reeled at the Salvation Army's institution at Aligarh and 3 seers of raw silk were obtained therefrom giving an average of 20 per cent.

During the current year, 210 ounces of eggs have been distributed, 10½ ounces of which have been distributed to village schools and it is hoped that results with the outturn of cocoons will be better this year. This year's seed has been distributed to 532 rearers which represent about 140 families.

Two reels have now been put up at Patiala and three reelers have been properly trained. Their number will be increased as work expands,

Patiala State provides various grades of climate suitable for sericulture and it is expected that with the exception of the District of Narnaul and portions of Bhatinda the entire State will be found suitable for silk rearing.

There are at present 38,574 trees in the State in 725 villages but there are only 210 villages which possess 50 trees or more in each. Steps are being taken to establish State nurseries and encourage mulberry plantation both by the State and through private agency.

It is a matter of great satisfaction that within the territories of the State the Chail Hill station provides quite a good place for the hybernation of seed. A proper hybernation house will be built there in course of time.

The hilly tract of the State which extends from Kalka to Chail and Kufrie could form a very good nursing ground for mulberry. There are no mulberry trees existing in this tract at present but it is hoped that early start will be made for the propagation and extension of mulberry trees over this part of the State as well. So that in course of time the State will be in a position to place a decent outturn of silk in the Indian and European markets.

Some of the raw silk produced experimentally during the last two years by the Sericulture Department was sent to Europe for test and report. Attached herewith are copies of the reports received, showing the quality and worth of the silk produced at Patiala.

DAYA KISHAN KAUL.

The 11th September 1916.

THE SILK ASSOCIATION OF GREAT BRITAIN AND IRELAND
INCORPORATED.

3/4, NEWGATE STREET, E.C.,

The 15th February 1916.

Since writing you to say that the small parcel of raw silk had arrived, I have had the skeins distributed to various quarters for examination and report, and I am glad to tell you the result, in each case, is most satisfactory. I enclose extracts from the reports sent in, also certificates from the Bradford Conditioning House, which will probably be useful for you to hold. Two of the skeins have been thrown into three threads tram; these I am going to have boiled off and woven into a cloth.

The outstanding merits of the silk are, regularity in size, good elasticity and strength. Its chief defect is that it is nibby, which entails more than the average waste in winding; this is a defect which you will undoubtedly be able to overcome.

REPORT No. 1.

With further reference to your favour of the 27th ultimo, we have now carefully tested the sample of raw silk which you sent on to us, and consider it a very good quality indeed. In order to assist you all possible we have also made a comparative test of 10/12 Denier Japan Filature, and the sample of silk you have sent gives better results than the Japan silk, the particular point in its favour being the great regularity in size, even in comparison with Japan Filature which is always considered quite satisfactory from this point of view. We found the Indian product to be an excellent winder and the thread was very free from Slubs, etc.

Below we give you the results of the two tests in detail, and trust same will be of service to you.

We consider the silk quite as regular and strong for its size as Exquis Italian.

Indian Silk—

Size in Deniers per 520 Yards.	
10	
10	
11	
10	
11	
11	
10	
10	
10.50	
10	
10	
10.50	
10.50	
10	
11	
10	
11	
10	
10.50	
10	
<hr/>	
20)	267 (10.30
	200 average.
	<hr/>
	70

Japan Silk—

Size in Deniers per 520 Yards.	
9	
9	
10.25	
10.50	
10.50	
10.75	
11	
11	
11.25	
11.25	
11.50	
11.50	
11.75	
11.75	
12	
12	
12	
12	
12.50	
13.25	
<hr/>	
2000)	224.75 (11.20
	2000 average
	<hr/>
	2475
	2000
	<hr/>
	4.750

The elasticity of both threads give the same average of $3\frac{1}{4}$ " on six tests, and each test was practically the same.

REPORT No. 2.

I can now report on the skein you sent me; no test for evenness would represent the bulk satisfactorily, without taken from a larger number of skeins. Still, the test from the two skeins submitted gives a good result. I send you with it a small skein marked AN. I, which you may like to compare with it, and it gives a very similar test, and is part of a run we have just completed throwing. We have specialised in this class of silk for some years.

The percentage marks resulting from the 4 tests are as follows :—

Test.	Per cent.	Remarks.
Cleanliness	91	Very good.
Winding	93	Over average.
Tenacity	71	Slightly under average.
Elasticity	79	Very good.
Titre . . . . .	...	Not stated.
Conclusion . . . . .	...	A generally satisfactory test.

REPORT No. 3.

We have yours of 27th instant, and have pleasure in reporting as under-noted on the two hanks of Indian silk, which we return herewith.

In appearance it is good and looks a nice silk—for strength it is fairly good, and it is also fairly clean. As to the evenliness—it contains a number of very fine ends, which would be fatal to the silk being used as warp—there are also some coarse threads.

REPORT No. 4.

The enclosed skeins of three threads tram, are the product of the two skeins Bengal on which you wished a report.

The silk was lightly washed, and wound very well at an easy speed.

The tenacity and elasticity test was on the *Single* thread, and is very good.

The size in three threads tram is $2\frac{1}{2}$ drams to 1,000 yards.

SERICULTURE OPERATIONS IN KALSIA STATE.

1912-13.—The operations were started for the first time this year as an experiment with 4 ounces of silkworms-seeds, which lasted upto 1st May 1913. The total expenditure has been Rs. 123 with an income of Rs. 45, price of 20 seers of cocoons produce. The seeds were very kindly supplied by the Director of Agriculture, Punjab.

1913-14.—This year the rearing of silk worms was started with 7 ounces of seeds. The total expenditure has been Rs. 49 with an income of Rs. 92 by the sale of cocoons weighing one maund. Mr. W. S. Hamilton, I.C.S., Director of Agriculture, Punjab, paid a visit and saw the work, and under his orders the Inspector, M. Jala-Uddin, made frequent inspections and gave good advices, Mr. Madan Mohan Lal, Entomologist, also visited the work.

1914-15.—This year the rearing of silkworms was started with 7 ounces of seeds. The total expenditure was Rs. 49, and one maund of dry cocoons were sold for Rs. 103-12. Mr. Madan Mohan Lal, B.Sc., Assistant Professor of Entomology, Lyallpur, visited Chachrauli, capital of State, on 25th January 1915, and gave his instructions on the rearing of silkworms. According to his advice the seeds were distributed this year among the villagers of Chachrauli and Bassi Tahsils for rearing under the supervision of Zaildars, Lambardars, and Lala Ram Sarup, Darogha, which was very satisfactory.

1915-16.—This year the rearing of silk worms was started with 4 ounces of silkworm seeds; but owing to the negligence of the rearers of the Chachrauli Tahsil 3 ounces were wasted altogether; and only one ounce reared in the Bassi Tahsil produced only 13 seers of cocoons, valuing Rs. 28. The expenditure incurred was Rs. 4 only.

1916-17.—Indent of 4 ounces of silk-worm seeds, has been sent for the next year 1916-17.

FOREST DEPARTMENT.

Changa Manga, 1884.—Forest Department tried operations at Changa Manga in 1884 and 1885, with Japanese worms and got cocoons. In 1886, worms died to 75 per cent. from intense heat.

	Rs.
The expenditure was	2,951
The receipts	821
	—
Loss	2,080
	—

Extract from the Annual Report of the Silk Centres of the Salvation Army in India and Ceylon, 1913-14, by F. de L. Booth Tucker.

Changa Manga.

The results for the season of 1914 are just to hand.

* * * * *

The crop was making excellent progress and promised to be a record one, when a sudden heat spell struck the district and for several days the temperature rose to 100 and upwards, just as the worms were commencing to spin. Those which had already spun produced cocoons equal to the best European samples. But the rest suffered severely, a large proportion of worms dying and the rest producing what might be described, as an eight anna crop of cocoons.

NORTH-WEST FRONTIER PROVINCE.

Copy of a letter from Rai Sahib Prabh Dyal, Bar.-at-Law, Peshawar, to the Revenue Commissioner, North-West Frontier Province, Peshawar.

With reference to your letter No. 395, dated the 21st December 1915, we beg to say that we worked Sericulture in Hazara for three years and had to give up at last. As far as rearing silkworm was concerned, it was quite a success and we were able to get as good cocoons as they sent us every year from France and Italy.

2. We had started silk reeling in Haripur which was very successful and we had trained 6 boys of Haripur who were able to do the reeling very nicely. The difficulties that we met in the way of carrying on the work were as follows:—

- (a) We could not find any market for the silk so produced in India. Wherever we sent the silk, they said it was too fine and superior and could not be used in India. We could sell the second quality only in India in Benares and not the best one, which we had to send to England after three years' collection. The net loss to us was about Rs. 3,000 during the three years.
- (b) The causes of this loss were that we had to hire houses in Haripur, which added to the cost of rearing. Ordinarily when Zamindars do the rearing they have not to pay anything in the shape of rent and use their own rooms and even if need be, they could get rooms in the villages at a very low rent.
- (c) We had to engage coolies to bring mulberry leaves from the roadside and paid them annas 4 and annas 5 per day, but as the season advanced and cutting of the crops were started, these coolies would desert the work and go to harvesting wheat where they could earn as much as Re. 1 per day, while we could not pay more than annas 8 per day.
- (d) The material for making shelves for the worms was also expensive, but this could be easily remedied as ordinary bamboo poles could be imported.

We were able to carry on the work with the permission of the Public Works Department authorities, who very kindly permitted us to use the mulberry leaves from the roadside and without their help we would not have been able to do anything in the matter. We tried to grow the worms in villages also, in the hope that the Zamindar would take up the cocoon growing and we could carry on the reeling but the Zamindars did not take up the idea. Had they taken up the industry we would have kept up the Model Farm in Haripur and would have supplied the seed to all who would have taken to silk rearing.

I requested the Deputy Commissioner to kindly ask the Patwaris and the Lambardars to advocate silk rearing, but nothing could be done without the help of Government and we had to give up the venture.

BALUCHISTAN.

Copy of a letter No. 1910, dated Mastung, the 6th October 1910, from the Political Agent, Kalat, to the First Assistant to the Hon'ble the Agent to the Governor General in Baluchistan.

I have the honour to submit the following report in connection with the sericulture operations conducted by the Kalat State.

2. I attach a statement at Appendix A, which gives in tabular form a brief history of the sericulture operations year by year from 1904 when they were first introduced up to the close of the operations of the current year.

3. It will be observed that the total cost of the operations and the upkeep of the industry has been Rs. 57,630 during the above period while the income derived therefrom comes to only Rs. 10,595 which shows a total loss to the State of Rs. 47,035 within the period of seven years. Against this may be credited the present value of the factory and plant which is estimated at Rs. 11,500. The industry has never been self supporting nor in any one year has the income received been sufficient to cover the cost of upkeep and working expenses.

4. This failure which is much to be regretted may be attributed to the following:—

(1) The exorbitant rate demanded for mulberry leaf which rose from annas 6 per maund in 1906 to Re. 1 in 1910. In this connection I would point out, as has already been mentioned in the Kalat Administration Reports, that the mulberry is not only a valuable marketable commodity among the Brahuīs of Mastung but is also often their only means of existence (in a dried form) during the winter. The process of leaf picking—as it at present exists—involves a certain amount of loss in fruit and consequently the Brahuīs are most unwilling even to sell their leaves. Every year since the scope of the operations was enlarged, we have had the greatest difficulty to obtain the supply necessary to feed the worms. Brahuīs have been known to tie Korans on their trees to secure exemption from having to give the leaf even at the exorbitant rate mentioned above.

(2) The want of enterprise on the part of the local inhabitants who have steadily refused to take any interest in the scheme or to be persuaded to introduce it into their homes as a cottage industry, and this in spite of the fact that every effort has been made to make the operations both attractive and remunerative locally.

5. At the beginning of the present year the supervision of the operations which had been in the hands of the Assistant Political Agent for the past six years, during which period all concerned had been carefully trained in their respective duties, was handed over to the State officials and the Political Adviser to His Highness the Khan has now reported that the estimated loss for this year will amount to Rs. 4,316 exclusive of the cost of mulberry leaf which he estimates at Rs. 4,051.

It is unfortunate that this year—the first, under his supervision,—disease which had hitherto never seriously attacked the worms, broke out in the factory at the end of the operations.

The Political Adviser asks on behalf of His Highness the Khan that further operations may be discontinued when the results have been proved to be “so ruinous and unprofitable” to the State.

6. I am reluctantly compelled to agree with him and to recommend that the industry should be abandoned at any rate for some years.

I would suggest that when the many thousands of mulberry trees which are reported by the Political Adviser to have been planted, have grown up the operations should be recommended say in four or five years' time. By that time the industry with its own plantations of mulberry bushes instead of trees ought to be independent of local owners for its leaf supply. I am, however, very doubtful even if the leaf be obtained gratis, whether any large profits could ever be expected as long as the inhabitants show no interests in the industry and as long as it is not taken up by them as a cottage industry.

APPENDIX A.

Statement showing the output annually and the cost of the upkeep in each year of the Mastung Silk Industry.

Year.	OUTPUT.					Results.
	Quantity of seed purchased.	Total yield of cocoons weight.	Raw silk obtained weight.	Amount realised by sale of silk.	Cost of upkeep.	
1904	4 oz.	40 lbs.	13 lbs.	Rs. 71	Ra. ..	The experiment was conducted in the Mastung Thana by a clerk of Political Agent's office under the supervision of Political Agent and a portion of the worms was made over to the Political Adviser who placed them in the out-offices of the Mastung Miri. No special establishment was entertained and nothing was paid for the mulberry leaf as the small amount required was obtained from His Highness the Khan's gardens. The reeling was done on a machine belonging to Mr. Rogers of Quetta and under the supervision of a Kashmir expert temporarily employed by him. The result was satisfactory.
1905	10 oz. 238 lbs.	No reeling was done during this year.		..	323	An experiment with $\frac{1}{4}$ oz. of seed was made at Mach in the Bolan Paas but it was not successful as all the eggs hatched out prematurely. The remaining quantity of seed was utilised in the Mastung Thana and Miri towards the end of the operations. Disease broke out among the worms owing to insufficient feeding. The yield worked out to 23 pounds of cocoons from one ounce of seed as compared with general continental average of 31 $\frac{1}{2}$ lbs. of cocoons per ounce of seed. Major Showers was of opinion that the success of the operations was so encouraging that it was determined to considerably extend the scope of the season's operations.
1906	240 oz.	2,080 lbs.	339 lbs. 14 oz.	2,462	14,000*	Major Showers anticipated that 1,040 lbs. or 50 per cent of raw silk would be obtained from 2,080 lbs. of cocoons but the actual yield of silk was only 339 lbs. The yield eventually worked out to 5 $\frac{1}{2}$ lbs. of silk per 100 lbs. of green cocoons and this result was considered to be sufficient to justify continuance of the operations. The supply of mulberry leaf had to be purchased. The price demanded and which was paid was 6 annas per maund.

* Includes cost of factory building.

Statement showing the output annually and the cost of the upkeep in each year of the Mastung Silk Industry—concl'd.

Year.	Output.					Results.
	Quantity of seed purchased.	Total yield of cocoons weight.	Raw silk obtained weight.	Amount realised by sale of silk	Cost of upkeep.	
1907	143 oz.	2,090 lbs.	361 lbs. 14 oz.	Rs. ..	Rs. 13,060	The result was not satisfactory and it was represented to H. A. G. G. that from a financial point of view the enterprise was at present being run at a loss to the State. This was mainly due to the necessity of our having to buy the leaf supply at exorbitant rates and pay heavily for the labour of rearing the worms. The price for leaves had to be raised from 6 annas to 10 annas per maund.
1908	147 oz. 4,410 grammes.	3,797 lbs.	228 lbs.	3,253	12,000	A box of 30 grammes of seed produced 13 seers of green cocoons if compared with 23½ seers from one box of the last year. The results were exceedingly unsatisfactory and it was reported in the Kalat Agency Administration Report that the industry had been again this year run at a loss to the State and that more than Rs. 40,000 had already been spent on it. It was also added that in view of the impossibility to run it as a cottage industry owing to the opposition of the local inhabitants and their refusal to give the leaf at anything but a prohibitive price, it would be necessary to consider seriously the advisability of discontinuing the operations. The price of leaves had again to be further raised from 10 annas to Re. 1 per maund.
1909	70 oz.	4,185 lbs.	320 lbs.	Cost not yet received from Quetta City but estimated Rs. 2,880	7,000	The rate of Re. 1 per maund for the leaf introduced last year had to be continued during the year. The result though more satisfactory than that it last year was a loss to the State from a business point of view. Upto this time the supervision of the industry had been in the hands of the Assistant Political Agent, Kalat.
1910	150 oz.	1,040 lbs.	2,281 lbs. (approximately).	2,000	11,247	The industry having been supervised for six years by the Assistant Political Agent during which period all concerned had been carefully trained in their respective duties, it was decided to transfer the supervision of the operations to the Political Adviser of His Highness the Khan. The price for the leaves remained unchanged and the results were exceedingly bad. This was attributed by the Political Adviser to the sudden outbreak of disease among the worms at the end of the operations.
TOTAL .	..	..	..	10,595	57,630	

Copy of a letter from Major H. B. St. JOHN, C.I.E., I.A., Political Agent, Quetta-Pishin, No. 1603, dated the 10th May 1916.

2. It appears from the records of my office that the question was taken up during the year 1903, and Mr. Rogers, the then Manager of the Murree Brewery Company, Limited, Quetta, took a great interest in starting an industry in this District. His efforts met with partial success as will be seen from the copy of the attached correspondence, but on his departure from Baluchistan, no one else came forward to carry on the work and the industry practically came to a standstill.

Extract from a demi-official letter, dated the 26th October 1904, from Mr. J. R. D. Rogers, to the Hon'ble Colonel Yate, C.S.I., C.M.G., Agent to the Governor General in Baluchistan.

1. With reference to Sericulture in Baluchistan, I have the honour to state that I continued my last year's experiments this summer, but on a very much larger scale.

2. I rented several houses in the village of Kasi and Kirani for rearing silk worms and employed over 100 men and boys from these and adjacent villages, all of whom were more or less taught how to rear worms.

3. I regret to state, however, owing to the ignorance and indifference of the Maliks, I had the greatest possible difficulty in obtaining sufficient mulberry leaf, what I did get I had to pay exorbitant prices for.

4. I even had to get leaf from as far off as Mach by mail train daily, but owing to the heat and railway journey the leaf on the way fermented and was useless. Had the Maliks given me sufficient leaf, my experiment would have been a great success, but owing to their obstinacy and refusing to give me leaf (which they had in abundance) I unfortunately lost $\frac{3}{4}$ of my crop, as the worms were starved and so became diseased and died, in consequence instead of the experiment being a financial success, it was a dead loss.

5. However, I have the satisfaction of knowing that I have managed to introduce Sericulture into Baluchistan and Kalat.

6. The people now have some idea as to what silk is and how the worms should be reared; a number have even expressed a wish to try and rear worms themselves next year. I have promised them eggs and every help.

7. So as to further teach the people of the country I erected 2 reeling machines, the parts having been imported from France. I did all I could to induce the people from the highest to the lowest to come and see the reeling of silk and personally explained every thing in detail.

8. I am sure Sericulture will soon spread throughout Baluchistan and Kalat, once the Maliks and the people realize what a profitable industry it is, if seriously taken up. The great drawback at present is the want of leaf though the villagers themselves have more than enough to make a start on.

9. If the Maliks would only interest themselves a bit and try to induce the people to take up an industry, which would be an additional source of profit with little trouble to them, Sericulture would flourish *next* year.

10. I have planted over 1,000 mulberry trees this year, all are doing exceptionally well. Next year I hope to be able to plant out a very much larger number, if I can only procure the necessary land.

Note regarding experiments made by Mr. Rogers in Sericulture, etc. (This forms an enclosure to letter No. 1603, dated the 10th May 1916, from the Political Agent, Quetta-Pishin.)

Mr. Rogers, who has taken great interest in starting Sericulture in Baluchistan, has recently made a report to the Local Government regarding

his operations during the past summer, which indicates that, in spite of some difficulties he had to encounter in the way of obtaining mulberry leaf on which to feed the worms, his experiments have been fairly successful. Several houses were rented by him in the villages of Kasi and Kirani near Quetta for rearing silk worms and some 100 men and boys from these and adjacent villages were employed, all of whom more or less were taught how to rear worms. The ignorance of the Maliks and people and the suspicion with which they are prone to regard any new departure prevented the experiments from proving as successful as would otherwise have been the case as it was difficult to induce them to give sufficient mulberry leaf, which they had in abundance, even at high prices. The importation of mulberry leaf, from Mach by rail was tried, but owing to the heat of the railway journey the leaf fermented and became useless. The consequence was that a considerable proportion of the crop failed as the worms being starved for want of leaf became diseased and died. However, a fair amount of silk of first rate quality was produced and was exhibited at the Horticultural Show and it is hoped that the people will soon realize the benefit of rearing worms and take to themselves, specially as Mr. Rogers has promised them eggs and every help. Mr. Rogers has also erected two reeling machines, which he imported from France. People were invited to come and see the reeling of silk and the process was explained to them in detail.

The great drawback at present is the insufficiency of mulberry leaf. With a view to increasing it, Mr. Rogers has himself planted over 1,000 mulberry trees, which are doing well and orders have been issued by the Revenue Commissioner which will, it is hoped lead to the increased planting of mulberries in the various districts. Mr. Rogers proposes to visit various parts of Baluchistan, in order to show the people the samples of silks, which were recently exhibited at the Horse Show at Quetta, to explain what excellent qualities can be produced in Baluchistan, and to see what can be done in the way of inducing the Maliks and people to start sericulture for themselves. Mr. Rogers has also experimented with success in the cultivation of tea, tobacco, castor oil and gram and he proposes to experiment with cotton from seed to be obtained from America, Australia and Egypt.

C. ARCHER,

*Revenue Commissioner
in Baluchistan.*

INDORE.

Enclosure to Central India Agency letter, No. 967-D., dated the 28th April 1916,
to the Imperial Silk Specialist.

Note on the Silk Industry Department.

With a view to provide the cultivators with means to make up the loss they sustained in the stoppage of opium cultivation, His Highness the Maharaja Holkar had opened the Silk Industry Department at Indore, in the year 1912, and ordered the purchase of cocoons through Commissioner Booth Tucker of the Salvation Army, Simla. Services of an expert were then secured, one officer and weavers were sent to Moradabad for training, cuttings of mulberry and necessary machines were ordered out from Bangalore and Ludhiana, respectively, and every effort was made to make a good start.

The following branches are at present worked in the Institute :—

- (1) Rearing of worms.
- (2) Reeling and spinning.
- (3) Dying and bleaching.
- (4) Twisting and weaving.
- (5) Central Nursery.
- (6) Museum and Library.

It is now more than three years that the Industry has been started here. The Silk Expert Mr. K. T. Achaya, remained here for about seven months, in which he made experiments on three main varieties of silk worms, taught local candidates and labourers reeling, twisting and bleaching of silk. By actual experiments he found that Indore was a suitable place for Sericulture and reported that univoltine variety of the French worms would be profitably reared by the cultivators in February and March, which is their slack season, without interruption to their Agricultural works.

The first rearing of worms in the Institute is generally carried on from October to April. In the months of April, May and June it is not taken up on account of rise in temperature. It is commenced in August. Almost all varieties of silkworms, Bengal, Nistari, Bara Polu, Chota Polu, Eri and Univoltine—are being reared in the Industry successfully. Of these varieties Univoltine variety of eggs is of a superior quality and is imported here from Italy and France, through the Salvation Army. Experiments in rearing have been carried on during the past three years. Rearing takes place in the months of December, January and February, which are particularly suited for this variety. A uniform temperature of 70° to 75° is kept by artificial means. For hatching incubators are utilised and the rooms are kept warm to a temperature of 70° to 75°. The other varieties can be reared at all times of the year, except the summer season. It is sometimes found that worms are affected by 'Grasserie' disease owing to improper supply of mulberry leaves as the mulberry plantation has not been adequately propagated.

The cocoons produced are reeled into silk here, and the silk is partly sold to the purchasers and partly used in the Institute. The branches of reeling and spinning twisting, bleaching and dyeing of silk are also working satisfactorily. The Weaving Department has immensely improved and all kinds of silk cloth, especially sáfás, shirtings, suiting cloth, handkerchiefs paithanis and saries are turned out here.

The plantation of mulberry and castor, which is very essential for the rearing of worms—at the nursery and in villages is in a flourishing condition and any number of cuttings can be supplied free of charge for plantation at other places.

But although a satisfactory progress is being noticed in all the branches of the Institute, it can not yet be hoped to be of any financial advantage, and has to be looked at from educational point of view. Its establishment as a paying concern depends upon its propagation amongst the cultivators. The Industry is lucrative and would compensate the peasantry if they take to it enthusiastically. It requires less work and does not stand in their agricultural work. The Institute is sparing no pains to induce the cultivators to take to this work by inculcating upon them the advantages accruing from it (Sericulture). Village teachers have been deputed to explain to them the methods of rearing silkworms and exhibits of all kinds of silk and silkworms in every stage are arranged every year at the Indore Agri-Horticultural Exhibition. And it is gratifying to note that with the co-operation of the Revenue Department, Khalsa, the missionary work that the village teachers have done has now produced good results, though not very satisfactory, Patels, Inamdars, and cultivators have now commenced the plantation of castor and mulberry gardens and it is hoped that the motive of His Highness of providing the cultivators with means to compensate them in a tolerable degree for their loss in the fall of opium trade will soon be fulfilled.

It may here also be mentioned that Mr. Hoogewerf, Principal Government Weaving Institute, Serampur, who is also an expert in Sericulture has spoken highly of the work done here and has given instructions to the Officer in Charge Silk Industry, in connection with vegetable colours to be used in dyeing silk, and has taught many simple methods of rearing silkworms and reeling and re-reeling, twisting and warping silk as would facilitate work in the above branches and prove economical.

All the initial work has been done and there is sufficient staff at the Institute to turn local cocoons into silk and cloth, even if the cultivators take to rearing work now.

No doubt the annual expenditure at the Institute appears at present to be very heavy as compared with its receipts. But this state of things will not remain for ever. The Industry is at present in its infancy and it will soon attain a stage, when it will be a source of income to the State. In Industries, which are quite new to locality the initial expenditure is naturally heavy in the beginning and unless that is incurred no good results can be expected.

CENTRAL PROVINCES.

The earliest recorded attempt to cultivate the mulberry worm appears to have been that made at Kamptee by Miss Calder in the years 1827 to 1831. The attempt was a failure. Trials appear to have been made at Nagpur also, but in 1836 these were acknowledged to have been quite unsuccessful. Years later in Seoni District, more serious experiments were undertaken. In 1852 a Mr. Wood, appears to have attempted sericulture, but there is no record of his proceedings extant. Then in 1869, Captain Brooke, Deputy Commissioner of Seoni, took the matter vigorously in hand. His notes both on mulberry and tasar silk cultivation form the most interesting part of the Central Provinces records on the subject. At first his experiments promised well, but in the second season he found that the mulberry tree would not grow well in the black cotton soil of the district, and the attempt had to be abandoned. In consequence of this failure, Captain Brooke, gave it as his final opinion that, instead of attempting to introduce a foreign silk, efforts should be concentrated on the development of the indigenous articles, tasar. Although it seems probable that the obstacle of a soil was not one which would necessarily prove insuperable in other districts, the failure of this experiment had the effect of shelving the subject for many years. So far as my information goes, no further attempt was made until 1883, when the Deputy Commissioner of Chhindwara, under the instructions of Mr. J. B. Fuller, then Director of Agriculture for these Provinces, carried through a very interesting experiment. Its object was to ascertain whether the climate of the Satpura tract was suitable for growing Japanese silk on the system followed in Dehra Dun. The experiment, carried out on a small scale, was most successful. A supply of Japanese eggs was obtained from Mussourie, and the worms hatched out were fed on the mulberry trees growing in Chhindwara station. There seems to have been no difficulty at all here as to the growth of the mulberry. The silk produced was placed in the hands of experts, and was pronounced to be superior to ordinary Bengal silk, and even equal to some classes of European silk. I have found no record of any more recent experiment, and I am not aware of any private enterprise having stepped in to test the commercial value of the information gained from the experiment of 1883.

(Monograph on the Silk Fabrics of the Central Provinces.)

Fortunately a record exists of this experiment in a report published in full in Liotard's silk in India. The object was to see if a single crop of silk could be taken in spring as is done in North India. Japanese eggs were got from Mussoorie, and $\frac{3}{4}$ ounce hatched between February 10th and 25th; in all they were given 59 maunds of leaf (which is an enormous amount) and 130 square feet of trays. The worms thrived better on leaf of *Morus atropurpurea* than on leaf of *Morus indica*, both being trees. The first cocoon spun on March 22nd, 32 days after hatching, the temperatures were high and at the end the thermometer rose to 94° and never fell below 82°. The outturn was 41 lbs. 12½ oz. green cocoons, yielding 14 lbs. 14 oz. dry cocoons, which yielded 4 lbs. 5 oz. raw silk, 10 oz. tape chassam, 4 oz. other waste. The cocoons were reeled by the Bengal Silk Co. at Berhampur.

The silk was well reported on, as likely to be near to Broussa, and really worth Rs. 30 a seer as against Bengal's then at Rs. 16—17. For details. Liotard should be consulted.

BOMBAY.

1823, the Collector of Dharwar, introduced mulberry worms from Mysore and grew silk in the jail and got ryots to do it. This went on locally till in 1842, 400 lbs. of inferior silk were made.

In 1880, a rearer was still doing it, presumably for local use.

The water is too deep for irrigation to pay. (Geoghegan.)

In Khandesh, the Collector commenced in 1826. In 1831 the silk was classed as equal to 3rd or 4th class Canton. In 1837, Mutti inspected it and found trees grew well, and worms were well, but the whole was in the charge of three peons, who were entirely ignorant. "From first to last no one, who had ever had any practical experience in silk culture had any share in the management." In 1838 it ceased. (Geoghegan.)

In 1831, Dr. Graham was growing mulberry at Ahmadnagar. He grew *M. indica* to start and later *M. alba*. He grew boro-polo apparently, but this is doubtful as he had worms in November. Dr. Graham went on leave, in 1838, others had it and in 1845, the whole stopped. The silk fetched Rs. 12 a seer. (Geoghegan.)

Failure probably due to irrigation being required and to ignorance.

Signor Mutti worked in Poona, Bombay, etc., from 1831 to 1848. Much mulberry was planted and he grew Bengal multivoltines. He distributed the worms as they hatched. The silk cocoons yielded at 9 kahans to 1 seer silk. Trees were planted at Poona, Ahmadnagar, Dhulia, Nasik, Kathiawar, Kaira, Ahmadabad, Bassein, Mahim, Dharwar, etc., and worms reared.

The failure ultimately seems to have been due to poor leaf, partly owing to 'standards,' no fresh seed, and no steady continuity in money supply. (Geoghegan.)

From 1865 to 1874, experiments were continued at Dharwar they showed that mulberry grew well and that silk could be produced, but nothing further happened. The following is of interest:—

*Extract from the Proceedings of the Poona Agricultural Conference,
held on 2nd October 1909.*

Mr. A. M. Bidikar (Belgaum). He can have half an acre of land or can use his backyard for growing mulberry trees, which would enable him to rear some silk-worms and thus gain a good income from it. From enquiries that I have made and from what I have read I have learnt that places where the thermometer does not rise over 90 or go below 60 in shade is a fit place for sericulture and such places can be found in and near about Belgaum. I have come to know from old persons that silkworms were reared in Belgaum some 70 years ago and many mulberry trees were seen by me in the backyards of several houses. Now a trace here and there of these trees can also be seen here. No causes why this industry was discontinued here can be known. I have seen about four years ago some silkworms were reared by a man and he used to collect mulberry leaves from trees in the backyard of several persons. It is plain at all events that the climate of Belgaum and places on the ghats to the West and South of Belgaum is suited for sericulture.

BARODA.

In 1905-06, the Director of Agriculture, visited Kashmir, to see the industry there and N. G. Mukherji, visited Baroda and advised; his report was very detailed and should be consulted.

The Administration reports from 1905-06 to 1913-14, give a record of subsequent progress. Two schools were started in 1905-06, five crops of silk were got and a special officer was put on duty at Navsari to spread the industry. There were 25 students at the Songad School next year, and this school was increased in 1907-08. There were 70 students at the Vyara School

in 1908-09. Crops of worms had been taken continuously and mulberry planted. Yet in 1908-09, the report says that only three persons were doing mulberry silk as an industry and 82 doing the newly introduced eri. Next year the two schools were moved away, one to Baroda, the other to Navsari, the latter was abandoned in 1913-14, both continued taking crops of silk but eri was the only silk the people took any interest in.

The Baroda station has continued to rear eri and mulberry with an occasional failure due to heat. The reasons ascribed for the failure of mulberry are the cost of irrigation of mulberry, the objection to killing the cocoons; the failure of eri is due to the loss of the market for cocoons, the Bombay Mill having ceased to buy cocoons. Something may be ascribed to the method adopted, which was the curious one of teaching sericulture before anyone knew how to make sericulture profitable in Baroda. Too much confidence was placed in N. G. Mukherji's proposals, which were afterwards found to be ill adapted to the climatic conditions of the State.

If sericulture is ever to be developed it will only be by beginning at the right end and growing silk profitably, with expert advice, before teaching sericulture.

COORG.

From the Deputy Director, Land Records and Agriculture, Mercara, Coorg.

Dated the 19th July 1916.

I have the honour to bring to your notice that the eggs of silkworms (Multivoltine), which you kindly supplied me about 18 months ago have done exceedingly well. They were not at all subject to any disease, and continued to breed regularly completing their course in about five weeks time, or less.

As regards the cocoons, am sending you a few specimens. But the Imperial Silk Expert, Mr. Maxwell Lefroy was of opinion that the quality of silk was inferior to that raised in Mysore and on his advice I obtained eggs from the Chennapatna Farm in Mysore. These were, however, most disappointing, as they were very delicate and suffered much from the disease known as flacherie. I don't think that their cocoons are even as good as the Pusa ones. And I am sending you also the specimens of the Mysore kind.

It is possible that your variety has deteriorated and I shall feel very thankful if you will kindly send me a fresh supply for about 80 trays, for which I shall gladly pay. Please also do me the favour to advise me whether you would advise me to cross breed and on what lines?

MADRAS.

1790-98. Dr. Anderson stimulated Government and large efforts were made to introduce the silk industry in Madras. It was abandoned finally after spending £20,000, as the cost of cultivation, irrigation, etc., was too high.

1794-96. Filature was established at Vallavedu and trees were planted. 460 lbs. of filature silk and 550 lbs. of waste had been made at the filature at the cost of Rs. 78,736.

1797, January to March. 169 lbs. of silk, and 135 lbs. of waste silk had been produced.

The whole failed as natives would not take to it and with paid labour it cost too much.

In 1870, silk cultivation was actually being carried on in Coimbatore and Salem, also in Cuddapah, North Arcot Tinnevely, and South Canara.

See reports of industry in Salem yielding Rs. 27-4-0 profit per acre, and of Tinnevely yielding Rs. 75 per .62 acre. (Geoghegan.)

