

Rare section



Dhananjayrao Gadgil Library



GIPE-PUNE-017853

G A Z E T T E E R

200

OF THE

B O M B A Y P R E S I D E N C Y .

Rare section

VOLUME XVIII. PART II.

Under Government Orders.

Bombay:

PRINTED AT THE

GOVERNMENT CENTRAL PRESS.

1885.

17 553

U. 231k

A. 18.2.1

CONTENTS.

POONA.

Chapter IV.—Agriculture.	PAGE
Husbandmen; Seasons; Soils; Arable Land; Holdings; Stock; Plough of Land; Crop Area	1-7
Field Tools; Hand Tools; Ploughing; Sowing; Manure	8-11
IRRIGATION:	
Motasthal; Patasthal; Government Water Works; Reservoirs	12-23
Weeding; Watching; Reaping; Thrashing; Winnowing; Storing; Mixed Sowings; Wood-ash Tillage; Rotation; Tillage; Gardening	29-33
Crop Details	34-62
Coffee; Genna; Cochineal; Silk	63-75
Experimental Gardens; Botanical Gardens	76-79
Plights; Locust and Rat Plagues; Famines	80-96
Chapter V.—Capital	
Capitalists; Saving Classes; Banking; Exchange Bills; Currency; Insurance	97-105
Moneylenders; Interest; Borrowers; Husbandmen; Deccan Riots; Deccan Riots' Commission; Deccan Agriculturists' Relief Act; Slaves	106-133
Wages; Prices; Weights and Measures	134-140
Chapter VI.—Trade.	
COMMUNICATIONS:	
Routes (No. 100 - A. D. 1884); Passes; Bridges; Ferries; Rest-houses; Tolls; Railway; Post and Telegraph Offices.	141-162
TRADE:	
Changes; Course; Centres; Market Towns; Fairs; Village Shopkeepers; Peddlers	163-172
Imports; Exports; Railway Traffic	167-172
CRAFTS:	
Brass Work; Silk Weaving; Gold and Silver Thread; Cotton Goods; Glass Bangles; Combs; Clay Figures; Paper; Iron Pots; Tape-weaving; Felt; Wood-turning.	173-210

CONTENTS.

History.	
(B. C. 109 - A. D. 1295) :	
Pass Inscriptions (B. C. 90 - A. D. 30) ; Junnar, Kāśī,	
Ajā and Bedsa Cave Inscriptions (A. D. 150) ; Early	
and Western Chalukyas (550 - 760) ; Rāṣṭrakutas	
(760 - 973) ; Devgiri Yādavs (1190 - 1295)	211-214
MUSALMĀNS (1295-1720) :	
Delhi Governors (1318 - 1347) ; Bahmanis (1347 - 1490) ;	
Nizām Shāhis (1490 - 1636) ; Adil Shāhis and the	
Moghals (1636 - 1680) ; Shivājī's rise and wars with the	
Adil Shāhis and the Moghals (1643-1680) ; Condition	
(1673) ; Sambhājī (1680-1689) ; Rājārām (1690-1700) ;	
Tārābāi (1700 - 1708) ; Shāhu's Restoration (1708) ;	
Bālājī Vishvanāth Peshwa (1714 - 1720)	215-242
MARĀTHĀS (1720-1817) :	
Imperial Grants (1719) ; Bājirāv Ballāl, Second Peshwa	
(1720-1740) ; Bālājī Bājirāv, Third Peshwa (1740-1761) ;	
Shāhu's death (1749) ; Brāhman supremacy (1749 -	
1817) ; Battle of Udgir (1760) ; Battle of Pānīpat	
(1761) ; Condition (1714 - 1760) ; Mādhavrāv, Ballāl,	
Fourth Peshwa (1761-1772) ; Nārāyanrāv, Fifth Peshwa	
(1772-1773) ; Raghunāthrāv, Sixth Peshwa (1773-1774) ;	
Gangābāi's Regency (1774) ; Mādhavrāv Nārāyan,	
Seventh Peshwa (1774-1795) ; Treaty of Surat (1775) ;	
Treaty of Purandhar (1776) ; Nāna Fadnavis (1761-	
1800) ; English Expedition (1778) ; Convention of Vadgaon	
(1779) ; Goddard's March (1779) ; Treaty of Salbāi	
(1782) ; Sindia in Poona (1792) ; Battle of Kharda	
(1795) ; Chimnājī Mādhavrāv, Eighth Peshwa (1796) ;	
Bājirāv Raghunāth, Ninth Peshwa (1796-1817) ; Poona	
plundered (1797) ; the Widows' War (1797) ; Yashwantrāv	
Holkar's invasion (1802) ; Holkar's victory (1802) ;	
Poona plundered (1802) ; Treaty of Bassein (1802) ;	
Bājirāv restored (1803) ; Condition (1803-1808) ; Mr.	
Mountstuart Elphinstone (1811 - 1815) ; Trimbakji	
Denglia (1815) ; Gangādhār Shāstri (1815) ; Bājirāv's	
disloyalty to the British (1816) ; Treaty of Poona	
(1817) ; Battle of Kirkee (1817) ; Poona surrendered	
to the British (1817)	243-301
THE BRITISH (1817, 1884) :	
Battle of Koregaon (1818) ; Sātāra Proclamation (1818) ;	
Bājirāv's Flights ; Settlement of the country ; Rāmōshī	
Rising (1827) ; R. . . Risings (1839 & 1846) ; the Mutinies	
(1857) ; H Gang Robberies (1879)	302-30

Chapter VIII.—The Land.

	PAGE
Acquisition ; Staff ; Alienated Villages	310-312
HISTORY :	
Early Hindu Thal or Jatha system ; Malik Ambar's system (1605 - 1626) ; Dádáji Kondadev's system (1630) ; the Moghal system (1664) ; the Marátha system (1669-1817).	313-340
BRITISH MANAGEMENT (1817-1884) :	
Management (1817 - 1820) ; Condition (1821) ; Slavery (1821) ; Tenures (1821) ; Landholders (1821) ; Village Communities (1820) ; Hereditary Officers (1820) ; Assess- ment (1820-21) ; Cesses (1820-21) ; Revenue system (1820-21) ; Seasons (1820-1828) ; Revenue system (1828-29) ; Mr. Pringle's Survey Settlement (1829-1836) ; Survey and Seasons (1836-1867) ; Revision Survey (1867-1884) ; Survey Results (1836 - 1880) ; Revenue Statistics (1837-1884) ; Agricultural Banks (1884) . .	341-513
INDEX	515-525

CHAPTER IV.

AGRICULTURE¹.

ACCORDING to the 1881 census, agriculture supports about 500,000 people or 56 per cent of the population. The details are :

POONA AGRICULTURAL POPULATION, 1881.

Age.	Males.	Females.	Total.
Under Fifteen ...	103,288	97,174	200,462
Over Fifteen ..	155,407	156,074	311,481
Total ...	258,695	253,248	511,943

Chapter IV.
Agriculture.
HUSBANDMEN.

² Kunbis and Mális, though the chief, are by no means the only husbandmen. Men of all classes, Bráhmans, Gujar Márwár and Lingáyat Vánis, Dhangars, Nhávis, Kolis, Rámoshis, Mhárs, Chámbhárs, and Musalmáns own land. About four-fifths of the landholders till with their own hands. The rest rent the land to tenants and add to their rents by the practice of some craft or calling. Kunbis depend almost entirely on the produce of their fields. They work more steadily, and have greater bodily strength than other husbandmen, and they show high skill both in dry-crop tillage and in cultivating the watered lands in which cereals are grown. At the same time, especially at a distance from trade centres, they are slow to adopt improvements, and, especially in the east, are not careful to keep their fields clear of weeds. Mális or gardeners cultivate a large area of garden and watered land. Some of them depend entirely on the produce of their fields, and manage their garden lands with great care and skill. Though, like Kunbis, Mális are slow to change their modes of tillage, they are ready to grow any new crop that seems likely to pay. They are most skilful in mixing and varying crops, and are the most regular and thorough ploughers and the cleanest weeders in the district. Where there is a constant drain on the land they are careful to use every available particle of manure and in the neighbourhood of Poona have completely overcome their dislike to the use of poudrette. Mális are of four kinds, Phul or flower Mális, Haldya or turmeric Mális, Lingáyat or *ling*-wearing Mális generally of southern or Karnátak origin, and Jire or cumin-seed Mális. Bráhmans generally have their lands tilled by hired labour, themselves superintending

¹ Details about Field-tools, Agricultural Processes, and Crops are chiefly taken from Mr. W. Fletcher's Deccan Agriculture.

² From materials supplied by Messrs. J. G. Moore, C.S. and A. Keyser, C.S.

Chapter IV.
Agriculture.
HUSBANDMEN.

and directing the workmen, but, in parts of Khed, and occasionally elsewhere in the west, Bráhmans have for generations worked their fields without the help of hired labour. Vánis are perhaps the only class who never till with their own hands. They let their lands to tenants who pay them either in money or in kind. A large section of the landholders are Dhangars or shepherds by caste. Most Dhangars, besides tilling their lands, rear sheep and weave blankets, but some have given up rearing sheep and live entirely on the produce of their lands. Except the Halद्या or तुर्मेरिc Mális, no husbandmen grow only one crop.

The uncertain rainfall over a great part of the district, the poverty of much of the soil, the want of variety in the crops grown, and a carelessness in their dealings with moneylenders, have, since the beginning of British rule, combined to keep the bulk of the Poona landholders poor and in debt. Between 1863 and 1868 they suffered from the introduction of revised rates of assessment based on very high produce prices which were wrongly believed to have risen to a permanent level. To their loss from the fall in produce prices was added the suffering and ruin of the 1876-77 famine. In spite of these recent causes of depression, the records of former years seem to show that except during the ten years of unusual prosperity ending about 1870, when great public works and the very high price of cotton and other field produce threw much wealth into the district, the mass of the landholding classes, though poor and largely in debt, are probably at present less harassed, and better fed, better clothed, and better housed than they have been at any time since the beginning of the present century. In the west, where famines are unknown and scarcity is unusual, the husbandmen are fairly off. But in Indápur and Bhimthadi and in parts of Sirur and Purandhar they have not recovered the distress and indebtedness caused by the 1876-77 famine. In 1876-77, a large area of land was thrown out of tillage and the low price of grain during the two years ending 1882-83 has made it difficult for the landholders to recover what they lost in the year of distress.¹ At the same time the Mutha canals and other water-works, by introducing a variety of crops and fostering more careful tillage, have done much to enrich the landholders. As a class the landholders are hardworking, frugal, and orderly. But, except near Poona, whose market quickens their energies, they are slower and less intelligent than the landholders of most other parts of the Presidency. Their tillage is careless, at times even slovenly, and they fail to strengthen the land by deep ploughing, by change of crops, or by the sufficient use of manure. This is due to poverty forcing them to take all they can from the land, rather than to laziness or to ignorance of the value of suitable ploughing, of plentiful manure, of clean weeding, of fallows, and of changes of crops. Their greatest want, and this with the spread of irrigation is more

¹ In Indápur *javári* sold at seventy-six pounds in 1881-82 and at sixty-two pounds in 1882-83. The corresponding average price during the twenty years before 1831-82 was thirty-seven pounds.

and more felt, is manure. As there are almost no leaf-yielding forests, as grass is scarce, and as most of the straw-giving crops are millets whose stalks are valuable fodder, there is a great scarcity of stable-litter, and from the want of other fuel most of the cowdung is lost to the land. In 1837 Colonel Sykes thought the mixing of several grains and pulses in one field was one of the chief blemishes in the Poona tillage.¹ More recent writers, including among them the revenue and survey officers of the district, do not share Colonel Sykes' opinion. Over most of the district the chief danger against which the husbandman has to guard is a failure of rain. Millet may perish in a year in which the hardier and less thirsty pulse will thrive or at worst will yield a fair crop. If the millet succeeds it smothers the pulse and takes no harm. The mixing of crops has also the advantage of lessening the drain on the land by taking different elements out of it.

In Poona all arable land comes under one or other of three great heads, *jirayat* or dry-crop land, *bágayat* or watered land, and *avan* or rice land. Dry-crop lands are divided into *kharif* or early and *rabi* or late. The early crops are brought to maturity by the rains of the south-west monsoon; the late crops depend on dews, on watering, and on the partial fair-weather showers which occasionally fall between November and March. Early or *kharif* crops are sown in June and July and are reaped in September and October or November. In the Mával or wet and hilly west, whose staple is rice and whose other crops are the coarse or *varkas* grains *vari*, *sáva*, *náchni*, and *khurásni* the chief harvest is the early harvest. The exposure to the cold damp of the south-west rains severely tries the husbandmen of the west. But they are a hardy cheerful race and their labour is seldom made useless by a failure of crops or unprofitable from the want of a market.

In the Desh or eastern plain, where the south-west rain is light and uncertain, the early or *kharif* harvest is less important than in the west. The chief early crops are spiked millet or *bájrí* mix with the hardy *tur* and early Indian millet or *javári*. These are sown in late May or in June on the first sufficient rainfall. In good years they ripen in late September and October; in bad years not till November. When the early crops are reaped in September and where the land permits, a second or *dusota* crop is raised. As, after October, rain rarely falls in the hilly west, except a little wheat grown on the eastern fringe, the late or *rabi* dry-crop harvest is of comparatively little importance. In the east of the district which is within the range of the north-east rains, the late or *rabi* harvest is more important than the early harvest. There the late crops are sown in October and November and ripen in February and March. They are chiefly *shálu* and other cold-weather Indian millets and gram, lentils, and other pulses.

² The soil of the district is lighter in the west than in the east. It

Chapter IV.
Agriculture
HUSBANDMEN.

SEASONS.

SOILS.

¹ Report British Association (1837), 324.

² Mr. A. Keyser, C.S., and Captain H. Robertson (1821) in East India Papers, IV. 565, 566.