A series of experiments were made in 1883 with seed from Kashmir, from Lister and Co., and from China, at Saidapet, at Coimbatore and Rajahmundry and at Yercaud in Salem. Results at Saidapet were indefinite; at the other places, they were spoilt by the eggs having largely hatched on arrival; at Coimbatore of Lister's eggs 5,230 worms hatched and all spun; they reeled at a rate equivalent to 4 lbs. raw silk per ounce of eggs; the Kashmir eggs gave worms many of which died of flacherie; the cocoons reeled at the rate of 4 lbs. 8 oz. raw silk per ounce of seed. At Yercaud, the worms that hatched apparently did well.

It will be evident that not much could be learned from these trials, done as they were in this curious manner; the same trials were made at Berhampur and Rampur Bauleah Jails, and at Saharanpur; the seed used at Chhindwara (see page 137) was from this source and there alone definite results were obtained.

TRAVANCORE.

Extract from report of Travancore, Department of Agriculture for 1914-15.
X. *Sericulture.*

The silk farm at Trivandrum, is intended solely for experimental purposes. Owing to the limited grant sanctioned for the farm and the absence of sufficient accommodation and appliances, silkworm culture cannot be undertaken on a commercial scale. Besides for the conduct of experiments, the farm serves for the distribution of mulberry cuttings and silkworm eggs to the public.

In previous years equal attention was bestowed upon the cultivation of eri and mulberry silkworms. But during the year under report more attention was paid to the latter than to the former, because of the practical difficulty experienced in conducting both the operations successfully in the limited accommodation available in the farm. Any how, two small crops of eri silkworms were raised in the earlier part of the year and five crops of mulberry silkworms throughout the year. The latter yielded 300 lbs. of green cocoons. A portion of this was reeled and woven into cloth, which was sold at Rs. 2 per yard, and the balance of the cocoons was sold to the Salvation Army's Silk Farm at Bangalore at 12 annas per lb. of dried cocoons.

The experiments conducted so far in the silk farm leave no room for doubt about the feasibility of carrying on silkworm culture in Travancore, in about six months of the year, when there is neither severe drought nor heavy rain, both of these conditions being unfavourable for the growth of silkworms. What remains to be done is to persuade the people to take interest in this new industry. This is now being done by delivering popular lectures and distributing leaflets on the subject and by supplying mulberry cuttings and silkworm eggs free to the people. During the year under report 20 bundles of cuttings were distributed to 160 persons through the Local Salvation Army Officers, 30 bundles were supplied to one Mr. Thomas of Vandeperiyar and some 10 bundles were distributed to a few people in and about Trivandrum.

The mulberry plantations, which the Department opened at Tiruvella and Oachaira continued to make satisfactory progress and a new plantation was also opened at Kaipattur. Cultivation of silkworms will be undertaken at all these places in due course. They are mainly intended to serve as centres for the distribution of Mulberry cuttings and silkworm seeds.

A new move towards the popularisation of the silk industry in Travancore has been decided upon and will be made in the course of the current year. It is the starting of a sericultural school at Trivandrum under the control of the Salvation Army, for which the army will receive a monthly grant of Rs. 50 from the Department. As at present arranged, the school will be opened in May 1916. To begin with the school will contain accommodation for 12 boys only; but in the course of three years accommodation will be provided for 50 boys.

APPENDIX XII.

Included here are notes on the Cleghorn Mulberry plant and the Cleghorn hybrid, by Miss Cleghorn, a note on Tukra disease by Mr. Misra, and an abstract of certain figures of rearing, reeling, etc., from text books intended mainly for convenience of reference.

A note on the Cleghorn Mulberry.

The old plantation at 57, Ballygunge Circular Road, consisted of:—

- (a) About 6 trees which had been obtained in 1894, 1895 from cuttings from trees at Mr. Anderson's distillery at Diamond Harbour Road. These trees had originally come from Berhampur.
- (b) About 2,000 plants of bush mulberry which were obtained from Berhampur and given as cuttings to my father by Anderson Wright - about 1910.
- (c) About 260 plants and 4 trees (two male and two female) of a new variety found by my father which has sweet thin glossy leaves.
- (d) Seventy plants of mulberry which produce leaf between October and January.
- (e) About 150 plants of *Morus alba* grown from cuttings taken from a *Morus alba* which appeared among the Berhampur bush mulberry.

When the work was started on a larger scale at Alipore 350 bushes of mulberry were transplanted daily from the plantation at 57, Ballygunge Circular Road, to the extent of about 2,000 bushes in all.

Seventy plants of specially selected fruitless mulberry which bear leaf between October and January were also transplanted.

Two hundred and thirty saplings of male mulberry were transplanted at the rate of ten per day, and laid out 10 feet apart.

All these male trees of which there are about 350 have invariably borne staminate flowers for the past seven years.

History of my father's Mulberry.— These trees were all obtained from cuttings from two male trees left in the old garden at Ballygunge and these two male trees have borne only staminate flowers for the last eight years. The original tree, from which my father obtained these two male trees at Ballygunge bore both staminate and pistillate flowers on separate branches. My father took cuttings from both the male and female branches and the cuttings from the male branches have borne only staminate flowers, and the cuttings from the female branches only pistillate flowers as great care was taken to cut the branches immediately below where the staminate and pistillate flowers terminated. This mulberry appears to be a sub-variety of *Morus Indica*. The flowers are a bit different to the typical *Morus Indica* and the leaves have a shiny waxy cuticle which keeps them fresher than any of the other varieties of mulberry. Carefully packed and damped occasionally they have remained fresh for over three weeks. The leaf also has a sweet taste compared to that of the common *Morus Indica*.

Among the bushes from the Berhampur cuttings my father allowed a few *Morus alba* from Berhampur; the Bombay Mulberry. to grow into trees to see if their flowers were staminate or pistillate and one of them bore white fruit; this he kept as *Morus Alba* and took over a hundred cuttings from it. These are now trees and bear white, and pale pink fruit.

MAUD CLEGHORN.

Note on the Cleghorn Hybrid.

The hybrid race between the Italian Japanese and the Nistari which was started in January 1911 and reared on a very small scale for 36 generations has

been reared on a large scale since September 1915, and on a very large scale since March 1916, and the 46th generation has given cocoons which still continue to be superior to the Nistari. From this six groups each consisting of hundreds of families, have been selected and are being reared separately.

A very rigorous selection is being made not only with regard to the cocoons but also with regard to the moths and layings. The best layings only are kept from moths which have lived many days after eggs hatch. I have found that selection for longevity alone gives very good results in making the race vigorous and immune to disease. Many of the moths live over twenty days, some about twenty-four days and one male moth lived nearly two months.

A black race of worms of a very dark grey colour has been obtained from five black mutations which appeared in family 303 of the 37th generation. The 37th generation was the first to be reared on a very large scale since the cross was started in January 1911. As the worms owing to their dark colour are almost invisible among the mulberry leaves I thought the native rearers would probably have nothing to do with them. However some rearers who have seen them say they would be much valued in the silk districts. Their dark colour may be of some use as the silkworm fly would have difficulty in finding them out. In their dark velvety markings they much resemble the larvæ of the wild silkworm *Theophila huttoni*, and are probably a throw back to some ancestral type and are interesting on this account.

Another mutation also appeared among the worms in the 43rd generation, these were spotted worms. There were only about six or seven at first but I now have quite a number. All the worms usually have four markings on two segments but these have markings on each segment and so in their markings much resemble the larvæ of *Theophila huttoni*.

In my Ital-Jap and Nistari cross I have found, that, after the direct influence of the fresh cross seemed to have disappeared, every third generation produced the best cocoons, for the cocoons of the 6th generation, 9th, 12th, and 15th generations were much superior to those of the intervening generations. Even those of the 12th generation seriposited during the rains in July, were much better than those of the 10th generation (April) and the 14th generation seriposited in October. From the 15th to 46th generation (which finished spinning at the end of August 1916), every third generation has produced the best cocoons. As the raiyats in India grow about three or four crops of cocoons a year (only rearing a few to keep the breed alive when they are short of leaf) it would be to their advantage to arrange that the crops reared are of every third generation.

The cocoons obtained from this multivoltine race are much superior to the Nistari; those of the 9th generation were valued at about 9½ francs per kilo in the Milan Market, which is close up to the price of good Italian cocoons, and the cocoons of the 13th generation were valued at about 7 francs per kilo.

In the 17th generation this hybrid race was recrossed with Nistari and in the 34th generation with family No. ³⁰³/₃₀₇ of my father's accidental Multivoltine race of the Italian-Japanese hybrid. After the first rearing on a large scale in September 1915 the race was divided into various groups:—

1. 303, the family in which the black worms appeared.
2. 7(a) and 4(b) sets with particularly good textured cocoons.
3. "One" and "two laying" sets, which were from the 303 set.
4. Black female set which has both black and white worms.
5. 108 and 4 and 5, recrossed with Mysore in the 36th generation.
6. My father's race of Italian-Japanese Hybrid which was recrossed with Nistari in the 35th generation. This race was also started in January 1911.
7. 329 set from a female of my father's race which lived twenty-four days.

M. L. CLEGHORN.

The 7th September 1916.

Annual report on Scientific work in connection with silk for the year ending 30th June 1916, by Miss M. L. Cleghorn, F.L.S., F.E.S.

In April 1916 a grant of Rs. 10,000 was sanctioned by Government for the extension of my silk experiments and research.

My silk laboratory has been much enlarged, the three control rearing houses for village rearers completed, and a new mulberry plantation of about 8 bighas of land in Hastings House, which was very kindly given by the Honourable Mr. W. W. Hornell, Director of Public Instruction, has been dug up and planted out with about 400 thin sweet-leaved male mulberry; and part of the plot is being prepared for the cultivation of bush mulberry according to indigenous methods.

Mr. H. Maxwell-Lefroy, Imperial Silk Expert, who was deputed by the Secretary of State to report on the Silk Industry, visited my Sericultural Laboratory and expressed much satisfaction at the way in which the work was being carried out. Mr. Lefroy suggested that a comparative trial should be made between my hybrid race and the indigenous Nistari and Desi. So a large education of the 41st generation of my multivoltine hybrid race, started in January 1911, was reared and a kahan of seed cocoons of this generation was forwarded to Mr. J. de Minvielle, Manager of Messrs. Anderson Wright & Co.'s Filature Concern at Ramnugger. The trial cocoons reared at Ramnugger were of the 42nd generation of my cross, and the worms from start to finish gave no trouble in spite of very hot weather, and were healthy throughout the education. These cocoons gave about 36 per cent. better produce than the control Nistari and Desi which were reared at the same time, and went 12 kahans 12 puns to the seer of silk, while the control Chotapolu went 18 kahans 10 puns, and the control Nistari 17 kahans 14 puns to the seer of silk.

This hybrid race between the Italian-Japanese and Nistari, which was started in January 1911, has been reared on a very large scale since September 1915. From this six groups each consisting of hundreds of families have been selected and are being reared separately.

A very rigorous selection is being made not only with regard to the cocoons but also with regard to the moths and layings. The best layings only are kept from moths which have lived many days after eggs hatch. I have found that selection for longevity alone gives very good results in making the race vigorous and immune to disease. Many of the moths live over twenty days, some about twenty-four days and one male moth lived nearly two months.

A black race of worms of a very dark grey colour has been obtained from five black mutations which appeared in family 303 of the 37th generation. The 37th generation was the first to be reared on a very large scale since the cross was started in January 1911. The worms owing to their dark colour are almost invisible among the mulberry leaves and on this account the native rearers would probably have nothing to do with them. However their dark colour may be of some use as the silkwormfly would have difficulty in finding them out. In their dark velvety markings they much resemble the larvæ of the wild silkworm *Theophila huttoni*, and probably a throw back to some ancestral type and are interesting on this account.

I received a letter from Dr. W. S. Sutherland of the Scottish Universities Mission, Kalimpong, asking for advice regarding silkworms. I gave him all the necessary assistance regarding them and also sent him fifteen layings of the 44th generation of my hybrid race. They were reared at Kalimpong, without a single loss during the education, and the cocoons produced were large and firm and of good texture. Dr. Sutherland has also planted out, in a special plot, 250 thin-sweet-leaved male mulberry plants which I sent him as I have found that silkworms fed on this variety give the best results. It is hoped that when there is enough of this mulberry that at least three crops a year of my cocoons may be obtained at Kalimpong for reeling in Bengal filatures.

M. L. CLEGHORN.

The Tukra disease of Mulberry.

The disease is caused by the presence of *Dactylopius Sp.* (Probably *Dactylopius bromelias*, Bouche) on the shoots of Mulberry. The shoots of the infested plants

become hard and compact. The leaves first become deep coppery green, turn pale yellow and either drop off or remain on the plants. They, however, become very crisp and are lacking in nutritive factors. In course of time, as more nymphs hatch out and mature on the infested plants, the plants lose their freshness and vigour and appear pale and sickly. The field presents a peculiar appearance, the individual plants having few leaves but with prominent gnarled heads.

In some places where the whitish leaf-fungus [*Phyllactinea Corylea* (Pers) Karst] is present leaf denudation is more rapid and prominent. In a case under observation it was found that a few potted plants of *Morus Sp.* remained immune from the attacks of the leaf-fungus for over three months, but as soon as the plants became infested with *Dactylopius Sp.* the appearance of the fungus on the leaves was very rapid and prominent. The first signs of the leaf-fungus were detected a fortnight after the plants were inoculated with a few nymphs of *Dactylopius Sp.* and a month later, there were left only a few leaves on the lower portion of the stem. With the presence of the leaf-fungus, the infested leaves turn pale yellow, assume a brownish colour, dry up and fall down. The plant subsequently presents a weak, straggling growth.

The female is light castaneous in colour, flat, somewhat longer than broad and is covered with a thin whitish meal, with a pair of stout, bent, caudal setæ. After laying eggs she is 1.32 mm. long, 1.29 mm. broad. The ovisac is pure white, at one end of which the female remains shrivelled up. The ovisac is full of small, cylindrical, pinkish eggs, each egg being .36 mm. long, .21 mm. broad, one end being suffused with pale brown. The eggs are laid compactly within the ovisac. A week after, the eggs hatch out into small, flat, pinkish nymphs which wander about slowly on the plant in search of suitable plant to fix themselves on. Each nymph is .42 mm. long, antennæ nearly as long as the caudal setæ.

After wandering about, the nymph prefers to fix itself in the axil of a leaf, and a week after, its presence makes itself prominent by the flattening out of the apical stem below the top shoot and the turning of the leaves into coppery green: soon after, the ants—*Monomorium indicum* Forel attend the nymphs to lick the honeydew and may then be seen hurrying up and down the infested plant. Ten days after the establishment of the nymph the apical leaves begin to curl and fourteen to fifteen days (after establishment of the nymph) the top shoot loses its freshness, becomes coppery-green and curly in appearance. A fortnight after, the whitish leaf-fungus (*Phyllactinea Corylea* (Pers) Karst), which remains dormant, shows itself out prominently on the leaves. Fifteen to seventeen days after the establishment of the nymph the female becomes mature and the males also begin to emerge, impregnate the female and die. The male puparium (as seen in most of the cases) is on a separate leaf away from the females. The male puparium consists of whitish, fibrous threads and is situated near the midribs or veinlets of leaves. It is small, cylindrical, made up of cretaceous white curly threads. Several male puparia may be found congregated together near the midrib of a leaf. The male is bright pink, with light pale legs and antennæ, with two cretaceous-white, caudal threads. As is usual with the male coccids, they are fragile little creatures, and move about slowly on the leaf stalks, stems, and shoot of infested plants. On a plant the maturing of eggs, the emergence of nymphs, the maturing of females and the emergence of males goes on intermittently, so that, at times it is difficult to separate the successive broods from each other.

In a case under observation, it was found that the growth of the infested plant was retarded so much that there was a growth of three and a quarter inches within the course of a month, and as soon as this growth had taken place it was infested by the nymphs and females, with the result that another gnarled head was formed immediately above the former one. In this case too, the leaves had become coppery green, curled and crisp and were unfit to be served to the worms.

C. S. MISRA.

PUSA,

The 9th November 1916.

MULBERRY SILK.

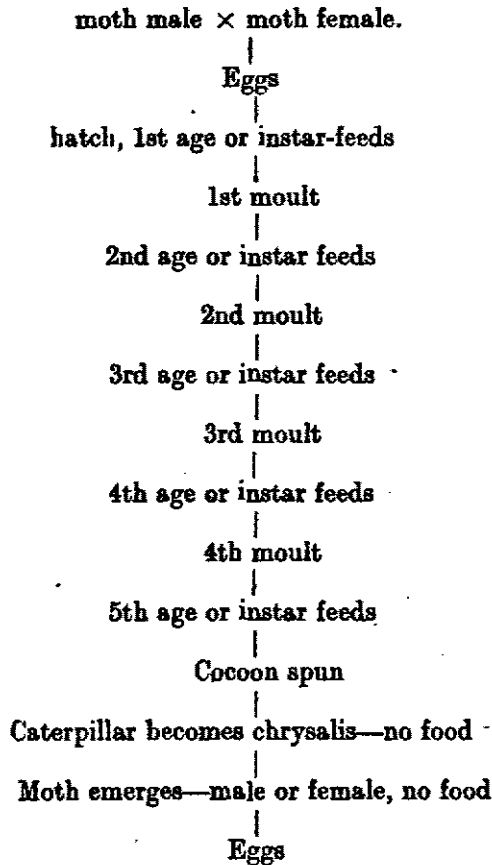
There are certain facts about sericulture which must be familiar in order to follow the subject at all.

Silk is the production of a caterpillar, which feeds on mulberry : it becomes a moth which lays eggs : the cycle is :—

Moth male couples with female.

Female lays eggs,

eggs hatch to caterpillars, which pass through five ages or instars, between each of which they moult : at the end of the caterpillar (worm) life a cocoon is spun and inside it the caterpillar becomes a chrysalis : so you get :



All technical terms are margined here for reference.

The facts here are abstracted from Maillot and Lambert "Le Traité sur le Ver-à-Soie" where not otherwise stated. Japan figures are from Honda "Silk Industry of Japan". They are given for reference and refer to the European univoltine race as a rule.

SUMMARY AND CONSTANTS.

Eggs are yellow, on being laid, and if they are not going to hatch till they have been through a winter, they turn grey in 5 or 6 days : if they are to hatch soon, they do not turn grey. The former would normally give one generation a year and are called univoltine = one-brooded : the latter in India give several broods a year and are multivoltine or polyvoltine.

	gramme.	oz.
French, Roussillon, yellow	1,537	38,425
" Cevennes "	1,431	35,775
Italian, Fossombrone "	1,303	32,575
Cyprus "	1,236	30,900
Persia, Sibsevar, white	1,176	29,400
China, Multivoltine "	2,151	53,775
India " yellow	2,200	55,000

Eggs weigh from 1,200 to 2,200 per gramme.

Eggs of univoltine are laid on cloth or paper, kept till winter, scraped off into water and all rejected that float: and are then put for hibernation: changes of temperature are very bad: eggs lose 13 per cent. weight in hibernation. Hibernation should be 3 months at 0°C. (32° F.): it would rise then 1° C. a day to 22° C. (1·8° F. to 72° F.). Humidity should be 50 per cent.

In Japan the temperatures recommended are:—

December under 40° F., January under 35°,
February under 40° F., March under 45°,
April under 50° F., then 14 days before wanted to hatch raise to 55, then daily 1° to 62°, then 2° to 72° F.

In India, the univoltines should be similarly treated but the multivoltines hatch in 10 days and are kept at normal temperatures.

When the eggs are to hatch, young leaf is put over the eggs if they are fixed, or if loose a fine net is put over and then leaf. Another method is to roll leaves like a cigar, cut it across in pieces and put the spirals down, they are easily lifted off with the worms. The object is to take off the worms. Eggs hatch in the morning, a few the first day, many the second and third, a few the fourth: there should be no more.

In Japan, the worms are brushed off the eggs with a feather broom at 11 A.M., 70 per cent. should hatch on one day and these are kept; they are mixed up with millet or rice husk, a quart per ounce of eggs, with chopped leaf: when the worms crawl up, the whole is shaken up, and perforated paper put over, the young worms then creep up and get on the paper where they are fed.

A few eggs of univoltine breeds will often hatch in 10 or 12 days instead of waiting for the 10 months. These are "accidental bivoltines" and if some of their eggs were to hatch again, they would become multivoltine. If univoltine eggs are wanted to hatch quickly, this can be done to some extent: "brushing" up to the third day makes half hatch. Dipping in concentrated Sulphuric Acid for 30 seconds, then washing, brings out 50 per cent. Strong Hydrochloric Acid, Nitric Acid or Water at 112° F., or hot and cold water (140° F. to 70° F.) ultimately does the same; exposure to oxygen brings some out.

<i>Rearing.</i>		
25 grammes seed	.	= 36,000 eggs.
Weighs at hatching	.	18 grammes.
After 1st moult	.	255 " i.e. × 15
" 2nd "	.	1,598 " "
" 3rd "	.	6,800 " "
" 4th "	.	27,676 " "
at greatest size	.	161,500 " "
at maturity	.	131,920 " "
as cocoons	.	76,250 " "
chrysalides alone	.	66,300 " "
Moths 50 per cent. each sex	.	39,685 " "
		<u>1,700+2,990</u>

25 grammes of seed reared by a rearer should give 50 kilos of cocoons, green. It costs in France 100 francs to rear this, and 35 kilos of green cocoons at francs 3 per kilo covers this cost.

Worms are kept on trays: space allowed is for one ounce:—

France (old and new figures).		
at hatching	.	3 square metre
after 1st moult	.	5 square metres.
" 2nd moult	.	10 " "
" 3rd moult	.	20 " "
" 4th moult	.	40 " "
before spinning	.	45—60 " "

L'Arbousset says that if you allow 40 square metres you will get only 40 kilos; if you allow 60 or 70 you will get 60 to 70 kilos; this is the limit, therefore you provide it.

In Japan for one ounce:

	first half.	at end of instar.
1st instar	3—9 square feet	15
2nd „	9—27 „ „	36
3rd „	36—48 „ „	90
4th „	64—90 „ „	180
5th „	180—270 „ „	270

Feeding.

	first half.	at end of instar.
1st instar	7 to 8 times daily.	
2nd „	6 to 7 „ „	
3rd „	5 to 8 „ „	
4th „	5 to 8 „ „	
5th „	4 to 8 „ „	

Table of feeding in kilos (seers) of leaf.

	Instar. 1	2	3	4	5
Day 1	0.350	1.680	2.800	9.1	16.8
„ 2	0.560	2.800	8.4	14.0	25.2
„ 3	1.120	3.080	9.1	21.0	39.2
„ 4	0.630	0.840	4.9	23.8	50.4
„ 5	0.140	..	2.8	11.9	75.6
„ 6 . . . . .	..	..	..	4.2	91.0
„ 7 . . . . .	..	..	..	..	84.0
„ 8 . . . . .	..	..	..	..	61.6
„ 9 . . . . .	..	..	..	..	46.2
„ 10 . . . . .	..	..	..	..	22.4
TOTAL LEAF	2.8	8.4	28.0	84.0	512.4
Excrement . . . . .	.05	0.55	1.675	8.675	61.6
Waste leaf	0.65	1.55	7.425	19.325	246.4
TOTAL WASTE	0.7	2.1	9.1	28.0	308.0
Leaf fed			635.6 kilos	=	1,398 lbs.
Excrement			72.55 „	=	160 „
Leaf left			275.350 „	=	606 „

Gives 56 kilos of green cocoons = live chrysalides plus cocoons.

Leaf should be given fresh, cut square: if watery it should be kept till it loses 5 to 10 per cent. of water.

30 grammes = 36,000 eggs.
 = 30,000 cocoons.
 = 60 to 65 kilos of cocoons.

L'Arbousset gives feeding as—

Hatching to 1st moult, 4 kilos.	=	20	kilos.	of ripe leaves.
1st moult to 2nd moult, 12 kilos.	=	48	„	„
2nd „ to 3rd „ 36	=	108	„	„
3rd „ to 4th „ 108	=	316	„	„
4th „ to pupation 650	=	700	„	„

1,192

= leaves for one ounce of Var seed = 60.65 kilos. of green cocoons.

(L'Arbousset).

Time taken varies :

in Japan at 65° F.	40 days from egg to spinning.
70° F.	35 days " " " "
75° F.	30 days " " " "
80° F.	24 days " " " "

65° F. to 75° F. is the best temperature for rearing. In Japan trays are

Trays and Nets.

3½ feet × 2½ feet and in rearing nets are used till the fourth stage or perforated paper : paper mesh is 0.1 inch, 0.15, 0.2, 0.3, 0.5, to 2 inches.

In India nets are used of 0.1, 0.2, 0.3 and 1 inch mesh and cost Rs. 45 per 100.

Spinning.—The caterpillar turns to the chrysalis as a rule three days after starting to spin : the cocoon is removed on the sixth and sold on the 8th day.

A ripe worm weighs 3.66 grammes,
Cocoon at selling 2.18 grammes,
of which chrysalis is 1.84 grammes,
on emergence moth weighs 1.10 grammes,
pierced cocoon 0.40 grammes.

Size depends on the humidity in rearing.

	No. to kilos.	Ripe worm.	Cocoon.	Silk.
Reared in dry air	543	3.51	1.84	0.28
" normal air	537	3.73	1.86	0.31
" wet air	500	4.10	2.07	0.34

The humidity should be under 70 per cent. at spinning, the temperature should be 75° to 80° : if both are higher, the cocoons reel badly.

Chrysalis period :

at 30° C. to 35° C.	(86°—95° F.)	10—15 days.
at 20° C. to 25° C.	(68°—77° F.)	18—20 " "
at 10° C. to 15° C.	(50°—59° F.)	several months.
at 2° C.	(36°—50° F.)	nearly a year.

Chrysalides die quickly at 75°—80° C., quicker if air is moist ; exposed for any time to 50° C.—60° C. (112—130° F.) they die. Such temperatures are got in India in the sun.

Cocoons are picked over and classed as :—

Superior,
Medium—deformed, stained, uneven, etc.,
Inferior,
Double.

L'Arbousset gives these figures :—

Fine cocoons	63.7 kilos.
Second "	2.1 " "
Double "	4.2 " "

as the yield of one oz. of seed.

70

Cocoons weighing 100 kilos at picking at 22° C.

	Kilos.
weight 1st day	99.1
" 2nd "	98.1
" 3rd "	97.5
" 4th "	97.0
" 5th "	96.6
" 6th "	96.0
" 7th "	95.2
" 8th "	94.3
" 9th "	93.4
" 10th "	92.5

Good French cocoons weigh 500 to the kilo.

For an equal number, female cocoons weigh more and give more silk. For an equal weight, male cocoons give more silk.

100 kilos fresh cocoons = 84.200 kilos. Chrysalides,
 0.450 „ moult,
 15.350 „ silk,

dries to 32 to 33 kilos. dry cocoons,
 17 to 18 kilos. chrysalis,
 gives 8, 9 or 10 kilos. raw silk,
 8, 7.5 or 7 kilos. waste silk.

Cocoons are killed with dry hot air at 70° to 80° C. for 10 minutes.

Moths.—Selected cocoons for seed are kept at 70°-75° F. Univoltines require 21 days, bivoltines 17 to 18. In Japan paper is put over the cocoons, with perforations big enough to let the moths through; then the coloured excretion of the moth does not fall on the cocoons. Moths emerge from 4—8 A.M. Coupling lasts from one to 5 or 6 hours and is done in the dark. One male can fertilise more than one female. In “cellular” production, moths are then isolated to lay: temperature should be 75 to 90° F., humidity 70 per cent. Moths lay most of their eggs in the next 24 hours.

Cellular seed.

Industrial seed.

In “industrial” production, 100 moths lay on one card; only a proportion are examined for disease.

In Japan, 100 moths lay 48,000 to 50,000 eggs, of which perhaps 40,000 become cocoons. In France 100 “cellules” should contain 35 to 37 grammes of seed = 53,800 of the Roussillon variety.

Reeling is done on the Chambon system, two or four threads at a time or on the Tavelette, self-croissance, several threads at a time. The former does 18 to 20 grammes per hour of better silk, the latter 25 to 28 grammes of less good silk.

Raw silk is judged by its—

Cleanness (Nettété) i.e., absence of kinks, knots, etc., estimated by re-winding through a fine point and noting breaks or by examination as it winds with a lens; the best have 50 to 60 “duvets” (ends) per 100 metres; and by regularity, fineness, weight, tenacity, elasticity, brilliance, colour, etc.

Conditioning (Titrage).

20 hanks of exact length are run off and weighed; the average is taken and one sees how much each varies from the original. The hanks are run off on reel with a perimeter of say 1.25 metre, with a self counter.

Hanks are of 400 aunes (476 metres) or of 500 metres; the weight is in grains (0.0531 grammes). If 24 times the length is taken the actual weights are deniers but now a silk of 10 deniers is one that weighs 10 grains when 400 aunes (476 metres) are run off. Deniers, etc., vary from place to place. The last Convention has agreed to take the titre at 450 metres with a weight of 0.05 grammes; a 450 hank of 10 denier silk would thus weigh 0.5 grammes. Weight is taken on silk containing 10 per cent. moisture. (11 per cent. added to absolute dry weight).

In a cocoon, the “titre” (size) of the thread varies; the following are figures of successive lengths of 120 metres of one cocoon (Milan) which had lost 4 per cent. of floss:—

	Milligrammes.
1st length weighed	44
2nd „ „	52
3rd „ „	49
4th „ „	43
5th „ „	37
6th „ „	31
7th „ „	27
8th „ „	23

This varies very much ; one usually gets 100-120 metres of fine silk outside ; then 100-200 metres of thickest silk ; then the thread goes steadily down.

Tenacity and elasticity.—If the thread is pulled it elongates ; part of this elongation is elastic, going when the tension is removed, part is permanent (stretching). This is tested by weights and measurements ; the table shows the results on 50 c. m. of silk :—

Weight.	Total elongation.	Permanent elongation.	Elastic elongation.
10 grs.	3 M.M.	0	3 M.M.
20 „	5 M.M.	0	5 M.M.
30 „	8 M.M.	0	8 M.M.
40 „	10 M.M.	1	9 M.M.
50 „	13 M.M.	1	9 M.M.
60 „	17 M.M.	1	9 M.M.
70 „	21 M.M.	1	9 M.M.
80 „	26 M.M.	3	23 M.M.
90 „	37 M.M.	9	28 M.M.
100 „	45 M.M.	14	31 M.M.
110 „	57 M.M.	23	34 M.M.
120 „	72 M.M.	33	39 M.M.
125 „	75 M.M.	36	39 M.M.
127 „	77 M.M.	broke	..

The permanent elongation here noted was observed at once. Much of it goes in time and much more if the thread is wetted. That is, wetting the thread adds elasticity and so the conditioning is important.

The Serimeter is an instrument meant to automatically indicate the elasticity, etc., of the silk.

Two or three fibres of raw silk twisted together at 75 to 100 turns to the metre is Tram ; (weft).

Two single fibres, each separately given 500 to 600 twists per metre (12 to 14 per inch) and united with an opposite twist of 400-500 per metre = Organzine (Warp).

There are other varieties.

Twisting is supposed to give strength ; it also prevents the subsequent tangling of the thread in working, and also gives different classes of fibre suited to various fabrics. Boiling off is done for one hour in a bath of 30 per cent. soap and then for one hour in a bath of 15 per cent. soap. The thread loses 25 per cent. in weight.

Soie Souple is made by exposing the silk to 90° C. in a weakly acid bath.

Spun waste is classed (titré) by the number of 1,000 metres required to weigh one kilo : No. 150 means 150,000 m. = 1 kilo. The finest spun is 300. The finest raw silk on this basis would be 1,331, and the single fibre (brin) would be 4,444.

GRAINAGE.

Seed Selection.

Pasteur's methods :

- (1) Never take eggs from a brood showing any flacherie at spinning.
- (2) Select moths by cellular laying and microscopic examination.

The moths as they couple are isolated in bags of gauze, on squares of cloth, under covers of paper or metal ; the male after coupling is allowed to die or pinned in the corner ; the female lays and dies ; she is then examined for pebrine. The body is pounded in a little water, a drop put under the microscope and looked at with a 1-6 or 1-9 objective.

RACES AND CROSSING.

1. *Eggs*—adherent (European and most others);
non-adherent (Turkish, Persia, China, etc.).
2. *Larva*—skin smooth, white
 ,, black banded and 2 ventral spots to each.
 Black
 ,, white banded.
 Blue (Chinese)
 Green ,,
 with processes—(China),—coloured or white.
3. *Cocoons*—White—Oval and spherical.
 Cylindrical.
 Conical and Cyliandroconical.
 Green—Oval (Chinese).
 Cylindrical (Japan and Persia).
 Conical.
 Yellow—Oval (China, Bengal).
 Cylindrical (Europe).
 Conical (Persia, China).
 Cyliandro-conical (Cyprus).
4. *Moths*—White
 ,, banded.
 Grey or black.

The Mulberry.

Morus nigra.
Morus nigra laciniata. } Give coarse silk.

Morus alba.—Origin in Asia.

Leaf much divided. Fruit (white, red or black) is on a long stalk. The best for silk.

Morus rubra.
 ,, *celtidifolia.* } American.
 ,, *insignis.* }

Of *Morus alba* there are many varieties; *Morus alba-vulgaris tenuifolia* is a shrub given to young worms because it comes out sooner.

Morus alba vulgaris rosea has whole leaves, is used as a graft to form a tree and stands dryness.

Morus alba vulgaris Moretti with large leaves; good for hedges, does not stand frost.

Morus alba latifolia (*Murier multicaule*) is good for shrubs and hedges because it grows well from cuttings. It has large dentate leaves.

L'Arbousset adds *Morus Japonica* a sprout found by M. Nourigat at Lunel among a plot of Japanese seedlings. It is large-leafed and very early.

The best permanent trees come from seed. To get seed, get fruits from a tree not too young or old (10 to 30 years), which is not being plucked. Collect the ripe fruits and rub them in water till all the seeds fall. Collect them, wash and dry in the shade.

Sow in loose friable soil, well manured, in lines or beds; the young plants come up in a fortnight; they are replanted after a year (if we sow in July, replant in November or December) a yard apart; the tap root is cut at 8 inches, and the stem above the 3rd eye; when 3 shoots grow two are destroyed and one left to grow. Select the best for planting out.

Grafting is used for all inferior ones. Budding is used for *multicaulis* and *Moretti*. Layering is also used for others.

The trees are planted out ; the tap root is cut, the top is cut, and only three shoots are allowed to grow to make main branches. This is done by cutting the main shoot at the top, letting the side buds grow, and cutting off all shoots from the bottom up except the three best placed to make main branches. The next year these three are cut at say one foot to leave two buds to make branches. In this way an even tree is got.

The following gives planting distances :—

	Orchard.	Alleys.	Border of avenues.
Tall plants . . .	5 to 10 metres.	10 to 12	10 to 12
Middle plants . . .	2 to 4 „	2 to 4	2 to 4
Dwarf plant. . .	$\frac{1}{2}$ to 2 „	0.9 to 2 m.	$\frac{1}{2}$ to 2
Hedges . . .	2 „	1 to 3	
or bushes . . .	1 foot.		

If trees show signs of becoming bad they are cut heavily back to be rejuvenated. A single well developed tree gives 200 kilos (seers) of leaf in one plucking : it requires a diameter space of 33 to 35 feet.

APPENDIX XIII.

Extract from the Prospectus of the O'Dwyer Silk Farm and Institute of Simla under the management of Salvation Army.

OUTLINE OF PROPOSED COURSE OF INSTRUCTION.

I.—Study of Indian and Foreign Silkworms.

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|--|---|
| <p>1.—Principal Indian Silkworms :—</p> <p>(a) Mysore Silkworms.</p> <p>(b) Assam Silkworms—</p> <p>(i) Muga.</p> <p>(ii) Eri.</p> <p>(c) Bengal.</p> <p>(d) Tassar.</p> <p>2.—Principal Foreign Silkworms :—</p> <p>(a) French—</p> <p>(i) Var.</p> <p>(ii) Bione.</p> <p>(iii) Pyrenees.</p> <p>(b) Italian—</p> <p>(i) White.</p> <p>(ii) Yellow.</p> | <p>(c) Japanese.</p> <p>(d) Chinese—</p> <p>(i) Shanghai.</p> <p>(ii) Canton.</p> <p>(iii) Oak-feeding Tassar.</p> <p>(e) Persian.</p> <p>3.—Crops in year—</p> <p>(a) Univoltine.</p> <p>(b) Bivoltine.</p> <p>(c) Polyvoltine.</p> <p>4.—Climates for Silkworms—</p> <p>(a) Average Temperature.</p> <p>(b) Effect of Cold.</p> <p>(c) Effect of Heat.</p> <p>(d) Effect of Damp.</p> <p>(e) Adaptation to Climate.</p> |
|--|---|

II.—Rearing Silkworms.

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|---|--|
| <p>1.—European and Japanese System.</p> <p>2.—Indian System—</p> <p>(a) Bengal and Mysore.</p> <p>(b) Kashmir.</p> <p>(c) Openair.</p> <p>(d) Partial Domestication.</p> <p>(e) Moradabad.</p> <p>(f) Persian.</p> <p>(g) Bonoris.</p> <p>3.—Hatching Machines—</p> <p>(a) Castellet.</p> | <p>(b) Wooden Box.</p> <p>(c) Home Incubator.</p> <p>(d) Kashmir System.</p> <p>4.—Systems for Feeding.</p> <p>5.—Moult.</p> <p>6.—Systems for Cocoons—</p> <p>(a) European System.</p> <p>(b) Chandrakis.</p> <p>(c) Ground.</p> <p>7.—Gathering Cocoons.</p> |
|---|--|

III.—Treatment of Cocoons.

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|---|--|
| <p>1.—Green Cocoons.</p> <p>2.—Drying Cocoons—</p> <p>(a) In the Sun.</p> <p>(b) Oven-drying.</p> <p>(c) Steam-drying.</p> <p>3.—Dangers and Advantages of each System.</p> | <p>4.—Classifying Cocoons—</p> <p>(a) For Grainage.</p> <p>(b) For Filature.</p> <p>(c) For Waste.</p> <p>5.—Storage of Cocoons.</p> |
|---|--|

IV.—Grainage or Production of Disease-free Eggs.

- | | |
|--|---|
| <p>1.—Selection of Cocoons.</p> <p>2.—Pairing Moths.</p> <p>3.—Pasteur System of detecting Disease.</p> <p>4.—Microscopic Examination.</p> <p>5.—Methods of Disinfecting.</p> <p>6.—Transport of Eggs.</p> | <p>7.—Study of Diseases—</p> <p>(a) Pebrine.</p> <p>(b) Flacherie.</p> <p>(c) Grasserie.</p> <p>(d) Muscardine.</p> |
|--|---|

V.—Silkworm foods.

- | | |
|---|--|
| <p>1.—Mulberry—</p> <p>(a)—Bush mulberry.</p> <p>(b)—Tree mulberry.</p> <p>(c)—Best varieties.</p> <p>(i) French.</p> <p>(ii) Italian.</p> <p>(iii) Indian.</p> <p>(iv) Philippine.</p> | <p>(v) Japanese.</p> <p>(d) Mulberry plantations.</p> <p>(e) Mulberry nursery.</p> <p>(f) Diseases of mulberry.</p> <p>(g) Manuring and pruning.</p> <p>2.—Castor.</p> <p>3.—Oak, Ber, Asan, Sum, Sualu.</p> |
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VI.—Bye-products.

- | | |
|-------------------------|--------------------------------|
| 1.—Chrysalis as manure. | 4.—Mulberry leaves as fodder. |
| 2.—Litter as manure. | 5.—Mulberry twigs for baskets. |
| 3.—Mulberry for fuel. | 6.—Chinese "Caps." |

VII.—Preparation of raw silk.

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|---|--|
| 1.—College implements—
(a) Reeling.
(b) Re-reeling. | 8.—Changing water. |
| 2.—Steam filature. | 9.—Softening water. |
| 3.—Avoidance of waste. | 10.—Study of faults—
(a) Irregularity of thread.
(b) Insufficient crossing.
(c) Knobs, fous and knifs.
(d) Breaks. |
| 4.—Maximum output. | 11.—Preparation and size of skeins. |
| 5.—Qualities of cocoons. | 12.—Packing skeins for market. |
| 6.—Methods for softening. | |
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VIII.—Preparing raw silk for weaving.

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| 1.—Twisting silk—
(a) Tram.
(b) Organzine. | 2.—Cottage twisting machines. |
| | 3.—Cottage warping machines. |
| | 4.—Bleaching. |
| | 5.—Dyeing. |

IX.—Waste silk.

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| 1.—Classification. | 2.—Preparation for market. |
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X.—Weaving silk.

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| 1.—The Desi Kadi. | 4.—Dressing and finishing. |
| 2.—Salvation Army looms. | 5.—Ribbon looms. |
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XI.—Conditioning silk.

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| 1.—What it means. | 3.—Dishonesty disastrous. |
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XII.—Commercial aspect of silk.

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| 1.—Market requirements—
(a) Cocoons.
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(d) Silk fabrics. | 6.—Market preferences—
(a) Indian.
(b) Continental.
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| 2.—Dangers to avoid. | 7.—India's competitors.
(a) Need India be last on the list ?
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(c) How to satisfy the market. |
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XIII.—Silk literature.

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| 1.—Indian books, pamphlets and bulletins. | 4.—Government reports on silk. |
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XIV.—Lecturers and silk staff.

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| 1.—Lectures from silk staff. | 2.—Lectures from Government Experts. |
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APPENDIX XIV.

The note on Wild Silks prepared by Mr. J. H. Watson of Manchester is produced as well as certain extracts about oak feeding silk : the remainder consists of reports from forest and district officers on the present condition of the tasar industry, with a report from the Director of Agriculture, Bihar and Orissa.

REMARKS ON THE DEVELOPMENT OF SERICULTURE IN INDIA.

J. HENRY WATSON.

The preliminary work to be done would be the complete survey of all the possible wild silks, Indian, Ceylonese and Andaman, and the obtaining of pure wild stock to commence with. I am aware that something has from time to time been done but only in sporadic and disconnected attempts but the results obtained are negligible, there being no continuity over a period, which is necessary if the best results are to be obtained. This would of course necessitate some travelling with the setting up of a small breeding station in various districts, but, having obtained the pure stock, work in selecting and production of better races could be at once proceeded with. As

Silk Survey ;
A.

an instance I have had during the last few years collected for me in Assam, *i.e.*, Dibrugarh, Sibsagar and Mouphlong, cocoons which are there said to be reared as *Muga* by the natives. These cocoons when hatched prove to be those of no less than three distinct species ; *Antheræa Assamensis*, *A. frithii* and a species which appears to be a form of a *roylei* but which has a cocoon, not double walled as *roylei*, but single walled and hardly distinguishable from *Assamensis*. Again in the Bengal and Manbhum districts, it is likely that here, there are two races of

Muga.
Mylitta.

Tasar (*A. Mylitta*) masquerading as one species and one race. Certain it is that in Assam the race of *Tasar* there is very distinct from the Bengalese and gives different broods. One of the things that I should like to do would be to try and separate these two races which I have never been able to do in England with the limited time at my disposal and little material which I have received from India. When these two probable races are separated and bred on Mendelian lines you can then in the third generation by selection be sure of obtaining in your cultures the *certainty of results* which has been obtained in the rearing of *Bombyx mori* and which I feel sure is not the case in India with *Tasar* at the present time.

The above case is analogous to that of the genus *Cricula* where what has been passing in collections since 1847 as a form of *C. trifenestrata*, M. André and myself simultaneously by breeding in Europe found there were two very distinct species. Cotes in his fine work " Wild Silk insects of India " No. 2 plate X falls in the same error and figures the male and larva of *C. trifenestrata* but the cocoon and female are *C. Andrei*. The segregation as before mentioned in *Tasar* would have to be done in the case of *Eri* silk as the insect I have received for experiment

Cricula trifenestrata.

P. ricini (Eri).

from Pusa is not a pure strain.

The species best to use in a *pure state* are the native species as *Tasar*, *Muga*, *Eri* and the *Andamans* species which last I have been investigating for some 5 years, about which so little is yet known ; and about which I will speak later.

C.
Species to use.
Native.

It is of little use to think of the Japanese *Yamamai* as this is *univoltine* with an awkward dormant period as the egg. This species is now being superseded by the Japanese themselves by *Antheræa perneyi* which is also an oak feeder and bivoltine, with a dormant period in cocoon

Foreign.
Japan and China.

state and is more responsive to special treatment in different environments and climates. But there is another species allied to *Perneyi* from Manchuria which is also bivoltine and which I am trying to get alive. This species, also an oak feeder like *Perneyi* (the Shantung silk moth) and the native Indian oak-feeder *A. Roylei*, produces a much paler silk than *Perneyi* and would be the one to rear in the hills on the oaks in India. I have at the moment from various districts in Eastern China and Manchuria 5 distinct classes of Shantung silk cocoons alive and one of these when hatched may be the sought for species which is only known from one in Lyons "Laboratory for Study of Silk" and a cocoon and a short series in British Museum. In any case one of the classes I have, my correspondent who is a Manchester man, now a Shantung silk exporter, informs me he can get 50 per cent. more money (as cloth) than the ordinary *Perneyi* cloth.

If this would mate and produce a fertile hybrid like *Perneyi* does with the Indian *Roylei* it would be the *ideal* silk producer for the Hills in India and on these lines with other species of close relationship to the Indian species, much valuable research and great advances would be done towards the production of better silks. Wailly, 35 years ago (who was my correspondent some years later) produced under the Aegis of the French Society of Acclimatisation, a *fertile hybrid* between your Indian *Roylei* and the Chinese *Perneyi* of which I have one female he gave me. It (the hybrid) was accidentally killed after rearing about 5 broods and was never again obtained to my knowledge until 3 years ago I again produced it, both ways being fertile. From the cocoons I obtained, I had a draft of silk made and it is very beautiful, almost pure white like *Roylei*; but the quantity of *Perneyi*. The hybrid was fertile in both crosses and both crosses were bivoltine in Manchester; but 3 broods may be reared in Assam probably, if the hill-oaks were prepared for the purpose. Investigations such as this and the careful selection of the finest strains would lift up the value of both quality and quantity of silk produced and there is no reason why as great a success should not accrue to India by the introduction of such foreign stock; as has been obtained in Sze-chuan and Yunnan in Western China by the introduction there of the East China Shantung Silk moth.

The Andaman Islands (and probably other districts in India and Burma) alone possesses three species or geographical races which I have had sent me the life histories of, together with their live cocoons; and from which I have had drafts of the silk made for me in Macclesfield. These are probably unknown economically in India but I have figured two in my "Wild Silk moths of the world." I refer to *Antheræa Andamana* which produces a very beautiful though dark silk and the other is the large Andaman race of *Actias selene* called *Callandra*. This last produces 50 per cent. more silk than the largest Indian *selene* and what is most valuable is that it is a pure white and lustrous. There also is another large *Antheræa* of which I have two cocoons. These are similar to a very large *A. frithii* but the silk is yellow outside but paler inside and I think the colour will be very pale yellow when boiled off.

If I am correct in saying that the Andamans is a convict settlement, it then appears to me that you have here a great opening for silk production with native silk and with labour at a low cost and what is more; placing in the convicts hands some trade which he can take up on his return to private life; but I myself am hampered by the fact that I have not been in India and am unacquainted with the conditions there.

Here the question is rather more difficult as so few entomologists I have knowledge of have taken the interest and trouble to search out the cocoons and life histories of these wild silks; most have been content to have just the imago in their collections.

There is however nothing that could be used in India from the New World, Europe or Africa but the investigation of Borneo and Indo-Malayan Islands may more than likely produce species which could be used in India and may perhaps be of value in hybridisation, as all are closely related to the Indian forms.

My own latest acquisition is the cocoon of the Assamese *Antheræa Compta* which has a cocoon of fine brown silk similar to *A. Andamanæa*.

There is besides the ordinary silk producers another what might be called a side line. This is the production of silk fishing line from the larva of *Saturnia (Eriogyna) pyretorum* of South China and Hainan. This is a business which is very considerable and extremely profitable. It is controlled, so my Japanese agent tells me, by a certain guild in Japan; and which he has often tried to get into. Now in India there is a race of this same species *Saturnia cidosa* (Moore) but it is smaller than the Hainan race which I named *Pearsoni*, but if *Liquidambar formosana* and *Cinnamomum Camphora* will grow in India, then the silk fish line production could be there introduced either the pure race *Pearsoni* from Hainan or a hybrid race between it and the Indian *S. Cidosa*. The silk of the 'Hainan race' is also exported (30,000 kilogrammes) and the Silk fish line which goes almost entirely to England is 7·200 kilog. I have living moths at this moment of the South China form from Canton.

To recapitulate. The development of Sericulture in India, etc., would mean the investigation of all sources and species over a continuous period, with travel facilities to the best centres. The examination of the best methods in Europe and China of the carding and spinning of such as could not be direct reeled. The hybridisation and the selection of the finest forms and the elimination of the inferior ones and after the production of these hybrids and races the placing of them on the market in *standard brands* carefully graded as is now done in Japan. If this is done in a proper manner the possibilities of silk production in India with its varied climates is absolutely without limit.

OAK-FEEDING SILKS.

There is a very great production in China of silk from semi-domesticated worms grown largely upon dwarf-oaks and this silk, the Shantung or tasar of commerce, is extremely cheap and very largely used as reeled silk and as waste.

So far as can be ascertained the only trials of these made in India are those described in the two notes following; and an extract is added from Sir G. Watt's Dictionary of Economic Products.

Extract from the Annual Forest Administration Report of the School Circle, North Western Provinces and Oudh, for the year 1897-98.

(5) EXPERIMENTS.

Para. 39.—

At the desire of the Inspector General of Forests an attempt was made during the year to rear the silk worms of the North China Moth *Antheraea Pernyi*. In its native country it feeds on two oaks, *Quercus robur* and *Quercus dentata*, and the problem was to rear it on one of the Himalayan Oaks. The cocoons were received in December 1897 and sent to Chakrata, many of the moths having already emerged in transit. Soon, one by one, they all came out and after pairing, the females began to lay eggs and eventually from these eggs worms hatched out in April and May. They were first tried at Chakrata and fed on leaves of the "ban" oak, *Quercus incana* and "Moru" oak, *Quercus dilatata*, but they did not succeed on this food, so they were tried with the high level oak, *Quercus semicarpifolia*, which fortunately seemed to suit them. As the temperature at Chakrata was too high and the food trees too far away, they were then moved to Deoban, and after undergoing the usual moults 182 of them spun cocoons. Next year, no doubt, in due course, these will produce moths and the life-round will begin again but as we shall know more about their requirements, we shall be able to obtain a better supply of silk.

It is unfortunate that they cannot be kept at a lower level than 8,000 feet, so that it is unlikely that the breeding of silkworms will be taken up by the people of Jaunsar.

Extract from the Annual Forest Administration Report in the School Circle, North-Western Provinces and Oudh, for the year 1898-99.

(5) EXPERIMENTS.

Para. 40.—

Jaunsar Division.—The Divisional Officer reports as follows on the experiment with the *Antheraea Pernyi* silkworm.

“The number of cocoons at the end of the previous seasons’ culture was 179. These were kept throughout the autumn and winter months at Deoban, and were brought down to Chakrata in the middle of March 1899. One hundred moths hatched out between the 6th and 17th April, and eggs were laid shortly afterwards. These eggs were kept at Chakrata to hasten the process of hatching, and as the larvæ hatched out they were put upon leaves of kharshu oak (brought down daily from Deoban) and were then transferred to Deoban themselves. 645 larvæ hatched, out of which 390 were still alive and healthy at Deoban on the 1st July, the rest having either died in transit between Chakrata and Deoban or after arrival at the latter place. The experiments carried out during the past 2 years clearly show that the insect cannot be successfully cultivated in Jaunsar except at considerable trouble. They do not thrive on either moru or ban oak and rearing them in the Kharshu forests is never likely to be taken up to any great extent by the Jaunsaris on account of the distance from their villages of such forests.”

Extract from the Dictionary of the Economic Products of India by G. Watt.

The author had the opportunity, while on a visit to Manipur, to witness the system followed of rearing the worms and reeling the cocoons. The worms were to a large extent allowed to run wild on a scrub of mulberry bushes, and absolutely no care was bestowed on them. Yet the silk obtained was of superior quality and the manufactures highly creditable. The people were, however, so superstitious on the subject that it was impossible to learn more than the most ordinary facts. Judging from the rampant growth of the mulberry bushes and the prevailing climatic features of the State, Manipur, next to Kashmir, would appear to offer the best prospects of a future extension of sericulture in India. Labour could be had plentifully, and large expanses of rich land, perfectly level, would be available, which for centuries have not been cultivated, and which bear a wild vegetation that in many respects resembles that of China and Japan. The average height of the northern portions of the valley is about 3,000 feet, but much land could be got at even 5,000 feet, in which the humidity and temperature closely resemble that of France or Italy. Perhaps no better country exists for the oak-feeding *Antheraea pernyi* than Manipur, so that both “Chinese tasar” and mulberry worms might be reared. Manipur might, in fact, be described as a land of oaks, and in many respects it possesses the characteristic features of Shantung, the home of *Antheraea pernyi*, which might be characterised as the best of all the so-called wild silkworms.

Tasar.—The following extracts illustrate the method of rearing and collecting :—

Tasar silk.—The following is an extract of a report by H. H. Haines, Esq., Deputy Conservator of Forests, on the Silk Industry in Singhbhum.

1. *Price, etc.*—The prices obtained for large quantities in this season are as follows :—

Mugas Rs. 10 per kahan (1,280 cocoons). Perhaps a different species.

Dabas, Rs. 8 to Rs. 9 per kahan.

Larias, Rs. 7 to Rs. 8 per kahan.

Bogui, Rs. 5 to Rs. 7 per kahan.

A French firm for some time has been engaged in the silk trade, and is believed to buy up half of the 40,000 kahans annually produced in the whole of Singhbhum the remainder being purchased by native reelers.

2. *Cultivation*.—Mr. A. W. Walker who was at one time engaged in the silk trade and has a wide knowledge of the subject kindly furnishes the following information on cultivation.

The insects begin to emerge from the seed cocoons with the increase of atmospheric humidity : the season thus depends much on the period of the monsoon.

The females are placed on thorny branches stuck into the ground in slightly shady places ; the thorns are to protect the moths from birds and bats. She should pair within 24 hours or is useless for breeding.

The period in Coitu may extend for 12 hours to allow all the eggs to be fertilised and during this time the female should not be disturbed. She commences to lay soon after separation ; the eggs laid during the first twelve hours give stronger and healthier progeny and are kept separate from those laid during the next six hours ; after 18 hours the eggs are rejected. The selected eggs " Hita " are arranged in a series of leaf pouches made of " Roong " *Bauhinia Vahlia*. They hatch in 6 to 8 days but must be kept out of the sun, and as soon as this occurs the leaf pouches are hung on the twigs of the food tree.

The food trees are very numerous but the *Terminalia tomentosa* is by far the most generally used for the purpose in Singhbhum, it being pollarded every two years for the purpose. For instance, a tree pruned in December 1898, will be used again in 1900, the 1899 leaves prove too rich. When the branches of the food tree are completely stripped of foliage, the larvæ are transferred to another, or better still the branches of one tree should meet those of another so that the larvæ can crawl to the next of their own accord. The least disturbance affects the growth and condition of the larvæ.

Before transferring larvæ to a food tree the ground beneath the latter is usually burnt to free it from ants and other enemies of the larvæ and the stem is painted round with a ring of juice of the Bhela (*Semecarpus Anacardium*) and small boys are posted under the trees to scare away birds, etc.

The larva first moults after 4 days then after 5 days again after 6 days and finally after 7 days, it then feeds for 30 to 32 days and then spins its cocoon.

A caterpillar on which a fly or wasp has laid its egg will hasten to spin its cocoon and will often commence from the 20th instead of 30th day. Even then it often fails to complete its cocoon so far as spinning out all the silk in its body.

3. *Nomenclature origin discussed*.—The first lot of cocoons from Daba seed is called Ampatia or Dhulia and is only used for seed. The Ampatia is then again used for breeding and the next crop is the Daba (producing the market Daba).

Daba originally came from the forests and as seed is called Langa Laria which after several years rearing produces the marketable silk as well as seed. Daba seed never comes originally from the forests as Daba.

There is certainly a good deal of confusion in the origin of the four kinds quoted in para. 1 and the names Muga-Laria and Bogui are often in Singhbhum only the distinguishing names of qualities of cocoons from a silk producing point of view, e.g., Langa Laria is bought as and reeled with Mugas cocoons ; the large Baguies are bought mixed with Dabas, because the cocoons give an equal quantity of silk and of an even thickness and elasticity of thread. The people are more particular about inferior Larias getting mixed with superior Baguies.

Mr. Walker says that the Muga are wild cocoons, but if so there is no difference between Muga (which fetches a high price) and Langa Laria unless the difference lies in the latter being only used for seed. He then suggests that Muga is another species, viz., *Antheræa Assama* of which the vernacular name in Assam is Muga. This, however, is improbable owing to the complete absence in Singhbhum of the food trees of *Antheræa Assama* which feeds entirely upon laurels and two other trees not existent in Singhbhum.

The origin of the names is probably judging by analogy with the custom in other silk producing districts to be found in the season of the crop of which these are about four in the year (often known as cycles) and Muga may be a corruption of what is known in Nagpur as the Magh or January crop. Mr. Meerza, Deputy Magistrate, who has been engaged in writing a monograph on the silk Industry in Singhbhum, quotes the following from *Hunter* : Three sorts of cocoons " only

are usually known in the district Laria, Bogui, Daba. The two former are obtained from the jungle parent moth and the moths lay their eggs in the growers home in August. The Daba cocoons are reared wholly in captivity. They are ready for sale in September and the silk derived from them commands the highest price."

One or two Kol cultivators whom Mr. Meerza questioned say that the Muga is the same as the Daba and comes from the same worm: the peculiarity of it being, that the cocoon is found made between two or three leaves (instead of hanging free from a twig). They said it was very rare.

From H. H. Haines, Esq., F.C.H., F.L.S., Conservator of Forests, Bihar and Orissa.

Dated the 1st May 1916.

In continuation of my letter No. 657-XXV-P-33, dated the 6th March 1916, and with reference to Mr. Lefroy's letter on the subject of the tasar industry I understand that District Officers have been also addressed on the subject and as they will be in a better position to state statistics of *outturn*, area under tasar, etc., I shall not attempt to deal with this part of the subject. From the figures of outturn or area under cultivation the 'present position of the industry' would also appear to be in the best manner deducible and I can only state in a very general way regarding districts visited by me that I have seen no cultivation in Puri, Angul and Sambalpur although I found wild cocoons in Sambalpur and this is a large weaving centre and was told that a very small amount of cultivation is carried on. In Palamau the cultivation according to Mr. Hannah is chiefly in the Khurchutta range and I saw practically none in area visited by me. Mr. Draper informs me that the industry is not carried on to any great extent in the Santhal Pargannas. In the Singhbhum district it still seems to me very much alive and Mr. Kirkpatrick has heard that in some years nearly a lakh of rupees worth of silk is purchased in this district. (The Settlement report in fact mentions four to five lakhs as the value in 1898.)

2. Nearly all the *tasar* cultivation takes place in the *village lands*. The reasons for this are said to be the danger of forest fires killing the worms, and the danger from wild animals to the cultivators themselves as these latter have to be up all night to keep off flying-foxes, owls, etc., from the worms. In consequence of this according to Mr. Kirkpatrick there are very few applicants for permission to cultivate in the protected forests. Mr. Grieve, Divisional Forest Officer, Singhbhum, writes "a good deal however might be done in the protected forests where cultivation of tasar is not at present allowed."

As a matter of fact in Porahat the cultivation in the protected blocks is disallowed under the *Rules*. I am told that were it not so the area under cultivation could be increased. In view of the value of the industry and the fact that the cultivation does not necessitate the entire clearance of an area of tree growth I am of opinion that the Forest Department should allow this cultivation provided that the Asan trees are clean pollarded. This is usually done in Chota Nagpur, though Mr. Draper informs me that the Central Provinces method alluded to in my letter to Mr. Lefroy is sometimes practised in the Santhal Pargannas.

(*Extract*).—"There was a very little tasar cultivation in the Central Provinces and the industry seemed quite moribund. There the cultivators have a suicidal system of half cutting through the Asan branches and bending them down, instead of clean pollarding as pursued by the Kols and the method was incompatible with the continued existence of the forest."

"In the Palamau division the cultivation is actually carried out in the protected forests and the Divisional Forest Officer states there is practically no control "and therefore very little use for expert advice."

3. As regard damage by fire this would only apply to the hot weather crop. In Singhbhum Mr. Kirkpatrick states that the early crop is cultivated in May and June (the resulting cocoons being termed "Larea"). The later crop is culti-

vated in July and August (producing cocoons known as " bogoi ") and he states that the cultivator cannot spare time to go to the forest and collect seed and then to watch the worms in these months. He also appears to think that the game is not sufficiently worth the candle as " the Hos are not generally well enough off to watch for four months over their cocoons as during these months May—August the poorer Hos are generally working at road work, Sabai-cutting, etc., and moreover, they want to collect Mohuwa flowers, etc." He quotes the rates of sale as 200 cocoons per Re. 1. Mr. Kirkpatrick states that he cannot offer any suggestions for improving the industry.

In Palamau the cultivators appear to confine themselves to a single crop. Mr. Hannah says that immediately after the transplantation of paddy in August the cultivators commence the rearing on Asan trees and gather only one crop at the end of October. - He states that there are three *qualities* of cocoons Munga, Lunga and Fuki and the market rate is about Rs. 3 to Rs. 4 on an average per Kahan (1,280 cocoons). Mr. Hannah estimates that the raiyat *makes a very good thing* out of the cultivation.

In Singhbhum Mr. Kirkpatrick says the rates for sale are 200 cocoons per Re. 1 and yet the industry is only for the more well-to-do : I presume that the poor man has to wait too long for his money so that possibly Takavi advances to the poor cultivators might assist matters.

4. On the question of a Sericultural Farm and expert advice it should be mentioned that such a farm was established in Chaibassa a few years ago but failed. Mr. Grieve believes this was due to mismanagement but is unable to ascertain for certain what the reason was. I might state that I do not think Chaibassa a good place for the farm. It is very hot and exposed to the violent west winds in May and is therefore not particularly suitable for Asan, or, I imagine for the worms. I believe however there is *great scope* for a farm and expert advice.

The question of good seed has always appeared to me the great difficulty and Mr. Grieve again alludes to this. He says " It is said there is great difficulty in obtaining seed cocoons, wild cocoons are used for seed purposes and these are generally obtained from the forest, but owing to the scarcity of the wild cocoon the collection is laborious and expensive."

Mr. Kirkpatrick says " out of the resultant cocoons some are kept for seed and the major portion sold " but I am not sure whether the early crop is not always raised from wild seed and at any rate for some reason or other I recollect that great stress was laid on the necessity for wild seed.

Mr. Hannah says " the seed is bought from the bazar." This bazar seed doubtlessly is brought in from the forest and is expensive. Why is it so necessary under the present system to obtain wild seed ? I presume that a large percentage of cultivated seed is infected and this difficulty with seed alone is well worth the attention and advice of an expert.

In addition to the reasons given by Mr. Kirkpatrick (mentioned above in paragraph 2) for not cultivating in the *protected forests* he gives the interesting item " A species of Ichneumon fly is also a great danger and these are cleverly caught by the Hos with bird-lime on a much forked branch of brush wood."

5. To summarize therefore it appears to me that the position of the industry might be greatly improved with the help of Government—

- (a) by providing cheap and good seed. (This alone necessitates an expert.)
- (b) by opening out more of the protected forest area to cultivation.
- (c) possibly (with expert advice) by offering Takavi loans to the poorer cultivators who cannot wait for the returns of their labour for so long as is necessitated by tasar cultivation.
- (d) by general expert advice to cultivators.

The following is a summary of N. G. Mukerji's classes of cocoons :—

- (Larya) *Narya*.—Small-wild—out in June.
- Gives *Ampatia*.—A flimsy cocoon in July-August.
- Barsati*.—October—Main crop.

Jaddui.—Cold weather crop.

Muda-Muga.—Wild cocoons, found in the *Ampatia* but the moths do not emerge in August but next June. These produce the *Daba*.

Daba.—Emerge in June and give an *Ampatia* brood and a *Barsati* brood.

Bugui.—Emerge first in September and give a *Barsati* crop only in November and December. If this is correct.

Larya is 3 brooded.

Daba is 2 brooded.

Bugui is 1 brooded.

One thousand two hundred and eighty cocoons produce $1\frac{1}{2}$ —4 lbs. reeled silk. *Barasati* cocoons fetch Rs. 8-10 a kahan. *Ampatias* fetch Rs. 2-3.

MUKERJI—1907.

Extract from G. R. No. 3533 of 6th April 1907, R. D. on Sericulture.

I have the honour to subjoin the remarks of Mr. Osmaston, Divisional Forest Officer, on the subject:—

“The *Tasar* cocoons can be had in all the ranges of this Division but in largest quantity in Navapur, Taloda, Nandurbar, Pimpalner, Shirpur, Shahada and Akrani.

“The cocoon is found most often on the Bor (*Zizyphus—Jujuba*); next to this they are found most often on Sadada Arati Murmulti, henkal, niwar khair, babul and dhavda.

“At present the cocoons are not much collected; in Shirpur, for instance, Dhangars (not Bhils) collect them to a small extent and use the silk for making very tough string and small boxes and also for preparing a medicine from the pupa inside the cocoon for giving as a tonic to children.

“In Taloda Bhil boys bring a certain number of cocoons to the market and sell them for about 1 pie each.

“My estimate of the number of cocoons available annually is as follows:—

Shirpur	50,000
Shahada	50,000
Taloda	30,000
Akrani	50,000
Nandurbar	50,000
Navapur	50,000
Pimpalner	30,000
Dhulia and Nizampur	10,000
TOTAL	320,000

But this estimate may be very wide of the mark indeed.

“Wild tribesmen would willingly collect the cocoons if a fair price were offered them. Eight annas per 100 might first be tried and I would undertake to collect them at the head-quarters of each range and forward them to any central depôt that might be fixed on if I were given money for the purpose.

“When a demand and trade in the cocoon is once established the collection might be done by contractors to whom the right should be sold annually.

“The contractor would have to be bound by a clause in the agreement not to collect cocoons unless the insects had emerged or otherwise the supply would decrease and the moth would eventually be killed out.”

2. Perhaps a sum of Rs. 500 or Rs. 1,000 might be placed at Mr. Osmaston's disposal for an experiment.

I have, etc.,

(Sd.) G. S. CURTIS,
Collector of Khandesh.

Extract from the Mirzapur Gazetteer.

The leaves of the *asan*, *asam*, or *sajja* tree (*terminalia tomentosa*) are the favourite diet of the silkworm.* The insect has no special name of its own but the industry of collecting the cocoons is generally spoken of as *koa*, which literally means a cocoon, and this term is sometimes loosely applied to the worm itself. The collections, which are chiefly in the hands of Kools, Bhuiyas and Dusadhs, are all made in the wild country south of Ahraura, beginning with the jungles on the Vindhya and going on to Dudhi and the extreme south. The tract where cocoons are found is divided into circles, each man having the right to collect from his own circle and paying the *zamindar* dues as for other jungle products. Good, large, strong cocoons to the number of 300 or 400 are selected by each collector from the November crop, put in earthen vessels, and brought home. At the beginning of the following rains they are taken out and hung up in a position from which leaves of the *asan* tree are easily accessible. After a short time a moist spot is observed towards the upper end of the cocoon. This indicates that the moth within is preparing to break the shell and emerge into the light of day. The moths are of a beautiful russet colour: their wings are edged with a greenish-grey line in front and a red and white band behind, and on each wing is a spot about the size of a big pea, in the centre of which is a transparent membrane similar to beetles' wings. The length of the body of the moth is a little less than two inches, while the breadth from tip to tip of its wings when fully extended is over six inches. The female moth remains in the empty cocoon while the male flies about. The moths enjoy their winged existence only for a day. In the afternoon the rearers prepare a *chauka* or plot of ground plastered with cowdung, and place the fertilized females on it, where they begin to lay their eggs soon after dark. Two or three of these are tied together to prevent escape; and about 100 or 150 eggs are expected from each. The eggs are collected in an earthen pot. Next morning the heavy eggs are picked out from the light ones, either by means of a winnowing fan, called *sup*, or by throwing them all into cold water, when the light eggs float on the surface. The selected eggs are next tied loosely in pieces of cloth and placed in a *nand* for about a week, the mouth of the *nand* being covered with a piece of cloth tied lightly round it. After eight days the *nand* is opened, and small worms about one-tenth of an inch long are seen to have been hatched out of the eggs. These worms are then placed in a *dauna* or platter of *tendu* leaves, and hung up from an *asan* or *kakor* tree. The *dauna* is a hollow made up of two leaves stitched together and kept stretched by means of small twigs inserted within. The worms make their way out of these artificial shelters and begin to devour the leaves; from these they spread to the branches; and as the latter become denuded, they are cut off with the worms and attached to other trees in full leaf. This process is continued for several weeks, until the worms are matured. September is the time when the tasar worms attain full maturity and begin to spin their cocoons. Each seeks a convenient nest and builds up the cocoon in about three days, the inside being composed of silken fibres and the outside covered with a hard shell which protects the chrysalis till it grows into a moth. The September chrysalis soon emerges as a moth and lays its eggs, from which the worm hatches out, grows to maturity, and builds the cocoon of the second generation by the month of November. It is the November crop which goes to market, a few cocoons being still retained and hung up in the forest for the perpetuation of the species next year. The estimated average output is between 4,000,000 and 5,000,000 cocoons a year; and these are sold to traders of the Patwa caste, who come from Ahraura to purchase them, at a price varying between Rs. 4 and Rs. 10 per 1,000. The September cocoon, without the insect, weighs about 16 grains, and the November cocoon about 26 grains. From every hundred pounds of cocoons about 14½ lbs. of raw tasar are obtained, having a length of 2,082,500 yards. This sells at about Rs. 3-8-0 per pound.† There are several superstitions connected with sericulture. During the period when the worms are on the tree the proprietor remains in a state of ceremonial defilement. If he violates the rules laid down, it is believed that the silkworms will die.

* It also lives on the leaves of the *kakor* (*zizyphus xylophera*). The worm is generally known as *tasar* and is identified as *Antheraea Paphia* of the genus *Salurnida*.

† Monograph on Silk Fabrics. By Yusuf Ali, I.C.S., 1890, pages 4 and 22 to 25.

From the Collector of Bhagalpur, Bhagalpur.