Chapter IV.
Agriculture.
Soils.

belongs to three classes, black or *káli*, red or *támbdi*, and coarse gray or *barad*. In some places each class of soil blends with the other in varying proportions and in turn is modified by sand, gravel, lime-salts, and other ingredients. The *káli* soil is generally black or nearly black, and has sometimes a gray or a bluish tinge. It is commonly found in layers several feet deep. It belongs to the plain east rather than to the hilly west, and covers wide areas near rivers and large streams. In such places it is of great and uniform depth. It is sometimes injured by being mixed with limestone, and, occasionally, from the action of water or the presence of mineral salts, it becomes stiff and clayey, which, except in years of heavy rainfall, much lessens its richness. Excellent black soil of small and varying depth, with its surface covered with black basalt stones, is found on tablelands. Black soils are richer than either red or coarse gray soils. The sun does not harden their surface but cracks and crumbles it, and as they keep their moisture longer than other soils they are the favourite land for late or *rabi* crops. They yield all the produce of the Deccan in abundance and are specially suited for the growth of wheat, gram, and sugarcane. Towards the west as the level rises the black soil shallows till in the waving slopes that skirt the hills it changes to red or gray. The black soil is of two kinds, the gaping black soil known as *Jombi* and *levaldhás* and the stony black called *khadkal* or *dhondal*. Though better than the stony black the gaping black soil is very thirsty and requires plentiful and constant watering to bring out its powers and keep them in action. If it is not continually drenched while the crop is growing the people say that the crops pine and wither. The stones in the stony black are said to make it firmer and better able to hold water. This is the most valued land for the ordinary dry-crops whose supply of water depends on the local rainfall. This stony black is not so strong and as a rule is shallower than the gaping black. Being lighter the gaping black is more easily worked, but has to be ploughed oftener than the stony black and wants more manure. The best black soil yields year after year apparently without suffering though its powers might have become exhausted if it were not for the relief given by sowing a mixed crop. Other and poorer black soils occur mixed with sand and clay. The reddish or copper-coloured soils called *támbat* or *támbdi* are always shallower and coarser than the black. They are probably the ruins of the iron-bearing rocks without the decayed vegetable element which deepens the colour of the black soils. They are often injured by a mixture of gravel, but when watered by frequent showers are generally well suited for the *kharif* or early crops. The red soil is commoner and richer in the west than in the east. It has many varieties, for it includes lands on the skirts of hills and other most barren soils. Red soil is generally rough and stiff and requires deep ploughing. The best red soil is found near Pábal, midway between Khed and Sirur, where also ploughing is very deep. The red soil of Pábal itself is very powerful but requires great labour. It is a mixture of sand with a small quantity of clay. There are three varieties of red soil, pure red c

nirmal támbdi, upland or *mál jamin*, and sandy or *valsári jamin*. The pure red or *nirmal támbdi* is lighter and richer than the others and has perhaps a larger proportion of sand. The upland or *mál jamin* is a reddish soil thick-spread over rock. According to its depth and the quantity of sand and friable stones it is of two varieties *mál murud* that is plain red land and *támbdi malsi* that is hill red land. Sandy or *valsári jamin* when deep enough yields fair crops. Higher up the slopes or covering the tops of the lower uplands of the eastern plain is the coarse gray or *barad*. It varies in colour from a light reddish brown to gray, is of a coarse gravelly or loose friable texture, and is greatly wanting in cohesion. It is decomposed basalt with a mixture of iron ore. It does not yield wheat, peas, or any late or cold-weather crops; but in seasons of heavy rainfall spiked millet and the early pulses give a good return. When waste it bears nothing but scanty spear-grass. It does not occur in the hilly west. *Gáukhar pándhari* or white village soil is much like the coarse gray in colour, but is finer and is often of great depth. It is only found close to villages or on deserted village sites. Its special appearance is probably due to the manure which gathers on village sites and gives the soil a chalky character. It is a clean light soil and on a basis of black mould yields excellent crops, especially of tobacco. There are also patches of stiff clayey soil called *shedvat* that is white clayey or *chopan* that is clayey or loamy and of *chikni* or pure clay in which nothing grows. Clayey patches, black brown or white in colour, are generally found on the banks of rivers. A rare swampy or undrained soil of a clayey texture is termed *shembat* that is stony and *upal* that is sodden. A rich alluvial soil called *dhebi* or *kevtal* that is soil left by the overflowing of rivers, ranges in colour from pale yellow to dark brown. It covers a limited area, but, partly from the vegetable matter it holds and partly because it is regularly strengthened by fresh deposits, it is the richest soil in the district. Near some of the larger rivers within flood limits is a narrow belt of land of no great value known as *malai* or vegetable land. In the hilly west is a barren blackish soil called *murmád* that is crumbly rock. It is very stiff and hard and is found mostly at the foots of hills wherever water lodges. Here and there in black and other rich soils spots yield wretched crops compared with the surrounding fields. These spots are called *chunkhadi* or lime-laden because limestone is always found near the surface.

Of an area of 5347 square miles 5198 square miles or 3,327,283 acres or 97·21 per cent have been surveyed in detail. Of these 467,884 acres or 14·06 per cent are the lands of alienated villages. The rest contains, according to the revenue survey, 2,113,221 acres or 63·51 per cent of arable land; 272,271 acres or 8·18 per cent of unarable; 21,107 acres or 0·63 per cent of grass or *kuran*; 263,797 acres or 7·92 per cent of forest; and 189,003 acres or 5·68 per cent of village sites, roads, and river beds.¹ In 1881-82 of the 2,113,221 acres of arable land in Government villages, of which 193,224 or 9·14 per cent are alienated, 1,786,065 acres or 84·51 per cent were held for tillage. Of this 44,503 or 2·50 per cent were garden land,

Chapter IV.
Agriculture.
SOILS.

ARABLE LAND.

¹ The forest area has lately been increased to 422,400 acres or 661 square miles.

DISTRICTS.

Chapter IV.
Agriculture.
HOLDINGS.

27,674 acres or 1.54 per cent were rice land, and 1,713,888 acres or 95.96 per cent were dry-crop land.

Though large holdings are found in many villages the holdings as a rule are small. They are also so divided among members of different families that the entries in the Government books are not a complete guide to the average size of a holding. In the hilly west, where the chief grains are rice, *nāgli*, and other coarse grains, which require great attention and labour, the holdings are generally smaller than in the east. In 1882-83, including alienated lands, the total number of holdings was 227,871 with an average area of about nine acres. Of the whole number, 86,193 were holdings of not more than five acres; 43,898 were of six to ten acres; 45,359 of eleven to twenty acres; 30,677 of twenty-one to fifty acres; 11,340 of thirty-one to forty acres; 7575 of forty-one to fifty acres; 2739 of fifty-one to one hundred acres; seventy-six of 101 to 200 acres; thirteen of 201 to 300 acres; and one above 300 acres. More than 100 acres of dry-crop land is considered a large holding, fifty to 100 acres is considered a middle-sized holding, and less than twenty-five acres is considered a small holding:

POONA HOLDINGS, 1882-83.

SUB-DIVISION.	1-5 Acres.	6-10 Acres.	11-20 Acres.	21-30 Acres.	31-40 Acres.	41-50 Acres.	51-100 Acres.	101-200 Acres.	201-300 Acres.	Over 300 Acres.	Total.	Land Revenue	Total Area.
Junnār ...	21,048	5004	4152	1594	653	191	180	20	2	...	32,844	14,747	221,761
Khad ...	27,524	8315	6829	2052	544	139	64	6	1	...	45,474	15,981	233,824
Māval ..	8373	6917	4929	4127	3414	5154	1092	2	2	...	34,010	7631	126,987
Havēll ...	14,435	13,925	11,829	9916	1125	103	95	...	...	...	51,480	16,823	261,295
Sirur ...	6022	3726	4832	2150	783	119	77	6	4	...	17,719	18,324	236,212
Purandhar ...	3458	2695	3843	2423	621	203	119	21	3	...	13,399	9798	166,216
Bhīnāthadi ...	3943	2645	7489	6443	2524	760	878	21	1	1	34,205	23,454	451,197
Indāspur ...	1390	671	1451	1967	1876	901	734	..	...	...	8790	10,645	230,746
Total ...	86,193	43,898	45,359	30,677	11,340	7575	2739	76	13	1	227,871	114,602	1,967,278

Stock.

As in other famine districts farm stock considerably decreased in 1876-77, and has not yet reached its former level. In 1875-76, the year before the famine, the stock included 21,857 carts, 63,629 ploughs, 233,759 bullocks, 160,097 cows, 12,107 he-buffaloes, 45,765 she-buffaloes, 12,790 horses including mares and foals, 4932 asses, and 342,081 sheep and goats.¹ According to the 1882-83 returns the farm stock included 21,044 carts, 52,630 ploughs, 227,619 bullocks, 144,949 cows, 12,084 he-buffaloes, 40,646 she-buffaloes, 11,163 horses including mares and foals, 6745 asses, and 289,588 sheep and goats. The details are:

¹ Horses and asses, though almost never used for field purposes, are usually classed with agricultural stock.

POONA.

POONA AGRICULTURAL STOCK, 1882-83.

Chapter IV.
Agriculture.
STOCK.

SUB-DIVISION.	CARTS.		PLOUGHS		BULLOCKS	COWS.	BUFFALOES		HORSES, MARES, AND FOALS.	SHEEP AND GOATS.	ASSES.
	Riding.	Draught.	With two Bullocks.	With four Bullocks.			Males.	Females.			
Junnar	543	1529	4288	3848	27,481	16,944	2731	6320	906	40,870	856
Khed	383	3224	7436	4849	44,176	31,664	1946	10,558	1252	19,409	783
Mával	22	2065	6213	813	16,523	12,370	2810	4175	293	1927	64
Haveli	962	5110	4508	4359	34,046	25,229	1556	8763	2176	21,169	2140
Sitru	472	1512	1432	4080	27,296	18,255	517	2183	1484	38,107	736
Purandhar	257	1093	1540	3017	23,987	13,883	597	3540	1252	31,267	589
Bhupthadi	59	2575	525	3434	36,596	18,518	866	2712	2547	83,786	1015
Indápur	25	1213	780	1508	17,514	8086	1061	2095	1253	53,163	562
	2723	18,321	26,722	25,908	227,619	144,949	12,084	40,646	11,163	289,683	6745

With four oxen a Kunbi will till some sixty acres of light soil. Sixty acres of shallowish black soil require six or eight oxen. Eight oxen can till some fifty acres of deep black soil, provided that in occasional years when ploughing is necessary the landholder is able to hire two more pairs of bullocks. With eight pairs of oxen, and the power where necessary of making use of two pairs more, an acre or two of the sixty might be kept under the lighter garden crops. Many husbandmen have much less than the proper number of cattle, and have to join with their neighbours before their fields can be ploughed.

PLOUGH OF
LAND.

In 1881-82, of 1,786,065 acres, the whole area held for tillage, 209,447 acres or 11.72 per cent were fallow or under grass. Of the remaining 1,576,618 acres, 18,740 were twice cropped. Of the 1,595,358 acres under tillage, grain crops occupied 1,374,702 acres or 86.16 per cent, of which 588,502 were under Indian millet, *javari*, *Sorghum vulgare*; 557,807 under spiked millet, *bajri*, *Penicillaria spicata*; 60,524 under wheat, *gahu*, *Triticum aestivum*; 52,365 under *ragi* or *nachni*, *Eleusine corocana*; 47,885 under rice, *bhat*, *Oryza sativa*; 32,342 under *sava* and *vari*, *Panicum miliaceum* and *miliare*; 3844 under maize, *makka*, *Zea mays*; 1084 under *rala* or *kang*, *Panicum italicum*; 397 under *kodra* or *harik*, *Paspalum frumentaceum*; 141 under barley, *jav*, *Hordeum hexastichon*; and 29,811 under other grains of which details are not given. Pulses occupied 85,919 acres or 5.38 per cent, of which 28,879 were under gram, *harbhara*, *Cicer arietinum*; 13,065 under *kulith* or *kulthi*, *Dolichos biflorus*; 12,851 under *tur*, *Cajanus indicus*; 3900 under *mug*, *Phaseolus mungo*; 1519 under *udid*, *Phaseolus radiatus*; 836 under peas, *vatana*, *Pisum sativum*; 836 under *masur*, *Eryum lens*; and 24,033 under other pulses. Oilseeds occupied 102,786 acres or 6.44 per cent, of which 29,449 were under gingally seed, *til*, *Sesamum indicum*; 159 under linseed, *alshi*, *Linum usitatissimum*; and 73,178 under other oilseeds. Fibres occupied 8382 acres or 0.52 per cent, of which 4565 were under cotton, *kapus*, *Gossypium herbaceum*; 1375 under Bombay hemp, *van* or *tog*, *Crotalaria juncea*; 18 under brown hemp, *ambadi*, *Hibiscus cannabinus*; and 2424 under other fibres. Miscellaneous crops occupied 23,569 acres or 1.47 per cent of which 8089 were under chillies, *mirchi*, *Capsicum frutescens*; 5502 under sugarcane,

CROPS.

Chapter IV.
Agriculture.

us, *Saccharum officinarum*; 817 under tobacco, *tambákhu*, *Nicotiana tabacum*; and the remaining 9161 under various vegetables and fruits.

FIELD TOOLS.

The field tools are, the plough, *nángar*; the seed-drills, *pábhar* and *moghad*; the hoes, *kulav*, *kulpe* or *jok*, and *pharát*; the beam-harrow, *maind*; the dredge or scoop, *petári*; and the cart, *gáda*.

Plough.

The plough, *nángar* or when small *nángri*, is usually of *bábhul* *Acacia arabica* wood. It contains five distinct pieces, the pole *halas*, the share or coulter *nángar*, the yoke *ju* or *shilvat*, the tail *rumane*, and the handle *muthya*. These five parts are kept together by a leather rope, *vethan*, which passes back from the yoke behind the plough tail, and forward again to the yoke. To the share a moveable iron shoe or *phál* is fixed by a ring called *vasu*. A large plough for stiff soil which works nine inches deep requires seven to ten yoke of oxen. In the light eastern Desh soils the plough requires only two yoke. In the west, where it is fit only for stirring flooded rice land and for breaking the surface after it has been softened by rain, the plough is light enough to be carried on a man's shoulder, and one yoke of oxen are enough to draw it. The large plough is an efficient implement passing under the hard crust, turning the soil in great lumps, and exposing a large surface to the weather. It can be made to cut a deep or a shallow furrow by changing the angle of the share or coulter. The Kunbis manage the plough with considerable skill. One man can work a plough with two yoke of oxen turning them at the end of the furrow by voice alone.—With a team of six or seven pair a boy is usually seated on the yoke of the third pair and hustles them along with whip and voice. Each ox knows his name and obeys the boy's voice. The furrows are never straight and the field is usually ploughed crosswise as well as lengthwise. In the plain east, the plough is often left in the field when not in use, the iron shoe the ropes and the yokes being taken home. In the east, a plough with four separate yokes varies in value from 16s. to £1 (Rs. 8-10). With yearly repairs costing about 3s. (Rs. 1½), a plough lasts for five years. In the west a complete plough costs 4s. to 5s. (Rs. 2-2½).¹

Seed-Drill.

The seed-drill, *pábhar*, is a model of simplicity and ingenuity and is cheap and effective. It consists of two to four wooden iron-shod shares or coulters called *phans*, fed with seed through bamboo tubes from a wooden bowl or *cháde* into which the seed is dropped by hand. The whole is held together by ropes strained in different directions. It is drawn by two oxen. Gram and wheat are sown by a larger drill called *moghad* drawn by four oxen. Its tubes are larger and the shares or coulters stronger so as to pass deeper into the soil. It sows four to six inches deep to suit some of the cold-weather

¹ Mr. Shearer, the agricultural instructor in the Poona College of Science, has found that, by using an iron share instead of the heavy wood block, the native plough becomes an excellent subsoiler, passing through the most caked and hardened surface, and cutting the roots of bushes which had formerly to be dug out by the hatchet. These adapted ploughs have been made at the workshops of the College of Science at a cost of £1 5s. (Rs. 12½). They have also been successfully copied by village blacksmiths. Mr. Shearer to Collector of Poona, 105, 14th July 1882.

crops. Both the small and the large seed-drill are often used as harrows by removing the middle shares, the bamboo tubes, and the bowl. A drill costs about 5s. (Rs. 2½) and with care lasts four or five years.

The hoe, *kular*, is used for breaking the clods thrown up by the plough, for loosening the surface when the plough is not used, for removing weeds, for filling cracks or fissures, and for covering the seed. The hoe is two shares or coulter joined by a level cross iron blade or *phás* set obliquely in a wooden beam. A pole unites it to the yoke and it is guided by an upright handle. When he wishes to work the hoe deep the driver stands on the wooden beam or lays heavy stones upon it. It requires only one yoke of oxen, costs about 7s. (Rs. 3½), and lasts four or five years. The *kulpe* also called the *joli* is a weeding hoe. It is two iron blades or *golis* like a mason's square with their inward ends six inches apart set in a piece of wood to which the yoke is joined by a pole and ropes. It has two handles the *rumane* and the *veski*, the *veski* being a loose forked stick which is held on the top. It is drawn by two oxen and is driven so that the row of young plants passes through the space between the blades. The *kulpe* is often worked double, that is two *kulpe* are drawn by one pair of oxen. It requires much care in working, costs about 4½s. (Rs. 9), and lasts five years. The *pharát* is like the *kular*, only its blade is longer, three feet six inches in length, and its woodwork is lighter. It is used to follow the seed-drill and cover the seed and is drawn by two oxen. It costs about 4s. (Rs. 2).

The beam-harrow, *maind* or *phála*, is a large beam of wood fitted with a yoke and upright handle. It requires four oxen and two men to work it. It is used chiefly in high tillage to break clods and level the surface. It is also used after the wheat and gram are in the ground to press the soil, as pressed soil keeps its moisture longer than loose soil. It costs about 8s. (Rs. 4) and lasts many years.