Dated the 24th October 1916.

I have the honour to state as follows after having enquiries duly made on the Tasar Industry in this district :—

- (1) Tasar weaving is still carried on in this district and has not declined to any appreciable extent.
- (2) There appears to have been no shortage in the supply of cocoons in recent years. But the manufacturers who produce coloured pieces and the merchants who deal in them have been working at a disadvantage, of late, due to the very abnormal rise in the price of colouring material (German dye) on account of the present war.
- (3) The weaving population in this district are, as a class, poor people and can hardly earn anything beyond their daily wages as they have to depend entirely on the local mahajans who take advantage of the situation by supplying materials at such higher prices and by making larger profits in marketing the products. Any measure calculated to make the weaver less dependent upon these mahajans is likely to place the industry on a more sound basis. The starting of some experimental co-operative societies among the Tasar weaving population here, with this object, is already in contemplation. An increased supply of cocoons with a corresponding cheapness in price will undoubtedly benefit the people engaged in the Tasar Industry.
- (4) So far as information is available from the weavers of this district the cessation of the large purchase of cocoons by Messrs. Norris Payen & Co. has not affected the cocoon rearing industry.

From L. E. B. Cobden-Ramsay, Esq., C.I.E., I.C.S., Political Agent, Orissa Feudatory States, Sambalpur.

Dated the 24th May 1916.

The Dhenkanal Darbar has been willing to supply the information you ask for and I accordingly have pleasure in forwarding the same. I observe you only ask for information as regards Dhenkanal whereas the Imperial Silk Specialist also asks for it as regards Mayurbhanj. I accordingly forward a note from the Mayurbhanj State on the subject, I observe that there is no request for information as regards the Sonapur Darbar where the industry is a very important one and the Bhulias are largely engaged on this work and some of the finest tasar weaving is supposed to come from Sonapur.

Statement showing the number of tasar weaving families as ascertained by local enquiry and from last Census return of the State.

No.	Name.	Name of Bisa.	Name of Mouza.	REMARKS.
1	Ram Kristo Behera	Gatnpur	Bhusan	*Ram Kristo's daughters.
2	His wife			
3	Kosola*			
4	Nerasi*			
5	Kunja Behari			

Statement showing the number of tasar weaving families as ascertained by local enquiry and from last Census return of the State—contd.

No.	Name.	Name of Bisa.	Name of village.	REMARKS.	
6	Baji Naik	Parjung	Bahihapur	Dead. His wife is living.	
7	His wife				
8	His 2nd wife				
9	Udeya, his daughter				
10	Kaloo Naik				
11	Daya Naik				
12	Abhiram Das				
13	Gobinda Naik				Absconded.
14	Aparta Sahu				
15	Bainsi Behera				Parimal.	Khuntabati
16	His wife	Parjung	Pangatira		
17	Gabha woman				
18	Brimd Behera				
19	Dhanis Behara				
20	Bhicari Behera				
21	Kina Behera				
22	Nahuri, his daughter				
23	Aseti widow				
24	Sunai widow				
25	Bhagawan Das				Balrampur	Indipur
26	Arta Pal				
27	His wife				
28	Dinabandhu Das				
29	Dangi Kund				
30	Boigari Naik				
31	Gadai Naik				
32	His wife				
33	His mother				
34	Gadai Naik's son				
35	His son				
36	His son				
37	Hari Pal				
38	Poonand Pal				
39	Uchhai Naik				
40	His wife				
41	His mother, widow				
42	Kapileswar, his son				

Statement showing the number of *tasar* weaving families as ascertained by local enquiry and from last Census return of the State—contd.

No.	Name.	Name of Biss.	Name of Mouza.	REMARKS.			
43	Chaitan Naik	}		Junior.			
44	Banamali Naik						
45	Padam Naik						
46	Mandar Naik						
47	Chinta Naik						
48	Nitai Nahak						
49	Apasti Nahak						
50	Adhikori Naik						
51	Rani woman						
52	Binga woman						
53	Manika woman						
54	Pooni woman						
55	Chanduri woman						
56	Tara woman				} Balrampur .	Sariapada .	(1)
57	Sabati woman						
58	Kangali Naik						
59	Jangali woman						
60	Nakphodi woman						
61	Dulai woman						
62	Bhagawan Naik						
63	Kangali Naik						
64	Banamali Naik						
65	Drupati woman						
66	Padwan woman				} Balrampur .	Siminoi .	Senior.
67	Udia woman						
68	Kela Naik						
69	His wife						
70	Madan Naik						
71	His son						
72	His daughter						
73	His mother						
74	Rama Naik						
75	His wife						
76	Achhut Naik						
77	His wife						
78	Barage Naik						

Statement showing the number of tasar weaving families as ascertained by local enquiry and from last Census return of the State—concl'd.

No.	Name.	Name of Bisa.	Name of Mouza.	REMARKS.
79	Hia wife	} Balrampur .	Siminoi . . .	
80	Samo Naik			
81	Suderson Naik			
82	Banchha Naik			

(Sd.) DEWAN,
for Feudatory Chief.

RAJ OFFICE DHENKANAL
The 12th-13th May 1916.

Note on the position of tasar industry in the Mayurbhanj State.

The number of weavers in this State is approximately 500 families, of these 200 are in Bamanghaty, 40 families in Kaptipada Sub-Division, 2 in Panchpir Sub-Division and 35 families in Perganna Upperbhag in the Sadar and the rest in Perganna Olmera also within Sadar. There are about 425 looms in work.

(1) Tasar weaving in this State is still carried on and has not declined except that during years of scarcity there occurs a temporary set back. The industry was declining but the opening of the Kalimati Gurumahisani Railway has given a great impetus to the tasar weaving industry in the Bamanghaty Sub-Division. At Olmera* and other places in Mayurbhanj except Bamanghaty, the weaving industry is stationary or tending to decline.

* An isolated pargana in the Midnapur district. Bamanghaty weavers now go to Kharagpur, Sakchi and Chakradharpur and other intermediate stations in the Bengal Nagpur Railway and sell their fabrics at good prices. Up-country men in these places purchase pugrees and Bengalees Chaddars. The decline in some places is locally attributed to dearness of cocoons and want of capital. The former grievance has been in a large measure removed by the fall in prices of cocoons. In Upperbhag out of about 35 or 40 families, only 5 or 6 weave tasar fabrics. The Patras are undoubtedly very poor and this year the general scarcity has hit them harder than most because they cannot buy any of the raw materials of their trade. Their head-men say prices have trebled for some classes of silk goods they make and gone up all round but the increased difficulty of obtaining cocoons and the rise in cost of living have more than balance rise in prices.

2. There need be no shortage of cocoons in this State. For more cocoons are reared here than are wanted by home weavers. Hence the major portion of the cocoons is exported. The amount collected is also growing larger. In 1914-15 Rs. 7,428-5-7 and in 1915-16 up to 31st January Rs. 7,935-9-10 were collected from royalty on tasar cocoons. As all this increase is certainly not due to wider collection of wild cocoons it is evident that tasar rearing also is improving.

3. In this State at present no measures are necessary to restore the industry except that it is necessary to lower the prices of cocoons to enable home fabrics to be put on the market at lower prices. A proposal is now afoot to supply cocoons to weavers free of all duties and to remit any taxes leviable from rearers. The matter is under the consideration of the State Departments concerned. The supply of cocoons would also be increased as more cocoons would be reared on the removal of taxes payable by rearers.

4. I do not think advances of money from the State at least in petty and unsecured doles, is of any use. Rs. 1,000 was spent in such loans. Rs. 500 is given in this particular village (village Bhinjua in Bamanghaty) and they admit nothing has resulted nor was the loan used for the purpose of trade. They them-

selves suggested Rs. 25,000 for the Sub-Division of Bamanghaty. They were however willing that a jointly responsible band of the better off weavers in each village should take a more modest loan, and declared they could find security. I have asked the Padhans to send in the names of such guilds in their own village to the Sub-Divisional Officer and he will have their security checked if we decided to allot further loans for this. Apart from finance the weavers themselves suggested other reasons for decline in the industry and methods of possible State help.

- (1) If they import cocoons from Chaibassa where the best variety (dapha) is found. They pay no royalty; whereas if they collect them in Mayurbhanj they pay a royalty which works out to about an anna per hundred cocoons.
- (2) The whole of their stock, except a few local orders used to be taken over by mahajans who had already advanced the whole price to the weavers to purchase cocoons. Since last year mahajans have refused advances owing to security.
- (3) Cocoons are very scarce and the price has risen enormously owing to wholesale export to Chaibasa, Bilaspur and the west.
- (4) The great grievance is the forest royalty and its accompaniment of petty *abwabs* by forest menials. They declare that if this were removed far more cocoons would be gathered and even reared.

5. I find the forest revenue from cocoons in 1914-15 was Rs. 7,528 and for 1915-16 up to January 31st Rs. 7,935 which will work out to somewhere in the neighbourhood of Rs. 9,000 for the year, *i.e.*, our revenue from this source is rising and is already considerable. As a business proposition I feel sure the protection of this infant industry at the expense of forest revenue would be a blunder.

6. We could do something for the weavers by remitting all royalty on cocoons collected for *bonâfide* home manufacture. One possible way of doing this would be to have a central Depôt at Bahalda to which collectors could bring their cocoons. They would pay the forest royalty at the usual rates and in the usual manner but would get a rebate of this royalty at the Depôt. This Depôt would then sell to the limited and known weavers community in Bamanghaty at a price fixed by the State.

7. If the forest revenue is not considered the course is completely easy. By remitting all collection charges and putting a high export duty on cocoons taken out of the State we should lower the price of raw material by half. This would incidentally ruin the export trade which is a source of rising profit to the State as shown above.

8. Messrs. Norris Payen & Co. generally purchased cocoons in the Singhbhum markets. Their withdrawal from the market has caused a decline in the value of cocoons from 25 to 75 per cent. and this proportionately benefited the weavers although at some less to rearers. The result of their withdrawal from markets is not perceptible in case of rearing of cocoons. The price of cocoons in Bamanghaty rose as high as one *Pan* per rupee 4 or 5 years ago, but now the price is about half of that or even less.

9. The weaving industry does not make marked progress in Mayurbhanj for want of organisation and capital. There are no markets for sale of tasar fabrics. There are no mahajans to advance money or buy fabrics. Several mahajans from Ganjam District come every year to Bamanghaty and advance Rs. 6,000 or 7,000 and buy some coarse fabrics suitable to their country. Good weavers are reluctant to accept their advances as their work deteriorates by weaving these coarse cloths. Dyeing is declining for want of dye stuff owing to war. At Olmera there are some local mahajans who owing to the close proximity of railways and the nature of fabrics produced have a ready sale. But as the most of the weavers at Olmera are confirmed opium eaters or madat smokers their condition remains as before, and no improvement is perceptible. Except at Binjhua in Bamanghaty and in Olmera the weavers are also cultivators, and treat tasar weaving as a secondary occupation. Thus many looms are kept closed during the continuance of agricultural operations.

10. I may add on hearsay evidence, that it is probably no use improving the local cocoon. The Patras do not rear the silk worm. This is done by Sonthals

and Koles and each kind of cocoon has its own peculiar deity to be appeased. Again, all the time the cocoon is being spun, the rearer cannot look on a woman's face and has various ceremonials to perform. When asked if they would take up Dapha cocoon cultivation if given seed free the aboriginals refused, alleging they knew not the Dapha Gods nor their ways.

From the Feudatory Chief of the Sonpur State.

Dated, the 19th June 1916.

I have the honour to let you know the following informations as desired by you:—

- (1) Tasar weaving is still carried on in this State as a cottage Industry and it has declined to an appreciable extent.
- (2) There has been of late a shortage in the supply of cocoons. The local produce is not sufficient and the weavers go as far as Chakradharpur and Chaibassa to get their supplies. Owing to the shortage of supplies and the consequent high price of the cocoons, the price of the tasar has increased. So the people who could in former times wear tasar cloths could now ill afford to do so.
- (3) The people engaged in this industry could no doubt benefit if the supply of cocoons was materially increased. But they should be taught the modern improved methods of weaving and should acquire some elementary knowledge of sericulture; otherwise their products would not be able to find a good market elsewhere. It may however be noted here that the cocoons procured from local forests and from the forests of the neighbouring States produce better silk—better in lustre, than that produced from cocoons of the Chakradharpur district.

From W. E. Ley, Esq., I.C.S., Deputy Commissioner, Chanda.

Dated, the 17th April 1916.

I have the honour to say that in all the localities mentioned in the list received from the Imperial Silk Specialist Tasar Silk Weaving is still carried on by a class of persons known as Koskatis and the number of families engaged has not declined to any marked extent. The supply of cocoons varies considerably from year to year and the price this year is double that of last year. This year the crop was damaged by excessive cold and prices are high.

The price of tasar silk varies little from year to year. Consequently any increase in the price which the weaver has to pay for cocoons falls almost entirely on the weaver. When the price is high, less silk is woven and the weaver resorts to other occupations. The people engaged would undoubtedly be benefited if the supply of cocoons were more constant. A large increase in supply of cocoons is not required as the total number of people engaged in tasar weaving is small.

From the Political Agent, Chhattisgarh Feudatory States, Raipur.

Dated, the 17th-18th May 1916.

I have the honour to state that the tasar industry is reported to be thriving in the Sarangarh, Raigarh and Sakti States of this Agency. Copies of the reports furnished by the Feudatory Chiefs of Sarangarh, Raigarh and Sakti giving information regarding the Industry in their respective States are enclosed.

From the Feudatory Chief, Sarangarh State.

Dated, the 21st February 1916.

I have the honour to say that tasar weaving is still carried on and has not declined but is flourishing. There is no deficiency in the supply of cocoons

which are locally produced to some extent, and mostly they are obtained from Chaibassa, in Manbhum District, Bengal. The largest number of varieties and the largest sized cocoons are reared and sold in the Chaibassa Market. There are 53 families engaged in tasar weaving, and the outturn amounts to Rs. 5 to 6 thousand a year. They work in tasar weaving for 5 months (November to March) in cold weather which is the most suitable season; and during the rest of the year, they engage themselves in making cotton piece-goods. If the supply of cocoons is increased or if they are supplied with cocoons at their homes, undoubtedly both the weaving works and the yield, will be very large.

From the Feudatory Chief, Sakti State.

Dated, the 1th-5th March 1916.

For want of large demand from outside, tasar weaving has slightly been affected during the last 3 years. Weavers had to make special arrangements to go to Chakradharpur and Chaibassa for purchasing cocoons, where they get at the rate of Rs. 12 to Rs. 14 per 1,000. These can also be had from the adjoining States, but in quality they are much inferior and as such are sold at Rs. 9 to Rs. 10 per 1,000. The latter are not however preferred by the weavers in general. During the rains the supply of cocoons they bring in from places quoted above fall short and only the well-to-do weavers with sufficient stock in hand take the advantage while others in normal condition engage themselves in agriculture.

If instructions based on improved methods together with sufficient supply of cocoons can be had on easy terms and with less inconvenience to the weavers the business is sure to be benefited materially.

There are about 60 families engaged in this industry in my State.

From the Feudatory Chief, Raigarh State.

Dated, the 26th April 1916.

I have the honour to furnish the following informations called for regarding the Tasar Industry :—

- (1) The tasar weaving is still carried on in the State and it does not seem to have declined to any marked extent.
- (2) There is some shortage in the supply of cocoons as Gandas, who rear tasar cocoons do not know the proper method of rearing and no other people except them would like to do the work. The produce of cocoons does not meet the want of the people of weaving class whose number has much increased than before, hence they have to import them from Chaibassa in Bengal and neighbouring States at much expense.
- (3) If other people also are engaged in it and they are taught the proper way of rearing tasar cocoons there is much hope that the industry will improve.
- (4) The families engaged in tasar weaving are about 100 in number.

From P. M. Baker, Esq., I.C.S., Officiating Deputy Commissioner, Bilaspur.

Dated, the 24th June 1916.

I have the honour to state that the tasar weaving industry is still carried on in this district, and it is on the increase in the Bilaspur, Janjgir and Katghora Tahsils, while in the Mungeli Tahsil it is not in such a flourishing condition. This is due to the shortage in the supply of cocoons, the high rates at which they are sold, the property of the weavers and consequent dependence of the weavers on advances from money-lenders.

2. It is stated that cocoons used to be produced in the Lormi and Ratanpur ranges, but the supply there failed some ten years ago. Formerly, the rates varied from Rs. 2 to 3 per thousand cocoons, but now range from Rs. 10 to Rs. 12 per thousand. The present supply is obtained from Chaibassa near Chakradharpur.

3. An increase in the supply of cocoons would probably lead to a drop in prices and so benefit the industry. And the same effect would be obtained by the formation of a Co-operative Credit Society of weavers in each Tahsil : co-operative buying in large quantities would enable the weavers to make better bargains and free them from the high rate of interest at which they borrow from money-lenders at present.

From G. E. R. Graham, Esq., I.C.S., Deputy Commissioner, Bhandara.

Dated, the 24th-26th June 1916.

1 * * * * *

2. Up till 1904, a number of Koshti families were carrying on tasar spinning business in different parts of this District but it has gradually decreased since then and many of the Koshties have left Bhandara and settled down at Naghbir in the Chanda District owing to the facility of Railway communication. There

Pauni 4 families.
Ekodi and Bampewada 20 families.

are however a few families still residing at places shown in the margin but their trade has practically become nominal as it has proved less paying to the labourers than any other work. The Kosa cloth is more costly than ordinary cloth and has less demand in the market, which also contributes towards decline of the trade.

3. Tasar weaving business is not carried on in this district nor was it carried on before.

4. There has been no shortage in the supply of cocoons but the industry has chiefly declined owing to the facts indicated in paragraph 2 *supra*.

5. As there are few families of weavers residing in this district, no special measures are needed to revive the industry. The increased supply of cocoons would not benefit them.

From the Collector of Burdwan.

Dated, the 8th May 1916.

I have the honour to say that tasar industry is carried on, on a very small scale in the Sadar and Katwa sub-divisions of this district. I enclose copies of report on the subject from the Sub-Divisional Officer, Sadar and Katwa, for your information.

Enclosures.

1. Report of the Sadar Sub-Divisional Officer, dated the 30th April 1916.
2. Katwa Sub-Divisional Officer's letter, dated 2nd March 1916.

Note.

The tasar industry in the Sadar Sub-division is confined to the marginally noted villages and embraces about 500 families. There has been a marked decline since the outbreak of the European War ; but the weavers are still clinging to it ; because they cannot pick up new tricks and also because the people are prone to be conservative and tradition bound. For a period of about six months the industry was wholly paralyzed but has since October last begun to look up. The causes of the depression are not to my mind very clear. The tasar clothes are ordinarily exported to East Bengal, Assam, Ceylon, and Turkey in Europe. The flood in East Bengal and the temporary depression of the jute market are commonly supposed to have crippled the resources of the purchasers and to have brought about the break down of the tasar industry. I do not think that they wholly account for the sudden and extraordinary decline. The fact remains that the cloths were exported on a fairly large scale to Turkey in Europe. The outbreak of hostilities with this country and the necessary tightening of blockade go far to explain the situation. Further more the general contraction of export trade has affected the industry in some measures.

(1) Memari, (2) Tantigantar, (3) Radhakantapur, (4) Jagadabad and Panchakut, (5) Mankar (including Jagatpur), (6) Kots.

There is no doubt that the price of cocoon has gone up to an appreciable degree owing to local causes. If the supply is materially increased it would to some extent benefit the industry. Unless and until demand for tasar cloths is stimulated it is not possible to improve the situation substantially and this will not happen until the war is over.

B. N. GUPTA.

The 30th April 1916.

From Babu Jatindra Mohan Banerji, Sub-divisional Officer, Katwa.

Dated, the 2nd March 1916.

1. Tasar weaving is still carried on but it has declined to a certain extent.
2. The industry has decreased for short supply of cocoons and also for want of fast red colour on account of the European War.
3. If cultivation of cocoons can be materially increased and fast red colour sufficiently supplied, the industry can be restored to its former position and the people engaged in it would be benefited.

There is no tasar industry in Katwa town but it is carried on in some villages in the sub-division, viz., Baghtikra, Singi, Chanduli Masthul, Ghoranash, Gopekhanji, Sribati and Madhabpur. Cocoons are imported from Chaibasa and Baharagora in Singhbhum, Pachamba and Giridi in Hazaribagh and Gobindapur in Manbhum. Cocoons are generally reared in those districts by Sonthals but many of them are now engaged in coal mines on better pay and most of the jungles have been turned into arable fields. These account for the short supply of cocoons.

From G. S. Dutt, Esq., I.C.S., Collector of Birbhum.

Dated, the 10th April 1916.

I have the honour to state that tasar weaving is still carried on in the five villages named in the letter under reference but has greatly declined. The total number of families employed in this business is about one-tenth of what it was up to the year 1904, the majority of weavers having taken to cotton weaving. The reasons of this decline are the rise in the price of cocoons due to insufficient supply and the falling off in demand owing to competition with foreign goods especially with Japanese silk. It is difficult for the tasar weavers to obtain supply of cocoons from Singhbhum as the expenses incurred are prohibitive. If means could be found to supply cocoons at a cheaper rate, the weavers will be in a better position to compete with foreign goods and there is every chance of the industry reviving.

BANKURA.

Tasar weaving.

In the Sadar Sub-Division tasar weaving is still carried on at Gopinathpur in Bankura Town, Rajgram, and Rajhat Birsinghpur. It does not appear that the number of families engaged in the industry has decreased, but the industry has somewhat declined and this is due to circumstances explained below.

2. There has not been any shortage in cocoon but prices have gone up enormously both in living and in price of cocoon. The price of yarn 15 years ago was 11 to 13 tola per rupee but now it is 7 to 8 tola per rupees. The cost in living has gone up 75 per cent. To a person who formerly required a capital of Rs. 50 for a loom it now requires Rs. 150. The weavers have thus to reduce their wages in order that the price of cloth did not go up very much. Formerly the wage earned by a weaver for making a 10 cubit cloth was Rs. 1-12-0 but now it is Re. 1-8-0. Still the price of cloth has gone up. Formerly a *Kete* (10 cubits length) (*Kete* is a coarse variety) cost from Rs. 2-12-0 to Rs. 3-4-0 but now it costs Rs. 3-4-0 to Rs. 3-8-0. Similarly a tasar cloth (10 cubits) which used to sell for Rs. 4-8-0 to

Rs. 5 now sells for Rs. 5 to Rs. 5-8-0. The demand for this cloth is also declining. Leaving aside the present year when the demand has gone down very much due to floods in Eastern Bengal which take a greater number of these cloths, the demand is falling on account of competition of cheaper stuff both Indian and Foreign.

3. It would thus appear that a greater supply of cocoon only will not solve the question. Of course a greater supply of cocoon will naturally reduce the price of yarn but unless it is very low and the price of food grains also comes down, the sale of tasar cloth would not stand competition with cheaper stuff, or stuff of same price having greater durability such as *Endi*.

Submitted to the Collector.

HEM KUMAR MULLICK,

Sadar S. D. O.

The 19th February 1916.

MIDNAPUR.

Regarding letter from the Imperial Silk Specialist about tasar silk industry in this district.

I visited the two places Kesiari and Anandapur mentioned in the letter and collected the following informations which I set forth in the form of answer to the questions raised in the letter.

1. In both the places, the industry has declined to a very appreciable degree, but weaving is still carried on in both the places. The decline has been more marked in Kesiari than at Anandapur. It is said that about 25 years ago, when the industry was at its best there were some 250 families at Kesiari working some 400 to 500 looms. Ten years ago the number of looms dwindled to about 100 and now there are about 30 families working about 50 looms.

The decline of the industry at Anandapur is not so marked. There were about 400 families in the palmy days of industry about 30 years ago. They number about 100 now working about 150 to 200 looms. The rapid decay of the industry at Kesiari is ascribed to the fact that the Kesiari weavers as a rule use more thread in the woof of the fabric and that the finest of their products is not as good as that of Anandapur.

2. The supply of cocoons in both the places is less than that in former years but there has never been any shortage in supply, nor is that taken to be the reason of the decline of the industry. Rather the demand of cocoons being less owing to the decline of the industry in the locality, they are transported to other places. The cocoons are sold in the local market in both the places, but the principal places of rearing are Nayaban, Mayurabhanja, Ghatsila and other jungle Mahals as far as Chaibassa; between the rearer of the cocoons and the weaver the cocoons generally change hands two or even three times. The weavers seem to have no clear knowledge of the reason for the decline of the industry. They only know that their products are not sought after at the prices fixed by them. Formerly Mahajans used to give advances in money for the produces but now things have been reversed. The Mahajans after disposing of the goods, pay a price to the weavers. The reason seems to be that the hand-loom made fabrics can not successfully compete with the mill-made foreign articles or articles of other places. The Mahajans are not confident that the fabrics will get a ready market at the prices fixed by the weavers.

One more thing deserves mention here: the circumstances of the weavers is bad everywhere and they are not in a position to buy and stock cocoons when they are selling cheapest and to stock their products and sell them when the market is highest.

3. The weaver wants that their products should find a ready market as soon as taken out of the loom, and at the price fixed by them: which can never be; material increase in the supply of cocoons may help them to some extent if it tends to lower their price.

It is said that adulterated tasar is used in other places but here both the warp and woof are of pure tasar this is the cause of the enhanced price charged by them.

Finish of the products should be more carefully attended to. The weavers neglect this and their products are not so attractive to the purchasers.

Submitted to the Collector.

K. C. BANERJEA,
Kanungoe.

The 2nd March 1916.

From the Sub-Divisional Officer, Arambagh.

Dated, the 26th February 1916.

(1) Tasar weaving is still carried on in villages Brojomohanpur in Goghat P. S. and Shambazar, Badanganj, Kayapat and Kristogunj in Badanganj P. S. The industry is reported to have declined to some extent since 1904.

(2) There has been shortage in the supply of cocoons now a days on account of which and for want of dyes the price of which is reported to have increased 20 times the industry has decreased to a considerable extent.

(3) There are reasons to believe that if the supply of cocoons and dyes be sufficient, the industry may be improved and the people engaged in it may be materially benefited.

From C. B. Smales, Esq., Conservator of Forests, Southern Circle,

Dated, the 17th July 1916.

I have the honour to say that records go to show that the subject of the encouragement of sericulture in these Provinces was taken up by this and the Agricultural Department between 1901 and 1905, but the net result has been failure.

Forest Officers loyally endeavoured throughout to bolster up this decaying industry but it must be said that they are not enthusiastic on the subject as the most approved method of providing the necessary feeding for the worms is to cut half through vigorous saj trees and bend them over to get accessible pollard shoots hardly to the sylvicultural advantage of the forest. Moreover it is accepted that the Central Provinces cocoon is of poor quality even in Bilaspur and deteriorates rapidly southwards.

One great cause of the decline of the industry seems to have been the very precarious nature of the crop owing to the prevalence of disease and unsuitable climate. These could doubtless be got over by improved methods and better seed, but a worse handicap seems to be, as reported by Raipur, the apathy of the Dhimars and the fact that more remunerative lines of employment are open to them. I attach a copy of the letter from the Divisional Forest Officer, Bhandara, on the subject.

No cultivation of tasar silk is carried on now in Reserved Forests. In South Chanda 438.22 acres of B. I. class forests are leased at 4 annas per acre, and the income of the Dhimars cultivating this is estimated to be from Rs. 4 to Rs. 8 per acre.

In Bilaspur, where the best Central Provinces silk is grown, it is only done in Malguzari and Zamindari Forests, whilst in South Raipur there is an export trade from Dhamtari of wild cocoons collected in Government forests, though the bulk are believed to be brought from the Bastar and Kankar States.

The matter would seem to be of little interest to the Forest Department. Trees on which the silk is grown must be carefully watched for the three months of growth and this is best done in the neighbourhood of villages. The trees used must be specially treated and I think that the Agricultural Department is more directly concerned.

From Mr. M. Narainga Rao, Divisional Forest Officer, Bhandara Division.

Dated, the 27th April 1916.

1. * * * * *

2. In the year 1902-03 the subject of tasar cultivation received a good deal of attention in this as well as in several other districts of the Central Provinces. The Director of Agriculture took up the matter and the Local Administration interested themselves in it. It was even proposed to disforest certain forest areas and place them entirely under the management of the Revenue Authorities for the purposes of tasar cultivation. However, about 1,000 acres of forest land containing Saj-Terminalia tomentosa trees were selected in the Weinganga and Pertabgarh Ranges and placed under the management of the Deputy Commissioner though this area was not disforested.

3. In his note on the decline of the tasar silk industry in the Central Provinces Mr. N. G. Mukerji said in 1904 that "in spite of these disadvantages, however, the spinners and weavers of Chanda and Bhandara make no complaints about lack of cocoons." He further adds that "though the conditions under which the tasar rearing industry is carried on in the southern districts are more unsuitable, there has been no deterioration of the industry as in Sambalpur and Bilaspur." While matters stood thus in the Bhandara district in the year 1904 all of a sudden we hear of a sudden fall in the area under tasar cultivation in the year 1907. Since then the industry is on the decline. From the old records in my office I understand that the reasons for this decline are the decease that prevails owing to severe cold in the month of November when the chief crop of tasar is collected in this district, want of a good supply of healthy seed cocoons and the poor profits which the industry yields to the Dhimars who are the cultivators of tasar. Another reason which has contributed to the decline of the industry seems to be that the Dhimars get sufficient work in the rainy season from the purchasers of our coupes on cutting poles and firewood and I think they consider that the cutting of wood pays them better than the uncertain profits of tasar industry.

4. For the last three years there has been no tasar cultivation in plots set aside for the purpose in the Government forests in this District. I know here and there some small plots are cultivated in the Malguzari forests.

5. None has yet been able to definitely find out the cause for the decline of the industry though the reasons set forth above are believed to be the cause. It is therefore desirable that an enquiry be made by an expert on the subject. With regard to the position of the Forest Department in relation to this industry it is to be stated that the present method of cultivating the tasar silk, viz., that of first cutting good saj trees at a height of 5' from the ground and then growing the cocoons on the leafy pollard shoots of the trees is against all rational silvicultural treatment besides being financially injurious. If after an enquiry by a silk expert it is found that the cultivation of silk is more profitable both to the cultivators and the Forest Department than by growing saj trees, there should be no objection to the industry being renewed in this district. There is plenty of almost pure saj forests in this district and if good seeds are introduced, and a rational method of cultivation without having to cut down trees at a considerable height from the ground taught to the Dhimars, there is no reason why the Forest Department should not encourage the industry.

Extract from the reports on the Forest Administration of the Central Provinces for the years 1901-02 to 1908-09.

1901-02.

45. *Bhandara Division.*—An experiment in connection with tasar silk cultivation was carried out by assigning areas aggregating 80 acres to Dhimars free of charge with a view to revive the industry. The second crop is reported to have been successful in one place only called Mohghatta, and the third crop in two other places Tambekhani, and Kanhargaon. The Dhimars earned enough from the operations for their livelihood for four months, but they are loth to tell the results. The number of families engaged was 19.

* * * * *

50. Tasar cultivation showed an improvement. Forest and Revenue Officials did their utmost to give effect to Government orders recently issued regarding the revival of *kosa baris*. Dhimars, however, were reluctant to take up land permanently on a four-year rotation, and preferred sticking to their usual old haphazard methods of taking up cultivation of an annual "bari" here and there.

They divided their time between tasar cultivation and their other avocations of fishing, etc., and then attributed their losses or small profits to supernatural causes, such as the evil-eye of an enemy, or the wrath of the local deity. The area taken up for tasar cultivation during the year was 241 acres as against 8 acres in the previous year.

1902-03.

24. *Bhandara*.—The experiment in tasar silk cultivation noticed last year has, unfortunately, been a failure owing to the damage done by four days of frost from the 25th to 28th December, which quite discouraged the Dhimars employed. The area set aside has now been made over to the Deputy Commissioner, and, it is hoped, that with the aid of small money advances, the industry may be fostered.

1903-04.

43. In Bhandara, Bilaspur, North Chanda, and South Chanda the tasar experiments were continued with poor success. The Agricultural Department is in a better position than the Forest Department to give the necessary attention to this most important question, and to attempt the revival of the decaying industry with fair prospects of success. To ensure this, arrangements are now being considered whose object is to place suitable portions of the least valuable forests at the disposal of the Agricultural Department for experimental purposes on a considerable scale.

1904-05.

48. The cultivation of tasar was continued in North Chanda and Bhandara. In the former 701 acres yielded 163 cocoons per acre, which is very little, but the disease locally called *hugri* destroyed many of the insects. In Bhandara the area increased from 615 to 1,225 acres. The Divisional Forest Officer reports that 39 families of Dhimars took up the cultivation of these silk worms, but the results are not available. The Director of Agriculture, however, has informed me that Mr. Mukerji's proposals involve the ultimate abandonment of the rearing of tasar in Government forests and the consequent pollarding of trees therein.

1905-06.

46. *Tasar silk*.—The cultivation of tasar appears to be decreasing steadily in North Chanda, where the area applied for this year was only 506 acres as against 701 acres in 1904-05 and 1,760 acres in 1903-04. In Bhandara, however, there was no falling off in the area cultivated, which remained the same as last year, 1,225 acres.

1906-07.

47. *Tasar silk*.—In north Chanda the area over which tasar was cultivated rose from 506 acres to 811 acres; but in Bhandara there was a sudden decrease from 1,225 acres to 145 acres, for which no explanation is forthcoming.

1907-08.

47. *Tasar silk*.—480 acres were set aside for this in Bhandara, but very little actual cultivation was undertaken. In North Chanda 680 acres (against 811 acres last year) were applied for.

1908-09.

35. *Tasar silk*.—Tasar silk was cultivated over 330 acres in the Bhandara and 308 acres in the North Chanda Divisions. In both Divisions the Dhimars, the only people who do this work, are taking to cultivation which they find more remunerative.

THE TASAR INDUSTRY IN BIHAR AND ORISSA.

Note by Mr. H. M. Lefroy, Imperial Silk Specialist, suggesting an enquiry into the Tasar-rearing Industry in Bihar and Orissa.

The last enquiry into the *tasar* industry was made by Mr. N. G. Mukharji in 1904. His report advocated certain measures, the chief being the establishment of seed-producing farms. The farm established in Chaibassa failed and was closed. I pointed out in 1908 that it must fail and the reason, which was that Mukharji entirely missed the point that *tasar* is not one species of insect but several, that until each was got pure, the farms were simply blindly hybridising and producing bad stock, and failure was therefore inevitable. Since then nothing seems to have been done and we have now to decide what to do.

The *tasar* industry used to affect directly probably at least 100,000 rearers and cocoon collectors, with whom it was a subsidiary occupation, 20,000 twistors, with whom it was a main occupation, and 50,000 weavers, who also wove cotton. Of these perhaps 120,000 are in the area included in Bihar and Orissa. So far as the weavers go, we are making direct enquiry into their position as they live compactly in villages and district officials can reach them. So also for twistors. But we cannot do this for rearers and collectors. It is important to inquire in the Chota Nagpur Division and Sonthal Pergannahs—

- (1) whether there is any shortage of supply of cocoons,
- (2) whether this is due to low prices,
- (3) whether there is any distress or poverty consequent on these,
- (4) whether improved cocoon production would be beneficial or is not needed.

This can only be done on the spot, needs no technical knowledge and should be done from now to October. The position with regard to *tasar* is this: the industry can be improved by two methods: one is to organise and improve the sale (and production) of cloth, to get wider markets, larger demand: that is easy and cheap: the other is to undertake the scientific enquiry required to put the breeding on a proper footing, which will make the rearing of *tasar* cocoons safe, easy and profitable. This enquiry will be hard, long and expensive, but till it is done, nothing further can be attempted to benefit the rearer and the problem lies at the root of the whole industry.

The question is whether the state of the industry, as regards the rearer, justifies the latter. Has the rearer given up because he prefers to or because he must: is the decrease in production due to the increase in value of rice and the increase in wages, leading rearers to abandon the less profitable *tasar*, or to inability to get good stock to rear from or to get good results from rearing: finally, is the decrease due to the Forest Department restricting areas in which rearing can be done?

If it is necessary to revive *tasar* we know what to do. What we do not know is whether it is necessary and this can be ascertained only by enquiry from the class of people who rear *tasar*. Bihar and Orissa are very much interested, the Central Provinces and Bengal very little and then chiefly the *tasar* users.

If the Bihar and Orissa Government can have the enquiry made, it will be possible to advise quite definitely about *tasar*. If anything like 100,000 people are affected and there is real distress, then the scientific enquiry necessary had better be considered and its cost worked out; if not, then *tasar* may be finally left to either continue, decay or revive as circumstances dictate.

H. M. LEFROY.

The 6th July 1916.

*Report on the Tasar-rearing Industry in Bihar and Orissa by Mr. J. R. Dain,
I.C.S., Officiating Director of Agriculture.*

TASAR REARING.

[To avoid burdening the note with explanations of the vernacular terms used, a glossary of the more common words is given in Appendix A. The terms, however, are not always used consistently by the rearers and dealers.]

1. This enquiry into the economic aspects of the *tasar*-rearing industry was undertaken during the months of August and September of this year. For the purpose the following places were visited:—Chaibassa, Barkundia, Pandabir and other villages in the district of Singhbhum; Sambalpur; Purulia and Raghunathpur in the district of Manbhum; Giridih, Gande, Mohanpur and other villages in the district of Hazaribagh; Bhagalpur; Tinpahar, Rajmahal, Pakaur, Hiranpur, Dumka and Katikund in the Sonthal Pergannahs. I have also been able to make use of information collected by district and local officers who have all rendered me great assistance. Owing to the claims of other work the time actually spent on the enquiry was strictly limited and could have been extended with advantage, but the places visited are fairly typical, and the conclusions reached, which are corroborated in the main by other enquiries, may be taken as generally applicable. Many points could have been more advantageously studied later in the year when the rearer is putting his *tasar* on the market. The *barsati* crop does not come on the market till the end of October in any quantity; and the winter crop which, though less valuable, is the larger in amount, is sold in December and January. On the subject of prices, it was necessary to depend largely on the information supplied by rearers and dealers, and there is reason to believe that a good deal of it was deliberately misleading.

2. A note by Mr. Maxwell Lefroy on which this enquiry is based is attached with this. He propounds in the body of that note four main questions; but the subsidiary questions which are put later in the same note indicate more clearly the scope of the enquiry. The main question is this: is it necessary or advisable to revive the declining *tasar* industry in the interests of the rearer and collector of cocoons? The interests of the twister and weaver are not in question. To answer this question I have endeavoured the almost impossible task of making an estimate of the number of persons who rear *tasar*, and further have enquired into the economic conditions under which the *tasar* rearer works. The following report contains a note of the facts ascertained in each locality visited and answers based on the information so obtained to the seven questions propounded by Mr. Maxwell Lefroy.

SINGHBHUM.

3. *The trade*.—There are several marts in Singhbhum of which Chaibassa is the most important. The chief sources of supply, besides the interior of the district, are Chakardharpur (these appear to be partly imported Hazaribagh cocoons) and the Feudatory States of Mayurbhanj and Keonjhar. The chief centres for export are Bankura, Burdwan, Bhagalpur, Gaya, Bilaspur and Nagpur. The demand though somewhat irregular is on the whole in excess of the supply and the *mahajans* cannot meet it. At present three quarters of the demand is from the Central Provinces and one quarter from all the other places taken together. Taking all the crops the total export is

20,000 to 25,000 *kahans** per annum.

*One *kahan* is equal to 1,280 cocoons generally. The demand is on the increase, especially from the west. No doubt consumption would rise with increased supplies because there are many weavers who weave cotton as a rule but prefer *tasar* if they can get it. Formerly there were several European firms in the market. Messrs. Payen et Cie of Lyons are said to have been trading before the mutiny when they were established in Berhampur. There was according to my information early competition between Messrs. Payen et Cie and Messrs. Jardine, Skinner and the latter were beaten out of the market about 1889. Messrs. Anderson, Wright & Co. were here for a time and Messrs. Lyall, Marshall worked almost up to the last. The last of all, however, were Messrs.

Payen et Cie. The *mahajans* declare that they were beaten out of the market by the Central Provinces dealers. But it appears that it was rather the slump in the Home markets and the competition of China and Japan that caused them to abandon the business. The statement of the *mahajans*, however, does indicate that the Central Provinces market was growing and that when the European firms ceased to buy, the Central Provinces market very rapidly stepped into its place; and this, coupled with the already diminishing supply, prevented any serious fall in prices. The easy railway communication with Central Provinces and the west encouraged the industry a good deal and the demand is said to extend now right up to Bombay. As far as my information goes, there never was a large export of *tasar* from India; most of it has always been consumed within the country. The annual value of the trade to the district is from two to two-and-a-half lakhs of rupees as against five lakhs estimated at the time of the Settlement Report. According to the statement of a "Thiccadar" this is distributed among the marts as follows:—Chaibassa Rs. 1,20,000, Gambaria Rs. 36,000, Chiru Rs. 36,000, Jaintgarh Rs. 40,000, Tantnagar Rs. 36,000, Sarada Rs. 18,000, Khotghar Rs. 6,000. His total exceeds what I have estimated as the value of the output of the district, but it indicates the ratio of distribution between the marts. Of course only a portion of this reaches the rearers of Singhbhum and the Feudatory States and a good deal is stopped by the middleman (*vide* under prices paid to rearers).

4. *Number of persons engaged in tasar rearing in Singhbhum.*—No particular persons are engaged in the industry. A man may take it up in any year and drop it again. The rearers are mostly Hos. It is very difficult to make even an approximate estimate of the number of persons engaged in it in any year. The census of 1911 contains no reference to it, presumably because it is not a permanent occupation. Mukharji in 1904 estimated that 500,000 persons were rearing *tasar* in the Lower Provinces of Bengal. He based his calculation on the amount of *tasar* consumed and the average output of each rearer. In the note of Mr. Maxwell Lefroy the figure is given as 100,000, but the facts on which it is based are not indicated. I think that even the latter figure is probably an over-estimate and that in spite of the fact that there is reason to believe that the scale on which *tasar* is reared (assuming that Mukharji's figure of 3,000 cocoons a rearer is correct) has declined to a greater extent than the number of persons doing it. The usual amount produced by a rearer appears to be one to one and-a-half *kahans*.

The only reliable source of information is the *dalkati* figures and these only for the Kolhan. A statement of these is appended with a note explaining it (Appendix B). The *dalkati* is a tax imposed in the Kolhan on those who "take *ara*" *i.e.*, cultivate *tasar* at Re. 1 a head. The figures are explained in a note with the statement where reasons are given for supposing that the number of rearers in the Kolhan is about 8,000. In Dhalbhum pargana the Manager of the Midnapur Zamindari Company informs me that there are 1,029 rearers this year. The remainder of the district is unimportant and perhaps another 1,000 may be added for it, making 10,000 for the district, the chief centre of *tasar* rearing in India [*vide* also paragraphs 14 and 17 (c)].

5. *Rearing and the prices obtained by the rearers.*—There are three main crops. In the case of the *daba* crop moths eclose in May and June, pairing takes place at once and when the eggs hatch the young caterpillars are put on *asan* trees and go through four changes of skin and in August form *ampatia* cocoons. The moths again eclose and the process is repeated and in November the cocoons of the *barsati* crop are formed. If the moth does not eclose in May or June but in October, there is only one cycle and the *bugui* crop comes about February. The *larya* appears to be a different kind of moth. It ecloses in July, goes through one life cycle and cocoons for the market are obtained about November. The dealers form a little ring and do not compete to any great extent: but they have not in Singhbhum succeeded in intercepting the increased profits on their way to the rearer in the same way as they have in other places. Sometimes they deal direct with the rearer and sometimes

another middleman intervenes in the shape of a *Tanti* who buys from the rearers and resells to the *mahajans* at a small profit. It must be remembered that the produce as put on the market is not uniform in character throughout, and this makes it difficult to ascertain rates; but the following are given by the dealers as the prices paid to rearers on the average:—

	Rs.
Larya crop	7 to 8 per kahan.
Kartik (daba) crop	8 to 9 „
Bugui crop	6 to 7 „

As a matter of fact these are somewhat below the prices stated by the rearers. It was too early in the season to study this aspect of the question at first hand and possibly the *mahajans* have private reasons of their own for giving these low figures. A statement furnished to me by the courtesy of the Bengal-Nagpur Railway Company will show that the cold weather months are the busy time in the trade. A certain weaver of Bankura who acted as a middleman states that the price last year was 100—108 cocoons to the rupee and that sometimes the price goes to 80 cocoons; but that eight or ten years ago the price was anything from 150 to 200. The rearers always reckon by

*20 cocoons and *jandas* (4 cocoons).
*pans** to the rupee and therefore it is convenient to reduce the average of the *mahajans*' figures to this denomination for comparison:—

Larya crop	2 pans 2 <i>gandas</i> .
Daba crop	1 pan 18 „
Bugui crop	2 pans 8 „
Tanti's figure	1 pan 7 „

A group of villages round Barkandia was visited where the practice of using fresh wild seed had been abandoned and the seed was kept from year to year. In Barkandia about 15 people were cultivating *tasar* out of about 148 families. Some of the cocoons now obtained will be distributed and more will go in for the main cultivation. It is said that more are doing it this year than in the last few years. A man who appeared to be a fairly typical case was taken. He had 10 *gandas* of seed cocoons. Out of these he hoped to get 2-3 *pans* of the second seed crop and from these again a *kahan* or so of *dabas* for sale. He will keep 10 *gandas* for seed next year and sell the rest. Last year people who sold early sold at 2 *pans* to the rupee, but those who waited for the market sold at 1 *pan* 10 *gandas*. This is said to be about the usual rate and is slightly more favourable to the rearer than the prices stated by the *mahajans*. About three years ago it went up to one *pan* per rupee, and the large number of reares shown in the *dalkuti* statement for 1913-14 is possibly the result of a temporary impetus given to the industry by these high prices. Similar enquiries were made in a village Khariataga and elicited the information that last year the crop sold at 1 *pan* 5 *gandas* to 1 *pan* 14 *gandas* per rupee, while three years ago it went up to 1 *pan* 2 *gandas*. The average output of a rearer is between one and two *kahans* and his earnings after some months of discomfort and toil in this precarious business are under the best circumstances well within Rs. 15. Another group of villages round Pandabir was visited where the wild seed is still used. It is brought from the surrounding Feudatory States and sometimes from great distances. Cultivation was reduced this year as rearers were short of money to buy seed for which they pay a rupee for 5 to 7 *gandas* as well as the export duty (annas 4 a *kahan* from Keonjhar and annas 8 from Mayurbhanj). The cultivation thus costs them rather more than where the domesticated seed is used, but on the other hand they mention a rather better range of prices (15 *gandas* to 2 *pans* per rupee for *daba*). This very slight difference in price is the only evidence which I have been able to find of the supposed deterioration of the cocoon which is denied by both dealers and weavers. Indeed the weakness of the domesticated cocoon appears to be its liability to disease rather than its inferiority as a silk-producer.

It may be noted here that the rearer is not affected in my opinion either by the *dalkati* tax or the export duties, both of which are paid by the consumer. It is the *mahajans* who cry out against them. The *mankis* consider that they have certain rights in the *asan* trees and would put obstacles in the way of rearers who used them without permission. The *dalkati* tax is a fixed rate instead of an arbitrary imposition and the *manki* receives annas 4 of it.

The prices now received by rearers are better than they were formerly, though in the last 30 years they have not perhaps risen in the same ratio as the price of staple food crops. But in respect of the relation between rearer and middleman the conditions in Singhbhum are different to those found elsewhere. The chief cause of decline, however, and of failure of supply to meet the demand must be sought elsewhere than in the prices at which the produce is selling.

6. *Reasons for the decline of tasar rearing in the Kolhan.*—The industry has never been more than a subsidiary occupation by which a man might add to his income, but by which he could never earn a livelihood. It is precarious in the extreme. A long drought causes the destruction of the crop and so does sudden and heavy rain. The worm is liable to attack by birds, flying foxes, insect pests and disease. The rearing involves many most irksome and exacting religious observances and austerities which are of too intimate a character for detailed description. These are in themselves a recognition of the large element of chance in the venture. The work is also very laborious and means constant and unremitting watching of the trees to scare away the enemies of the *tasar*. The statement that has been made to the effect that it is light and easy work which can be left to the weaker members of the family appears to be a mistake. A man who is comfortably off will not take the trouble to rear *tasar*; on the other hand, a poor man can hardly afford to spend two or three months on work that is not bringing in money all the time. If he has cultivation he must look after that unless there are others in his family capable of doing so. If he supports himself wholly or partly by labour, he cannot afford to abandon his labour during the months in which he must be watching his *tasar*. Indeed some said that they would cultivate if they could get advances to keep them while waiting for their profits. With the increased cost of living and the rise in the value of agricultural produce and agricultural wages this cause is operating with more force than formerly. More attention is now being given to cultivation and to the more valuable crops like chillies. Poultry-keeping has increased very much in recent years and a man can take to this without neglecting his other work. The same is true in a lesser degree of the keeping of cattle and sheep. There is also work in the mines and in the Sakchi iron works. There is a growing practice of buying up one or two rupees worth of tobacco in the town and hawking it about the villages. Enquiries made from one or two persons who were doing this elicited the fact that they formerly cultivated *tasar* but had given it up as they found this petty hawking more profitable. The fact that this occupation stands on the same footing as *tasar* rearing illustrates the position of the latter in the estimation of the Ho, and also that what is wanted by the class of people who usually cultivate *tasar* is small profits and quick returns. The first point to be grasped is that a man who is well-off will not be bothered to do *tasar*; a man who is living from hand to mouth cannot afford to do it because he cannot wait for his money; between these two comes the class who have enough but to whom a small addition to their incomes is welcome and these are taking to less precarious alternatives. In my opinion and in the opinion of others whom I have consulted, this is the most important factor in the decline.

Another reason generally given is the reduction in the number of *asan* trees. It must be remembered that in Singhbhum the Ho puts the worms on trees about his fields and not in the jungle. These have been cut for fuel or to sell the bark for tanning. With the extension of cultivation they are not replaced to the same extent as formerly. This, however, does not appear to be of much importance—were *tasar* rearing popular, means would be found to protect and propagate the *asan* trees, and the reduction in the number of these trees is a symptom of the decline rather than the cause of it.

A third factor is the difficulty of getting seed. The reserved forests are closed altogether and in the protected forests the monopoly of purchasing the wild cocoon has been given to one man for some years. At first, he paid Rs. 900 for it but the amount tendered has decreased annually and this year he pays only Rs. 355. There seems reason to believe that the lessee has damaged his business by his own exactions; but in any case the shortage of seed is now met by importing a seed-cocoon from Hazaribagh which under-sells the local article. The local wild seed may cost as much as 2 pice the cocoon or 32 to the rupee; though this appears an outside price, the ordinary price is about 60 to the rupee while imported Giridih seed sells at 80. Some villages have given up the use of the wild seed altogether. Others get it from the Feudatory States surrounding Singhbhum from as much as twenty miles distance. This shortage of seed is certainly a factor in the decline in the Kolan, but its importance has been over-estimated. Wild seed is obtainable from the surrounding Feudatory States if the trouble is taken to fetch it and the small royalty paid. Villagers from villages which still use the wild seed pass on their way to fetch it through villages where domesticated seed only is used, and it is obvious that these latter use the domesticated seed through laziness or lack of enterprise rather than from sheer necessity. The ruling economic factor is, as stated above, the value of the rearer's own time and labour.

SAMBALPUR.

7. Although Sambalpur is not included in the districts to which the enquiry refers, I visited the town of Sambalpur to obtain some information by way of corroboration from the weavers. *Tasar* is here known as *kosa*. The seed is collected in May by Kols and others who are residents of the jungle villages. These cocoons are sold at one or two to the pice to Gondas who are the principal rearers. The cocoons are tied up to trees in June or July, one or two to a tree. Early in July the moths eclose and the males are allowed to go, but the females are kept. When the females lay, the eggs are collected; rubbed between the hands to clean them (*Rannu* root is not used as in Singhbhum), and kept in *chhar* tree leaves. When the caterpillars hatch out, jungle shrubs are cleared from round the *sahaj* tree and the worms are placed on it. They go through four "jogs" and then form the cocoons of commerce. There is only one life cycle. There are two kinds of cocoons—*sankosa* (small) and *barkosa* (large). The former are collected in Asvin at the time of Dasahra and the latter in Kartik. There appears to be no difference between them except in the duration of the process and they are stated to be the same as the *laryas* of Singhbhum. The *barkosa* can be kept for rearing but the *sankosa* cannot. It is denied that the cocoon degenerates under domestication. The rearing is done by a particular caste, the Gondas who are also criminals and chaukidars. Some were interviewed at a chaukidari parade. The rearing is done purely to meet a local demand and there is no export. The supply is insufficient and the weavers import cocoons from Chakradharpur and Giridih. The rearers sell direct to the weavers (*kostas*) and there is no middleman. Cocoons are generally sold by the thousand and the Chai-bassa *kahan* is almost unknown. Twenty years ago they were selling at 240—200 to the rupee or Rs. 5 a thousand. Now they are up to Rs. 7 a thousand or above that. The deficiency is met by import and the local demand has decreased, so that prices have not risen in proportion to the shortage of the local supply. The reasons given for the failure of supply are much the same as in Singhbhum, *viz.*, (a) the precarious and gambling nature of the business. "Helata *tasar*, na hela *khassar*" (*i.e.*, a venture in the business means either *tasar* or ruin), and (b) reservation of the forests. Within the last few years there has been some extension of the area of forest reserved in the Sadr thana, and all Gondas in this thana have given up *tasar* now. In this district I learn that Messrs. Bros. Partners & Co. of London buy up the waste silk (*i.e.*, the coarse part of the cocoon which is cast aside by the twistors) at 3½ seers to the rupee and send it home; and it comes out again as yarn. So no part of the cocoon is wasted.

MANBHUM.

8. Weaving is much more important than rearing in the Manbhum district. The weavers are suffering much as a result of the shortage of cocoons and the rise in the price of them. Many in Raghunathpur have abandoned *tasar* for cotton. There is no doubt that they would benefit considerably by increased production of cocoons which would enable them to manufacture *tasar* cloth at a cost which would not bring it into competition with the pure silk products. The weavers depend, and have always depended, chiefly on Chaibassa cocoons and only supplement them with the local article which is inferior in quality, as the output has always been comparatively small in quantity. At present about 2,000 to 3,000 *kahans* are obtained by the *mahajans* from Barabhum and neighbouring places during the year and the average turn-over annually is about Rs. 18,000. Formerly as much as this used to be obtained in the neighbourhood of Purulia alone. There is a small export to Bankura and Birbhum. The chief area of *tasar* rearing is within an area of four or five miles about Kenda on the Manbazar road. In Kenda itself about 30 persons were doing *tasar* last year whereas ten years ago the number was more like 50, and was perhaps 80 or 90 twenty years ago. The supply from this village was between 40 and 50 *kahans* last year whereas twenty years ago it often amounted to 200 or 300 *kahans*. The total number of rearers in this area may be put down as varying from 200 to 300 and the average output at present as from 1,200 to 1,500 *kahans*.

As the Manbhum cocoon is not highly appreciated by weavers and only used when better cannot be obtained, the prices have not risen much with the shortage. The rearers say that they receive Rs. 5 to Rs. 7 a *kahan* according to demand, but a *mahajan* of Purulia says that recently he has paid as much as Rs. 8 or Rs. 9. There is a story that the price once rose to Rs. 20 a *kahan* owing to a sudden and heavy demand. It would, however, be impossible to manufacture *tasar* profitably with cocoons at this price, and if the story is true, it must have been a very exceptional condition of affairs due to weavers being bound to execute orders already placed. The rearers deny that there has been any material variation in prices during the last twenty years. It is obvious, however, that with the rise in the price of food-stuffs *tasar* bringing in the same income as it did twenty years ago is less profitable now. The rearers, however, ascribe the decline to other causes as in Singhbhum, *viz.*, (a) deforestation and lack of money to purchase seed cocoons from other places, (b) the increased attention to cultivation and the fact that, unless a man has food-stocks, he cannot afford the time to rear *tasar*, (c) the precarious and irksome nature of the business and the austerities dictated by religion which lead the rearer to drop this casual occupation and to take to others equally profitable and less troublesome. Among these may be included the cultivation of lac the prices of which have risen very much.

Landlords, of course, attempt to make some profit for themselves out of the *tasar*. Formerly all cut cocoons were the perquisite of the landlord, but it was found that the rearers disposed of these *phukhas* by stealth and the landlord took Re. 1 per *ara* instead. He further claims one cocoon per *pan* of outturn but the rearers contest this. It does not appear that such small impositions have any influence in discouraging the rearing of *tasar*. The condition of the cocoon depends very much on the weather, but it is denied that there is any deterioration.

HAZARIBAGH.

9. *The trade and prices.*—From information received in various places, I was prepared to find that the trade done in cocoons in Giridih is larger than generally supposed, but the facts stated by the *mahajans*' servants came somewhat as a surprise. If they are to be believed, the trade done here is at least equal to that done in Singhbhum and perhaps larger. Singhbhum has the advantage of producing a better cocoon and of proximity to the western market, but Giridih taps a larger area of country. In some matters, however, the information seems unreliable. The *mahajans* did not appear them-

selves but sent their servants and after some hours spent in cross-questioning there, it became apparent that on many points they were giving deliberately false information. There is evidently a ring of *mahajans* here who make their profits by queering the market and are interested in suppressing the true state of affairs. At last one man appeared who failed some time ago and at present has a very petty interest in *tasar*. His statement may be accepted as reliable and contradicted those of the others on several material points.

The facts seem to be that for some twenty or thirty years there were only two firms trading here, *viz.*, Messrs. Payen et Cie and Jagannath Ram. The former took three quarters of the demand and (as I learned in the villages) paid a fair price for it. But they retired and Jagannath Ram failed. Their place was taken by many dealers on a smaller scale. The shrinkage in the demand caused by the retirement of Messrs. Payen et Cie caused a large shrinkage in the supply, and though the demand has in a considerable measure recovered and Giridih is now supplying the Western market, the supply has not recovered in the same proportion. The present dealers do not stock cocoons but act entirely as brokers. The *Paikar* goes round the villages and buys from Sonthals and others who rear *tasar*. He is said by the villagers to "loot" them, especially those who produce only a few *pans*, and he pays at the rate of perhaps Rs. 6 only for a *khari* of *mugas* that he may sell at anything from Rs. 9 to Rs. 14 and perhaps less than Rs. 3 for *laryas* that may fetch Rs. 6 or Rs. 7 in the market at Giridih. The rearers are for the most part aboriginals who are afraid to go into the markets. Even when they do so the *Paikar* still steps between them and the buyers. The *Paikar*, not infrequently it is said, sorts over the cocoons, rejects some and demands others in their place and then takes the rejected cocoons for nothing. A Marwari (*Paikar*) at Gande pays his fellow caste men better prices than he pays to others—a clear indication that it is the will of the dealer and not the state of the market that fixes the price paid to the rearers and that there is scope for paying a higher price without loss to the purchasers. There is a further middleman, the broker who sells the *Paikar's* cocoons to customers and receives anna 1 per *khari* from each party for doing it. The agents of Messrs. Payen et Cie used to buy direct from rearers to a large extent. Their system was to take sixteen cocoons from a *khari* selected to represent the whole (the cocoons placed on the Giridih market are mixed) and after the chrysalis had been cut from these, they were weighed and payment made at known rates accordingly. The rearer is getting less and the dealer more for his cocoons than formerly.

10. *Other causes of decline.*—In this matter the story told here is much the same as that told elsewhere. In the first village visited, Kalyanpur, the first man met said that he had done *tasar* last year, but had not done it this year, as there was no other person in his household to look after the cultivation of the land and he could not spare the time. The next man questioned was watching his *tasar* on the trees, and said that he was doing less this year than last year because his search for seed had been unsuccessful. He attributed this to the great heat and short rainfall last year. Other places were visited but most information was obtained in Mohanpur. It appears that here only one crop is raised for the market, *viz.*, the *barsati* crop, and the *jadui* crop is unknown. No seed is kept from year to year, but it is sought in the jungles in July and August. *Laryas* are used for breeding, but the *mugas* are sold off as they eclose uncertainly. When the moth comes out the males are allowed to go and the females are put outside for the night, when they are visited by the males and begin to lay at once. In eight or nine days the eggs hatch, the caterpillars are put on the trees, and then the trouble begins. Constant vigilance is required, and unless a man can afford the time, or has relatives who can look after the more important business of tilling the soil, the two months of watching is impossible. In any case he must be of an industrious character to undertake it. The *tasar*-rearer "does not do it for his food, but for the salt with his food," and a lazy man will prefer to go without the salt. Some two months elapse while the caterpillar changes its skin four times and then spins itself in and forms the cocoon of commerce. This is the period of risk. Besides the depredations of birds there are the chances of

the seasons. A dry season may mean the loss of the whole crop. The villagers about here state that *larya* seed may give some *muga* cocoons and *muga* might give some *larya* cocoons, and it much depends on the weather in September which kind of cocoon is produced. I do not know whether this is a scientific fact. There are further the risks from disease of which they recognise three—*chherna*, *larka* and *murli*. It was in this village also that the chief complaints against the dealers were made. It is not surprising that as he labours under these many disadvantages the villager is always ready to abandon *tasar* for anything else that offers better prospects; for instance, a large amount of *tasar* was formerly reared about Gajhandi in this district, but it has been abandoned for work in the mines.

As in other places, no evidence can be found here that the cocoon has on the whole degenerated in quality.

RANCHI AND PALAMAU.

11. As far as my enquiries go, there is very little *tasar* rearing still left in Ranchi and no villages in the district were visited. At one time Palamau used to supply cocoons to the weavers of the Aurangabad subdivision of Gaya, but the weaving industry there has practically ceased. Owing to the very limited time at my disposal Palamau could not be visited.

SONTHAL PARGANNAHS.

12. *General.*—The industry in this district is a jungle industry. Cultivation is carried on in the small jungle surrounding the villages and not actually in the fields as in Singhbhum. The rearers are Sonthals and Paharias in the Damin-i-Koh and Khetarias, Bhuiyas, Goalas, Kewats and Parighas in the jungles of the zamindari tracts. The subdivisions of Rajmahal, Godda, and Pakaur are the most important areas for *tasar*.

13. *The method of rearing and the crops.*—The Sonthals in the Damin-i-Koh used both wild and domesticated seed: elsewhere seed cocoons are generally preserved from the previous year's crop. The actual process is much the same as elsewhere. The insect passes through the usual metamorphoses and there are two crops, one about the end of September called by Sonthals and Paharias *barsali* or *barsati* and by others the *bhadoi* crop. There is also a *jadui* crop in December or January. The former crop is small, but it is of the best quality; the latter is very abundant but sells at a much lower rate. The former crop is, I think, being largely abandoned, as in the places where I made enquiries only the *jadui* crop was known. In Hiranpur and Tinpahar markets of this district and in Bhagalpur, the persons examined spoke only of a winter crop from the Sonthal Pargannahs.

14. *The number of persons engaged in rearing tasar in this district.*—This is here as elsewhere very difficult to estimate. At Katikund I was told that it is done in eight or ten villages of the Gopi Bungalow, three or four villages in the Narganj Bungalow and ten or twelve villages in the Katikund Bungalow. In each village three or four families take it up. These three bungalows belong to the Dumka Damin and the figures indicate that roughly 300 persons are rearing *tasar*. This would mean at the same rate 1,200 persons in the whole Damin-i-Koh. But the cultivation is much greater in the direction of Sahibganj. The average output of each rearer is said by the Sonthals of Katikund to be about 30 *pans* or, say, 2 *kahans*. In Tinpahar market the residents say that some bring cocoons in handfuls and some in sackfuls and it is impossible to obtain any idea of the average amount of cocoons brought by each person. Accepting R4 as the average selling price and R25,000 as the average turn-over in Tinpahar bazar, the result is 6,250 *kahans* or 3,125 rearers. But probably where more people rear *tasar* they also do it on a somewhat larger scale, and this figure may be reduced; and it is probably safe to estimate the number of rearers in the Damin in any year as about 3,000. An estimate made independently of mine gives 3,000 for the Damin and the same number for the zamindari tracts or 6,000 for the whole district.

15. *Trade and prices.*—Some thirty years ago a European firm of which the name is doubtful used to send an agent to camp in Tinpahar bazar and buy cocoons. It has been suggested that he was an agent of Messrs. Newcomer & Co., but some of the villagers in Tinpahar spoke of him as "Dibru Sahib" which makes it possible that he was Mr. Jules Deveria of Rampur Boalia who is mentioned in Watt's "Economic Products of India" as doing a large business in *tasar*. However, the point is not important. Since this European firm ceased to buy, the amount of the produce has been decreasing. In Singhbhum with the decreasing supply prices have, as might be expected, been rising; but the Sonthal Pargannahs cocoons appear to have an independent market and are not affected by the large demands of the Central Provinces market, nor do they enter into competition with the superior Singhbhum cocoons. There may be occasionally inflated prices owing to sudden and unexpected demands, but on the whole the prices received by the rearers in the Sonthal Pargannahs are falling. The rearers in the Damin-i-Koh used to pay a tax to Government for *tasar*-rearing. This was remitted at the time of the last settlement, and though the slump had already set in, the removal of the tax gave a certain impetus to the industry. About ten years ago the rearers used to receive ₹6 and ₹7 a *kahan*. Rupees 4 was once considered a really bad price. But a few years ago the Forest Department appointed certain "licensedars" and gave them a monopoly of the right to buy *tasar* cocoons. These "licensedars" have formed a ring and give what price they like for the *tasar* and naturally give an absurdly low price. They pay ₹1 for their license and annas 6 tax per *kahan* to the lessees of the market in which they purchase. They insist on having cocoons at 8 *pans* to the rupee or ₹2 a *kahan*. It is marvellous that this sickly industry should survive at all under such disabilities; but no one is dependent on *tasar*. A man uses his surplus time and energy to add a little to his income by this means and looks on anything he makes, however small, as profit and therefore he is content to go on doing it.

The annual value of the trade to the district is estimated at ₹80,000, distributed as follows among the subdivisions:—Rajmahal ₹25,000, Pakur ₹16,000, Godda ₹25,000 and Dumka ₹14,000. These figures exclude Jamtara, where some weaving is done, but no enquiries about rearing have been made. Most of this money goes into the pockets of the middleman, at least in the Damin. In the zamindari tracts the rearer has to pay a cess which varies from ₹1 to ₹1-8 per *ara*. He has nothing else to pay and gets better prices from the "Paikar," last year he received ₹1 for 3 *pans* of the *jadui* crop. The market rate when produce is abundant is ₹6 per *kahan* for *muga*, ₹3 for *lenga* or *larya*, and ₹1-8 for *phukha*. At present before this year's produce is on the market the rates are ₹14, ₹6 and ₹4, respectively. *Phukhas* were selling at ₹2-8 in the Hiranpur market at the time of my visit. I was informed in Bhagalpur that ₹5 to ₹7 was the ordinary rate to pay for Sonthal Pargannahs cold weather produce according to quality. The Bhagalpur dealers visit Tinpahar mart in person and there is no middleman except the "licensedar" or "paikar." The former is making an unfair profit at the expense of the rearer.

16. *Other causes for the decline of tasar rearing.*—The monopoly of "licensedars" by itself would be enough to account for the decline within the last few years in the Damin; but *tasar* rearing was declining before the "licensedar" came and it is declining elsewhere also. It is, therefore, necessary to look for other causes. The chief cause of decline originally was the reservation and protection of the forests. The caterpillar was previously reared on *asan* trees in the jungle; now it is reared on the patches of forest bordering on the village. The number of trees is insufficient as, even if they are not cut for fuel, a tree is almost completely destroyed by worms in one season. To obtain fresh shoots on the same trees they are pollarded; and from feeding entirely on new leaves the worms get a disease *chhirai* (Chherua or Cholera) and die off in large numbers. There is another disease *angaria* in which the worm turns black "like coal." It is attributed to always cultivating the *tasar* on the same spot, though its nature is not understood. The semi-domesticated moth (*i.e.*, those cocoons kept from the previous crop) is

more liable to disease than that from the wild seed of the jungle; and as the closing of the forest has made it increasingly difficult to obtain wild seed, the proportion of domesticated seed is greater than it was. There is the same story as in other districts of the risks and trouble involved in the business. It is only done by those who have a little time to spare from agriculture and a little spare cash for seed. If any alternative occupation is offered, *tasar* is gladly abandoned for it. The people have now largely taken to lac which is far more paying. Many also are employed in stone quarries and ballasting work on the Railway in the Rajmahal and Pakaur subdivisions.

17. The question propounded in Mr. Maxwell Lefroy's note can now be answered. In the previous notes each district has been treated separately because conditions varied so much that it was difficult to write a combined note.

(a) *Is there any shortage in the supply of cocoons?*—Yes, the supply is this year very considerably short of the demand and this is the usual state of affairs. But at the same time the demand is irregular and uncertain.

(b) *Is this due to low prices?*—Conditions vary very much from district to district; the *tasar* itself as put on the market is not a uniform product, and it is very difficult to ascertain rates. Further, the enquiry was made before the rearer was putting his *tasar* on the market and it was necessary to depend on oral, and sometimes deliberately incorrect, information. But the fact seems to be that in Singbhum the rearer is getting the advantage of the enhanced prices, but the price of *tasar* has not increased in the same ratio as the price of staple food crops and *tasar* rearing from this point of view only is less profitable than it was. In Hazaribagh the rearer is robbed by the middleman, and in the Sonthal Pargannahs he is the victim of the monopolist. The bad prices received are one factor in the decline.

(c) *Is there any distress or poverty consequent on this?*—Most certainly not among the rearers. Among the weavers, with whom this note is not concerned, there is reported to be a certain amount of distress from the shortage of cocoons and the enhanced cost of them. But the rearer is not and never has been even partially dependent on *tasar*. It is essentially an occasional occupation for his surplus time and energy by which he may make a welcome addition to his income, but by which he never looked to live. If all *tasar* rearing could be stopped to-morrow, no one would go hungry by reason of it. The idea that it is necessary to revive the *tasar* industry in order to save the rearer from want is a mistake.