The scoop or dredge, *petári*, is used only in rice lands. The bottom lip is formed by a plank three feet long to which the oxen are harnessed. A stout handle fixed into the middle of the plank sloping back forms a support to a series of bamboo slips laced together with string which rise one above the other about two feet six inches, presenting a curved sloping surface against which as the scoop passes through the ground the loose earth gathers. It is drawn by two oxen and costs about 3s. (Rs. 1½).

Up till 1836 the carts or *gádás*, of which there were very few, were cumbrous vehicles consisting of a large strong frame of wood supported on two solid wooden wheels over which the sides projected on props that rested on the axle outside of the wheels. The naves of the wheels were fitted inside with iron tubes in which the axles worked. These and the wheel tires were the only iron-work as the whole construction was held together by tightly strained ropes. The cart was used to carry crops, and with the addition of a large shallow basket to carry manure. It cost about £10 (Rs. 100) and was usually the joint property of three or four landholders. The axles being wooden often broke and new wheels and tires were needed at long intervals. With these repairs the cart lasted from generation to

Chapter IV.
Agriculture
FIELD TOOLS.

Hoe.

Beam-Harrow.

Scoop.

Cart.

Chapter IV.
Agriculture.
FIELD TOOLS.
Cart.

generation. Colonel Sykes mentions a cart called *jang* or *jungia* used for carrying manure. It was a common cart with a basket of *nirgundi*, *Vitex trifolia*, and *tur*, *Cajanus indicus*, stems tied to the top of it. In 1836 Lieutenant Gaisford, of the Revenue Survey, planned a new cart with high light wheels and a light body. The new carts were first made at Tembhatni in Sholapur and the craftsmen of the villages round were trained to repair them.¹ At first very few landholders would buy the new carts. Afterwards the opening of roads which did away with the necessity of very heavy and massive carts, and the abolition of transit duties which made it possible to carry local produce to distant markets, increased the number of carts in Indapur from 291 in 1835-36 to 1165 or 300 per cent in 1865-66, in Bhimthadi from 273 in 1840-41 to 1011 or 270 per cent in 1870-71, in Pabal from 754 in 1840-41 to 1304 or 73 per cent in 1870-71, in Haveli from 1146 in 1840-41 to 2284 or 99-30 per cent in 1871-72, and in Purandhar from 191 in 1843 to 578 or 202 per cent in 1873. In spite of the opening of the railway, which greatly reduced the number of carts employed in long journeys, the latest returns show a total of 18,321 carts throughout the district. The present carts cost £6 to £8 (Rs. 60-80) and hold ten to twenty hundredweights (16-30 *mans*). They are drawn by one pair of bullocks, and are chiefly made of ~~*babhal* and teak~~ wood by local carpenters.

HAND TOOLS.

Besides the tools worked with the help of bullocks there are five hand tools: the pick, *kudal*, costing 1s. (8 *as*); the hoe, *khore*, costing 1s. to 1½s. (8-12 *as*); the sickle, *khurpe*, used for weeding and grass-cutting, costing 3d. to 6d. (2-4 *as*); the billhook, *koyatu*, used only in the west and carried behind the back in a wooden socket, costing 1s. to 2s. (Re. ½-1); and the rake, *dantale*, made of wood with four or five broad teeth, used to gather chaff in the thrashing floor and in the west to gather grass and tree loppings to burn on the rice fields. These tools can all be easily bought in any village, and every Kunbi owns a fairly complete set worth about £2 (Rs. 20). A yearly charge of 6s. to 8s. (Rs. 3-4) keeps them in good order. If fresh tools are wanted the Kunbi, if necessary, buys a tree, fells it, strips it, and hales it to the village. The carpenter fashions the tools, and the iron-work is bought from wandering blacksmiths. The ropes are made either by the Kunbi himself or by the village Máng from fibre grown in the Kunbi's field.¹

PLOUGHING.

A field is not ploughed every year. In dry-crop lands thorough ploughing is rare. The usual practice both in the west and in the east is to plough the shallower black and light soils every other year, on the alternate years going over the land only with the hoe or *kulav*. Many deep heavy soils are ploughed not oftener than once in four or five years. In the interval the hoe or perhaps the harrow is used. Early or *kharif* land is ploughed in December, January, and February, and the hoe is used to break the surface immediately before sowing. As the soil is lighter, the heavy eastern plough with six or eight pairs of bullocks is not required in the west.

¹ Bombay Government Selections, CLI, 33-34.

Chapter IV.
Agriculture.

A lighter plough with one or two pairs of bullocks is enough in the western plains, and on the steep hill-sides where a plough cannot work the shallow soil is loosened by the hand with a bent piece of wood tipped with iron.

SOWING.

The Kunbi is very careful in his choice of seed. If his own crop is good he picks the largest and best-filled heads and keeps their grains separate as seed for the next year. The produce of special heads is often sold as seed and fetches half as much again as ordinary grain of the same kind. Vánis also keep good seed grain in stock which they advance to Kunbis, exacting fifty or a hundred per cent more in kind at harvest time. The sowing of the early or *kharif* crops begins in May or in June after the soil is well moistened by rain. In the plain country the seed is sown by the drill and covered by the long-bladed hoe or *pharát* which follows close behind the drill. When a mixed crop is to be sown one of the drill tubes is stopped and a man follows the drill, holding a horn-tipped tube fastened by a rope from which he sows seed in the furrow left by the stopped tube. This process is called *moghane*. In the west for the early or *kharif* crops a small plot is chosen, and, in March or April is covered a foot or so deep with cowdung, grass, leaves, and branches, which are burnt. In this plot, after a good fall of rain in May or June, the surface is loosened by an iron-tipped wooden hoe and the seed is sown broadcast and thick. In the course of a month when the thick-sown seedlings are about a foot high they are planted in irregular rows in patches of prepared land.

MANURE.

The people understand the value of manure, but litter and cowdung are scarce and mineral and other rich manures are too dear to be used in the growth of the ordinary crops. In the plain part of the district east of Pábal, where the rainfall is scanty or uncertain, dry-crop land is seldom manured. This is partly because manure is scarce and partly it is said because if the rainfall is scanty, manure does more harm than good to the crop. In the hilly west and in the western fringe of plain land where the rain is regular and plentiful, manure is carefully hoarded and used whenever possible. The quantity used seems to be regulated entirely by the supply. Even here manure is scarce and weak, merely wood-ashes and sweepings. In the case of watered crops, hemp or *tág* *Crotalaria juncea*, *methi* *Trigonella fœnum-græcum*, or *khurásni* *Verbesina sativa* are sown and when about five inches high are ploughed and the land is flooded and left for twenty days. Mális or gardeners and all others who raise crops all the year round are very careful to save every available particle of manure. In the land about Poona, which is watered all the year round, poudrette, the dung of cattle sheep and goats, stable litter, and refuse are used. The use of poudrette as a rule is restricted to a range of ten miles to the east of Poona along the line of the Mutha canals. Formerly there was a strong feeling against the import into a village of outside manure. This feeling has passed away, and manure is eagerly sought and frequently brought from long distances. The sewage of the cantonment and city of Poona, after being buried for three or four months, is bought by the husbandmen of the surrounding villages, and it has become a recognized and allowed

Chapter IV.
Agriculture.
MANURE.

practice for Kunbis to cart and handle this manure, which not many years ago they held in horror. The manure is sold in the trench at about three carts or one ton for 2s. (Re. 1). In 1874-75, the year when the right bank Mutha canal was opened, the quantity of pou-drette turned out by the Poona municipality was 2220 cubic yards and the value realised was £76 12s. (Rs. 766); in 1881-82 the quantity turned out was 11,760 cubic yards and its value £3077 12s. (Rs. 30,776). Cowdung is used only by those who have stall-fed cattle or who are rich enough to buy it. As cowdung cakes are the fuel of Poona most of the cowdung within twenty miles of the city is carefully stored, made into cakes, and sent in large cartloads to Poona where it is also used for burning the dead.¹ In dry land and in watered lands in outlying towns and villages, cowdung, goat and sheep dung, stable-litter, and village refuse are the chief manures. The dung and urine of sheep are a valuable manure and owners of flocks are hired to graze their sheep in fields for two or three nights at a time. Dhangars usually wander from village to village in a regular yearly circuit, in the plains during the rains and cold weather, and in the west during the hot months. They are paid by the husbandmen to fold their sheep in their fields. In some places they get only their food, in other places where gardens abound as much as 1s. or 2s. (Re. $\frac{1}{2}$ -1) is paid for one night of a hundred sheep. No chemical or imported manures are used, but the district officials are making experiments with bone-dust.

IRRIGATION.

Watered land is of two classes, *motasthal* or bag-watered, and *pátasthal* or channel-watered. Well or bag irrigation is of great importance in Indápúr and other drought-stricken parts of the east.

Motasthal.

Wells used for irrigation are circular, eight to ten feet across and twenty to fifty feet deep. They are sometimes pitched with brick or stone and mortar, more usually they are lined with dry cut-stone, and frequently they are built only on the side on which the bag is worked. An unpitched well costs £10 to £20 (Rs. 100-200), a well lined with dry stone £25 to £50 (Rs. 250-500), and with brick or stone and mortar £40 to £200 (Rs. 400-2000). The water is raised in a leather-bag or *mot*, one half of which is two feet broad and is stretched open at the mouth by an iron ring, the other end is much narrower and is not stretched. A thick rope is fixed to the centre of two stout bars, which, at right angles to each other, cross the broad mouth of the bucket, and is passed over a small wheel some four feet above the lip of the water-trough or *thárole* where it is supported by a rough wooden frame. A second thinner rope is fastened to the small mouth of the bucket and passed over a roller which works on the lip of the trough. Both these ropes are fastened to a yoke drawn by oxen. The length of the ropes is so adjusted that the narrow half of the bucket doubles along the broad half and in passing up or down the well the two mouths are

¹ Not even cowdung cakes escape adulteration. There are two kinds of cowdung cakes the *kanshen* or pure cake and the *válsken* or mixed cake half earth and half cowdung. Mr. J. G. Moore, C.S.

brought on a level with each other. When the full bucket reaches the top of the well the narrow mouth follows its own rope over the roller into the trough and allows the water to escape while the broad mouth is drawn up by its rope to the wheel four feet higher. The water-bag or *moti* of two sizes, one measuring about ten feet from mouth to mouth and worked in deep wells and by four oxen, the other five to six feet and worked in small wells and by two oxen. The bag and its appliances cost about £1 10s. (Rs. 15).¹ The bucket lasts ten or twelve months and the wooden work and the ring four or five years. The thicker rope lasts a year and the thinner rope six months. A six feet long bag on an average raises 57 gallons and 3 quarts of water each time it is emptied. In this way a man and a pair of bullocks raise 2931 gallons of water in an hour or 20,517 gallons in a working day of seven hours. The same man with two buckets and two pairs of bullocks raises 41,034 gallons of water which at eight pounds to the gallon is equal to 328,272 pounds Troy.

In 1882-83, of 18,651 wells about 3203 were step-wells and 15,448 dip-wells.² A well generally waters one to thirteen acres and the depth varies from twenty feet in Haveli and Sirur to fifty feet in Junnar and Bhimthadi. The cost of building varies from £30 to £500 (Rs. 300 - 5000) in the case of a step-well, and from £10 to £200 (Rs. 100 - 2000) in the case of a dip-well. There were also 838 ponds or reservoirs :

POONA WELLS AND PONDS, 1882-83.

Sub-Division.	WELLS.						PONDS
	With Steps.			Without Steps.			
	Number	Depth	Cost.	Number	Depth	Cost.	
Junnar	193	Feet. 50	£ 30-100	3853	Feet. 50	£. 20-50	...
Khed	456	30	100-500	2338	20	20-200	483
Maval	220	30	50-90	275	40	30-50	245
Haveli	600	20	55-200	1329	25	10-150	77
Sirur	197	35	50-110	1819	40	40-90	26
Purandhar	308	31	50-120	1589	33	40-100	11
Bhimthadi	865	40	70-90	2518	50	50-70	20
Indapur	314	30	40-120	1227	35	30-100	26
Total	3203	20-50	30-500	15,448	20-50	10-200	838

A class of people called *Pánádis*, that is water-showers, who are generally *Maráthás*, *Mhárs* or *Gosávis* by caste, are employed to point out where water will be found. They examine the soil and the adjoining wells and sometimes lie down with one of their ears to the ground to ascertain the flow of water below. The people still consult them though they are said to be less trusted than they used to be. The water-shower is paid a small fee in advance and a larger fee if water is found.

¹ The details are : The leather part 16s. to £1 (Rs. 8-10), the iron ring 2s. to 3s. (Rs. 1-1½), the upper or thick rope 1s. 6d. to 2s. (Rs. ½-1), the lower rope about 6d. (4 as.), the wheel including its iron axle 1s. 6d. (12 as.), the roller from 9d. to 1s. (6-8 as.), and the rough wood frame 2s. (Rs. 1).

² Of these 3105 were used in 1881-82 for drinking and washing, and 15,423 for watering the land.

Chapter IV.
Agriculture.
IRRIGATION.
Pátasthal.

Pátasthal or channel-watering from the great saving of labour is far more profitable than well-watering. At the same time it is much less common as the number of sites with a sufficient head of water and command of land is limited. The chief channel water-works are across the Mina at Kusur, Vaduj, and Náráyangaon, which water respectively twenty-five, seventy-eight, and 367 acres of garden land. The Náráyangaon work is of some magnitude, the irrigating channels being two miles in length. None of these last through the year; the supply in almost all cases fails in February or March. Where sugarcane and other twelve-month crops are grown the channel supply is eked out from wells. Except the Government canals, channel water-works on a large scale are hardly known. The majority of the dams or *bandhárás* are built of mud, and are renewed every year after the rains. A masonry dam which commands 500 to 600 acres and has cost £300 to £400 (Rs. 3000-4000) is considered a large work. The channels are not bridged, hedged, or otherwise sheltered, and the village cattle and carts cause much injury and waste. When the water in the river begins to fall below the level of the dam or channel head it is usual, if the distance is not great, to lift the water into the channel by a large wooden shovel or scoop hung by a rope at the proper level from a rough tripod of sticks. The scoop is swung to and fro by one or two men in such a way as at each swing to scoop up and throw a small quantity of water into the channel. This method does not raise water more than a foot or eighteen inches, but is useful when perhaps only one watering is required to complete the irrigation of a crop. The wells are the property of individuals, but the channel water is shared by all who originally built or who yearly rebuild the dam. The shares are portioned out in time, hours or days. This system of division by time works smoothly. The arrangement is superintended and regulated by one or more men called *pátkaris* or channel-keepers who prevent disputes and keep the canals in working order. They are paid sometimes by grants of land and more often by small shares of garden produce.

GOVERNMENT
WATER WORKS.

¹ The chief water-works made or repaired by the British Government are the Mutha and Nira canals, and the Kásurdi, Mátoba, Shirsuphal, and Bhádalvádi reservoirs. Of these the Mutha and Nira canals draw their supply from the Mutha and Nira rivers which rise in the Sahyádris and have a never failing flow of water. The Mátoba reservoir is fed from the right bank Mutha canal; the remaining reservoirs entirely depend on local rain. No landholders are forced to make use of water. Landholders who wish to have water apply to the subordinate resident on the works, and, either at the time of asking or at some later time, sign a form showing for how long and for what crop water is required. At the end of the season the areas watered are measured by the canal staff and the area and the charges sanctioned by Government are shown in a form which is sent to the Collector to recover the amount. The water rates,

¹ The Poona Water Works Account owes much to corrections and additions by Mr. W. Clerke, M.Inst.C.E., Executive Engineer for Irrigation, Poona.

which are in addition to and distinct from the land rates, are fixed under the orders of Government on a scale which varies according to the crop for which water is required.