In this connection it may be noted that the estimate of the number of people in the province engaged in rearing *tasar* as 100,000 is, in my opinion, very wide of the mark. The number fluctuates and the same people do not do it every year. I have given reasons for fixing the maximum at 10,000 in Singbhum (which is the chief centre of the industry), 6,000 in the Sonthal Pargannahs and perhaps 1,000 in Manbhum. In Hazaribagh the only fact on which any guess can be based is that the trade is about equal to that of Singbhum. But if 10,000 is added for this it will include many of the Sonthal Pargannahs and Manbhum rearers. If we reduce it to 7,000 it gives a total of 25,000 rearers who sell through the most important marts. The few rearers of Ranchi and Palamau still remain to be counted and the industry is not altogether dead in Gaya and South Monghyr. There is also a very little done in some of the Orissa districts. The figures already given are maxima and in my opinion the number of rearers in the whole province in any year cannot exceed 30,000.

(d) *Would improved cocoon production be beneficial or is it not needed?*—The cry is for increased not improved production, and that comes from the weavers. Neither improved nor increased production is needed in the sense that it is necessary to save the rearer from want. Improved production might mean the production of a cocoon that would eclose regularly and not be liable to disease and thus would remove certain elements of risk; but it could not guarantee the seasons or scare away the kites. *Tasar* rearing must under any circumstances be a precarious undertaking and not one to which a man could look for his livelihood. I cannot find any evidence for

the supposed deterioration of the cocoon as a silk-producer. Moreover, in the present uncertain and disorganized state of the *tasar* market, an expensive enquiry which may or may not be successful and the very purpose of which is not altogether clearly defined, would be a waste of money. Certain unjust disabilities from which the *tasar* rearer suffers should, if possible, be removed; and when it has been ascertained what power of recuperation the industry has within itself, it will be time enough to undertake scientific enquiries for the purpose of improving the breed of the moth.

(e) *Has the rearer given up because he prefers to or because he must?—*The rearer is abandoning *tasar* because he is finding more profitable and less precarious methods of employing his surplus time and energy. This question is answered throughout this note.

(f) *Is the decrease in production due to the increase in value of rice and the increase in wages, leading rearers to abandon the less profitable tasar, or to inability to get good stock to rear from and good results from rearing?—*The increased cost of living and the rise in the money value of agricultural produce means that increased attention is being given to agriculture, and the cultivator has less spare time and money to spend on *tasar*. The rise in the wages paid to labourers is, of course, only one aspect of the increased cost of living; in any case it must be remembered that a man who lives by daily labour cannot do *tasar*, for he has not the means of living while he is engaged upon it. This is the reason why agricultural scarcity is always followed by a setback in *tasar* rearing. Enquiries show that this is the most important factor. There is more difficulty than formerly about getting seed, and this is one among many things which go to make *tasar* unpopular and lead the raiyat to take to other kinds of employment if they are open to him.

(g) *Finally, is the decrease due to the Forest Department restricting areas in which rearing can be done?—*The decrease is largely due to the reservation or destruction of the jungles, especially in districts like Sambalpur and the Sonthal Pargannahs where the industry is mainly a jungle industry. But throwing open of the whole of the reserved forests would not, I think, result in restoring the industry to its former position; because the rise in the cost of living and the increased economic value of a man's time and labour, making the petty earnings from *tasar* of less worth than formerly, are more potent factors in the decline.

18. *General summary.*—Conditions vary much from place to place and there seems no organized market to produce uniformity. The demand was probably more regular and certain when European firms were trading; though the Central Provinces market has largely taken their place and its demands usually exceed the available supply, the market is on the whole irregular and uncertain and does not encourage systematized rearing. *Tasar* rearing has never been an industry on which any one depended for a living; it is occasional occupation in which a constantly fluctuating number of persons invest their surplus time and energy. If anything more profitable and less irksome and precarious presents itself, *tasar* is dropped without regret. Even in a good year the value of the output of a single rearer is small; over a series of years owing to the risks of the business the profits are negligible. It is worth doing as long as it does not interfere with anything else, and while the time not spent on it would be lost; but the increased cost of living and consequently increased value of a man's time and labour, and the other avenues of employment which are opening, make *tasar* rearing year by year of less account.

Weavers and dealers interested in the increased production of *tasar* urge that advances of money should be given to the raiyats to enable them to tide over the two or three months while the *tasar* is on the trees. In the present state of the *tasar* market I think it would be unwise to attempt to stimulate production at all, and to stimulate it by advances would be a disastrous mistake. The *tasar* is too precarious to secure a loan, and it would certainly mean mortgaging land for the sake of the *tasar*, and in the end heavy indebtedness and loss of the land. The *tasar* is not worth it.

At the same time I think that something should be done to remove obstacles from the way of those who still wish to do *tasar* (and they are fairly numerous) and to enable them to get the fair market price for their produce. The rearers are mostly jungle folk and the jungle produce is their birth right. It ought to be possible to give them permits to go into the reserved forests to search for seed. In districts where rearing is done in the jungles, an area of *asan* trees might be set apart in the protected forests for the purpose and divided into four blocks. One block could be used each year and have three years' rest. The trees would not suffer from *tasar*-rearing on them once in four years. The Forest Department should not look to make any profit out of *tasar*. If it is necessary to exercise control over the purchasers of forest produce, at least a sufficient number of licenses should be granted to ensure competition. Monopolies of the right of purchase given to one or two persons constitute a grave injustice to the rearers. There might also be room for co-operative selling. The difficulty in this is that the rearers are different persons from year to year, the number doing *tasar* in any one village is small and the output of each man is very small; a society to be large enough to employ their own agent in the market would have to embrace a great number of villages. Co-operative credit for the purpose of financing production could not be recommended, because the *tasar* is too precarious a crop to afford security for a loan.

JOHN R. DAIN,

Offg. Director of Agriculture,
Bihar and Orissa.

RANCHI :

The 28th September 1916

APPENDIX A.

Ampatia.—The first or seed crop consisting of flimsy cocoons.

Angaria.—A disease in which the worm turns black.

Ara.—(1) The area where cocoons are reared, (2) the license to grow cocoons there, (3) generally cocoon rearing; "bura ara," the chief crop.

Asan.—The tree on which *tasar* is chiefly reared (*terminalia tomentosa*).

Banela.—Barra.

Barkosa.—The large cocoon of Sambalpur.

Barra.—Wild *mugas* that cut first year and pierced cocoons of same.

Boga.—The caterpillar after the fourth casting of its skin. There is no particular name for it in the previous stages (Sambalpur).

Borki.—A particular disease of the moth.

Bugui.—A kind of cocoon obtained from *mugas* at the end of the cold weather.

Chhar.—A tree the leaves of which are used to wrap the eggs.

Chherna.—A disease somewhat like cholera.

Chhirai.—Chherna.

Daba.—The domesticated cocoon. It is called "jata daba" in its first year of domestication.

Dhulia or *dhuria*.—Cocoons of the *ampatia* crop.

Guti.—A common word for cocoon.

Hagiri.—Is chherna.

Jata daba.—See *daba*.

Jadui.—The winter crop.

Kahan.—A measure—

4 cocoons	1 <i>ganda</i> .
20 <i>gandas</i>	1 <i>pan</i> (80 cocoons).
16 <i>pans</i>	1 <i>kahan</i> (1,280 cocoons).

but the *kahan* is sometimes taken as 1,300.

Khari.—Is the same as *kahan*.

Koa.—A common word for cocoon.

Kosa.—Used in Sambalpur for *tasar*.

Larka.—A disease of *tasar*—*Meshia*.

Larya.—A somewhat soft cocoon with a long stalk. Found wild.

Lenga.—Is the same as *larya*.

Lumam.—Santali for *tasar*.

Meshia.—A disease of *tasar-larka* (?)—"angaria."

Muda.—*Muga* cocoons which have not eclosed during the first year.

Muga.—(1) The large, hard, wild cocoon; (2) any large and hard cocoon.

Murli.—A disease (?) the same as "angaria" (see Mukharji's report, page 7).

• *Narya.*—Is the same as *larya*?

Pagala.—A colloquial term applied to a cocoon fixed close to the branch without a stalk and more nearly spherical than the ordinary cocoon. It is rejected by dealers (Giridih).

Pan.—See *kahan*.

Path Muga.—Another name for wild *laryas*.

Pukha.—A "blown" cocoon from which moth has eclosed.

Raksata.—Pierced cocoons of the *larya* crop (Giridih).

Rannu.—A root used to rub the eggs of the moth to hasten hatching.

Sahaj.—Is the *asan* tree (Sambalpur).

Sankosa.—The small cocoon of Sambalpur.

Sarihan.—A term used by dealers in the Sonthal Pargannahs for a mixed lot of cocoons.

Tira.—A small *muga* cocoon. The Sonthals say it is the cocoon of the male while the large *muga* is the cocoon of the female (*patni*).

APPENDIX B.

Dalkati figures from the Kolhan.

Year.	Realizations.	Rearers	Year.
1	2	3	4
	Rs.		
1908-09	5,712	7,616	1907-08
1909-10	5,395	7,193	1908-09
1910-11	5,395	7,193	1909-10
1911-12	4,488	5,984	1910-11
1912-13	6,000	8,000	1911-12
1913-14	5,807	7,742	1912-13
1914-15	7,790	10,387	1913-14
1915-16	5,760	7,680	1914-15

The *dalkati* is a tax of R1 on those who take *ara*. The first two columns are taken from the Budget estimates for the year indicated, the figure

in the estimate being the actual realizations of the previous year. Possibly this system was not consistently followed, as the second and third items are indetical and ₹6,000 in 1912 looks like a round figure. Figures for years previous to 1908 were not obtainable, as the *dalkati* was then lumped together with other miscellaneous receipts. The Government receive only annas 12 of the *dalkati* tax and therefore the figure is multiplied by 4—3 (in column 3) to give the number of rearers in the year noted in column 4. Further, if the crop of any cultivator is an entire failure, *dalkati* is remitted. Something therefore has to be added to these figures for total failures: but it will be on a sliding scale, for it is probable that the larger the number of successful rearers who paid, the better must have been the crop and the lower the ratio of failures to successes. In my opinion 8,000 should be taken as about the normal number of rearers in the Kolhan. The figure 10,387 is exceptional and probably due to a temporary impetus given to the industry by high prices in the previous year (*vide* paragraph 5).

APPENDIX C.

Statement of cocoons despatched from Chakradharpur station during the years 1912-15, in maunds.

Month.	1912.	1913.	1911.	1915.
1	2	3	4	5
January	402	640	966	344
February	<i>Nil</i>	454	863	343
March	<i>Nil</i>	207	108	33
April	<i>Nil</i>	53	108	<i>Nil.</i>
May	<i>Nil</i>	<i>Nil</i>	68	<i>Nil.</i>
June	<i>Nil</i>	47	98	<i>Nil.</i>
July	<i>Nil</i>	41	69	<i>Nil.</i>
August	12	29	9	<i>Nil.</i>
September	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil.</i>
October	331	184	396	480
November	3,185	2,027	2,131	2,619
December	1,381	1,291	1,492	1,769
	5,310	4,974	6,308	8,888

This statement was furnished to me by the courtesy of Bengal-Nagpur Railway Company. It will be noted that in August and September, the time during which the enquiry was made, *tasar* is not coming on to the market. Further, it will be noted that the export fluctuates considerably. It would have been interesting to have obtained a similar statement for Giridih and other stations in Hazaribagh, but the enquiry there was undertaken late and there was no time to obtain it before submitting this report.

APPENDIX XV.

TRADE IN BURMA.

TABLES.

FRONTIER TRADE.

Raw Silk.

The figures of imports and exports of raw silk and piece-goods are abstracted from Reports on the Transfrontier Trade of Burma for the years 1913, 1914 and 1915. There is a small export (100 maunds) of raw silk to the Southern Shan States and North Siam: there is a larger import (2,500 maunds) from West China little from the Southern Shan States: it has fluctuated singularly little, perhaps as the war has not affected transport: only the export in 1914-15 fell notably.

The import from West China is important: it is worth remembering that this pays no import duty and that this has been a bonus of 5 per cent. up to 1916, when it became $7\frac{1}{2}$ per cent.; there has been a total loss of revenue of about three lakhs on the total imports of raw silk on the last five years.

Piece-goods.—The imports were considerable, with a value of six to eight lakhs a year but this has fallen to under three: nearly all is from Siam. The exports have also fallen from seven lakhs a year to nearly four, but 1914-15 saw an export to the Southern Shan States worth $8\frac{1}{4}$ lakhs, which has fallen to two lakhs. The exports and imports of piece-goods about balance, but the imports are from Siam, the exports to the Shan States, so that the balance is against Burma.

FRONTIER TRADE.

Exports by Land.

—	1911-12 to 1913-14.		1913-14.		1914-15.		1915-16.	
	Mda.	Rs.	Mda.	Rs.	Mda.	Rs.	Mda.	Rs.
<i>Raw Silk.</i>								
Western China . . . . .	..	..	..	..	..	..	..	..
Kachin . . . . .	..	..	..	..	..	..	..	..
Northern Shan States	..	..	..	..	3	1,402	20	8,802
Southern Shan States	249	1,56,886	47	24,136	3	185	71	16,288
North Siam	150	71,415	69	35,600	24	10,500	58	69,605
South Siam . . . . .	..	..	..	..	..	..	..	..
TOTAL	399	2,28,301	116	59,736	30	12,087	149	64,695

FRONTIER TRADE—concl'd.

Exports by Land—concl'd.

—	1911-12 to 1913-14.		1913-14.		1914-15.		1915-16.	
	Mds.	Ra.	Mds.	Ra.	Mds.	Ra.	Mds.	Ra.
<i>Piece-Goods.</i>								
Western China . . . . .	..	..	..	..	2	3,120	..	..
Kachin	3	3,912	..	..	1	1,350	1	1,035
Northern Shan States	83	1,62,349	18	35,415	23	47,660	41	89,568
Southern Shan States	690	11,76,398	362	5,77,419	556	8,26,883	142	2,06,890
North Siam	226	4,55,409	58	1,08,317	42	85,271	35	75,800
South Siam	103	2,17,729	32	60,900	23	46,905	21	46,732
Karenni	48	1,03,074	21	46,721	12	23,194	8	15,332
TOTAL	1,153	21,17,718	491	8,28,772	659	10,34,588	248	4,35,357

FRONTIER TRADE.

Imports by Land.

—	1911-12 to 1913-14.		1913-14.		1914-15.		1915-16.	
	Mds.	Ra.	Mds.	Ra.	Mds.	Ra.	Mds.	Ra.
<i>Raw Silk.</i>								
Western China	5,765	26,45,650	2,597	11,84,400	2,082	9,14,975	2,377	10,03,050
Kachin . . . . .	..	..	..	..	..	..	..	..
Northern Shan States	..	..	..	..	..	..	..	..
Southern Shan States	361	1,56,246	178	79,630	200	79,374	238	88,286
North Siam	17	5,850	..	..	..	..	..	..
South Siam	6	1,950	..	..	..	..	17	6,000
Karenni . . . . .	..	..	..	..	..	..	..	..
TOTAL	6,149	28,09,696	2,775	12,64,030	2,282	9,94,349	2,632	10,97,336
<i>Piece-Goods.</i>								
Western China . . . . .	..	..	..	..	..	..	..	..
Kachin . . . . .	..	..	..	..	..	..	..	..
Northern Shan States	..	..	..	..	..	..	..	..
Southern Shan States	75	90,875	32	47,026	49	72,240	28	35,772
North Siam	97	2,95,657	48	1,61,597	18	74,425	7	24,120
South Siam	415	16,74,671	189	6,25,033	61	2,06,545	63	2,02,200
Karenni . . . . .	..	..	1	750	..	..	..	..
TOTAL	588	20,61,953	269	8,33,656	128	3,53,210	98	2,62,092

Imports by sea.

Eight tables are here reproduced, supplied by the Chief Collector of Customs, Rangoon.

The first gives the imports of raw silk and piece-goods from foreign countries for ten years: China, Hongkong and Straits Settlements (all China produce) are alone concerned in raw silk till 1911, when Siam comes in and the total fluctuates from ten lakhs in 1906 and 1915 to 31 lakhs in 1912-13. In piece-goods Japan leads with six million yards in 1906 and 1915, eleven million in 1912; China sends from three thousand to eighty-four thousand yards, this last in 1915; Germany, Holland, Belgium, France, Austria, sent 150,000 yards in 1906, only 4,000 in 1913-14: and the United Kingdom has fluctuated from 235,000 yards in 1908 to 25,900 in 1910-11.

The second gives foreign imports in detail: the most interesting point is the importation of mixed silk fabrics from the United Kingdom: there was a small import also of spun-silk (silk yarn) from Germany and Belgium.

The third enumerates Coasting imports, of Indian merchandise: the two interesting items are Indian piece-goods from Calcutta, Bombay, Madras and "provincial ports" (the last the biggest and presumably covering the Tavoy production), and the import from Madras of mixed piece-goods.

The fourth table is of Coasting imports of foreign merchandise: and the item of import of piece-goods of foreign manufacture from Provincial ports presumably covers importations of Siam silk fabrics through provincial ports.

The fifth table of foreign exports of Indian merchandise is interesting chiefly as a record of an export of Chássam to the United Kingdom, fluctuating from four to twenty-eight thousand pounds weight.

The sixth is of no great interest, the seventh shows the distribution of foreign raw silk, and piece-goods to provincial ports and the last the distribution similarly of Indian piece-goods chiefly of Burma production probably.

Imports of Raw Silk into the Province of Burma from Foreign Countries during the ten years 1906-07 to 1915-16.

	1906-07.		1907-08.		1908-09.		1909-10.		1910-11.		1911-12.		1912-13.		1913-14.		1914-15.		1915-16.	
	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.
Straits Settlements	124,617	6,47,135	131,609	7,23,178	171,693	10,02,300	104,956	5,41,811	117,588	5,89,795	135,119	6,43,138	96,980	4,67,076	92,108	4,34,360	52,476	2,37,160	19,318	86,052
Hongkong	47,806	2,31,426	56,787	3,06,525	86,894	6,13,466	43,939	2,64,460	81,121	4,44,748	100,975	6,54,003	118,703	8,29,961	56,751	3,07,514	26,617	1,38,373	2,304	16,962
Siam	..	..	..	..	..	..	..	..	..	..	3,645	14,680	23,730	85,310	39,920	1,03,012	13,726	47,083	75,402	2,55,186
Indo-China	..	..	..	..	..	..	..	..	..	..	160	993	..	..	..	..	..	..	..	..
China	23,622	1,29,018	109,979	6,27,598	220,552	12,57,407	192,864	9,31,883	73,123	3,83,768	153,190	9,43,777	302,453	17,16,603	372,258	14,89,227	38,983	5,02,822	128,842	6,62,240
Japan	..	..	..	..	140	700	2,128	12,768	..	..	..	..	7,929	44,650	2,133	16,361	405	1,565	..	..
TOTAL	196,045	10,37,579	208,375	17,52,301	479,279	28,73,773	344,687	17,50,372	371,832	14,18,306	393,089	22,57,089	549,760	31,44,189	453,171	24,40,474	177,200	9,77,003	325,866	10,21,340

Imports of Silk Fabrics (piece-goods) into the Province of Burma from Foreign Countries during the ten years 1906-07 to 1915-16.

	1906-07.		1907-08.		1908-09.		1909-10.		1910-11.		1911-12.		1912-13.		1913-14.		1914-15.		1915-16.	
	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.	Yds.	Rs.
United Kingdom	134,772	1,21,153	197,009	1,89,774	235,603	2,26,644	26,113	26,964	25,900	27,027	65,860	47,424	43,100	34,966	47,556	42,520	92,814	90,314	30,550	31,523
Ceylon	..	..	..	..	..	..	410	274	..	..	..	..	438	389	..	..	..	..	..	..
Straits Settlements	104,682	71,640	48,230	56,941	57,976	65,870	48,449	43,791	54,959	53,264	32,785	42,856	36,223	43,078	65,404	50,586	39,156	30,593	88,191	81,564
Hongkong	26,251	30,973	32,229	46,277	44,173	58,505	40,831	52,415	37,469	48,538	59,660	76,943	100,040	1,13,350	117,810	1,69,632	73,272	1,07,694	103,758	1,92,934
Natal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	173	173
Germany	42,393	39,330	4,599	4,620	24,142	19,987	2,231	1,652	..	..	702	705	..	..	..	..	..	..	..	..
Holland	1,000	1,250	..	..	1,250	1,050	..	..	..	..	..	..	..	..	569	582	..	..	..	..
Belgium	69,896	44,066	3,404	6,329	4,746	3,746	4,485	3,270	3,303	6,669	4,771	3,864	..	..	..	..	1,082	613	..	..
France	39,855	49,435	14,610	23,541	5,174	7,523	4,799	3,004	5,020	6,356	2,073	2,032	6,730	7,971	3,390	5,581	320	221	..	..
Austria-Hungary	233	585	..	..	..	..	..	..	..	..	1,551	1,471	..	..	..	..	..	..	..	..
Switzerland	..	..	..	..	..	..	..	..	..	..	..	..	4,303	7,333	..	..	1,300	3,656	..	..
Java	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	30
China	2,945	5,453	7,109	9,356	20,274	26,766	17,530	30,329	12,353	15,726	14,213	25,113	10,533	15,989	24,414	33,968	37,716	39,633	34,670	74,429
Siam	360	955	263	297	204	1,732	213	233	441	686	..	..	713	700	1,525	1,731	305	237	433	1,114
Japan	6,607,974	39,53,364	3,113,215	43,77,472	9,375,065	53,03,509	3,314,693	46,39,729	3,151,432	42,33,262	9,716,526	50,41,131	11,345,421	61,86,412	9,132,675	51,37,167	4,033,112	30,37,731	6,461,101	34,30,513
Egypt	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	12
TOTAL	7,030,403	43,18,199	3,431,403	52,15,007	9,768,606	57,15,287	3,959,759	43,06,711	3,296,937	43,97,123	9,393,146	52,41,039	11,547,567	64,10,663	9,393,343	54,55,707	4,234,477	23,30,792	6,768,958	39,33,236

Foreign Imports.

ARTICLES AND COUNTRIES FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
SILK—						Rs.	Rs.	Rs.	Rs.	Rs.
Raw—										
British Empire—										
Straits Settlements . . . lbs.	124,617	131,609	171,698	104,956	117,568	6,47,135	7,28,178	10,02,200	5,41,811	5,89,795
Hongkong "	47,806	56,787	86,894	48,939	81,121	2,61,426	3,86,525	6,18,466	2,64,480	4,44,748
Foreign Countries—										
China (exclusive of Hongkong, etc.)	23,822	109,979	220,552	193,664	73,123	1,20,018	6,27,598	12,57,407	9,31,833	3,83,768
Japan . . . . . "	..	..	140	2,128	..	..	..	700	12,708	..
TOTAL "	196,045	298,375	479,279	344,687	271,832	10,37,579	17,52,301	28,78,778	17,50,872	14,18,306
Silk yarns, nolls and warps—										
British Empire—										
United Kingdom . . . . . "	..	..	..	12	13	..	..	..	305	228
Foreign Countries—										
China (exclusive of Hongkong, etc.)	..	..	920	..	..	..	..	3,294	..	..
Japan "	..	110	..	218	1	..	700	..	2,240	3
TOTAL "	..	110	920	230	14	..	700	3,294	2,545	229
Goods of silk mixed with other materials—										
British Empire—										
United Kingdom Yds.	9,136	31,069	90,823	108,059	162,225	7,599	32,016	91,484	1,11,091	1,70,969
Straits Settlements "	8,203	17,052	17,114	5,706	73,588	6,977	5,847	8,369	3,337	26,735
Hongkong "	23,811	7,086	9,643	8,672	10,883	17,950	4,091	7,159	6,410	7,581
Foreign Countries—										
Germany—Free Ports "	5,917	30,676	52,604	27,752	29,096	5,322	25,309	42,924	19,133	23,184
Holland "	25,141	4,391	2,114	24,054	11,126	10,059	2,502	2,250	8,708	5,550
Belgium "	43,285	40,761	114,159	74,422	109,871	31,062	32,810	94,747	56,975	90,866
France "	16,100	4,680	11,914	11,395	1,080	6,966	11,400	20,386	18,969	1,687
Italy "	897	..	..	720	779	1,876	..	..	1,244	1,835
Indo-China, etc. . . . . "	..	..	..	..	262	..	..	..	..	1,210
China (exclusive of Hongkong, etc.)	1,606	..	1,139	1,715	1,935	1,513	..	818	608	2,639
Japan "	100	3,870	3,276	11,673	45,227	26	1,000	2,167	5,501	21,864
Egypt . . . . . "	..	..	..	..	684	..	..	..	..	1,946
Other Countries "	216	262	..	27	..	93	95	..	100	..
TOTAL "	138,912	139,677	302,588	274,795	452,756	86,982	1,14,960	2,70,184	2,32,161	3,53,065
SILK—										
Piece-goods—										
British Empire—										
United Kingdom "	134,772	197,699	235,603	26,113	25,900	1,21,153	1,89,774	2,26,544	26,064	27,627
Ceylon . . . . . "	..	..	..	410	..	..	..	..	274	..
Straits Settlements "	104,882	48,280	57,976	48,449	54,969	71,640	56,341	65,870	43,791	58,264
Hongkong "	26,251	82,229	44,173	40,831	37,460	30,973	46,277	58,605	62,415	48,533
Foreign Countries—										
Germany—Free Ports "	52,303	4,599	24,142	2,231	..	39,330	4,620	19,967	1,652	..
Holland "	1,006	..	1,250	..	..	1,250	..	1,050	..	..
Belgium "	59,898	8,404	4,745	4,485	8,803	44,066	6,829	3,746	3,270	6,689
France "	39,885	14,810	5,174	4,799	5,020	49,425	23,541	7,528	8,004	6,356
Austria Hungary—Free Ports "	238	..	..	..	..	585	..	..	..	..
Siam "	360	263	204	213	441	955	297	1,732	283	686
China (exclusive of Hongkong, etc.)	3,945	7,109	20,274	17,530	12,653	5,458	9,856	26,766	30,329	15,725
Japan "	6,007,974	8,118,215	9,375,085	8,614,698	8,151,482	39,52,364	48,77,472	53,93,509	46,39,729	42,33,262
TOTAL "	7,080,402	8,431,408	9,766,606	8,959,759	8,296,937	48,18,199	52,16,007	57,16,267	48,06,711	43,97,123

Foreign Imports—contd.

ARTICLES AND COUNTRIES FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909 10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910 11.
						Rs.	Rs.	Rs.	Rs.	Rs.
Thread for sewing—										
British Empire—										
United Kingdom . . . lbs.	33	103	108	470	243	623	1,321	1,722	1,948	1,867
Straits Settlements . . . "	337	154	127	153	235	1,661	1,019	934	955	1,763
Hongkong "	97	105	216	222	262	542	1,088	1,477	1,331	1,714
Foreign Countries "	..	40	13	4	11	..	105	107	29	23
TOTAL	617	462	462	849	791	2,831	3,534	4,240	4,263	5,071
Other sorts—										
British Empire—										
United Kingdom "	24	2,597	1,224	35,611	5,878	119	2,864	3,512	41,237	9,301
Straits Settlements . . . "	370	1,075	2	20	20	670	1,839	5	138	152
Foreign Countries—										
Germany—Free Ports . . . "	..	..	300	464	1,000	..	..	754	503	1,019
Other Countries "	..	3	..	56	87	..	5	1	128	300
TOTAL	394	3,675	1,526	36,151	6,985	789	4,708	4,272	42,066	10,772
TOTAL VALUE OF SILK . . . . .	..	..	..	..	..	54,48,330	70,91,210	88,71,030	68,38,618	61,84,566

ARTICLES AND COUNTRIES FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
						Rs.	Rs.	Rs.	Rs.	Rs.
TEXTILES—										
Silk—										
Raw—										
British Empire—										
Straits Settlements . . . lbs.	135,119	98,930	92,108	52,476	19,818	6,43,136	4,67,676	4,34,369	2,37,166	86,952
Hongkong "	100,975	118,703	56,751	26,617	2,304	6,54,603	8,29,951	3,97,514	1,38,373	16,962
Foreign Countries—										
Siam "	3,045	23,730	29,920	13,726	75,402	14,530	65,310	1,08,012	47,082	2,55,186
Indo-China, etc. . . . "	160	..	..	..	..	993	..	..	..	..
China (exclusive of Hongkong and Macao). "	152,190	302,458	272,259	33,932	128,842	9,43,777	17,16,602	14,39,227	5,02,822	6,62,240
Japan "	..	7,929	2,133	405	..	..	44,650	18,361	1,565	..
TOTAL	393,089	549,750	453,171	177,306	225,866	22,57,039	31,44,189	24,40,483	6,77,003	10,21,349
Waste—										
Foreign Countries—										
Japan . . . . . "	..	..	..	5	..	..	..	..	6	..
Silk yarn, noils and warps—										
British Empire—										
United Kingdom "	..	2	61	100	100	..	14	190	620	595
Foreign Countries—										
Germany "	2,200	2,500	4,200	..	..	3,799	6,231	12,809	..	..
Belgium "	2,200	4,500	5,644	..	..	5,053	12,566	13,168	..	..
Italy "	..	348	..	..	..	..	1,286	..	..	..
China (exclusive of Hongkong and Macao). "	..	..	..	50	..	..	..	..	275	..
TOTAL	4,400	7,350	9,805	150	100	3,852	20,157	31,167	895	595

Foreign Imports—contd.

ARTICLES AND COUNTRIES FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
Manufactures—						Rs.	Rs.	Rs.	Rs.	Rs.
Goods of silk mixed with other materials—										
British Empire—										
United Kingdom . Yds.	188,463	493,514	559,924	244,982	56,213	1,04,915	4,32,821	4,75,706	2,50,370	2,98,996
Straits Settlements . "	5,492	8,606	50,772	67,471	229,081	3,397	5,569	19,855	18,693	9,803
Hongkong . "	10,879	3,670	79,569	142,329	124,332	6,381	2,294	23,504	53,001	45,327
Natal . "	..	..	..	..	10	..	..	..	..	10
Foreign Countries—										
Germany . "	10,099	64,090	88,350	14,705	..	11,019	54,359	72,516	11,759	..
Holland . "	13,366	25,608	10,969	9,125	3,238	4,554	10,709	7,105	4,454	1,644
Belgium . "	50,271	3,765	65,193	2,155	..	40,169	2,075	57,751	1,221	..
France . "	1,653	1,797	3,705	1,618	..	1,632	3,257	2,976	2,176	..
Switzerland . "	..	..	1,707	..	..	..	..	3,046	..	..
China (exclusive of Hongkong and Macao). "	2,378	360	410	3,200	126	1,301	867	700	1,160	126
Japan . "	7,173	12,926	13,837	821	1,146	2,173	4,087	4,377	195	735
Other Countries . "	10	..	..	..	201	10	..	..	..	200
TOTAL . "	289,784	614,384	879,436	486,406	414,397	2,66,046	6,16,038	6,67,536	3,43,029	3,56,841
Silk piece-goods—										
British Empire—										
United Kingdom . "	65,890	43,100	47,556	92,614	30,550	47,424	34,966	42,560	90,314	31,523
Straits Settlements . "	32,785	36,228	65,404	39,156	88,191	42,356	43,078	59,586	30,593	81,564
Hongkong . "	59,660	100,040	117,910	73,272	103,768	76,943	1,13,350	1,09,632	1,07,694	1,93,934
Other British Possessions . "	..	498	..	..	173	..	389	..	..	172
Foreign Countries—										
Belgium . "	4,771	..	..	1,032	..	3,864	..	..	613	..
France . "	2,073	6,730	3,390	320	..	2,032	7,971	5,581	221	..
Switzerland . "	..	4,309	..	1,800	..	..	7,833	..	8,656	..
Austria-Hungary . "	1,651	..	..	..	..	1,471	..	..	..	..
Siam . "	..	713	1,525	205	483	..	700	1,731	257	1,114
China (exclusive of Hongkong and Macao). "	14,218	10,688	24,414	87,716	84,670	25,113	15,989	38,868	39,633	74,429
Japan . "	9,716,526	11,845,421	9,132,675	4,038,112	6,481,101	50,41,131	61,86,412	51,37,167	20,87,781	34,30,513
Other Countries . "	702	..	569	..	32	705	..	582	..	32
TOTAL . "	9,893,146	11,547,567	9,393,343	4,234,477	6,763,958	52,41,039	84,10,688	54,55,707	23,60,762	38,63,286
Thread for sewing—										
British Empire—										
United Kingdom . lbs.	59	312	148	109	305	1,102	2,929	2,023	1,494	4,418
Straits Settlements . "	68	71	4	13	25	409	110	44	71	163
Hongkong . "	188	89	64	270	68	1,187	1,086	455	1,200	474
Foreign Countries—										
Japan . "	26	..	3	30	35	276	4	16	52	130
TOTAL . "	341	472	219	412	433	2,974	4,129	2,539	2,907	5,139
Other sorts—										
British Empire—										
United Kingdom . "	13,140	13,975	5,014	410	467	16,645	31,144	12,331	3,400	2,709
Hongkong . "	7	1,620	777	213	36	40	2,991	2,125	1,256	345
Other British Possessions . "	5	365	94	139	50	20	381	369	523	451
Foreign Countries—										
Germany . "	693	500	60	..	..	1,332	592	271	..	..
France . "	40	97	29	..	..	1,626	3,425	363	..	..
Japan . "	41	4,353	2,139	748	441	421	37,712	36,930	11,093	7,563
United States of America.—										
Atlantic Coast . "	..	171	233	..	..	..	1,069	1,758	..	..
Other Countries . "	..	..	3	31	7	..	2	20	139	21
TOTAL . "	13,831	20,771	8,390	1,591	1,051	19,984	77,816	55,273	16,564	11,189
TOTAL VALUE OF SILK . "	..	..	..	..	..	77,95,984	1,01,73,017	86,52,705	37,61,156	62,53,439

Coasting Imports.