Since the beginning of British rule the scanty and uncertain rainfall in the country to the east of Poona had caused frequent failure of crops and much loss and suffering. In 1863-64, a more than usually severe drought caused such distress that Government determined to find how far this tract could be protected from famine by water-works. The inquiry was entrusted to Captain, now Lieutenant-General, Fife, R. E., who, as small reservoirs were then in favour, spent the season of 1863-64 in surveying the district to find sites for storage lakes. In a report dated the 25th of February 1864, Colonel Fife submitted the result of his investigation. This comprised detailed plans and estimates for six small reservoirs at Kasurdi where there was an old work, at Mátoba, Khateka Durva, Khámbugaon, Bhádgaon, and Chutorikur, all in Bhimthadi. Many other sites were examined and found unfavourable. His experience in this part of Poona satisfied Colonel Fife that small reservoirs were enormously costly and were open to the fatal objection that in any season of severe drought they would be useless as the streams that feed them entirely fail. He recommended that water should be led from the Mutha river by a high level canal starting from above Poona and extending to near Indápur, a distance of about a hundred miles. The Bombay Government agreed with Colonel Fife that small lakes were useless and that the only certain means of protection from famine was the water of rivers whose source is in the Sahyádris. The Mutha canal works were sanctioned, and the experience since gained, which embraces both river and lake works, leaves no question that Colonel Fife was right in holding that small storage lakes would fail to guard east Poona from famine.¹

Of the water-works which have been made since 1864 the chief are Lake Fife and the Mutha Canals. The final plans and estimates for the Mutha Canals scheme were submitted in 1868 and the work was begun in December of that year. The scheme included a large storage reservoir or lake at Khadakvásla on the Mutha river ten miles west of Poona, which has since been named Lake Fife.² From Lake Fife two canals start, one on each bank of the river. The right bank canal was designed to be 99½ miles long, but the actual completed length is 69½ miles ending in the village of Pátas. The discharge at the head is 412 cubic feet a second and this can be increased to 535 cubic feet. The canal passes through the station of Poona. It was designed to command 230 square miles or 147,200 acres of land. As the complete design has not been carried out the actual area under command is 147 square miles or

Chapter IV. Agriculture.

GOVERNMENT WATER WORKS

Mutha Canals.

¹ Colonel, now Major-General, Strachey, then Inspector-General of Irrigation, expressed similar opinions with regard to Gujarát, Khándesh, and the Deccan. Mutha Canals Report, 14th February 1879.

² By placing the headworks on the Mutha river an unfailing supply of water was secured as the source of the Mutha is among the Sahyádris hills where there is a certain rainfall of about 200 inches. The suggestion to use the Mutha river water for irrigation was recorded by the Honourable Mr. Reeves in 1855. Mutha Canals Report, 14th February 1879.

Chapter IV.
Agriculture.

GOVERNMENT
WATER WORKS.

Mutha Canals.

94,080 acres, the whole of which suffers from scanty and uncertain rainfall.¹ The left bank canal is eighteen miles long, passing a short distance beyond Kirkee. It commands an area of 3500 acres and the full supply discharge at the head is 38·5 cubic feet the second. The area which the complete scheme commanded was thus 150,700 acres which by shortening the right-bank canal has been reduced to 97,580 acres. Besides providing water for this parched tract of country, the work furnishes an abundant supply of pure drinking water to the city and cantonment of Poona, the Powder Works at Kirkee, and the numerous villages along the course of the canals.²

¹ The details of the rainfall at six places on the canal during the three years ending 1881 are:

Mutha Canals Rainfall, 1879-1881

MONTH.	HEAD-WORKS, LAKE FIFE.			POONA, 10TH MILE.			URULI, 35TH MILE.		
	1879.		1880.	1879.		1880.	1879.		1880.
	In.	In.	In.	In.	In.	In.	In.	In.	In.
January	...	...	...	...	...	...	...	...	...
February	0·03	..	...	0·06	..	...	...	...	...
March	...	0·69	...	..	0·20	...	..	0·64	...
April	...	0·24	0·45	...	0·74	2·60	...	0·10	0·35
May	3·48	0·87	0·16	7·71	0·64	0·04	3·69	0·10	3·20
June	10·10	8·51	1·12	9·29	3·99	0·76	4·16	1·74	0·53
July	5·74	5·47	8·56	2·87	4·03	9·85	2·45	1·01	2·05
August	11·43	0·63	5·62	8·66	0·48	4·56	3·69	0·90	1·0
September	1·13	3·83	2·32	2·45	7·34	2·34	1·09	4·09	3·38
October	2·28	4·34	2·38	6·80	4·02	4·04	2·37	4·47	1·23
November	0·61	0·30	0·29	1·71	0·89	0·31	6·24	0·57	0·23
December	...	...	...	...	...	...	...	...	...
Total	34·80	24·68	20·90	83·62	22·23	24·60	17·06	13·62	12·01

MONTH.	KA'SURDI, 45TH MILE.			KEDGAON, 60TH MILE.			PA'TAS, 70TH MILE.		
	1879.		1880.	1879.		1880.	1879.		1880.
	In.	In.	In.	In.	In.	In.	In.	In.	In.
January	...	...	...	...	...	...	...	...	...
February	0·03	...	...	...	...	...	0·04	...	...
March	...	...	...	0·04	0·42	...	...	0·19	...
April	...	...	...	...	...	...	...	0·07	0·16
May	2·54	0·23	0·69	2·67	0·72	2·28	4·29	0·75	1·82
June	4·60	1·79	0·44	5·68	2·23	0·42	9·41	1·69	3·63
July	5·28	0·50	1·68	2·00	0·80	1·02	4·57	0·46	2·11
August	3·37	0·22	1·34	2·34	0·08	1·33	5·06	...	1·13
September	0·25	2·15	2·75	0·08	6·93	4·99	0·66	8·19	4·89
October	1·36	1·55	2·37	2·13	2·40	3·58	2·39	2·60	1·84
November	0·12	1·0	0·61	0·02	3·77	1·65	6·85	2·63	2·00
December	...	...	...	...	...	...	...	...	...
Total	17·55	7·44	9·78	16·41	16·96	15·06	27·46	16·53	17·63

² The Poona Municipality pays £1000 (Rs. 10,000) a year for the supply of about 750,000 gallons daily delivered at the canal-bank. This supply is practically unlimited. Any excess is charged 4½d. (3 as.) the 1000 gallons. The following are

Lake Fife is formed by a masonry dam founded on solid rock. The dam is of partly coursed and partly uncoursed rubble masonry and is one of the largest works of its kind in the world. Exclusive of the waste weir which is 1393 feet long, the dam is 3687 feet long and rises ninety-nine feet above the river bed; the greatest height above the foundation level is 107 feet. The crest of the waste weir is eleven feet below the top of the dam. The contents of the reservoir are 4911 millions of cubic feet and the area of the water surface is 3535 acres or 5½ square miles. To gain sufficient elevation to command the station of Poona and the country beyond, the bed of the canals is fixed at fifty-nine feet above the river bed or bottom of the reservoir. The volume of water stored above the canal level is 3161 millions of cubic feet. At the site of the dam the river has a catchment area of 196 square miles. During an average season it is calculated that the reservoir will fill sixteen times. The canals are completely bridged and regulated throughout. The right-bank canal is navigable in the ten miles to Poona. In the tenth mile the water-supply for the city is drawn off. To avoid interfering with the buildings and the parade-ground, the canal is carried through the station of Poona in two tunnels. On leaving the first tunnel in the centre of the cantonment, there is a drop in the canal bed. By means of an undershot wheel this fall is used to drive pumps for raising the water for the supply of the cantonment into the settling tanks, filter beds,

Chapter IV.
Agriculture.
GOVERNMENT
WATER WORKS.
Mutha Canals.

the results of analyses of the water made by the Chemical Analyser during the years 1878, 1879, and 1880.

Mutha Canals Water, 1878-1880.

	SOLIDS.	CHLO- RINE	AMMO- NIA.	ALBU- MENOID AMMO- NIA.	REMARKS.
	Grains per Gallon.	Parts per Million.			
No. 1. Taken from the canal near head-works at 4 P.M. 11th June 1878.	7.70	0.42	0.16	0.07.	<i>Sediments.</i> In Nos. 1 and 2, small in quantity; contain vegetable debris, paramacia, and rotifers. In No. 3, very scanty, only vegetable debris, no infusoria.
No. 2. Taken from the canal near St. Mary's Church, Poona, 10 A.M. 12th June 1878.	5.85	0.42	0.04	0.06	
No. 3. Taken from dispense reservoirs at 10 A.M. 12th June 1878.	5.60	0.42	0.06	0.06	
No. 1. Taken from the canal near head-works at 6 P.M. 26th March 1879.	5.60	0.42	0.04	0.12	<i>Sediments.</i> In No. 1 vegetable debris, paramacia. In No. 2 the same but scanty. In No. 3 vegetable debris only.
No. 2. Taken from the canal near St. Mary's Church at 6 A.M. 21st March 1879.	5.25	0.42	0.04	0.12	
No. 3. Taken from dispense reservoirs at 6 P.M. on 21st March 1879.	5.60	0.42	0.02	0.08	
No. 1. Taken from the canal near head-works at 6 P.M. on 23rd January 1880.	4.20	0.70	0.05	0.10.	<i>Sediments.</i> In Nos. 1, 2, and 3: all scanty, chiefly vegetable debris with confusoria, diatoms, and paramacia; a few rotifers in No. 2.
No. 2. Taken from the canal near St. Mary's Church at 6 A.M. 24th January 1880.	3.50	0.70	0.05	0.11	
No. 3. Taken from the canal from distribution pipe in Poona at 6 P.M. on the 24th January 1880.	4.90	0.70	---	0.03	

Chapter IV.

Agriculture.

GOVERNMENT
WATER WORKS.
Mutha Canals.

and covered dispense-reservoirs of the high and middle service systems. From the canal itself low service mains and branches are led off. For irrigation beyond Poona there is provision for complete distribution. The total estimated cost of the works, including the Poona water-supply and indirect charges, that is capitalization of abatement of land revenue leave and pension allowances and interest on direct outlay, is £937,436 (Rs. 93,74,360). The works were partly opened in November 1873. Enough of the dam and waste weir was completed to store the water of the lake twelve feet above the level of the canal sluices and the canal was nearly finished to Poona. At first water was supplied only for house purposes in Poona. In February 1874 it was made available for crops, the area under command up to Poona being 3040 acres. Before June 1874, the depth of storage was increased to fourteen feet and the distribution arrangements in the station of Poona were begun, and with the exception of the high service distribution were completed during the two following years. By 1877-78 the depth of storage was increased to twenty-five feet. The right-bank canal earthworks were completed as far as the sixty-fourth mile, but water was admitted only as far as the forty-fourth mile. By the fifteenth of January 1878 the eighteen miles of the left-bank canal were opened commanding 3500 acres, and the high service distribution for water-supply to the station of Poona was completed. In 1879-80 the parapet of the dam at Lake Fife and the earthwork on the rear side of the dam were completed. The unfinished parts of the waste weir were raised by temporary earthen banks so as to impound water up to the full supply level, twenty-nine feet above the sill of the sluices. The masonry works on the right-bank canal were completed and water admitted as far as the sixty-fifth mile. By 1882 the waste weir was completed with the exception of 500 feet at the west end, which was one foot below full supply level; the masonry works of the seventh portion to Pátas were completed and the whole of the 69½ miles of the right-bank canal were made available for use, thus practically completing the work. The following statement compares the areas irrigated and assessed, and the actual revenue, working expenses, and net revenue during the nine years ending 1881-82 :

MUTHA CANALS RECEIPTS, 1873-1882.

YEAR.	AREA WATERED.	ASSESSMENT.			
		Water Rates.	Town Water.	Other.	Total.
	Acres.	£	£	£	£
1873-74	44	18	..	21	37
1874-75	85	36	2300	207	2542
1875-76	732	303	4034	94	4431
1876-77	2034	1137	5277	55	6490
1877-78	5361	2275	6538	54	8866
1878-79	4513	2899	5850	89	8789
1879-80	7319	4995	6124	71	11,190
1880-81	12,201	5534	6880	119	12,394
1881-82	8973	6079	6990	130	13,199
Total	41,662	23,274	43,613	700	67,578

MUTHA CANALS RECEIPTS, 1873-1882—continued.

YEAR.	RECEIPTS.						CHARGES.
	Water Rates.	Town Water.	Other.	Total.	Savings.	Total.	
	£	£	£	£	£	£	
1873-74	...	...	21	21	...	21	4
1874-75	16	537	206	759	2618	3377	1474
1875-76	51	2337	95	2514	1481	4445	1540
1876-77	1065	3356	43	3569	1364	5133	2378
1877-78	269	10,931	60	12,056	1726	13,382	3645
1878-79	2519	6157	30	8716	2046	10,762	4588
1879-80	3989	5872	69	9930	2047	11,977	4453
1880-81	4323	6790	120	11,241	1763	13,009	4561
1881-82	7232	6798	131	14,160	1969	16,129	6588
Total ...	19,494	42,682	784	63,966	15,260	78,225	30,381

The following statement gives a comparison of the area watered and the rainfall during the same period :

MUTHA CANALS IRRIGATION AND RAINFALL, 1873-1882.

YEAR.	IRRIGATION.			RAINFALL.					
	Early.	Late.	Total.	AT POONA.			AT PA'TAS.		
				Early.	Late.	Total.	Early.	Late.	Total.
	Acres.	Acres.	Acres.	In.	In.	In.	In.	In.	In.
1873-74	...	44	44	25 00	1 80	26 80	12 71	1 47	11 18
1874-75	1	84	85	28 61	6 27	34 88	22 61	1 45	24 06
1875-76	401	331	732	33 19	1 59	34 78	7 92	4 49	12 41
1876-77	234	1746	2034	14 28	0 52	14 80	6 97	6 35	12 32
1877-78	2495	2806	5361	14 31	4 13	18 44	9 72	6 33	16 05
1878-79	2225	2688	4913	25 4	6 51	31 91	22 00	3 58	25 58
1879-80	3332	3937	7319	23 27	2 53	25 85	19 90	3 22	23 13
1880-81	5966	6255	12,201	15 74	4 91	20 65	10 34	5 23	15 57
1881-82	4456	4847	8973	17 61	4 88	21 49	11 32	3 84	15 05

In 1880-81 the area watered was sixty-six per cent greater than in 1879-80. This was partly due to short rainfall but mostly to the extension of distributing channels. In 1880-81 the crops irrigated under the canals were cereals 8339 acres, pulses 967 acres, sugarcane 1966 acres, and other garden produce 929 acres. The irrigation rates at present in force belong to five classes with an acre charge on the first class of £1 to £2 10s. (Rs.10-25), on the second of 8s. to 10s. (Rs.4-5), on the third of 3s. to 4s. (Rs.1½-2), on the fourth of 6d. to 1s. (4-8 as.), and on the fifth of 9d. (6 as.). After the opening of the Mutha canals the amount of vegetables and green fruits booked at the Poona station rose from 4574 tons (123,094 *mans*) in 1871 to 7008 tons (196,236 *mans*) in 1876. The first effect of the opening of the canal was that the people gave up their wells and took to canal water. Of ninety-nine wells on the lands commanded by the canal by the end of 1876 sixty-five had ceased to be used. Since its opening the sowing of *bábhul* seed and the planting of trees along the banks of the canal have been steadily carried on. In some places the trees have grown freely and the line of the canal is marked by a belt of green. Other places are too rocky for trees. Still year by year as the sowing of *bábhul* seed is continued with the breaks in the line are gradually becoming fewer in number. The Mutha canals project is in every respect the most important of the water-works yet undertaken in the Deccan. The

Chapter IV.
Agriculture.

GOVERNMENT
WATER WORKS.
Mutha Canals.

rapid spread of irrigation has been satisfactory, and there can be little doubt that it will ere long pay the interest on its borrowed capital. So much of the canal passes through crumbly trap or *murum* that loss from leakage is serious and somewhat interferes with the original estimate of the area which the canal can water. Besides the direct receipts the canal confers many indirect gains on the country through which it passes. Villages in which during the greater part of the year there was formerly a great scarcity of water have now an abundant supply for drinking and for cattle.