ARTICLES AND PORTS FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
INDIAN MERCHANDISE.										
SILK—										
Raw—										
Bengal—Calcutta . . . lbs.	2,382	4,194	4,489	22,248	21,290	12,415	28,860	31,280	2,10,987	2,05,770
Other Provinces . . . . .	..	075	..	1,072	..	..	2,025	..	5,415	..
Provincial ports	864	180	..	205	260	1,180	40	..	1,320	110
TOTAL	3,046	5,029	4,489	23,526	21,650	13,545	25,945	31,280	2,17,722	2,05,880
Manufactures—										
Piece-goods—										
Bengal—Calcutta Yds.	62,680	41,536	41,443	3,883	9,543	42,051	34,543	43,884	6,375	11,725
Eastern Bengal and Assam—Chittagong . . . . .	..	917	4,811	245	..	..	1,690	9,863	880	..
Bombay—Bombay	90,859	790	21,655	28,953	5,298	88,093	960	27,060	68,151	5,809
Madras—Madras	11,637	2,001	2,801	2,326	7,758	11,080	2,553	4,086	3,303	7,936
other ports	5,573	12,604	9,054	90	620	5,388	12,809	8,175	204	1,000
Provincial ports	251,543	249,211	215,713	219,039	251,185	5,21,315	5,44,267	4,94,804	4,58,722	5,22,660
Pondicherry	7	..	..	..	..	30	..	..	..	..
TOTAL	422,399	307,119	295,277	252,516	274,402	6,68,957	5,96,912	5,92,271	5,37,635	5,49,220
Goods of silk mixed with other materials—										
Bengal—Calcutta	30	2,405	6,104	981	..	40	1,267	2,532	1,173	..
Eastern Bengal and Assam—Chittagong . . . . .	..	1,807	18,370	4,050	..	..	2,911	13,007	2,800	..
Bombay—Bombay	32,919	15,840	..	..	..	35,485	9,810	..	..	..
Madras—Madras	101,611	86,327	67,921	59,783	55,552	59,069	30,477	44,791	30,009	43,412
other ports	9,772	13,143	7,119	2,732	11,772	8,500	11,284	3,924	6,710	6,656
Provincial ports	31,073	29,654	6,347	5,102	9,133	40,768	29,570	12,848	7,068	16,716
Pondicherry . . . . .	..	1,190	..	193	..	..	668	..	160	..
TOTAL	175,405	131,426	105,361	78,841	76,457	1,49,853	85,887	78,102	50,938	66,788
Other sorts—										
Bengal—Calcutta lbs.	17,480	26,909	24,738	2	..	1,69,950	2,56,519	2,45,598	5	..
Other provinces	106	353	1,212	40	2	830	1,042	2,809	1,200	16
Provincial ports	27	..	..	..	..	270	..	..	..	..
TOTAL	17,622	27,262	25,950	42	2	1,71,050	2,57,861	2,48,407	1,205	16

ARTICLES AND PORTS FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
INDIAN MERCHANDISE.										
SILK—										
Raw—										
Bengal—Calcutta . . . lbs.	18,568	21,957	12,608	6,030	..	1,80,616	1,98,094	1,17,637	68,070	..
Bombay—Bombay	600	6,388	..	..	5,667	1,600	13,358	..	..	23,758
Provincial ports	320	5,503	2,039	4,022	14,214	1,320	26,806	8,875	18,710	61,715
TOTAL	19,488	33,848	14,647	10,052	19,781	1,83,436	2,37,256	1,26,512	77,386	85,473
Manufactures—										
Piece-goods—										
Bengal—Calcutta Yds.	13,446	10,014	15,467	15,300	7,219	18,571	13,959	26,572	17,223	12,074
other ports . . . . .	..	..	..	..	10,751	..	..	..	..	3,568
Bombay—Bombay	319	..	..	2	4,317	492	..	..	6	4,183
Madras—Madras	640	38,956	1,368	800	400	1,151	36,732	2,939	1,000	300
other ports	1,728	770	997	..	..	3,218	828	725	..	..
Provincial ports	245,123	264,837	258,011	139,767	69,460	5,26,276	5,77,094	5,74,028	2,78,489	1,52,023
TOTAL	261,250	314,577	276,773	155,860	92,147	5,49,708	6,28,611	6,03,664	2,96,720	1,72,150
Goods of silk mixed with other materials—										
Bengal—Calcutta	5,330	7,144	1,093	417	1,720	1,028	6,916	1,122	466	1,526
other ports	1,390	..	..	20	570	1,000	..	..	10	340
Bombay—Bombay	1,470	876	152	..	812	1,470	320	133	..	1,016
Madras—Madras	24,235	19,710	24,857	23,398	23,294	15,415	13,327	18,985	14,185	20,282
other ports	4,948	1,547	638	..	120	2,526	1,166	584	..	150
Provincial ports	11,189	43,078	51,085	13,584	29,401	11,172	36,736	66,971	17,246	21,764
TOTAL	48,432	72,855	77,825	37,419	55,917	32,609	58,466	64,895	31,887	45,060
Other sorts—										
Bengal—Calcutta lbs.	110	116	67	1,214	1,230	382	228	300	3,000	12,020
Other provinces . . . . .	..	1,010	1,698	..	..	..	3,010	6,984	..	..
TOTAL	110	1,126	1,765	1,214	1,230	382	3,238	6,384	3,000	12,020

Coasting Imports—contd.

ARTICLES AND PORTS FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
FOREIGN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Provincial ports . . . lbs.	86,833	75,136	101,783	87,330	90,301	4,33,822	3,52,208	4,81,821	4,46,211	4,57,057
Bombay—Bombay . . . "	..	..	..	..	3,554	..	..	..	..	14,025
TOTAL . . . "	86,833	75,136	101,783	87,330	93,855	4,38,822	3,52,208	4,81,821	4,46,211	4,71,082
Manufactures—										
Piece-goods—										
Bengal—Calcutta . . . Yds.	6,108	12,949	22,092	6,820	6,062	9,015	17,231	23,137	7,373	6,031
Other provinces . . . "	4,714	492	3,684	419	1,745	4,012	761	2,058	974	3,894
Provincial ports . . . "	204,492	276,343	266,311	212,511	205,359	1,50,970	2,21,374	1,92,410	1,27,051	1,20,858
TOTAL . . . "	215,312	289,784	292,087	219,560	212,166	1,64,006	2,39,366	2,22,605	1,35,898	1,30,583
Goods of silk mixed with other materials—										
Provincial ports . . . "	118,897	140,708	98,597	42,563	25,540	69,855	87,225	68,828	27,568	14,338
Other provinces . . . "	17,699	9,659	6,209	4,020	2,460	11,348	7,872	6,097	2,780	3,090
TOTAL . . . "	136,596	150,367	104,806	46,583	28,000	81,203	95,097	74,925	30,348	17,428
Other sorts—										
Provincial ports . . . lbs.	375	18	298	46	..	1,142	45	567	92	..
Other provinces . . . "	18	449	..	754	449	54	1,268	..	2,341	1,586
TOTAL . . . "	393	467	298	800	449	1,196	1,208	567	2,433	1,586

ARTICLES AND PORTS FROM WHICH IMPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
FOREIGN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Bengal—Calcutta . . . lbs.	..	44	232	1,032	504	..	440	815	10,148	3,200
Bombay—Bombay . . . "	695	7,022	1,055	..	5,444	2,935	23,548	4,349	..	20,400
Provincial ports . . . "	89,050	119,096	119,950	87,119	14,530	4,55,038	5,74,477	5,47,175	2,28,905	60,555
TOTAL . . . "	89,745	126,102	121,236	88,161	20,523	4,57,973	5,98,465	5,52,330	3,39,051	84,155
Manufactures—										
Piece-goods—										
Bengal—Calcutta . . . Yds.	5,607	17,330	17,533	4,264	4,090	6,535	16,553	17,404	4,123	4,814
.. other ports . . . "	34	..	1,000	60	7,663	63	..	1,000	60	4,221
Other provinces . . . "	1,687	505	700	1,438	3,336	1,687	233	800	1,401	2,682
Provincial ports . . . "	161,350	261,775	367,432	109,000	233,962	92,732	1,57,023	2,25,662	63,406	1,20,133
TOTAL . . . "	168,678	269,610	386,770	114,762	249,015	1,01,022	1,74,759	2,44,856	68,995	1,31,160
Goods of silk mixed with other materials—										
Provincial ports . . . "	3,563	1,777	776	1,255	3,947	2,112	2,137	7,578	640	1,762
Other provinces . . . "	1,779	875	586	143	72	1,278	285	1,323	92	54
TOTAL . . . "	5,342	2,652	1,362	1,398	3,919	3,390	2,422	8,901	732	1,816
Other sorts—										
Provincial ports . . . lbs.	40	552	1,741	209	531	78	323	5,464	1,773	3,845
Other provinces . . . "	6	93	1,498	73	105	44	220	5,734	372	611
TOTAL . . . "	46	645	3,239	282	636	122	543	11,198	2,145	4,456

Foreign Exports.

ARTICLES AND COUNTRIES TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
INDIAN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Wild silk, tasar, munga, eria and others—										
Chassam or waste—										
British Empire—										
United Kingdom . . lbs.	7,119	6,045	7,834	4,191	..	6,498	5,873	7,160	4,018	..
Piece-goods—										
British Empire—										
United Kingdom . . Yds.	94	94	191	402	486	236	139	277	1,087	789
Straits Settlements . . "	5,025	1,045	..	..	160	3,504	980	..	..	400
Other British Possessions . . "	..	180	4	..	24	..	288	8	..	40
Foreign Countries . . "	..	..	20	145	576	..	..	100	775	1,800
TOTAL . . "	5,119	1,319	215	547	1,226	3,840	1,357	395	1,882	2,629
Goods of silk mixed with other materials—										
British Empire—										
Aden and Dependencies . Yds.	..	..	20	..	..	..	..	65	..	..
Straits Settlements . . "	8,987	3,777	..	..	..	8,320	4,300	..	..	..
TOTAL . . "	8,987	3,777	20	..	..	8,320	4,300	65	..	..

ARTICLES AND COUNTRIES TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
INDIAN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Mulberry silk, excluding tasar and other wild silks—										
Raw—										
Foreign Countries—										
China (exclusive of Hong-kong and Macao). lbs.	..	..	..	240	..	..	..	..	1,000	..
Wild silk, tasar, munga, eria and others—										
Raw—										
British Empire—										
Hongkong . . . . "	..	..	..	100	..	..	..	..	300	..
Chassam or waste—										
British Empire—										
United Kingdom "	5,758	23,222	24,543	21,763	9,603	5,702	21,481	22,059	24,501	12,229
Hongkong "	..	890	..	..	..	..	500	..	..	..
TOTAL "	5,758	29,211	24,543	21,763	9,603	5,702	21,981	22,059	24,501	12,229
Total of wild silk, tasar, munga, eria and others. "	5,758	29,211	24,543	21,863	9,603	5,702	21,981	22,059	24,801	12,229
Total of silk, raw "	5,758	29,211	24,543	22,103	9,603	5,702	21,981	22,059	25,801	12,229
Manufactures—										
Silk Piece-goods—										
British Empire Yds.	23	112	626	706	189	69	259	956	892	223
Foreign Countries "	..	40	..	..	354	..	62	..	..	196
TOTAL "	23	152	626	706	493	69	321	956	892	419
TOTAL VALUE OF SILK . . . . "	..	..	..	..	..	5,771	22,302	23,015	25,692	12,648

Foreign Exports—contd.

ARTICLES AND COUNTRIES TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
FOREIGN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
British Empire—										
United Kingdom . . . lbs.	..	..	..	1,905	10,959	..	..	..	1,827	10,467
Foreign Countries—										
Japan . . . . . "	..	..	267	..	..	..	..	850	..	..
TOTAL . . . . . "	..	..	267	1,905	10,959	..	..	850	1,827	10,467
Piece-goods—										
British Empire—										
United Kingdom . . . Yds.	147	91	272	199	65	310	73	668	338	115
Straits Settlements . . . "	10,654	9,006	3,730	..	82	9,102	7,754	2,870	..	130
Foreign Countries—										
France "	2,089	..	..	..	..	1,367	..	..	..	..
Japan "	9,292	1,205	..	..	..	14,045	2,603	..	..	..
Other Foreign Countries . . . "	240	475	300	240	285	230	530	890	200	615
TOTAL "	22,402	10,777	4,802	439	432	25,354	10,900	3,928	538	800
Goods of silk mixed with other materials—										
British Empire—										
Straits Settlements . . . "	5,210	1,860	1,258	..	570	3,300	2,060	1,413	..	420
Other sorts—										
British Empire lbs.	..	..	6	..	12	..	..	15	..	60
Foreign Countries—										
Japan . . . . . "	..	..	..	..	900	..	..	..	..	2,726
TOTAL . . . . . "	..	..	6	..	912	..	..	15	..	2,786

ARTICLES AND COUNTRIES TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
FOREIGN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
British Empire—										
United Kingdom . . . lbs.	10	133	..	..	..	15	908	..	..	..
Foreign Countries—										
China, etc. . . . . "	..	..	..	131	..	..	..	..	625	..
Egypt "	..	688	..	..	..	..	3,956	..	..	..
TOTAL "	10	821	..	131	..	15	4,924	..	625	..
Silk Yarns, noils and warps—(a)										
Foreign Countries—										
Japan "	..	3,200	2,000	..	..	..	3,750	6,847	..	..
Manufactures—										
Goods of silk mixed with other materials—										
British Empire—										
United Kingdom . . . Yds.	..	..	1,242	..	..	..	..	1,245	..	..
Straits Settlements . . . "	..	..	3,200	..	..	..	..	1,100	..	..
TOTAL . . . . . "	..	..	4,442	..	..	..	..	2,345	..	..
Silk Piece-goods—										
British Empire—										
United Kingdom "	32	24	446	..	88	90	124	1,467	..	220
Ceylon . . . . . "	..	..	555	480	..	..	..	1,005	650	..
Straits Settlements . . . "	301	1,047	1,045	..	..	325	896	867	..	..
Foreign Countries—										
Persia . . . . . "	..	..	..	..	154	..	..	..	..	75
TOTAL "	333	1,071	2,046	480	242	485	1,020	3,339	650	295
TOTAL VALUE OF SILK . . . Val.	..	..	..	..	..	500	2,743	12,531	1,275	225

(a) Separately recorded from 1914.

Coasting Exports.

ARTICLES AND PORTS TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
FOREIGN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Bombay—Bombay . . . lbs.	..	..	..	2,508	5,812	..	..	..	7,749	27,128
Provincial ports . . . "	87,778	73,936	101,002	88,710	92,922	4,27,226	3,41,573	4,04,700	4,06,867	4,29,851
TOTAL . . . "	87,778	73,936	101,002	91,278	98,834	4,27,226	3,41,573	4,04,700	4,14,616	4,17,979
Manufactures—										
Piece-goods—										
Provincial ports . . . Yds.	135,098	95,124	148,300	181,894	222,128	77,881	60,711	78,406	96,477	1,23,271
Other Provinces . . . "	2,938	1,728	5,610	435	2,155	2,684	2,765	5,530	477	8,710
TOTAL . . . "	138,036	96,852	153,910	182,329	224,283	80,565	63,476	83,936	96,954	1,31,981
Goods of silk mixed with other materials—										
Provincial ports . . . Yds.	110,591	76,880	46,558	31,205	16,557	62,528	47,384	24,526	17,285	6,584
Other provinces . . . "	200	..	2,200	..	400	200	..	1,400	..	400
TOTAL . . . "	110,591	76,880	42,758	31,205	16,957	62,728	47,384	25,926	17,285	6,984
Other sorts—										
Bombay—Bombay . . . lbs.	..	112	667	..	..	..	760	3,385	..	..
Provincial ports . . . "	..	12	30	291	..	..	25	50	110	..
TOTAL . . . "	..	124	697	291	..	..	725	3,435	110	..

ARTICLES AND PORTS TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
FOREIGN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Other provinces . . . lbs.	491	104	1,970	..	127	1,950	1,173	9,501	..	850
Provincial ports . . . "	92,531	117,780	118,027	61,420	14,580	4,27,397	5,28,270	5,04,120	2,26,280	56,060
TOTAL . . . "	93,022	117,884	119,997	61,420	14,707	4,29,347	5,29,443	5,13,621	2,26,280	56,710
Manufactures—										
Piece-goods—										
Bengal—Calcutta . . . Yds.	9,320	182	1,125	..	46,823	6,875	239	626	..	47,721
.. other ports . . . "	500	..	747	797	1,000	500	..	1,519	758	250
Provincial ports . . . "	203,841	149,544	180,044	62,665	150,045	1,00,191	74,171	67,163	28,540	66,210
Other provinces . . . "	1,485	4,215	645	1,960	485	1,475	3,325	817	686	852
TOTAL . . . "	215,146	153,941	183,461	65,442	198,308	1,09,041	77,735	70,124	29,984	1,13,813
Goods of silk mixed with other materials—										
Provincial ports . . . Yds.	4,922	703	1,621	1,139	3,807	2,725	812	1,711	490	1,607
Other provinces . . . "	4,000	2,400	..	326	..	2,825	1,370	..	222	..
TOTAL . . . "	8,922	3,103	1,621	1,465	3,807	5,550	2,182	1,711	712	1,607
Other sorts—										
Provincial ports . . . lbs.	..	454	688	210	124	..	567	420	997	1,125
Other provinces . . . "	60	250	..	..	..	400	1,800	..	..	..
TOTAL . . . "	60	704	688	210	124	400	2,367	420	997	1,125

Coasting Exports—contd.

ARTICLES AND PORTS TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.	1906-07.	1907-08.	1908-09.	1909-10.	1910-11.
INDIAN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Bengal—Calcutta . . . lbs.	..	..	104	..	205	..	..	600	..	2,000
Provincial ports . . . "	365	87	112	455	520	600	20	500	2,100	3,350
TOTAL . . .	365	87	276	455	725	600	20	1,100	2,100	3,350
Manufactures—										
Piece-goods—										
Provincial ports . . . Yds.	244,784	260,857	240,485	213,755	256,916	5,30,611	5,30,729	5,05,547	4,31,972	4,96,559
Other provinces . . . "	160	2,941	157	6,334	100	300	2,315	322	2,981	60
TOTAL . . .	244,944	263,798	240,642	220,089	257,016	5,30,911	5,33,044	5,05,869	4,34,953	4,96,619
Goods of silk mixed with other materials—										
Provincial ports . . . Yds.	45,815	25,750	12,043	21,476	6,681	29,938	26,171	11,528	26,291	6,579
Other provinces . . . "	1,818	504	..	..	48	1,506	360	..	..	35
TOTAL . . .	47,431	26,254	12,043	21,476	6,729	31,438	26,531	11,528	26,291	6,612
Other sorts—										
Bengal—Calcutta . . . lbs.	44	48	..	..	..	440	600	..	..	..
Madras—other ports . . . "	112	..	..	..	..	350	..	..	..	..
TOTAL . . .	156	48	..	..	..	790	600	..	..	..

ARTICLES AND PORTS TO WHICH EXPORTED.	PROVINCE OF BURMA.									
	QUANTITY.					VALUE.				
	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.
INDIAN MERCHANDISE.						Rs.	Rs.	Rs.	Rs.	Rs.
SILK—										
Raw—										
Provincial ports . . . lbs.	54	..	..	1,143	14,224	200	..	..	5,509	56,105
Other provinces . . . "	48	..	..	869	..	100	..	..	2,700	..
TOTAL . . .	97	..	..	2,011	14,224	300	..	..	8,209	56,105
Manufactures—										
Piece-goods—										
Provincial ports . . . Yds.	256,188	264,521	321,949	147,403	68,821	5,20,782	5,65,774	5,67,365	2,63,548	1,38,486
Other provinces . . . "	..	365	2,084	19,190	1,550	..	312	1,855	6,590	1,808
TOTAL . . .	256,188	264,886	324,033	166,683	70,371	5,20,782	5,66,086	5,69,220	2,69,138	1,40,294
Goods of silk mixed with other materials—										
Provincial ports . . . Yds.	13,369	13,105	10,333	9,359	15,624	14,069	13,661	10,639	11,009	8,352
Other provinces . . . "	..	8	297	..	..	..	10	270	..	..
TOTAL . . .	13,369	13,113	10,630	9,359	15,624	14,069	13,671	10,709	11,009	8,352
Other sorts—										
Provincial ports . . . lbs.	..	..	103	..	..	..	..	30	..	..

APPENDIX XVI.

CENTRAL PROVINCES AND BERAR.

Imports.

Articles.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Silk, raw	4,222	2,945	3,885	3,731	3,603	4,211	4,515
Silk, piece-goods	10	40	215	29	126	95	45

Exports.

Articles.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Silk, raw	330	529	231	146	185	262	235
Silk, piece-goods . . . . .	..	..	..	..	25	2	2

Values adopted are :—

	Rs.
Foreign Raw Silk	320 per maund of 82½ lbs.
Indian " "	520 " "
Foreign Piece-goods	410 " "
Indian "	990 " "

CENTRAL PROVINCES AND BERAR.

1910.

IMPORTS.

Articles and whence Imported.	To Jubbulpore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chattisgarh Block.	To Berar Block.	To Satpura Block.	TOTAL.	
								Weight.	Value.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
RAW SILK.									
(1) Foreign—									
Bombay Port	13½	..	8½	..	..	..	..	10½	3,525
(2) Indian—									
Bengal	16½	..	..	372½	2,519½	..	1½	2,910½	11,28,571
Other British Provinces	6	..	..	5½	12½	..	..	24½	8,178
TOTAL	22½	..	..	378½	2,532½	..	1½	2,935½	11,31,749
GRAND TOTAL	24½	..	8½	378½	2,532½	..	1½	2,945½	11,35,274

CENTRAL PROVINCES AND BERAR.

1910—contd.

IMPORTS—contd.

Articles and whence Imported.	To Jubbulpore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chhattisgarh Block.	To Berar Block.	To Satpura Block.	TOTAL.	
								Weight.	Value.
SILK PIECE-GOODS.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
(1) Foreign—									
Bombay Port . . . . .	..	..	12½	..	..	..	..	12½	4,195
(2) Indian—									
British Provinces	2	..	..	..	14½	..	..	16½	13,138
Bombay Port . . . . .	..	..	..	..	10½	..	..	10½	7,812
TOTAL	2	..	..	..	25½	..	..	27½	20,960
GRAND TOTAL	2	..	12½	..	25½	..	..	39½	25,145

EXPORTS.

SILK RAW.									
(1) Foreign . . . . .	..	..	..	..	..	..	..	..	..
(2) Indian—									
Bengal . . . . .	..	..	..	14	510½	..	..	524½	2,72,857
United Provinces of Agra and Oudh.	..	..	..	..	4	..	..	4	2,050
Rajputana and Central India.	..	..	..	½	..	..	..	½	312
TOTAL . . . . .	..	..	..	14½	514½	..	..	529½	2,75,249
Silk piece-goods . . . . .	..	..	..	..	..	..	..	..	..

CENTRAL PROVINCES AND BERAR.

1911.

IMPORTS.

Articles and whence Imported.	To Jubbulpore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chhattisgarh Block.	To Berar Block.	To Satpura Block.	TOTAL.	
								Weight.	Value.
SILK RAW.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
(1) Foreign—									
Bombay Port	4½	..	58½	8½	..	11½	..	78½	26,350
Calcutta Port . . . . .	..	½	..	..	..	..	..	½	149
TOTAL	4½	½	58½	8½	..	11½	..	79½	26,605
(2) Indian—									
Bengal . . . . .	..	..	..	129½	3,658½	..	..	3,782½	26,505
Other British Provinces	6	..	..	8	2½	..	..	16½	5,057
Rajputana and Central India.	..	..	..	..	2	..	..	2	1,040
Calcutta Port . . . . .	..	..	..	5½	..	..	..	5½	2,043
TOTAL	6	..	..	142½	3,658½	..	..	3,805½	14,67,327
GRAND TOTAL	9½	½	58½	145½	3,658½	11½	..	3,884½	14,93,842
SILK PIECE-GOODS.									
(1) Foreign—									
Bombay Port . . . . .	..	138½	4½	..	..	..	..	138½	45,302
(2) Indian—									
Bengal . . . . .	..	..	..	..	77½	..	..	77½	1,25,263
TOTAL . . . . .	..	138½	4½	..	77½	..	..	215½	1,71,165

CENTRAL PROVINCES AND BERAR.

1911—contd.

EXPORTS.

Articles and whence Imported.	To Jubbulpore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chhattisgarh Block.	To Berar Block.	To Satpura Block.	TOTAL.	
								Weight.	Value.
SILK RAW.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
(1) Foreign—									
Bombay Port . . . . .	..	..	..	1½	1½	..	..	1½	440
(2) Indian—									
Bengal	½	..	..	..	227	..	..	227½	1,16,430
Rajputana and Central India.	2	..	..	..	..	..	..	2	1,040
TOTAL	2½	..	..	..	227	..	..	229½	1,19,470
GRAND TOTAL	2½	..	..	1½	227½	..	..	231½	1,19,910
SILK PIECE-GOODS.									
(1) Foreign . . . . .	..	..	..	..	..	..	..	..	..
(2) Indian—									
Bombay Port . . . . .	..	..	..	½	..	..	..	½	509
TOTAL	..	..	..	½	..	..	..	½	509

CENTRAL PROVINCES AND BERAR.

1913.

IMPORTS.

Articles and whence Imported.	To Jubbulpore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chhattisgarh Block.	To Berar Block.	To Satpura Block.	TOTAL.	
								Weight.	Value.
SILK RAW.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
(1) Foreign—									
Bombay Port . . . . .	..	3½	04½	8	..	13½	..	89½	56,568
(2) Indian—									
Bengal	3	..	..	13½	18½	..	..	34½	22,818
Bihar and Orissa . . . . .	..	..	..	184½	3,300½	..	..	3,484½	22,28,018
United Provinces of Agra and Oudh.	2	..	..	..	107½	..	..	109½	43,810
Bombay Port . . . . .	..	14½	..	2½	..	..	..	17½	6,834
TOTAL	5	14½	..	150	3,426½	..	..	3,595½	22,98,781
GRAND TOTAL	5	18	04½	158	3,426½	13½	..	3,684½	23,35,340

EXPORTS.

SILK, RAW.									
(1) Foreign—									
Bombay Port . . . . .	..	..	..	½	..	..	..	½	812
(2) Indian—									
Bihar and Orissa . . . . .	..	..	..	1½	192½	..	..	194½	1,00,776
Other British Provinces . . . . .	..	..	1	..	½	..	..	1½	910
Rajputana and Central India.	..	..	..	..	7½	..	..	7½	3,770
Bombay Port . . . . .	..	..	..	3½	..	..	..	3½	1,989
TOTAL	..	..	1	4½	200½	..	..	206½	1,07,445
GRAND TOTAL	..	..	1	5½	200½	..	..	207½	1,07,757

CENTRAL PROVINCES AND BERAË.

1914.

IMPORTS.

Articles and whence imported.	To Jabbul-pore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chhattis-garh Block.	To Berar Block.	To Satpura Block.	TOTAL.	
								Weight.	Value.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
SILK, RAW.									
(1) Foreign—									
Bombay Port	1½	..	32½	24½	..	97½	..	156½	64,380
(2) Indian—									
Bombay . . . . .	..	..	..	..	..	2½	..	2½	787
Bengal	6½	..	..	21½	1	..	..	28½	18,684
Bihar and Orissa . . . . .	..	..	..	800½	3,665½	..	..	3,905½	25,82,713
United Provinces of Agra and Oudh.	2	..	..	23½	..	..	..	25½	10,290
Bombay Port . . . . .	..	..	..	82½	..	..	..	82½	11,772
TOTAL	8½	..	..	377½	3,666½	2½	..	4,065½	25,26,246
GRAND TOTAL	8½	..	32½	402½	3,666½	99½	..	4,211½	25,58,626
SILK PIECE-GOODS.									
(1) Foreign—									
Bombay Port . . . . .	..	..	10½	7½	..	46½	..	66½	21,471
(2) Indian—									
British Provinces . . . . .	..	..	1½	2½	..	..	..	4½	2,616
Bombay Port . . . . .	..	..	..	24½	..	..	..	24½	17,298
TOTAL . . . . .	..	..	1½	26½	..	..	..	28½	19,914
GRAND TOTAL . . . . .	..	..	12½	33½	..	49½	..	94½	41,385

EXPORTS.

SILK, RAW.									
(1) Foreign—									
Bombay Port . . . . .	..	..	..	2½	..	..	..	2½	728
(2) Indian—									
Bihar and Orissa . . . . .	..	..	..	18½	175½	..	..	193½	1,06,484
Other British Provinces	9	..	1	..	4½	..	..	14½	7,462
Bombay Port . . . . .	..	..	..	52½	..	..	..	52½	27,002
TOTAL	9	..	1	70½	179½	..	..	259½	1,35,018
GRAND TOTAL	9	..	1	72½	179½	..	..	261½	1,35,740
SILK PIECE-GOODS.									
(1) Foreign									
Bombay Port . . . . .	..	..	..	..	..	..	..	..	..
(2) Indian—									
Bombay Port . . . . .	..	..	..	2½	..	..	..	2½	2,425

CENTRAL PROVINCES AND BERAR.

1915.

IMPORTS.

Articles and whence Imported.	To Jubbulpore Block.	To Nerbudda Block.	To Nimar Block.	To Nagpur Block.	To Chhattisgarh Block.	To Berar Block.	To Raipura Block.	TOTAL.	
								Weight.	Value.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
SILK, RAW.									
(1) Foreign—									
Bombay Port . . . . .	..	..	63½	13½	..	20½	..	103½	41,712
(2) Indian—									
Bengal	4½	..	..	..	..	..	..	4½	2,016
Bihar and Orissa	82	..	..	66½	4,177½	..	..	4,320½	81,44,114
United Provinces of Agra and Oudh. . . . .	..	..	..	50½	12½	..	..	63½	25,250
Rajputana and Central India.	11	..	..	..	..	..	..	11	5,720
Bombay Port . . . . .	..	..	..	3½	2½	..	..	6½	2,384
TOTAL	97½	..	..	120½	4,194	..	..	4,411½	31,80,394
GRAND TOTAL	97½	..	63½	133½	4,194	26½	..	4,515½	32,22,106
SILK PIECE-GOODS.									
(1) Foreign—									
Bombay Port . . . . .	..	..	1½	4½	..	..	..	5½	2,018
(2) Indian—									
Bengal . . . . .	..	..	..	9½	..	..	..	9½	10,568
Bihar and Orissa . . . . .	..	..	..	7½	20½	..	..	28½	32,486
United Provinces of Agra and Oudh. . . . .	..	..	..	2½	..	..	..	2½	1,708
TOTAL . . . . .	..	..	..	18½	20½	..	..	39½	44,762
GRAND TOTAL . . . . .	..	..	1½	22½	20½	..	..	45½	46,776

EXPORTS.

SILK, RAW.									
(1) Foreign . . . . .	..	..	..	..	..	..	..	..	..
(2) Indian—									
Bihar and Orissa . . . . .	..	..	..	36½	181½	..	..	220½	1,14,478
Other British Provinces . . . . .	..	..	½	8½	½	..	..	9½	5,187
Bombay Port . . . . .	..	..	..	5½	..	..	..	5½	3,003
TOTAL . . . . .	..	..	½	52½	182½	..	..	235½	1,22,668
SILK PIECE-GOODS.									
(1) Foreign . . . . .	..	..	..	..	..	..	..	..	..
(2) Indian—									
Bihar and Orissa . . . . .	..	..	..	..	2	..	..	2	1,980

APPENDIX XVII.

Madras Weaving Centres (Thurston, Monograph of silk fabrics, 1899).

- Ganjam—
 Berhampur—330 weavers, 88 looms, partly tasar; now 256 looms, 80 for simple borders, 12 for ornamental cloths, 164 for plain fabrics.
- Godavari—
 Amalpur taluk—20 weavers.
 Peddapur Taluk—5 weavers, tasar is obtained in the west.
- Bellary—
 Adoni—7,000 looms
 Hospet—320 looms
 Hodagalli—1,175 looms } mostly cotton: some silk borders.
- Kistna—
 Jaggayapeta—28 looms.
- Kurnool—
 747 looms, 1,490 weavers.
- Anantapur—
 Gooty—400 looms.
 Tadpatri—320 looms.
 Dharmavaram—200 looms.
- Madras City—
 720 looms, 1,100 weavers—None at present.
- Chingleput—
 Conjeeveram—5,270 looms, 16,500 weavers—9,545 silk spinners and weavers now.
- North Arcot—
 1,621 looms, 4,080 weavers.
- South Arcot—
 Chidambaram—200 looms, 10,000 weavers.
- Trichinopoly—
 1,500 looms, 2,500 weavers—Mixed and silk goods.
- Tanjore—
 Tanjore—1,200 looms, 1,800 weavers
 Mannargudi—30 looms, 35 weavers
 Negapatam—629 looms, 1,370 weavers
 Kumbakonam—6,300 looms, 4,225 weavers
 Mayavaram—1,547 looms, 4,020 weavers } now 18,000 silk looms, 22,244 silk spinners and weavers.
- Madura—
 Madura town—2,000 looms, 1,500 weavers now 7,820 looms, 4,778 on silk and cotton 299 on pure silk.
 Dindigul—300 looms, 600 weavers.—760 silk looms now.
 Paramakudi—700 looms, 2,100 weavers.
 Ramnad—20 looms—14,000 looms in the whole district.
- Salem—
 Atur—519 looms, 3,299 weavers.
 Salem—10 looms, 30 weavers.
 Hosur—460 looms.
 Dharmapuri—84 looms, 145 weavers.
 Trichengodu—200 looms, 250 weavers.
- Coimbatore—
 Kollegal—1,000 looms, 1,000 weavers.

The figures for the 1911 Census are reprinted below in Appendix X but are not reliable.

APPENDIX XVIII.**SILK INSTITUTE.****ESTABLISHMENT.**

- 1 Director.
- 1 Assistant Director.
- 1 Head Clerk.
- 4 Clerks.
- 2 Typists.
- 2 Cashiers.
- 2 Store-keepers.
- 8 Peons.
- 1 Chowkidar.
- 1 Sweeper.
- 1 European Trade Organiser.
- 1 Weaving Assistant.
- 2 Trade Assistants.
- 1 Twisting and warping Assistant.
- 1 Co-operative Credit Assistant.
- 1 Eri Assistant.
- 1 Wild Silk Assistant.
- 1 Artist.
- 1 Dyeing Assistant.
- 1 Finishing Assistant.
- 1 Raw Silk Assistant.
- 1 Reeling Master.
- 2 Fieldmen.
- 1 Mechanic.
- 1 Apprentice artist.
- 5 Dhobies.
- Temporary Staff (Rs. 1,200.)

Rearing.

- 1 Hybridising Assistant.
- 1 Rearing Assistant.
- 1 Reeling Assistant.
- 4 Fieldmen.
- 1 Mechanic.
- 1 Clerk and Store-keeper.
- 2 Peons.
- 1 Chowkidar .
- Total cost Rs. (99,538.)

Industrial Institute.

	EXPENDITURE.	
	Non-recurring.	Recurring.
Model—	Ra.	Rs.
Reeling Factory	1,000	..
Re-reeling Factory	1,000	..
Dye-house 20' x 20' (pans, etc.)	1,000	..
Weaving Shed 100' x 20'	2,000	..
Twisting Shed 50' x 20'	1,000	..
Warping Shed 100' x 20'	1,000	..
Experimental weaving shed 100' x 20'	2,000	..
Godown and fittings 50' x 20'	2,000	..
Office, Library, Testing Room	20,000	..
Studio, store and Fabric Room	10,000	..
Workshop for mechanics	500	..
Finishing shed with fittings 20' x 20'	2,000	..
10 acres of land	5,000	200
Fencing and laying out	1,000	..
12 Model Rearing houses	1,200	500
Well	3,000	..
Equipment	10,000	1,000
Fuel . . . . .	..	1,000
Furniture and Fittings	5,000	1,000
TOTAL	68,700	3,700

Rearing and Seed Supply.

	Non-recurring.	Recurring.
	Ra.	Rs.
50 acres of land (Rent) . . . . .	..	250
Fencing	2,000	..
Hybridising house with water laid on	5,000	..
Tank, iron on trestle	1,000	..
12 Model Rearing Houses and trays, etc.	1,200	..
Model Reeling Factory	1,000	..
Experimental Reeling Factory	3,000	..
Model re-reeling shed	1,000	..
Well	3,000	..
Four pairs bullocks	800	..
Cattle food . . . . .	..	500
Pumping Machinery	2,000	..
Total carried over	20,000	750

Rearing and Seed Supply—conold.

	Non-recurring.	Recurring.
	Rs. 20,000	Rs. 750
Total brought forward		
Cultivation . . . . .	..	750
Machinery upkeep . . . . .	..	200
Fuel . . . . .	..	1,000
Contingencies . . . . .	..	300
Refrigerating plant	25,000	4,800
Labour . . . . .	..	1,500
TOTAL	45,000	9,300

General Expenditure.