A white marble tablet with the following inscription cut in black letters, and a companion Maráthi tablet, have been let into the bridge by which the right bank canal crosses the Sholápur road about thirty-eight miles east of Poona :

V. R. ET L.

THE MUTHA CANAL

Supplied by Lake Fife situated 10 miles west of Poona,

Extends to Patas, in the Bhimthadi Taluka.

Its total length is 69½ miles.

The earthworks of this section, extending from 29 to 69½ miles, afforded employment for the people during the Famine of 1876-77.

On an average, 10,000 people of all ages were employed daily for a period of fourteen months,

the highest number on any one day being 21,000.

The expenditure was Rs. 3,90,000

on wages and charitable relief,

and the value of the work executed was Rs. 2,17,000.

The masonry works were subsequently completed, and water was admitted up to the 65th mile in September 1879.

..... M. Clarke, M.Inst.C.E., Executive Engineer for Irrigation, Poona.

R. B. Joyner, C. E., Assistant Engineer, in immediate charge of the Works.

Nira Canal.

The Nira Canal is designed to irrigate the left bank of the Nira valley and a part of the Bhima valley near the meeting of the two rivers, to supply towns and villages along the valley with water for household purposes wherever the wells are insufficient or brackish, and to utilize the water power that will be generated at the head-works and near the tail of the canal at Indápur. In 1864, as part of his inquiry into the best means of protecting East Poona from famine Colonel Fife, R. E., organised surveys of the Nira river. These surveys showed that by starting near Shirval about thirty-two miles south of Poona, a canal would reach the parts of Bhimthadi and Indápur which chiefly required water. Nothing further appears to have been done till January 1868, when, in consequence of a threatened failure of crops, a committee consisting of Colonel Francis, Survey and Settlement Commissioner Northern Division, Mr. J. E. Oliphant C. S., Collector of Poona, and the late Lieutenant Backle, R. E., Executive Engineer for Irrigation, were appointed to consider what survey operations should be undertaken for irrigational works.

¹ Contributed by Mr. J. E. Whiting, M.A., M.Inst.C.E., Executive Engineer for Irrigation Nira Canal.

This committee reported that the tract most deserving of attention was the part of Indápur which lies between the Bhima and the Nira. In this tract the annual rainfall was so uncertain and capricious that the crops frequently failed several years in succession ; it might with reason be termed a drought-stricken region. In these opinions Mr. A. F. Bellasis, C. S. the Revenue Commissioner concurred and Mr. J. W. Hadow, C. S. Revenue Commissioner Southern Division, in forwarding Colonel Francis' report, speaks of Indápur as having a worse rainfall than almost any part of the Deccan or of the Bombay Karnátak. In consequence of these recommendations in 1868 the surveys of the Nira project were resumed by Lieutenant Buckle. At the close of 1868 the Mutha works required Lieutenant Buckle's whole attention, and early in 1869 Mr. J. E. Whiting, M.A. M.Inst.C.E., was appointed to the survey under Colonel Fife's orders. Detailed surveys for the canal alignment, the choice of the site for the reservoir and the site for the canal headworks, together with the making of plans and estimates and writing the final report, occupied Mr. Whiting and his staff for two and a half years. During this period, in consequence of a severe drought, fifty per cent remissions were granted in forty-three dry-crop villages and twenty-five per cent in thirteen other villages of Indápur. The plans had been reviewed by the Chief Engineer, but further progress was stopped by order of the Government of India. Mr. Whiting was appointed Executive Engineer for Irrigation in Poona, and nothing more was done until the failure of rain in 1876. Towards the close of 1876 Mr. Whiting, with four of the staff that had formerly helped in making the Nira surveys, was sent to recover the old line and to modify the plans so as to make the work suitable for famine relief. Early in 1877 earthworks were opened for gangs sent by the Collectors of Sholápur, Sátára, and Poona. The numbers rapidly rose from 5000 to 24,132 persons, who, with their sick and children, were employed or received relief on the Nira canal. Towards the end of 1877 as the famine was over relief-works were closed ; but the high price of grain caused so much distress that for six months in 1878 relief-works had to be re-opened on the Nira canal and again on account of damage done to the crops by rats in 1879. The relief-works were finally closed in March 1880. During twenty-six months they had given employment to an average of 8096 persons of all ages. Mr. Moore, C. S. Collector of Poona, Mr. Richey, C. S. acting Collector, and Mr. Robertson, C. S. Revenue Commissioner Central Division, urged the necessity of completing the works. Petitions from forty-six villages representing over 60,000 acres of land in Indápur were received praying for the early construction of the canal and promising to pay the water rates. The matter was strongly pressed by the Government of Bombay and their views were submitted by the Government of India to the Secretary of State in August 1880. Sanction to complete the head-works and the first thirty-five miles of the canal from ordinary funds was granted by the Secretary of State in November 1880. In 1881 the Government of India accorded sanction to the first two stages of the Nira canal project as a protective work at an estimated cost of £415,000 (Rs. 41½ lakhs). Of this £80,000 (Rs. 8 lakhs) had been

Chapter IV.
Agriculture.
GOVERNMENT
WATER WORKS.
Nira Canal.

Chapter IV.
Agriculture.
GOVERNMENT
WATER WORKS.
Nira Canal

spent. To complete the project funds were provided from the grant for Protective Public Works and the execution of the project was entrusted to Mr. Whiting, Executive Engineer 1st Grade, Mr. J. H. E. Hart being Chief Engineer for Irrigation.

The Nira canal lies along the left bank of the Nira river. It has a length of 103 miles exclusive of distributing channels, and commands 280,000 acres of arable land in ninety villages in the Purandhar, Bhimthadi, and Indápur sub-divisions. The works will furnish an unfailing supply of water to 106,500 acres. The Nira and its three large feeders rise in the Sahyadris and up to the canal head have a catchment area of over 700 square miles. During the south-west monsoon, that is from mid-June to mid-October, the Nira continuously discharges far more water than can be used in the canal. It has also in ordinary seasons a considerable flow to the end of December. To ensure the supply during the rest of the dry season very extensive storage works were required. A reservoir nineteen miles long and with an area of 7½ square miles, or nearly two square miles more than the area of Lake Fife, is to be formed on the Velvandi, a feeder of the Nira, at Bhátghar near the town of Bhor by a masonry dam over 3000 feet long and over 100 feet high. This lake will have a capacity of 46½ million cubic feet, which by the use of falling shutters designed for the weir can be increased to 5500 millions. This gives a storage cost of £18 2s (Rs. 181) per million cubic feet, a low rate compared with the cost in other reservoirs. Twenty large under-sluices are provided to carry off the early silt-laden floods. The headworks of the canal are at Virvádi in Purandhar, nineteen miles further down the river, where a weir of concrete faced with rubble masonry forty-two feet high and 2300 feet long and backed by subsidiary weirs about half its height has been built across the Nira and the Vir near their meeting. This will raise the water to the full supply level in the canal, to which it will be admitted by large iron sluice gates. The supply basin above the weir will extend about eleven miles to Shirval, which is half-way between Vir and Bhátghar. After leaving Vir the canal crosses the old Sátára road about two miles north of the Nira bridge and passes above all the larger villages in the valley. These are, Vadgaon at the 26th mile, Korhále at the 29th mile, Pandar at the 35th, Malegaon at the 40th, Baramati at the 48th, Sansar at the 64th, Háturne at the 76th, Shelgaon at the 81st, Gotundi at the 87th, and Nimgaon at the 92nd. Near Nimgaon the canal crosses the water-shed above the town of Indápur into the Bhima valley and ends at Bijavdi at the 77th mile of the Poona and Sholápur road. The Mutha right bank canal ends near the 40th mile of that road and the Shirsaphal and Bhádalvádi reservoirs with their distributaries have been constructed between the ends of the two chief irrigation canals. In addition to the Nira canal two large reservoirs have been designed, one just above the town of Indápur and the other at Vadpuri near Nimgaon. These have little or no natural catchments, but will be filled from the canal during the south-west monsoon and will thus increase the supply available during the dry weather at the end of the valley most distant from the main reservoir at Bhátghar. A branch canal

has also been proposed, which will leave the main canal near Pandar at the thirty-fourth mile, and cross the river Nira at Kamleshvar in order to water the drought-stricken sub-division of Málsiras in Sholápur on the right bank of the valley. These extra works and the necessary widening of the canal will probably be undertaken only if famine breaks out afresh and if employment is again required for the relief of neighbouring sub-divisions or if the demand for water under the canal exceeds the supply available from the first two stages, namely the Bhátghar reservoir and the present canal.

In many places the hilly nature of the ground has made the course of the canal winding. In several cases, as at Korhále, Málegaon, and Nimgaon, rocky spurs have been cut through to avoid long detours. At those places the cuttings are thirty-five feet deep at the centre and half a mile long. Many large watercourses had also to be crossed so that twenty aqueducts, ninety-four culverts, and nine over-passages had to be constructed. Of the watercourses the largest is the Karha, which drains 440 square miles and has a steep and generally rocky bed. The canal crosses it at the forty-fifth mile near Báraмати by an aqueduct of thirteen spans of thirty feet and twenty-three feet headway. This is probably the most favourable crossing in India of a large and dangerous torrent by an aqueduct. The over-passages are of somewhat novel design and appear like huge inverts over which the streams are passed while the canal runs underneath, through double galleries arched across. In two of the over-passages, one near Vadgaon and one at Pandar, the inverts have a span of ninety feet. There are thirty-seven road and accommodation bridges and several foot and cattle bridges. Most of the aqueducts and culverts have been made so as to allow carts or cattle to pass under them, so that on an average there is some crossing provided at about every half mile of the canal. First class bungalows have been built at Bhátghar, at Virvádi, and at Báraмати, and smaller bungalows at the Nira bridge, Vadgaon, Pandar, Sansar, Háturne, Gotundi, and Tarangvádi. The population of the valley has greatly decreased of late years, but the soil is generally good and capable of maintaining a much larger population than it now supports. It is expected that the first fifty-two miles of the canal will be opened so as to utilize the Nira water in the monsoon of 1884. There can be little doubt that when the valley is protected from drought capital will flow into it and enable the people to utilize the water to the utmost. It is hoped that this canal, whose primary object is to protect the area under command from the effects of drought, will ultimately develop a net revenue more than enough to cover the interest on the outlay.

A white marble tablet with the following inscription cut in black letters and a companion Maráthi tablet have been set at the canal headworks twenty miles east of Bhátghar :

V. R. ET I.

THE NIRA CANAL.

Designed for the irrigation of the lands of 90 villages.

On the left bank of the Nira River.

Comprising a cultivable area of 437 square miles.

Chapter IV.

Agriculture.

GOVERNMENT
WATER WORKS.

Nira Canal.

Chapter IV.
Agriculture.

GOVERNMENT
WATER WORKS.
Nira Canal.

Is 103 miles in length, excluding branches,
Its supply is rendered perennial by a storage lake at Bhatghar
on the Velwandi river, 20 miles west of this place.

The canal was commenced for the employment of the people
during the Famine in 1876-77.
For twenty-six months an average of 8096 persons of all ages were employed,
the highest number in any one day being 24,132
The expenditure was Rs. 7,56,873 on wages and charitable relief.
The value of the work executed was Rs. 5,00,365.
On the cessation of the distress caused by the Famine and subsequent
period of high prices, the works were suspended in March 1880.

They were resumed in January 1881,
and the canal was first opened for irrigation in 1884.
J. E. Whiting, M.A., M.Inst.C.E., Executive Engineer, Nira Canal.¹

Reservoirs.
Kásurdi.

At Kásurdi in Bhimthadi, twenty-four miles east of Poona, at a cost
of £1182 8s. (Rs. 11,824) a reservoir was made in 1838 under the
advice of the Revenue Commissioner Mr. Williamson. In 1843, the
whole of the earthen embankment was washed away, but the masonry
was unhurt. Its restoration was begun by the irrigation department
as a famine relief work in 1864, and it was completed as an ordinary
work when the necessity for relief ceased. It is a small reservoir,
dependent for its supply on the local rainfall over an area of six square
miles. It was finished to test the value of reservoirs which depended
for their supply on local rainfall. The restored reservoir holds 14½
millions of cubic feet of water and is furnished with two distributing
channels commanding 585 acres. The work was finished in 1869
and the pond was filled for the first time in August of that year.
The total cost was £4749 12s. (Rs. 47,496), that is at the rate of £8
(Rs. 80) on every acre under command. From 1869 to 1883 the supply
has been most uncertain. In some years the reservoir has filled;
in others it has remained almost dry. The irrigation rates at present
in force are the same as those sanctioned for the Mutha canal beyond
the eight mile radius from Poona. *Bábhul* seed has been sown below
the embankment and has thriven fairly. A few trees of other kinds
have also been planted. As this work depends for its supply on a
restricted area, in a tract of very uncertain rainfall, the results can
never be satisfactory.

Mátoba.

In the village of Pimpalgaon in Bhimthadi, twenty-eight miles east
of Poona, near the railway station of Yevat, a reservoir called *Mátoba*
after a neighbouring temple of *Mátoba* or *Matakmal*, was made in
1876-77. The reservoir is designed to store the surplus waters of
the right bank Mutha canal and water the land between it and the
Mutha-Mula river. At full supply level it has an area of 470 acres
and a capacity of 229 millions of cubic feet. The site was chosen
and surveyed by Colonel Fife, R. E., in 1863, when examining the
best means for irrigating the country east of Poona. As the Mutha
canal project was undertaken the scheme for the *Mátoba* reservoir

¹ Mr. Whiting mentions the names of Messrs. E. Behrman, assistant engineer, D. Henry and Rávjí Trimbak sub-engineers, Rokmáji Náráyan, supervisor, and Ganesh Janardan and Náráyan Vishnu overseers. The chief contractor was a Nágari Brahman of Surat named Navtamráam Uttamráam.

was laid aside. In 1876-77, when famine relief works were started, the Executive Engineer for Poona, Mr. Clerke, revised the plans and estimates and recommended the project because as the Mutha right-bank canal passes close above the site of the lake it would form an auxiliary to the canal, whose surplus waters might during the south-west monsoon be stored in use in the dry season. The work was begun in December 1876 and completed almost entirely by famine labour in August 1877. The reservoir is formed by an earthen dam 6095 feet long and forty-eight feet in greatest height. The full supply level is nine feet below the top of the dam. The waste weir on the left flank of the dam is 600 feet long. The outlet whose level is ten feet above the bottom consists of a masonry culvert under the dam where it abuts on the right flank and three twelve-inch iron sluice valves of the ordinary pattern in use for water-supply mains. These valves are attached to lengths of pipes set in concrete at the inner end of the culvert and are worked by iron rods laid along the dam slope. The main distributing channel is $11\frac{1}{2}$ miles long and is capable of discharging twenty-six cubic feet a second. It has a main branch to the village of Pimpalgaon which again divides into two branches of a total length of six miles. Of 8550 acres under command, 3600 acres are in Pimpalgaon, 2900 in Delavdi, fifty in Khatbái, and 2000 in Párgaon. The catchment area is only ten square miles and the average rainfall under twenty inches, but with the aid of the surplus water from the right bank Mutha canal the monsoon demand for water can be supplied and the reservoir can always be left full in October when the south-west monsoon closes. A regulating bridge is built across the Mutha canal at the $49\frac{1}{2}$ th mile from Poona by which the water in the canal can at any time be turned into the reservoir. From the fifth of August 1878 water from the Mutha canal began to be available. The irrigation rates at present in force are the same as those sanctioned for the Mutha canals beyond the eight mile radius from Poona. For a length of four miles the boundary of the land taken for the reservoir is fenced with aloe. The margin above the water level has been sown with *bábhul* seed, which at the upper end has grown remarkably well.

A white marble tablet with the following inscription carved in black letters and a companion Maráthi tablet have been set at the west end of the dam :

V. R. ET I.

THE MATOBA TANK

Designed for storing surplus water from the Mutha Canal
and irrigating the tract of land lying between
the Tank and the Mutha-Mula River
Has an area of 470 acres and a capacity of
229 millions of cubic feet.

The earthworks of the dam were commenced for the
employment of the people
during the Famine of
1876-77.

For eighteen months they afforded employment for,
on an average, 3100 people of all ages,
the highest number on any one day being 6300.

Chapter IV.
Agriculture.

GOVERNMENT
WATER WORKS.

Reservoirs.

Shirsuphal.

The expenditure was Rs. 1,98,000
on wages and charitable relief,
and the value of the work executed was Rs. 1,40,000.

The Tank was completed
and opened for irrigation in October 1878.
William Clerke, M.Inst.C.E., Executive Engineer for Irrigation, Poona.

One and a half miles above the Bhimthadi village of Rāvangaon, fifty miles east of Poona, on the Rotimal, a small feeder, is the Shirsuphal reservoir called after the village of that name three miles further up the stream. The reservoir was designed to water the lands on the left bank of the Rotimal. At full supply it has an area of 834 acres and a capacity of 367 millions of cubic feet. In January 1877, when it became necessary to provide work for the destitute people of East Poona, plans and estimates were prepared by Mr. Clerke the Executive Engineer for Irrigation. Work was begun in February 1877 and finished in October 1878. The dam is of earth, 2200 feet long and fifty-three feet in greatest height. The full supply level is eleven feet below the top of the dam, and the outlet level is eleven feet above the bottom of the reservoir. The waste weir channel, which is on the right flank of the dam, is 300 feet wide. The outlet, a masonry culvert under the dam where it abuts on the right flank and three twelve-inch iron sluice valves, is of the same pattern as that described for the Mátoba reservoir. The canal leading from the reservoir is $12\frac{1}{2}$ miles long, with a fall of three feet a mile and a discharging capacity at the head of thirty cubic feet a second. Of 4500 acres under command 800 are in Rāvangaon, 1500 in Kharki, and 2200 in Chincholi. The catchment basin has an area of twenty-three square miles, with an average rainfall of eighteen to twenty inches. The reservoir fills only during years in which the rainfall is considerably above the average, but the additional storage capacity admits of the supply of favourable years being stored for use in years of short rainfall and thus ensures a large average supply. In 1880-81 the irrigated crops were cereals 661 acres, pulses 55 acres, sugarcane 4 acres, garden produce 4 acres, and condiments 14 acres. The water rates at present in force are based on the classified lists sanctioned for the Mutha canals. There are five classes with an acre charge on the first class of £1 (Rs. 10), on the second of 8s. (Rs. 4), on the third of 4s. (Rs. 2), on the fourth of 2s. (Rs. 1), and on the fifth of 8s. (Rs. 4). The margin of the reservoir above the line of full supply has been fenced with aloe and sown with *bábhul* seed, but owing to the stony soil the *bábhul* has not done well. *Bábhul* seed sown below the dam has thriven remarkably well and now forms a belt of good-sized trees. As the rainfall on the catchment is very uncertain the supply of water is precarious and in some years the irrigation has to be much restricted; this is to be regretted as the holders of the land commanded by the reservoir have shown themselves anxious to obtain a supply of water.

A white marble tablet with the following inscription cut in black letters and a companion Maráthi tablet have been set at the west end of the dam :

V. R. ET I.

THE SHIRSUPHAL TAL.—

Designed for the irrigation of the lands lying
on the Left Bank of the Rotimal Nala,
Has an area of 834 acres and a capacity of
36½ millions of cubic feet.

The earthworks of the dam were commenced for the
employment of the people
during the Famine of
1876-77.

For sixteen months they afforded employment for,
on an average, 2400 people of all ages,
the highest number on any one day being 9000.

The expenditure was Rs. 1,58,000
on wages and charitable relief,
and the value of the work executed was Rs. 1,45,000.

The Tank was completed
and opened for Irrigation in October 1878.

William Clerke, C.E., Executive Engineer for Irrigation, Poona Division.

In the Indápur village of Bhádálvádi, on a feeder of the Bhima, about sixty-four miles east of Poona, the Bhádálvádi reservoir was begun as a relief work in the famine of 1876-77, and finished and opened for irrigation in May 1881. It was designed to water the lands of the villages of Daluj and Palasdev. At full supply it has an area of 335 acres and a capacity of 222 millions of cubic feet. It is formed by an earthen dam 2725 feet long and fifty-five feet at its greatest height. The drainage area above the dam is twenty-three square miles. During the five years ending 1882-83 the average rainfall has been 21.53 inches. The waste weir on the left flank is 400 feet long with a crest eleven feet below the top of the dam.

Bhádálvádi.

A white marble tablet with the following inscription cut in black letters and a companion Maráthi tablet have been set at the north end of the dam :

V. R. ET I.

THE BHADALVADI TANK

Designed for the irrigation of lands in the villages
of Daluj and Palasdev.

Has an area of 335 acres and a capacity of
222 millions of cubic feet.

The earthworks of the dam were commenced for the
employment of the people
during the Famine of
1876-77.

For twelve months they afforded employment for,
on an average, 1600 people of all ages,
the highest number on any one day being 5400.

The expenditure was Rs. 54,000
on wages and charitable relief,
and the value of the work executed was Rs. 48,000.

The Tank was completed
and opened for Irrigation in May 1881.

William Clerke, M.Inst.C.E., Executive Engineer for Irrigation, Poona.

The outlet, which is on the right flank of the dam, is of similar construction to those described in the Mátoba and Shirsuphal reservoirs. Its sill is thirty-five feet below full supply level. From it a

Chapter IV.
Agriculture.

GOVERNMENT
WATER WORKS.
Reservoirs.

canal or distributing channel, with, at the head a discharging capacity of fifteen cubic feet the second, is led $6\frac{1}{2}$ miles along the right bank of the stream. The area under command is 1900 acres. A distributing channel heading from the same outlet in the left bank of the stream is also projected. Its length will be $3\frac{1}{2}$ miles and it will command 1100 acres. The work was opened in 1881. The irrigation rates are the same as those mentioned under the Shirsuphal reservoir.

Besides these works designed for irrigation, there are two large reservoirs at Kátraj and Páshán and two more at Pátas and Supa. The Pátas and Supa reservoirs were made as relief works during the 1876-77 famine.

Kátraj.

In the high land about two miles to the north of the Kátraj pass and about six miles south of Poona is the Kátraj lake, which was built in 1750 by Peshwa Baláji Bájiráo. It covers an area of $5\frac{1}{2}$ acres and has a dam of rubble masonry 1000 feet long and forty feet high. It holds water all the year round and has a greatest depth of forty feet. The water is used only for drinking. Masonry conduits lead to Poona where there are cisterns or *hauds* in different parts of the town.

Pátas.

In the Bhimthadi village of Pátas, about thirty-seven miles east of Poona, a reservoir was begun as a famine relief work in January 1877 and finished in 1879. It is a small reservoir with a full supply area of forty-six acres, a capacity of fifteen millions of cubic feet, and a catchment area of three square miles. The earthen dam is 2900 feet long and twenty-nine feet in greatest height. The waste weir is 170 feet long and is seven feet below the top of the dam. The total cost was £3400 (Rs. 34,000). The site is very unfavourable and the cost is out of proportion to the capacity of the reservoir. Its only use is to provide water for house purposes and cattle in the village of Pátas. It was carried out only to afford relief which was urgently needed.

Supa.

About one mile north-west of the Bhimthadi village of Supa and thirty-five miles east of Poona, the Supa reservoir was begun as a famine relief work in November 1876 and finished in 1877. An earthen dam is laid across a gap in an old embankment thrown up from the excavation of a small pond many years old. The total cost was £220 (Rs. 2200). This is a trifling work useful only for cattle. It was carried out solely to relieve distress in the immediate neighbourhood.

Páshán.

On a feeder of the Mula in the village of Páshán six miles west of Poona a reservoir was made in 1867-68 at a cost of £16,700 (Rs. 1,67,000) to furnish water for the station of Kirkee and Government House, Ganeshkhind. It is formed by an earthen dam 2750 feet in length with a greatest height of fifty-two feet. The waste weir is 400 feet long and its crest is ten feet below the top of the dam. The full supply area of the lake is 153 acres. Its available capacity is seventy-three millions of cubic feet, and the catchment area is sixteen square miles. The water is led from the reservoir in a ten-inch cast-iron main which goes through the Government House grounds, by the cantonment of Kirkee, on to the Powder Works. The water is fully distributed in Government

House and in Kirkee barracks and cantonment. It was of great use before the left bank Mutha canal was made.

There are two modes of weeding, by a sickle or *khurpe* which is generally practised in hill-lands, and by a small hoe or *kulpe*. When the crop is six inches high, to clear it of weeds, the small hoe or *kulpe* is usually used twice at intervals of ten to twelve days. The hoe is drawn by two muzzled oxen and is driven so that the row of springing crop passes through the space between the blades. It is often used double, that is one pair of oxen draw two hoes. The uprooted weeds are gathered and are either thrown away or left to rot on the spot. Besides lessening the drain on the soil, weeding loosens the soil and enables it to take in and hold more moisture. The crop roots have free scope and the plants grow vigorously. If weeding is neglected the surface grows hard and crusted and the water failing to soak in washes away the particles of soil. Cold-weather crops seldom want weeding, as the ground is both too carefully cleaned and too dry to yield any large supply of weeds. *Mális* are the cleanest weeders; *Kunbis*, especially in the east, are careless.

From the time the grain forms, to drive off birds the crop is watched from a wooden shed called *mála* generally set on a platform or in a tree about ten feet from the ground. The watcher, who is generally a boy, shouts and throws stones from a sling called *gophan*.

When ripe the crop is either reaped by the sickle or *vila* or pulled up by the roots, and bound in sheaves. It is carried in carts to the thrashing-floor or *khale* and stored there till it is dry. The largest and best filled heads are separated and their grain kept for seed. In the sowing season this seed grain realizes half as much again as ordinary grain.

The crops are taken in carts to the thrashing-floor or *khale*. The thrashing-floor is made in the hardest part of the field or sometimes near the village site, by wetting and beating the ground till it is hard and smooth, and then smearing it with cowdung. An upright post or *tivda* is set in the centre and a sheaf of the crop is tied to the top of the post. In the case of Indian millet or *javári* and spiked millet or *bájrí* the heads of grain are broken off by women and thrown round the central post five or six inches deep; of wheat and rice the whole plant is thrashed; and of *math*, *mug*, and other pulses sometimes the whole plant and sometimes only the stalks are thrashed. Six, eight, or more muzzled oxen are tied to the pole, half on one side half on the other, facing opposite ways, and driven round and round treading out the grain. *Tur* pods and barley heads are beaten against a log of wood so that the grain falls on the floor.

The grain is winnowed from the chaff with the help of the wind. The chaff is filled into baskets which are handed by one man to a second man who stands on a high three-legged stool called *várdí*, and empties the basket slowly with a shaking motion. The heavy grain falls, the light grain and chaff are blown aside. A man at the foot of the stool sweeps the chaff from the edge of the grain with a small broom called *hátñi*. To cleanse it still further the grain is afterwards passed through a sieve or *chólan*.

Chapter IV. Agriculture.

WEEDING.

WATCHING.

REAPING.

THRASHING:

WINNOWING.

Chapter IV.
Agriculture.

STORING.

In the east grain is often stored in underground chambers or *pevs*. Grain is also often in the east and always in the west stored in large cylindrical baskets called *kanings* or *kangis* made of *nirgundi* or *tur* twigs and smeared inside and out with cowdung. The surface of the grain is also thick plastered with cowdung and the basket is covered with a conical thatch roof. In the west, the baskets stand at some little distance in front of the house for safety from fire, with a few loose stones under them to keep out white ants. In the east they usually stand in the veranda of the house.

MIXED SOWINGS.

In the lighter eastern soils as many as six grains may be seen growing together year after year. A field with one crop is seldom seen. In the May or June sowings *bájri*, *tur*, *ambádi*, gingelly seed, *rála*, *mug*, and *shálu jvári* may all or almost all be seen together. In the late crops, safflower is almost always mixed with the staple crop gram or *shálu jvári*. Linseed is sown in rows with gram and wheat. The practice of mixed sowings arises chiefly from the poverty which dares not risk the total failure of a single crop. It was fostered by a custom which prevailed under former Governments of attaching the staple crop until the assessment was paid. In such a case the Kunbi could still make something out of a mixed crop.

WOOD-ASH
TILLAGE.

Wood-ash tillage, called *dalhi* or *kumri*, is confined to the hilly west. The word *dalhi* is taken from the small hill-side plots or *dalhás* where none but hand tools can be used. The spots cultivated are often extremely steep. Operations are begun in the cold weather by felling the brushwood and small trees and lopping the branches of the larger trees. At the end of the hot weather the dry branches are burnt and the ground is at once cleared and manured. After rain has fallen the soil is loosened with the hand hoe or *kudal* and the crop is planted or sown as the case may be. *Khurásni*, *ndgli*, *sáva*, *vari*, and *kodra* or *harik* are the crops. Tillage is generally continued for five years beginning with *khurásni* and ending with *kodru*. The subsequent fallow lasts ten to fifteen years. This form of tillage was never practised except by Kolis, Thákurs, and other half-wild tribes. It is now confined within very narrow limits.

ROTATION.

Rotation of crops is not unknown though the practice of mixed sowings robs it of half its value. In the lighter soils *javari* and *bajri* mixed as above alternate, the plough being used after *javari* on the borders of the west, and after *bajri* in the east. *Bajri* is often grown three or four years running; *javari* is seldom repeated so often as it takes more out of the ground. In the heavy deep soils cold-weather millet or *shálu jvári* is grown for several years running, relieved sometimes by a crop of gram or wheat. Where wheat is the staple late crop it alternates with gram, but is not grown year by year. In the west the rotation in early or *kharif* lands is more elaborate. Fallow land is ploughed and sown with *khurásni* the first year, with *ndgli* the second year, and with *vari*, *sáva*, *rála*, *bhadli*, or *kodru* the third and fourth years. In the fifth year *khurásni* is again sown and the land is left fallow for four or five years. The land is ploughed before each crop, but, except in the *ndgli* and *vari* seed beds no manure is used. This course of crops is sometimes

cut short by sowing *khurásni* in the third year succeeded by the fallow. It is also occasionally prolonged a year or two with similar crops, *khurásni* being always the last. Under the most favourable circumstances the rotation in gardens lasts three years. The course begins in July with *tág* or hemp, *Hibiscus sativus*, a crop which requires water about once in fifteen days. In October, after the larger plants have been picked and set aside for rope-making, the rest is ploughed into the ground as manure. The land is then flooded and left for twenty days, when it is ploughed twice and prepared for sugarcane. When the cane begins to sprout *vál* pulse is sown. The sugarcane is cut in the following March, the leaves are lopped on the spot and burnt as soon as they are dry, and the land is flooded. The land is ploughed with shallow furrows and *vál* is sown as fodder. The *vál* is taken up before July when the land has to be prepared for *kamod* rice. The rice is sown in July and cut in December. After two or three ploughings wheat is sown and cut in the end of April. The land is now ploughed and lies uncropped till July when perhaps earthnuts are planted and dug up in October. This order is liable to many changes according to the varying qualities of soil, water-supply, and the circumstances and opinions of the husbandman. Sometimes *methi*, that is Greek grass, or *khurásni* are ploughed into the soil instead of *tág* or hemp, and a four-year or even a five-year rotation is followed. In well-watered lands a three-year rotation is not common, for, in addition to the expense of well irrigation, the water-supply lacks the power supplied by the combination and co-operation which are distinctive of canal watered lands.

In the plain parts of the district land is sometimes left fallow, but it is a question how far husbandmen leave plain land fallow simply for to rest it. The fallow in wood-ash or *dalhi* land is certainly with the object of resting the land and lasts ten to fifteen years.

Chapter IV.
Agriculture.
ROTATION.

FALLOWS.