	Non-recurring.	Recurring.
	Rs.	Rs.
Raw Materials	10,000	2,000
Samples	10,000	20,000
Samples for export . . . . .	..	2,000
Experiment Grants . . . . .	..	10,000
Advertising . . . . .	..	2,000
Office expenses . . . . .	..	2,000
Travelling Allowance—		
Director . . . . .	..	5,000
Assistant Director . . . . .	..	2,000
11 Assistants . . . . .	..	11,000
6 Fieldmen . . . . .	..	3,000
Punkahs and Lights . . . . .	..	2,000
Labour . . . . .	..	5,000
Books and periodicals . . . . .	..	500
Technical Advice (London, Paris, etc.) . . . . .	..	3,000
Capital for—		
model factories	1,00,000	..
trading purposes	2,00,000	..
TOTAL	3,20,000	69,500
Quarters for staff	?	?
Quarters for menials	?	?
Quarters for students	?	?
Establishment . . . . .	..	99,538
Industrial Institute	68,700	3,700
Rearing and seed supply	45,000	9,300
General Expenditure	3,20,000	69,500
TOTAL	4,33,700	1,82,038

APPENDIX XIX.

Order of the Austrian Minister of Commerce, dated June 24, 1904, concerning the subsidy granted to the silk reelers in Southern Tyrol and in the territory of Görz and Gradiska.

Considering the unfavourable economic conditions of silk spinning in Southern Tyrol and in the districts of Görz and Gradiska and with a view to improving the position of the women employed in this industry this Ministry, in concert with the Ministries of the Interior and of Finance, conditional on the constitutional approval of the necessary funds devotes the sum of 150,000 kronen* per annum for five years, for the granting of subsidies.

The conditions under which these subsidies will be granted to individual spinneries are contained in the following articles and may be modified subsequently if found necessary.

Article 1.

The subsidies will be granted according to the number of basins at work, at the rate of 12.5 cents,† for every basin and for every quarter of a day's work up to a yearly maximum amount of 120 kronen per basin.

In granting these subsidies, other conditions being equal, preference will be given to those basins tended by women belonging to the same silk district.

As the whole subsidy may not exceed 150,000 fr., if applications by reelers entitled to receive subsidies should be so numerous as not to allow all of them being granted, preference will be given to those which were recently working.

Reelers in receipt of subsidies are bound for the whole season of production to conform to the present regulations, also in the event of their output being above the quantity which entitles them to the maximum yearly subsidy.

Article 2.

Only those factories which conform to the provisions of the industrial regulations and are in a condition to work in all seasons may claim subsidies.

Article 3.

Only basins heated by steam and provided with mechanical reels constructed for reeling four or more threads and assisted by stirrers may be subsidized.

Article 4.

Basins constructed for spinning four or more threads will be subsidized even if they spin less than four threads, provided the weight per unit length spun be above 16 *denari* (one *denaro* corresponds to 0.05 grams per length of 450 metres).

Article 5.

Every subsidized basin must be served by a woman who must not be employed at another basin.

Article 6.

The subsidy will be granted only to those basins which work at least 150 whole days per annum during the first three years and at least 180 whole days in the following years.

* Kronen - 10 pence.

† Cent - $\frac{1}{4}$ of a penny.

The industrial year will begin on June 1 and end on May 31 of the following year.

Basins which start work in the course of the season may also apply for subsidy for the time up to the beginning of the next season provided they work at least for a period equal to half the number of work days in this period.

Article 7.

Reelers in receipt of subsidies engage to adopt the following minimum scale of wages:—

- (a) Head reelers, 10 cents. per hour.
- (b) Sub-headed reelers 9 cents. per hour.
- (c) Experienced stirrers and apprentice reelers 8 cents. per hour.
- (d) Young stirrers 7 cents. per hour.
- (e) Apprentices during the first year 6 cents. per hour.
- (f) Beginners during the first six months 5 cents. per hour.

As a rule no workwoman may remain more than one year in any of the four lower classes *b—e*.

Reelers must keep to the maximum of 11 hours work per day as fixed by the industrial regulations for factory work; they have no right to avail themselves of the provisions of the Ministerial despatch No. 16175 of May 23, 1886, according to which reelers are allowed, on special request, to work 13 hours a day for a period up to 8 months.

Article 8.

Reelers who apply for a subsidy must state in their applications to the proper industrial authorities the number of basins which will be worked; and the approximate number of women employed; they must also send in a copy of the regulations of their factory. The said authorities, who may meanwhile consult trustworthy and competent persons, will then forward, through the provincial political authorities, their proposals to the Ministry of Commerce. The decision of the latter is sent directly to the industrial authorities and notice of it is forwarded to the provincial political authorities.

Article 9.

Reelers who have presented their application for a subsidy must inform the industrial authorities as early as possible of the date on which they will begin to work and they must notify them also of every suspension or interruption of work, Sundays and holidays excepted. Such notice must possibly be sent in advance, and at latest within 24 hours.

Article 10.

For the purpose of surveillance every factory must keep the following books:—

- (a) A daybook showing—
 - the numbers of basins in daily use,
 - the output of each basin per day expressed in whole days or in quarters of a day,
 - the quantity of cocoons consumed by each basin and of the reeled silk, also its weight per unit length (titolo).

The reelers are free to add further data as they may consider opportune for their factories.

- (b) A register of the wages compiled exactly in accordance with the Form A.

(c) A pay book for each workwoman, kept in accordance with Form B.

(d) A register for the inscription of the result of the inspection by the official charged with the inspection of the factory.

The payment of the wages of the workwomen to be made every 14 days.

At the beginning of each fortnight the workwomen shall deposit their pay books with the reeler.

Workwomen not complying with the last-mentioned conditions are not to be allowed to a work. The output of work of each workwoman during the fortnight (including quarter days) shall be registered in the pay book and the books shall be returned to the workwoman at the end of each fortnight with the calculated quantity of wages entered and at the same time payment shall be made for the said period.

All books including registers relating to the work of reeling except commercial books, shall be presented on request to the authority charged with the inspection, which shall have free access to the workrooms at any time.

Not later than the 5th of each month, there shall be consigned to the industrial authority a report of the basins in use each day during the preceding month.

Article 11.

The officials charged with carrying out the provisions of this ordinance shall be presented to the reelers by the industrial authorities.

Article 12.

The awarding of the bounties will take place at the end of each six-working months.

The reelers having the right to the bounties shall present through the channel of the industrial authority concerned an application provided with proper documents, with the name of the office at which payment is to be made, and drawn up so as to obtain settlement of the subsidy. The industrial authority on the basis of the monthly reports (Article 10, last paragraph) and the revisions made on the spot, shall fix the corresponding amounts of subsidy and, after again consulting with reliable persons competent in the matter, eventually consign the application with relative proposals, through the provincial political authority to the Ministry of Commerce.

The award of the bounties by the Ministry of Commerce is made through the channel of the provincial political authority.

Article 13.

In case of abuse of any of the provisions of this law the subsidies shall be temporarily or absolutely suspended, and the offenders shall be liable to the consequences of the common law. These provisions shall come into force immediately.

IV.

Decree of the Imperial and Royal Ministry of Commerce modifying Article 1 of the provisions of June 24, 1904, concerning the subsidies to Silk Reelers of the Southern Tyrol, Görz and Gradiska.

In agreement with the Ministry of the Interior and Finance the provisions of paragraph 1 of Article 1 of the decree of June 24, 1904, concerning the subsidies to silk reelers of Southern Tyrol, Görz and Gradiska are modified as follows:—

(1st paragraph of Article 1.)

The subsidies shall be granted on the basis of the number of basins at work and at the rate of 11·5 hellers* for every basin and for every quarter of a day's work up to a maximum of 135 fr. for every basin.

* Heller = $\frac{1}{10}$ of a penny.

This provision will be considered as having come into force on June 1, 1905.

Loi relative aux encouragements spéciaux à donner à la sériciculture et à la filature de la soie. (Loi du 11 juin 1909.)

Le Sénat et la Chambre des Députés ont adopté.

Le Président de la République promulgue la loi dont la teneur suit :

Article 1.

A partir du 31 mai 1909, jusqu'au 31 décembre 1929, il sera alloué aux sériciculteurs une prime de soixante centimes (0 fr. 60) par kilogramme de cocons frais, qu'ils soient destinés à la filature ou au grainage.

Article 2.

Dans chacun des départements séricicoles, il sera institué, par les soins du préfet, une commission de contrôle des primes à la sériciculture.

Pour faciliter le contrôle de cette commission, les emballages immédiats contenant des graines de vers à soie devront, au moment de la vente et de la mise en vente, porter sur une banderole de fermeture, en caractères connus et apparents, le nom et l'adresse soit du producteur, soit du vendeur ainsi que l'indication, exprimée en grammes, du poids net des graines de vers à soie qu'ils contiennent avec une tolérance maximum de cinq pour cent.

Un décret rendu sur le rapport du Ministre de l'Agriculture et contresigné par le Ministre des Finances déterminera les conditions d'organisation et de fonctionnement de la commission ci-dessus prévue, ainsi que les conditions d'application de la présente loi en ce qui concerne la sériciculture.

Article 3.

Quiconque aura contrevenu aux dispositions de l'article précédent ou se sera rendu coupable d'une tentative de fraude pour l'obtention de primes à la sériciculture sera passible des peines portées à l'article 471 du Code pénal.

Quiconque se sera rendu coupable d'une fraude pour l'obtention des primes à la sériciculture sera passible des peines portées aux articles 1 et 7 de la loi du 1^{er} août 1905, sans préjudice de la restitution de la prime indûment perçue.

L'article 463 du Code pénal et la loi du 26 mars 1891, sont applicables à la présente disposition.

Article 4.

A partir du 1^{er} juin 1909, jusqu'au 31 mai 1929, il sera alloué aux filateurs de soie, proportionnellement au travail annuel de la bassine, une prime de quatre cents francs (400 fr.) par bassine filant à plus de trois bouts, et une prime de deux cents francs (200 fr.) par bassine même à un bout, pour les filatures de cocons doubles.

Auront droit à la prime de 400 francs les bassines accessoires servant à la préparation de la bassine fileuse.

1. Dans les usines travaillant à plus de trois bouts et à moins de six bouts, à raison d'une bassine accessoire par trois bassines fileuses;
2. Dans les usines travaillant à plus de cinq bouts, à raison d'une bassine accessoire par deux bassines fileuses.

En outre, dans les usines travaillant à plus de cinq bouts, il sera alloué, proportionnellement au travail annuel, une prime de quatre cents francs (400

fr.) pour chaque service de noueuses ou rattacheuses desservant six bassines fileuses.

Toutefois, le montant des primes, liquidées trimestriellement à chaque filateur, ne pourra excéder, par kilogramme de soie filée dans l'ensemble de ses usines, six francs cinquante centimes (6 fr. 50) pendant les quatre premières années d'application de la loi; six francs (6 fr.) pendant les huit années suivantes et cinq francs cinquante centimes (5 fr. 50) pendant les huit dernières années d'application de la loi.

Sur le total des primes versées aux filateurs de soie, il sera prélevé six pour cent (6 pour cent) pour la constitution d'un fonds de secours et de maladie en faveur du personnel des usines, qui sera réparti par l'Etat entre les Sociétés de secours mutuels constituées par le personnel ouvrier des usines de filature.

Un règlement d'administration publique déterminera la nature et la quotité des secours, la circonscription de chaque Société, leur mode d'administration, de gestion et de contrôle.

Les statuts de ces Sociétés devront être approuvés par arrêtés ministériels, conformément aux dispositions du titre III de la loi du 1^{er} avril 1898, relative aux Sociétés de secours mutuels.

Article 5.

Le montant de la prime fixée par l'article 4 à 400 francs par bassine à plus de trois bouts sera réduit à trois cent quarante francs (340 fr.) et celui de la prime de 200 francs par bassine, même à un bout, pour les filatures de cocons doubles, sera réduit à cent soixante-dix francs (170 fr.) pour les bassines filant des cocons étrangers, avec un maximum inférieur de un franc (1 fr.) au maximum établi par ledit article par kilogramme de soie filée.

A cet effet, il sera déduit du montant total de chaque liquidation trimestrielle de prime, calculée comme si, dans les bassines, il n'avait été filé que des cocons français, une somme de vingt-cinq centimes (0 fr. 25) par kilogramme de cocons secs étrangers pris en charge dans l'ensemble des usines du filateur pendant le même trimestre.

Les cocons étrangers susceptibles d'être filés ne pourront circuler, en France, qu'en vertu d'acquits-à-caution garantissant leur prise en charge dans une filature de soie ou leur réexportation.

Article 6.

En vue du contrôle du nombre des heures de travail et des quantités de soie filée, les filateurs devront tenir, dans chaque usine, un livre de filature dans des conditions uniformes qui seront déterminées par le règlement d'administration publique, et un registre dit de contrôle, sur lequel ils porteront, en conformité avec leur livre-journal, le poids net des cocons reçus ou revendus et le poids net des soies sorties de l'usine.

Le filateur certifiera la conformité de ces extraits avec son livre-journal.

Il sera constitué une Commission chargée du contrôle trimestriel des primes, et composée d'agents de l'Etat et de filateurs.

Un règlement d'administration publique déterminera les conditions d'organisation et de fonctionnement de cette Commission, ainsi que les conditions d'application de la présente loi, en ce qui concerne la filature de la soie.

Article 7.

Les infractions aux dispositions réglementaires présentant seulement le caractère d'erreurs ou de négligences seront soumises à l'examen de la Commission de contrôle prévue à l'article précédent et pourront entraîner, pour l'usine, la suppression du droit à la prime pendant une semaine, et, en cas de récidive, pendant un mois ou un trimestre.

Quiconque se sera rendu coupable d'une fraude ou d'une tentative de fraude pour l'obtention de la prime sera, à l'avenir, déchu du droit à la prime,

sans préjudice de la restitution de la prime indûment perçue et sera passible des peines portées aux articles 1^{er} et 7 de la loi du 1^{er} août 1905.

L'article 463 du Code pénal et la loi du 26 mars 1891 sont applicable à la présente disposition.

Article 8.

Pourront entraîner pour l'usine la suppression du droit à la prime pendant une semaine au moins et pendant un trimestre au plus, les infractions aux dispositions des lois concernant l'hygiène et la sécurité des travailleurs, qui auront fait l'objet de condamnations devenues définitives. Ladite suppression du droit à la prime sera prononcée dans la même forme que celle prévue au paragraphe premier de l'article 7 de la présente loi.

Article 9.

Le taux des primes ne pourra être modifié que par une loi. Un rapport sur les résultats de la présente loi sera publié au *Journal officiel* le 31 mai 1909, contenant un tableau des paiements effectués.

Article 10.

Les frais de surveillance et de contrôle nécessaires pour l'application de la présente loi, en ce qui concerne les primes à la filature de la soie, sont à la charge des intéressés. Le montant en est recouvré au moyen d'une retenue fixée à 1 fr. 50 centimes effectuée sur le montant de chaque liquidation de primes. La somme ainsi retenue est versée au Trésor public au titre des "produits divers du budget."

Dans le cas où, par suite de modifications au chiffre des crédits votés pour les primes à la filature, la recette provenant de l'application du taux de 1 fr. 50 centimes sera inférieure au montant des dépenses de surveillance et de contrôle, un nouveau taux pourra être fixé par décret rendu sur la proposition du Ministre des Finances et du Ministre du Commerce et de l'Industrie.

Article 11.

La présente loi est *applicable à l'Algérie*.

La présente loi délibérée et adoptée par le Sénat et par la Chambre des députés sera exécutée comme loi de l'Etat.

Fait à Paris le 11 juin 1909.

A. FAILLIÈRES.

Décret portant règlement d'administration publique pour l'application, en ce qui concerne les primes à la filature de la soie, de la loi du 11 juin 1909, relative aux encouragements spéciaux à la sériciculture et à la filature de la soie. (Décret du 23 septembre 1909.)

Article 1.

Les primes allouées aux filateurs de soie par la loi du 11 juin 1910 sont liquidées dans les conditions déterminées ci-dessous, proportionnellement au nombre d'heures de travail accompli par les bassines et par les services de noueuses ou rattacheuses.

Article 2.

Sous réserve de l'application des maxima fixés par l'article 4 de la loi du 11 juin 1909, il est alloué au filateur pour chaque heure de fonctionnement d'une bassine :—

- 0 fr. 13333 pour une bassine à plus de trois bouts;
- 0 fr. 13333 par bassine accessoire primée;

0 fr. 06666 par bassine même à une bout pour filature de cocons doubles. Est compté comme une bout pour l'application du présent règlement, l'assemblage des baves de cocons réunies dans la première filière placée immédiatement au-dessus de la bassine.

Il est, en outre, alloué au filateur 0 fr. 13333 par chaque heure de fonctionnement d'un service de noueuses ou rattacheuses. Quelque soit le nombre des services de noueuses le montant des primes trimestriellement allouées pour le travail de ces services ne peut dépasser le sixième du montant des primes allouées, pendant la même période, pour le travail des bassines fileuses à plus de cinq bouts.

Article 3.

Pour ouvrir le droit à la prime, chaque bassine fileuse doit être menée par une ouvrière spéciale. Quelque soit le nombre des bassines accessoires servant à la préparation du travail des bassines fileuses à plus de trois bouts, le montant des primes trimestriellement allouées pour le travail de ces bassines ne peut dépasser le tiers du montant des primes allouées, pendant la même période, pour le travail des bassines fileuses à moins de six bouts ou la moitié du montant des primes allouées pour le travail des bassines fileuses à plus de cinq bouts.

Pour ouvrir le droit à la prime, chaque bassine accessoire doit être menée par une ouvrière spéciale.

Toutefois, lorsque les bassines accessoires sont mues mécaniquement, le nombre des ouvrières qui les mènent peut être seulement du quart du nombre des bassines accessoires.

Article 4.

Ne sont considérées comme bassines à plus de trois bouts, donnant droit à la prime, que les bassines chauffées à la vapeur et dont les guindres sont actionnés par un moteur mécanique.

Article 5.

Les filateurs conservent l'intégralité de leurs droits à la prime pour les bassines en état de filer à plus de trois bouts, alors même que ces bassines ne fileraient qu'à deux bouts ou à trois bouts, pourvu que les soies filées à deux bouts présentent 1 gramme au minimum par 450 mètres de longueur (fils gros dits du titre 20 et au-dessus), et que les soies filées à trois bouts présentent au moins 85 centigrammes par 450 mètres de longueur (fils gros dits du titre 17 et au-dessus).

Ils conservent également l'intégralité de leurs droits à la prime pour les bassines en état de filer à plus de cinq bouts, alors même que ces bassines ne fileraient qu'à cinq ou quatre bouts, pourvu que les soies filées présentent au moins 65 centigrammes par 450 mètres de longueur (fils dits du titre 13 et au-dessus).

Article 6.

L'administration remettra à chaque filateur imposable comme tel à la contribution des patentes, et qui lui en fera la demande sur papier timbré, un registre nominatif trimestriel à souche pour les déclarations journalières, un livre de filature et un registre dit de contrôle à feuilles numérotées.

Les modèles de ces livres et registres sont fixés par arrêté du Ministre du commerce.

Les filateurs joindront à leur demande les indications suivantes sur leur outillage et sur l'organisation du travail :—

1. Nombre des bassines fileuses à plus de trois bouts et à moins de six bouts;
2. Nombre des bassines fileuses à plus de cinq bouts;
3. Nombre des bassines accessoires en spécifiant si les opérations effectuent à la main ou mécaniquement;

4. Nombre des services de noueuses ou rattacheuses;
5. Nombre des bassines même à un bout pour filatures de cocons doubles.

Article 7.

Pour l'application du présent règlement la journée de travail est divisée en périodes ou séances. Une affiche apposée en un endroit apparent de l'usine indique l'heure du commencement et la durée de chacune de ces périodes. Une copie de cette affiche est adressée à l'inspecteur divisionnaire du travail et au directeur des contributions indirectes de la circonscription, qui devront être informés vingt-quatre heures à l'avance de toutes les modifications apportées à cette division de la journée de travail.

Article 8.

Dans la première demi-heure de l'ouverture réglementaire de chacune des périodes de travail, le filateur ou son représentant inscrit sur la souche de la partie du registre de déclarations afférente à cette période et dans les blancs ménagés à cet effet :—

1. La date du jour;
2. L'heure d'ouverture de chaque séance de travail et celle de sa clôture;
3. Le nombre d'heures de travail effectif;
4. Le nombre des bassines fileuses en activité le nombre des bassines mues mécaniquement et le nombre des services de noueuses ou rattacheuses en activité;
5. Le titre filé par des bassines filant à deux, trois, quatre ou cinq bouts dans le cas prévu par l'article 5.

Le nombre des bassines mises en œuvre et celui des services de noueuses ou rattacheuses sont inscrits en toutes lettres.

Cette déclaration est signée et ne doit contenir ni rature ni surcharge.

Elle est reproduite sur le volant suivant les dispositions prescrites par arrêté du ministre du commerce.

Une demi-heure après l'ouverture de chaque séance, le volant séparé de la souche doit être déposé dans une boîte placée à l'entrée de l'usine et scellée au mur.

Cette boîte dont le modèle est fixé par l'Administration, est fermée par deux serrures.

La clef de l'une de ces serrures reste entre les mains de l'industriel. La clef de l'autre serrure est confiée à un agent de l'administration.

Article 9.

En cas de chômage accidentel de l'usine pendant un jour ou une fraction de journée, la mention " chômage pour la séance " ou " pour la journée " doit être inscrite au plus tard à l'heure réglementaire sur la souche et le volant de chaque déclaration ordinaire. Le volant est déposé dans la boîte.

En cas de chômage prolongée de l'usine, le filateur peut s'affranchir de l'obligation de signer chaque jour pour les déclarations de chômage en renvoyant le registre au ministère du commerce.

Article 10.

Si, par suite d'une circonstance fortuite, une ou plusieurs ouvrières quittent l'usine pendant une période réglementaire de travail sans être remplacées par d'autres ouvrières, la première déclaration est rectifiée par l'inscription immédiate, sur le registre, dans la colonne des observations, de

l'heure du départ des ouvrières et de leur nom, ainsi que du nombre et de la nature des bassines qui viendraient à être mises ainsi en chômage.

Un bulletin de correction est, en même temps, déposé dans la boîte.

Article 11.

Les filateurs possédant plusieurs usines doivent, pour chacune de ces usines, tenir un livre de filature et un registre de contrôle.

Article 12.

Le livre de filature indique l'organisation et le développement du travail dans l'usine.

A cet effet, le filateur mentionne en tête du livre trimestriel et par chaque atelier :—

1. Le numéro de chaque bassine fileuse, en indiquant le nombre des bouts qu'elle est en état de filer;
2. Le numéro de chaque bassine accessoire, en spécifiant si elle est mue à la main ou mécaniquement et en indiquant les numéros des bassines qu'elle dessert;
3. Le numéro de chaque service de noueuses en indiquant les numéros des bassines qu'il dessert.

En outre, le filateur inscrit jour par jour sur le livre :—

1. Les noms des ouvrières concourant directement à la production de la soie par catégorie (fileuses à moins de six bouts, fileuses à plus de cinq bouts, batteuses, noueuses ou rattacheuses et leurs remplaçantes) et les numéros des bassines auxquelles elles sont affectées;
2. Le nombre d'heures de fonctionnement de chaque bassine et de chaque service;
3. Les pesées de soie qui auraient été successivement effectuées par bassine à chaque tombée de guindre en indiquant le titre de la soie filée.

A la fin de chaque semaine, ces chiffres partiels sont totalisés de manière à présenter :—

1. Le total des heures de fonctionnement de chaque bassine ou service, et le nombre total des heures de fonctionnement dans chaque catégorie;
2. Le total des pesées successives de soie et le total général de la soie produite pendant la semaine.

Les colonnes d'heures de travail et de pesées des soies ne doivent contenir aucun blanc. Le filateur doit donc, soit inscrire à chacune des colonnes un chiffre d'heures ou un poids de soie, soit y tracer une croix épaisse s'opposant à toute inscription ultérieure.

A la fin du trimestre, les chiffres des heures de fonctionnement des bassines ou des services par catégorie et des pesées de soie de chaque semaine sont totalisés.

Les flottes de soie correspondant à la dernière pesée inscrite sur le livre de filature doivent être conservées avec le numéro de l'ouvrière dans le magasin de la filature à la disposition des agents de l'Administration jusqu'à la pesée suivante, sans que toutefois ce délai puisse excéder vingt heures, à partir de la fin de la journée, non compris les dimanches et jours fériés.

Ces agents peuvent faire procéder en leur présence, par le personnel de l'usine, au pesage des flottes de la dernière pesée pour s'assurer que leur poids correspond à celui qui est inscrit dans la colonne des pesées. Ils peuvent

également, en cas de présomption d'erreur importante, se faire représenter la soie en magasin et faire procéder au pesage de cette soie en leur présence par le personnel de l'usine.

Un extrait certifié conforme du livre de filature, indiquant pour chaque semaine la liste nominative de toutes les ouvrières, la nature de leur emploi et le nombre d'heures de travail effectué par chacune d'elles, restera, pendant la semaine suivante et à partir du mercredi matin-au plus tard, affiché dans une partie bien en vue de l'atelier.

Article 13.

Le registre de contrôle indique la situation de l'usine au point de vue des entrées et des sorties des marchandises.

Sur la première feuille de ce registre, le filateur inscrit le poids net du stock des cocons et des soies existant dans le magasin de la filature au premier jour du trimestre.

Sont successivement inscrites à leurs dates dans chacune des colonnes du registre réservées à cet effet :—

1. Les entrées ou sorties de cocons frais ou secs d'origine française et de cocons secs d'origine étrangère;
2. Les sorties de soie filée.

En cas d'envoi de cocons étrangers déjà pris en charge par une filature à une autre filature, l'entrée doit être portée dans la colonne réservée aux cocons étrangers, mais en indiquant comme observation qu'ils ont été antérieurement nationalisés. Le registre mentionne également : (1) dans la filature qui reçoit les cocons, le nom et le lieu de la filature qui les envoie et, s'il est possible, la date et le numéro de l'acquit-à-caution en vertu duquel ils ont été autorisés à circuler en France; (2) dans la filature qui les envoie, le nom et le lieu de la filature à laquelle ils sont destinés.

Dans les usines comprenant à la fois des ateliers de filature et des ateliers de moulinage, les soies filées entrées au moulinage doivent être inscrites comme sorties de la filature à leur d'entrée dans l'atelier de moulinage.

A la fin de chaque semaine, le filateur relève, en outre, dans les colonnes réservées à cet effet le poids net des cocons filés et le poids de la soie obtenue pendant la semaine. Si le filateur exploite à la fois des bassines servant à la filature des cocons simples et des bassines servant à la filature des cocons doubles, le poids de la soie provenant de la filature des cocons simples et le poids de la soie provenant de la filature des cocons doubles sont inscrits dans deux colonnes distinctes.

A la fin du trimestre, le filateur fait ressortir sur le registre de contrôle la quantité de soie française et étrangère filée pendant le trimestre.

L'application des maxima fixés par l'article 4 de la loi du 11 juin 1909 sera faite séparément à ces deux catégories de soie.

A la fin du trimestre, le filateur inscrit le stock des cocons et des soies en magasin et clôt le registre de contrôle par la mention suivante : " Certifié en conformité des écritures qui sont énoncées au livre-journal, réserves étant faite, en ce qui concerne les soies, de la tolérance d'un écart de poids de 5 p. 100 correspondant, soit à la perte en condition, soit au déchet de moulinage.

Article 14.

Les agents chargés d'assurer l'exécution des dispositions de la loi du 11 juin 1909 et du présent règlement, relatives aux primes à la filature, sont désignés par le ministre du commerce et de l'industrie et choisis parmi les agents de l'Administration des douanes et des contributions indirectes, les inspecteurs du travail et les vérificateurs des poids et mesures. Ces agents ont le droit d'entrer à toute heure de la journée dans les filatures de soie ayant réclamé le bénéfice des primes et dans les locaux annexes servant de

magasin pour les cocons et les soies filées. - Ils peuvent exiger la communication sur place des livres de journée et de paye de l'établissement ainsi que des livres d'achat des cocons, et de sortie des soies filées. Ils peuvent également prélever des échantillons des titres filés dans les conditions de l'article 15 et faire établir les titres par le personnel de l'usine.

Article 15.

A chacune de leurs visites, les agents de l'Administration s'assurent de l'observation des prescriptions du règlement, vérifient l'exactitude des diverses déclarations imposées au filateur et apposent leur signature sur le registre de déclarations, sur le livre de filature et sur le registre dit "de contrôle".

S'ils constatent une irrégularité, ils en rendent compte dans un rapport qui est transmis par la voie hiérarchique au ministre du commerce et au ministre des finances. S'ils constatent une fraude ou tentative de fraude, ils dressent un procès-verbal qui est transmis au parquet.

Un agent de l'Administration est spécialement chargé pour chaque usine, de garder la clef de l'une des serrures de la boîte prévue à l'article 8.

A chacune de ces visites, cet agent ouvre la boîte en présence du filateur ou de son fondé de pouvoir; il en retire tous les volants qui y ont été déposés depuis sa dernière visite.

Après avoir classé ces bulletins par date, il les compare à la souche du registre et, s'il constate la conformité des écritures et du nombre, il donne au filateur décharge des volants dans la colonne d'observations de la souche portant la date de sa visite.

En cas de divergence du volant avec la souche ou de manquants, l'agent mentionne les irrégularités sur chacune des souches qu'elles concernent et en fait l'objet d'un rapport ou d'un procès-verbal.

Les volants, réunis en liasse et accompagnés d'un bordereau qui mentionne leur nombre, sont envoyés sous pli recommandé au ministère du commerce.

Le registre des déclarations journalières n'est envoyé par le filateur au ministère du commerce qu'après que l'agent de l'Administration a vérifié et extrait de la boîte tous les volants afférents au trimestre écoulé.

Article 16.

Les primes à la filature sont liquidées par trimestre. Les filateurs adressent directement, pli recommandé, au ministre du commerce et de l'industrie, les pièces constatant le droit à la prime, savoir :—

1. Un bulletin trimestriel récapitulatif faisant ressortir le total des primes réclamées pour chaque espèce de bassine et pour chaque service de noueuses ou rattacheuses, calculées conformément aux prescriptions de l'article 4, et le poids de la soie filée dans l'usine avec l'indication du poids de la soie provenant de la filature des cocons doubles. Le filateur conserve comme titre la souche de ce bulletin;
2. Un extrait du rôle des patentes pour l'année courante, et, en cas de mise en activité, en cours d'année, de nouvelles bassines, soit l'extrait du rôle supplémentaire des patentes, soit au moins un certificat du service des contributions directes, constatant que la déclaration en a été faite en temps utile;
3. Le registre des déclarations journalières;
4. Le livre de filature;
5. Le registre dit de contrôle.

Ces trois registres doivent avoir conservé le nombre exact de feuilles numérotées qu'ils contenaient lors de leur remise par l'Administration. En cas de non-représentation, même d'une seule de ces feuilles il n'est pas procédé à la liquidation.

Ces pièces sont vérifiées par le service compétent qui propose au ministre l'approbation des états collectifs de dépense.

Dans les cas prévus par les articles 7, S. I. et 8 de la loi du 11 juin 1909, le ministre ne prend pas de décision définitive qu'après avis de la Commission de contrôle.

Un extrait de l'état des dépenses approuvées est transmis au préfet du département avec les pièces comptables.

Le Ministre du commerce et de l'industrie adresse en même temps à chaque préfet une ordonnance de délégation en vertu de laquelle des mandats sont délivrés individuellement à chacun des filateurs.

Article 17.

La Commission de contrôle instituée par l'article 6 de la loi est nommée par arrêté du Ministre du commerce et de l'industrie et composée suit :

Membres de droit.

Le Directeur Général des Douanes ou son délégué.

Le Directeur Général des Contributions indirectes ou son délégué.

Le directeur des affaires commerciales et industrielles au Ministère du Commerce et de l'industrie ou son délégué.

Le directeur dans les attributions duquel rentre le service de la comptabilité du Ministre du commerce et de l'industrie ou son délégué.

Membres nommés.

Deux membres de Conseil d'Etat, dont un conseiller d'Etat président de la Commission;

Un inspecteur des finances.

Un inspecteur du travail.

Cinq filateurs de soie ou anciens filateurs et cinq suppléants.

Deux auditeurs au Conseil d'Etat sont adjoints à la Commission comme rapporteurs.

Un secrétaire et un secrétaire adjoint sont choisis parmi les chefs et sous-chefs de bureau du Ministère du commerce et de l'industrie.

Les membres ne faisant pas partie de droit de la Commission sont nommés pour trois ans et peuvent être renommés.

La Commission se réunit tous les trois mois sur la convocation du Ministre du commerce. Sur le rapport qui lui est présenté par les secrétaires et les rapporteurs, elle donne son avis sur la liquidation des primes réclamées par les filateurs, ainsi que sur les cas litigieux qui lui sont signalés par l'Administration.

Article 18.

Les cocons étrangers susceptibles d'être filés sont admis en entrepôt fictif dans les ports où cet entrepôt est autorisé, moyennant une soumission cautionnée d'en représenter les poids nets en mêmes quantités et qualités, sous les mêmes marques et numéros, à toute réquisition, ou de payer une somme de 50 centimes par kilogramme manquant.

Il sera toutefois admis un déchet de 10 p. 100, tant pour défaut de siccité lors des pesées que pour prélèvement d'échantillons.

Les cocons ne pourront être changés de magasin sans une déclaration préalable et un permis spécial de la douane.

Ils ne pourront sortir de l'entrepôt pour l'intérieur que sous le couvert d'un acquit-à-caution portant engagement de rapporter dans un délai de trois

mois le certificat émanant soit du service des Douanes, soit de celui des contributions indirectes ou diverses constatant, soit la prise en charge dans une filature, soit la réexportation, ou de payer une somme de 50 centimes par kilogramme non apuré.

Le délai fixé pour la décharge de l'acquit-à-caution peut être sur la demande motivée du soumissionnaire, prolongé d'une durée qui ne peut excéder trois mois par décision du Ministre des finances, sur avis conforme du Ministre du commerce.

Dans les villes où l'entrepôt fictif n'est pas autorisé, les cocons pourront être placés en entrepôt réel aux frais des destinataires, jusqu'à la levée des acquits-à-caution applicables à leur transport en filature ou à leur réexportation.

Dans le cas d'envoi au filature l'acquit-à-caution est déchargé sur le vu du certificat de prise en charge du filateur ou de son fondé de pouvoirs, dûment autorisé par le service des Douanes ou des contributions indirectes.

Dans le cas de réexportation l'acquit-à-caution est déchargé sur le vu du certificat du bureau de douane de sortie.

Après décharge de l'acquit-à-caution constant la prise en charge dans une filature il en est envoyé un double au Ministre du commerce en vue de la liquidation des primes dues au filateur qui les a pris en charge.

L'entrée et le transport des échantillons de cocons d'un poids de 4 kilogrammes et au-dessous ne sont soumis à aucune formalité.

Article 19.

Le présent décret est applicable à l'Algérie.

Article 20.

Le Ministre du commerce et de l'industrie et le Ministre des finances sont chargés, chacun en ce qui le concerne, de l'exécution du présent décret, qui sera publié au Journal Officiel et inséré au Bulletin des Lois.

Fait à Rambouillet, le 23 septembre 1909.

A. FAILLIÈRES.