¹ The moderate climate and fertile soil of the Poona district offer every inducement to gardening. Yet the area under gardens is not large. Of late near Poona the best garden soil to a great extent has been given to the less troublesome and very profitable cultivation of sugarcane. This land will probably remain under sugarcane until it is exhausted of soluble silicates when it will doubtless be given to garden crops until it is again fit to bear sugarcane. The best garden soil is a dark brown friable loam lying on loose open trap rock. In such positions, if walls have been built to keep the soil over three feet deep, and water is available, it bears excellent crops of cabbage, cauliflower, beet, cucumber, radish, spinach of several kinds, and other nutritious vegetables, and custard apples, pomegranates, oranges, guavas, mangoes, plantains, and other fruit. Another very similar soil is found on river banks. This is also a dark-yellow or brown loam but its particles are finer and in consequence it is sometimes apt to hold too much water and to stick in hard lumps. Its situation makes it liable to floods, and it

GARDENING.

¹ Mr. G. M. Woodrow, Superintendent Botanical Garden, Poona.

Chapter IV.
Agriculture.
GARDENING.

contains a very small proportion of lime. Still on the whole it is an admirable soil, specially suited for *popai* and plantain trees and flowering shrubs, and if it is some height above flood level is excellent for orange and mango trees. The black soil overlying open calcareous marl is also a valuable garden soil. With liberal manuring and watering it bears first-rate vegetable and flowers, but is less suited to fruit trees as they are apt to run to wood.

In preparing the soil even in market gardens the native plough is the favourite tool. When drawn by four pairs of willing oxen, and when the furrows cross and recross and pass as deep as fifteen inches below the surface, the native plough is remarkably efficient. Though it is costly to work it can be used during many days on which European and American ploughs must remain idle. A stout hoe, or *pāde* and a small weeding-hook or *khurpe* almost complete the list of market garden tools; while in ornamental grounds the pick, rake, Dutch hoe, pruning shears, budding knife, watering pot, syringe, lawn-mowing machine, and other tools may be seen in use. The spade is seldom employed. The soil is so sticky when wet and so hard when dry, that the spade cannot often be used with advantage. In watering a garden plot the ground is laid out in ridges about fifteen inches apart and ten inches high, and the hollow between is flooded. The ground is also arranged in flat beds about ten feet by ten feet divided by one ridge or by a pair of ridges. The pair of ridges forms a water channel; and the single ridge separates one line of beds from the next line. The quantity of water given weekly averages in dry weather eighty tons the acre to plantains; sixty tons to cabbage, cauliflower, and other quick-growing garden crops; and forty tons to rose trees and similar crops. According to the age of the plant and the nature of the soil five to fifteen days pass between the waterings.

The chief garden-manure is the ashes of cowdung cakes mixed with goat's dung and vegetable refuse. When kept in a pit so that it may be moist and yet not have its soluble constituents washed away by rain, this is an excellent manure and is applied to all garden crops. Poudrette prepared by mixing fresh nightsoil with dry cowdung and wood-ashes has of late come into general use. It is specially suited for quick-growing leaf or root crops such as cabbage, cauliflower, potatoes, plantains, and sugarcane, and for maize and flowering plants which require regular watering. Cowdung mixed with vegetable refuse which has been kept moist until it is well decayed is perhaps the safest and most generally useful garden manure. If the cattle are fed with oil-cake or grain it is particularly rich; in any case it is safe and gentle and can be used without fear of ill effects. Dried fish and castor-oil cake are also used for garden crops of rapid growth and are especially profitable when applied to cabbage, cauliflower, beet, and sugarcane.

The best seed-sowing season is about the end of June; the heavy rains with which the south-west monsoon bursts are over, and the air is cooled to a temperate warmth. At this season green fly and other insect pests abound, and so much care is required to protect young cabbage and cauliflower plants that their sowing is generally

put off till August or September. Beans, beet, brinjals, carrots, celery, cress, knol-kohl, lettuces, mustard, onions, parsley, peas, radishes, spinach, and tomatoes among vegetables; and asters, balsams, convolvulus, nasturtium, pinks, phlox, and many other flower seeds, and the seeds of all local trees or trees belonging to districts with a similar climate may be sown about the end of June and repeated at intervals for succession up to September. In the hot air of October good seed often fails. November and December are the proper seasons for sowing lucerne and asparagus, for planting potatoes, and most of the vegetables and flowers in the previous list; also for larkspur and mignonette. In February and March several kinds of melons are sown in river-beds where water is near the surface. In April, early crops of beet, celery, cucumbers, knol-kohl, lettuce, spinach, and tomato are sown. In sowing at this season great care must be taken to provide proper shade and moisture. If complete shelter from the impending burst of the south-west rains is available the April sowings may be repeated in May and annual flower seeds be sown in pots in moist shady places. Sweet-smelling flowers are grown to a large extent in market gardens. Among the commonest kinds are roses, jessamines called *jai* and *mogra*, the tuberose called *gulchhabbu*, chrysanthemums or *shevtis*, and oleanders or *kaners*. In rearing these flowers the chief rule is to keep the plant growing. With this object, as soon as one crop of flowers is gathered, the plants are pruned to within a few buds of the old wood, manure is dug in between the plants, and if the weather is dry the ground is watered. By this treatment three crops of flowers are raised in the year, but the plants soon grow weakly and have to be replaced, and the flowers are small. *Michelia champaca son chāpha*, *Plumieria acuminata chāpha*, *Tagetes Marigold jhendu*, *Canna indica kerdali*, and *Pandanus odoratissimus kerda* are also grown as market flowers. The list of vegetables includes nearly all the chief kinds known in Europe. Several fine spinaches are raised from *pokla* *Amaranthus*, *pālak* *Chenopodium*, *methi* *Foenumgræcum*, and *ambādi* *Hibiscus cannabinnus*. A large white radish or *mula* is grown for its roots, and the pods of the *bhendi* *Hibiscus esculentus* are a favourite crop. The chief fruit trees are the custard apple, pomegranate, fig, grape, mango, *jāmbhul*, *bor*, and orange. The betel-leaf *pān* *Piper betel* is also grown in large quantities.

Among the commonest ornamental plants are allamanda, alocasia; beaumontia, begonia, bignonia, bougainvillea, caladium, convolvulus, cupresses, ferns, geranium, gesnera, hibiscus, nelumbium, nymphaea, palms, poivre, quisqualis, rose, and tabernæmontana.

The art of grafting by buds called *handi*, and grafting by enarching or *kalam* are practised to a limited extent. The better kinds of rose, orange, pomelo, and *bor* may be budded at any time during the rainy or cold season if the sap is flowing freely. Enarching or grafting by approach is employed to propagate the finer kinds of mango, guava, and *bor*. The true graft, that is uniting a branch entirely removed from its parent tree on to a

Chapter IV.
Agriculture.

GARDENING.

separate tree, is occasionally practised during November, to improve mango trees.

The use of the pruning knife is well understood. In pruning the rule followed in most cases is to cut back the shoot that has borne flowers or fruit to within a few buds from the base, and to remove weakly and decaying branches. Flowering shrubs of all kinds, the vine, and the fig tree are regularly pruned by cutting back the branches which have fruited. Other fruit trees are kept free from unsound wood.

The moving of small plants which can be guarded from strong wind and from the sun is carried on during the rainy season with success. To move large shrubs or trees the best time of the year is between November and January. In spite of the dryness of the cold season large trees can be moved more easily in Poona than in Europe.

CROPS.

The following are the chief details of the leading local field and garden crops.¹ Of cereals there are thirteen :

¹ The following interesting statement was prepared by Captain Robertson, the first Collector of Poona in 1821. It shows the chief products of the district, the proportion each bore to the whole outturn, and the times of sowing and reaping :

POONA CROPS, 1821.

Proportion.	NAME.	Sown.	Reaped.
1	Udid	May - June	August - September.
1	Mug	Do.	Do.
1	Makhi	Do.	Do.
1	Rala	Do.	Do.
1	Sava	Do.	Do.
29	Jodri	June - July	October.
6	Tur	Do.	Do.
27	Edjri	Do.	Do.
4	Rice	Do.	October - November.
1	Nachni or Nagli	Do.	Do.
1	Til	Do.	September - October.
1	Bhadli	Do.	Do.
1	Yari	Do.	Do.
1	Bhusmug	Do.	December.
14	Wheat	September - October	February - March.
11	Gram	Do.	Do.
11	Vatana	October - November	Do.
1	Masur	Do.	Do.
3	Muth	June - July	November.
1	Hulga or Kulith	Do.	Do.
1	Sugarcane	June and January	After twelve months.
1	Sweet Potatoes	All the year	After five months.
1	Onions and Garlic	January and August	April and December.
1	Chillies	June - July	January - February.
1	Betel Leaves	July - August	July - August.
1	Kaduvadi	April - May	July - August.
1	Carrots	October - November	January - February.
1	Kautti	May - June	September - October.
1	Barley	October - November	February - March.
1	Tobacco	June	November - December.
1	Chauli, Ambadi, Kardai, Pavie, Aishi, Cotton.	...	.....
100			

POONA CEREALS.

No.	MARATHI.	ENGLISH.	BOTANICAL.
1	<i>Bájrí</i>	Spiked millet	<i>Penicillaria spicata.</i>
2	<i>Bári</i> ... ..	... ..	<i>Paspalum scrobiculatum.</i>
3	<i>Bhádti</i> ... ..	... ..	<i>Panicum pilosum.</i>
4	<i>Bhádt</i>	Rice	<i>Oryza sativa.</i>
5	<i>Gáhu</i>	Wheat	<i>Triticum aestivum.</i>
6	<i>Hark</i> or <i>Kodru</i> ... ..	... ..	<i>Paspalum frumentaceum.</i>
7	<i>Jvári</i>	Indian millet	<i>Sorghum vulgare.</i>
8	<i>Makka</i>	Indian corn or maize	<i>Zea mays.</i>
9	<i>Nágl</i> or <i>Náchni</i> ... ..	... ..	<i>Eleusine corocana.</i>
10	<i>Rála</i> ... ..	... ..	<i>Panicum italicum.</i>
11	<i>Satu</i> or <i>Jav</i>	Barley	<i>Hordeum hexastichon.</i>
12	<i>Sava</i> ... ..	... ..	<i>Panicum mitaceum.</i>
13	<i>Vári</i> ... ..	... ..	<i>Panicum miliare.</i>

Chapter IV.
Agriculture.CROPS.
Cereals.

1. *Bájrí*, Spiked Millet, *Penicillaria spicata*, in 1881-82 covered 557,807 acres, 116,306 acres of them in Sirur, 108,599 in Junnar, 107,856 in Khed, 82,159 in Bhimthadi, 81,283 in Haveli, 32,840 in Purandhar, 24,136 in Indápur, and 4648 in Mával. *Bájrí* with *javári* is the staple crop of the district. It is grown all over the district but in small quantities in the hilly west of Junnar, Khed, Mával, and Haveli. It is a finer grain than *javári* and requires more careful tillage. There are three varieties of *bájrí* which can hardly be distinguished except by the initiated, *gari* or early, an inferior variety maturing in three and a half months; *hali* or late, a finer variety taking longer to mature; and *sajguri*, a quickly maturing variety with a smaller grain and grown chiefly under water. *Bájrí* is sown in June or July usually in shallow black or light gravelly soils mixed with *rála* a coarse grain, *math* a pulse, *ambádi* hemp, *til* sesamum, and *tur* a pulse. These grains are mixed in the following proportions: *bájrí* 32, *rála* 1, *math* 4, *ambádi* 2, *til* 1, and *tur* 4. In rich soils *tur* is commonly sown in alternate rows with *bájrí* and in poor soils a small legume called *hulga* or *kulith* *Dolichos biflorus* is always sown. A brown mould partly of red and partly of black soil is considered best for the growth of *bájrí*. Two to two and a half pounds of the mixed seed is sown to the acre, the better the soil the less the seed. *Bájrí* is seldom watered or manured. It depends less on the soil and more on the rain than *javári*. It never yields so large a crop as *javári* and where both can grow *javári* is always chosen. *Bájrí* wants more ploughing, manuring, and weeding than *javári*. When the crop is four or five inches high the weeds and grass are cleared. A timely fall in August favours the growth of *bájrí*, but, especially in shallow soils, too much rain settles at the roots and rots the stalks. *Bájrí* is harvested in October and November, and from mid-October to mid-February the crops grown with it ripen, first the panic *rála*, then the pulse *math*, then the hemp *ambádi*, then the sesamum *til*, and last the pulse *tur*. The average yield of *bájrí* on different unwatered soils in good and bad years is 300 to 400 pounds. The green ears are parched and eaten under the name of *limbur* or *nimbur*. The ripe grain is sometimes parched and made into *láhis*. *Bájrí* is chiefly used as a bread grain, being kneaded with salt into round cakes about five inches across and half an inch thick. It is not liked by the working classes, but is the favourite food of the upper classes, especially of the people of Poona. The stalks called *sarmad*

Chapter IV.
Agriculture.

CROPS.
Cereals.

are given to cattle, but unless trodden into chaff are held inferior to almost all other fodder.

2. *Bárti* commonly *barti*,¹ *Paspalum scrobiculatum* or *flavidum*, is grown almost entirely in the east of the district, usually in separate furrows in fields of *bájri*. It is sown in June and July, and, without water or manure, ripens in October. The grain, which is white and round, is about the size of *bájri*, and grows on crooked finger-like side shoots which stand out at distinct intervals from the main stem of the ear. The grain has to be pounded to separate the husk, and is usually boiled and eaten like rice. It is much esteemed by the poor and is said to be most wholesome.

3. *Bhádli*, *Panicum pilosum*, is grown almost entirely in the east of the district and usually in the same fields as *bájri*. It is sown in June, and, without water or manure is reaped in October or November. *Bhádli* is much like red *rála* and is sometimes confounded with it. It is larger, grows well in poorer soil, and the ripe ear is reddish brown and bristly, while the ripe *rála* is smooth and of a pale yellow. The grain is unhusked by pounding. It is eaten by the poor, chiefly in the east. It is sometimes boiled and eaten whole, and more rarely ground to flour. The straw is used as fodder.

4. *Bhát*,² Rice, *Oryza sativa*, in 1881-82 covered 47,885 acres, 21,104 of them in Haveli, 14,990 in Mával, 5998 in Khed, 4169 in Junnar, 1489 in Purandhar, 102 in Indápur, and 33 in Bhimthadi. It is the chief product of the west lands or Mávals, and is sometimes found in moist places in the eastern plain. About eleven kinds of rice are grown in the Poona district. One kind, *kamod*, the best rice in the district was brought by Dr. Gibson from Kaira in 1842. It is grown as a channel-watered crop. Four kinds, *ámbemohar*, *kále*, *ráybág*, and *rájával*, are sown in late May in manured seed-beds, planted into wet fields in July-August, and reaped in late October. Five poor sorts, *chimansál*, *dodke*, *kolambe*, *kothimbare*, and *varangal*, are generally sown broadcast or by drill in poor rice-fields or on high-lying ground in June and reaped in September.³ Much the greater part of the Poona rice is grown under the planting system. In March or April a plot is chosen for the seed-bed either in the rice field itself or on higher ground close to the field and ploughed once and levelled. Cowdung, grass, and leaves are spread on the ground, a second layer is added of branches and brushwood covered with grass, and fine earth is sprinkled over all. These layers of cowdung, brushwood, and grass are called *ráb*.⁴ In early May the brushwood is fired on the leeward side to ensure slow and thorough burning and the ashes remain guarded from the wind by the upper

¹ *Bárti* is said by Colonel Sykes to be the same as *kodru* or *harik* *Paspalum frumentaceum*. Inquiry in different parts of the Deccan satisfied Mr. Fletcher that the two are different.

² The Maráthi names of rice in its various stages are the seed *bhát*, the seedlings *rop*, the plants *avan*, the planted rice *bhát*, the husked seed *tándul*, the straw *pendha* or *bháte*, and the husk to which the grain clings *konda*.

³ Bom. Gov. Rev. Rec. 1453 of 1843, 79.

⁴ The chief difference between *ráb* and *dalhi*, the two forms of wood-ash tillage, is that in *dalhi* the bushes are burnt where they grow and in *ráb* they are brought from somewhere else.

Chapter IV.
Agriculture.

CROPS.
Cereals.

layer of earth. After the first rain in June the seed is sown broadcast and covered by the hand-hoe or *kudal*. In July, when five or six inches high, the seedlings are pulled up, tied in small bundles, and taken and planted by hand in the rice-field in bundles of four to six plants. This planting is expensive. To plant about 110 acres (150 *bighás*) is a day's work for 150 men. The planting of rice takes longer than the planting of *náchni* and *vari* as in the case of these coarser and hardier grains it is enough to throw the plants on the ground. Rice-fields, which are called *kháchars* in Maráthi, are formed by throwing earthen banks across the beds of water-courses or lines of drainage, by holding back the muddy deposit, and controlling the supply of water which during the rainy months comes from the higher lands. The best rice soil is a bright yellow deepening to black as the quality declines. At the same time the yield of rice depends as much on the plentiful and constant supply of water as on the character of the soil. Once in two or three years, to prevent their silting, rice-fields are three or four times ploughed in opposite directions. The clods are broken with the *kulav* and the *petári* is then used to clear the loose soil out of the bottom of the field, and heap it on the bank. In June and early July while the seedlings are getting ready for planting, the flooded rice-field is ploughed and trodden by oxen into a mass of soft slushy mud. Fifteen days after planting, when the seedlings have begun to shoot, their dead leaves are plucked off by the hand. As the planting is usually done during pouring rain and in deep mud the head and back of the planter are always shaded by a water-tight shell made of wicker-work and teak leaves called *virle* or *pánghongadi*, and a stool or *tivas*, whose seat and bottom are two parallel planks separated by a single leg of wood, is used to sit on. After the planting is over, the water is kept standing in the field at a certain depth till the crop ripens when it is allowed to dry. Between September and November planted rice is reaped with the sickle or *vila* and carried as cut and laid on the bank lest the ripe grain should be injured by lying on the wet ground. In eight or nine days a man and his wife can cut about four acres (5 *bighás*) of rice. As the whole crop should be carried and stacked before the grain dries labourers have to be hired to carry the sheaves to the thrashing-floor. To separate the husk from the grain rice has to be pounded or ground. Except where it is grown rice is eaten by the poor on feast days only; it enters into the daily food of all the middle and upper classes, whether Hindus or Musalmáns. It is most commonly simply boiled; it is also eaten parched as *láhis* and *pohás* and *murmurás*.¹ These are most useful as ready-cooked food for a journey and are generally given along with *dále* or parched gram pulse as rations to Hindu soldiers on a

¹ To make *pohás* the husked rice is soaked in cold water for three days, scalded, and left to drain dry in an open basket. It is then slightly parched and pounded in a stone mortar. The crushed pulp forms into flat lozenge-shaped pieces and the husk is separated by a winnowing fan. *Pohás* are sometimes ground to flour and used in sweetmeats. For *murmurás* the husked rice is partially dried in the sun after a three days' soaking and scalding. It is slightly parched and the husk separated by traying in a mortar. Salt water is next thrown over it and the grain is again parched in hot sand which makes it puff and swell.

Chapter IV.
Agriculture.

CROPS.
Wheat.

sea voyage. The flour is also used in various preparations; the straw or *pendha* is used as cattle fodder.

5. *Gahu*, Wheat, *Triticum æstivum*, in 1881-82 covered 60,524 acres 21,677 of them in Junnar, 9537 in Mával, 8688 in Bhimthadi, 8205 in Khed, 4919 in Sirur, 3503 in Hayli, 2983 in Indápur, and 1012 in Purandhar. Wheat is a late or cold-weather (October-March) crop. It is grown over the whole district but in small quantities in the west lands of Junnar, Khed, and Haveli. It requires a moister climate than *javari* and in the eastern fringe of the west lands is generally grown as a dry-crop. Elsewhere it is grown as a dry-crop only in favoured places, but over the whole eastern plain it is largely grown as watered crop. Wheat wants black or rich soil. The best soil is the alluvial loam known as *gavháli* or the wheat land. Wheat also thrives in the lowlying black or better brown clay soils in low lands where drainage gathers. Four kinds of wheat are grown, *bakshi*, *káte*, *khaple* also called *jod*, and *pote* that is big-bellied.¹ *Bakshi* requires good black soil. It is sown in October or November, is usually watered and manured, and is reaped in February or March. This wheat is of the finest quality, but as it is delicate it is not largely grown. The stem is sometimes as much as five feet high, the grain is larger than the grain of other kinds of wheat, and the beard, when ripe, is tipped with black. *Káte* wheat is sown in good black soil in October, is usually watered but not manured, and is reaped in February. It is shorter-stalked and smaller-grained than either the *bakshi* or *khaple*, is hardier than the *bakshi*, and is the wheat commonly grown in dry lands. *Khaple* or *jod*, husk wheat, is sown in black soil in November, is always both watered and manured, and is reaped in March. *Khaple* is the wheat usually grown in gardens. It is very hardy. It owes its name to the fact that the grain cannot be separated from the husk without pounding. It is sown as a second or *dusota* crop in January and February in irrigated lands after *báji*, maize, tobacco, chillies, or wheat with good results. *Pote* or big-bellied wheat is less esteemed than other varieties. It is sown in poor black soils in November, is neither watered nor manured, and is reaped in February. Other varieties known in the district are *dáudkháni* and *kále-kusal*. Two and a half to three and a half pounds of wheat are sown to the acre, the better the soil the less the seed. The average acre yield from all kinds of wheat in unwatered land is 500 to 600 pounds and in watered land 1000 to 1100 pounds. In garden land wheat follows rice and in dry-crop land it comes best after *báji*, maize, tobacco, or chillies. After two or three ploughings the wheat is sown and the land is levelled with the harrow. When the seed has begun to sprout, to regulate the watering, ridges and small water-courses are made with a large rake in the shape of squares or *váphás*. Wheat after it has come into ear is affected by mildew called *támbera* and *garva* or *khaira*. These diseases are said to be commoner in fields where mustard is grown than elsewhere. *Támbera* appears after unseasonable and

¹ In 1842 Dr. Gibson is said to have introduced about thirty-eight choice varieties of wheat. Bom. Gov. Rev. Rec. 1453 of 1843, 79.

heavy rain and covers the crop with small swellings containing a reddish powder. It very seriously injures if it does not totally destroy the crop. *Garva* or *khaira* appears after cloudy and misty weather in circles at distances from each other. It covers the crop with small swellings containing a dark brown powder. The grain becomes small and shrivelled. *Garva* is neither so common nor so destructive as *támbera*. Green wheat ears called *ombya* are parched and eaten. The ripe grain is used only as bread. It is seldom eaten by the poor except on feast days as it is never eaten without the addition of clarified butter or *tup*. The flour is used largely in pastry and sweetmeats. Wheat straw is eaten as fodder with or without a mixture of chaff.

6. *Harik* or *Kodru*, *Paspalum frumentaceum*, in 1881-82 covered 397 acres in Junnar. It is grown almost entirely in the western hill-sides and light soils. It is sown in June and reaped in October or November. The grain, which is round and flattish and of the size of a mustard seed, forms in double rows on one side of a flat stem, and until ripe the ear remains enveloped in a sheath. New *harik* is said to be powerfully narcotic and is eaten only by the poor who prepare it in various ways, and from use are able to eat it with impunity.¹ The straw is hurtful to cattle.

7. *Jvári*, Indian Millet, *Sorghum vulgare*, the most largely grown cereal in Poona, in 1881-82 covered 588,502 acres, 226,152 of which were in Haveli, 129,069 in Indápur, 73,026 in Purandhar, 53,239 in Sirur, 54,877 in Bhimthadi, 28,782 in Khed, 16,438 in Junnar, and 2918 in Mával. It is grown over the whole district but in the hilly west of Junnar, Khed, Mával, and Haveli only in small quantities. It is the staple grain of the eastern plain. There are many varieties of Indian millet some of which belong to the early and others to the late harvest. The early varieties are found only in the belt which fringes the east of the western districts, and are sown thickly for fodder rather than grain. The late varieties are grown in the eastern plain, yield grain plentifully, and their fodder though less abundant is of better quality than that of the early varieties. There are three chief early varieties *argadi*, *kálbhondi*, and *nilva*. *Argadi*, also called *utávli*, is sown in June or July in shallow black or light soil, and, without the help of water or as a rule of manure, is grown and cut in November. The stalk is sometimes ten feet high; the head is small. This variety is also sown as a watered crop in April and matures in June or July. When grown as a watered crop it is called *khondi* or *hundi*.² This crop is sometimes sown broadcast and thick and cut for fodder before the head appears. *Kálbhondi*, that is black husk, is sown in June or July without either water or manure, and is harvested in November. The stem is six or eight feet high and the head large. *Nilva*, that is blue-husk, a variety much grown in Khándesh, is sown in June in black soils without either water or manure and is cut in November. The stem is very tall and coarse and the head

Chapter IV. Agriculture.

CROPS.
Cereals.

¹ Mr. Sinclair, C.S., found that in Thána the grain was intoxicating when grown for the second or third time in the same land. Fletcher's Deccan Agriculture.

² *Khondi* or *hundi* is described as a separate variety by Colonel Sykes.

Chapter IV.
Agriculture.

CROPS.
Cereals.

large. The fodder is prized for milch cattle. There are three late varieties of Indian millet *shálu*, *dudh-mogra*, and *támbdi*. The best of the late kinds is *shálu*. It is sown in black soils from mid-August to mid-October and harvested from mid-January to mid-February. The stalk is three to five feet long and sweet-juiced, and the grain white. *Dudh-mogra* is sown with *shálu* either mixed in the same furrow or in separate furrows. The straight hard stalk is poor fodder and the scattered feather head has the merit of being too light to give birds a foothold. The full milky grain parches into excellent *láhis*. A dark-husked variety of *dudh-mogra* has a stem which is sometimes used as a weaver's hand-rod. *Támbdi*, that is red, Marshall's Sorghum *devia*, is sown generally in light soils in late July and early August, and, without either water or manure, ripens in early January to early February. The stem is three to four feet high and poor as fodder, and the grain is white and hard. Four to five pounds of late *javári* are sown to the acre, the better the soil the less the seed. The early Indian millets take eight to ten pounds of seed an acre. Unwatered *javári* in all kinds of soil gives an average yield of 400 to 500 pounds the acre, and watered *javári* yields 1000 to 1200 pounds. *Shálu* is the most productive variety sometimes yielding as much as 2500 pounds the acre. Before the head forms the plant is called *kadval* and when perfect *bátuk*.¹ *Jvári* is the only cereal whose straw or *hadba* is used as fodder in its natural state. The straw of all other cereals and of all soft stemmed pulses is trodden to pieces, mixed with chaff, and stowed in large baskets, and is called *bhuskat*. *Jvári* stalks are stacked and thatched in the rainy west; in the drier east they are stowed in long grave-like ridges and covered with clods of black soil. The grain is chiefly used as a bread grain, but is also eaten parched as *láhi*. When in season the parched unripe *javári* heads form a chief item of food with the labouring classes and are called *hurda*.

8. *Makka*, Indian Corn, *Zea mays*, in 1881-82 covered 3844 acres, 2435 of which were in Purandhar, 720 in Bhimthadi, 630 in Indápur, fifty in Haveli, and nine in Sirur. In 1842 the American maize was naturalised at the experimental garden at Hivra in Junnar.² It is sown in the eastern sub-divisions in black soil. When unwatered it is sown in June and ripens in August; when watered it may be grown at any season. The heads or *butás* are usually eaten parched or boiled while green and the ripe grain is also parched and made into *láhis*, and after grinding is used as flour. The stalk is a very coarse fodder.

9. *Nágli* or *Náchni*, Eleusine *corocana*, in 1881-82 covered 52,365 acres, 16,310 of which were in Khed, 14,036 in Mával, 12,572 in Haveli, 6983 in Junnar, and 2464 in Purandhar. It is grown only in the hilly west sometimes in wet lands by planting like rice or by sowing with the drill, and often in high lands. In planting *náchni* the seedlings are simply thrown on the ground in little trenches at about equal distances apart and left to root as they can. *Náchni*

¹ *Bátuk* is also applied to the plants of *tur* sown in a crop of *báji*.

² Bombay Gov. Rev. Rec. 1453 of 1843, 77.

Chapter IV.
Agriculture

CROPS.
Cereals.

does not want a deep or a rich soil, but in any but a moist soil it perishes. It is sown in June and ripens in October or November. As the stalk is hard, reaping is difficult and costly. It takes four persons eight days to cut about three acres (2 *bighás*) of *náchni*. The carrying and stacking are also expensive. *Náchni* should be carried as soon as possible after the crop is cut, and the sheaves should be carried only in the morning when the heads are wet with dew. Later in the day the heat of the sun shrivels the husk and loosens the seed. Under the name of *hurda* the green heads are parched and eaten. The ripe grain is eaten in cakes by the west country poor and the flour is made into a cooling drink called *ámbil*. The straw, powdered and mixed with chaff, is used as fodder.

10. *Rála*, *Panicum italicum*, in 1881-82 covered 1084 acres, 681 of which were in Purandhar, 136 in Bhimthadi, 113 in Haveli, eighty-one in Indápur, sixty-eight in Sirur, and one in Junnar. It is grown chiefly in the east of the district in shallow black or light soils usually in the same fields as *bájri*. It is of two varieties, a red and a white, which differ only in colour. It is sown in June and ripens in October. The grain is separated from the husk by pounding and is usually boiled and eaten whole. The stalk is used for fodder and thatch.

11. *Sátu* or *Jav*, Barley, *Hordeum hexastichon*, in 1881-82 covered 141 acres fifty-one of which are in Bhimthadi, fifty in Haveli, twenty in Purandhar, fourteen in Indápur, and six in Junnar. It grows only in black soil, is sown in November, and, with the help of water and manure, is reaped in February. Barley is chiefly used in making the ready-cooked food called *sátuche-pith* or barley flour. The grain is parched, ground, and mixed with a small proportion of gram and wheat-flour and flavoured with seeds. When eaten it is usually made into little dough balls with water. The grain is also used in the *shrádha* or mind-rités for the dead and the flour in the *shrávani* or Shrávan purification.

12 and 13. *Sáva*, *Panicum miliaceum*, and *Vari*, *Panicum miliare*, in 1881-82 covered 32,342 acres, 11,163 of which were in Khed, 8282 in Haveli, 7885 in Mával, 4317 in Junnar, and 689 in Purandhar. They are grown only in the west of the district usually in light red soils and on hill-sides. They are not watered or manured, but the seedlings are planted like rice-seedlings except that instead of fixing them in the ground they are simply thrown on the surface and left to root. When the plants are about a foot high *sáva* requires weeding. This is done for each other by the villagers at no expense except some liquor for the weeders. In 1821, in these weeding parties a drummer was at hand who beat incessantly and at intervals stirred on the weeders calling out *Bhalere Dáda*, *Bhale Bháu Dáda*, Well done brothers, well done. The weeders got as much spirit as they could drink.¹ From the hardness of the stalks and the need of prompt and early-morning carrying, labour has to be hired in harvesting *sáva* and *vari* as well as in harvesting *náchni*. Both *sáva* and *vari* have

¹ Captain H. Robertson in East India Papers, IV. 579.

Chapter IV.
Agriculture.CROPS.
Pulses.

to be unhusked by pounding. They are mostly eaten by the west country poor. They are boiled like rice and are sometimes ground to flour and made into bread. The straw is not used as fodder.

Thirteen pulses are grown in Poona. The details are :

POONA PULSES.

No.	MARATHI	ENGLISH.	BOTANICAL.
14	<i>Dáng Chavli</i> ... ..	...	<i>Dolichos sinensis.</i>
15	<i>Harbhara</i>	Gram	<i>Cicer arietinum.</i>
16	<i>Kulthi or Hulga</i> ... ..	...	<i>Dolichos biflorus.</i>
17	<i>Lákh</i> ... ..	...	<i>Lathyrus sativus.</i>
18	<i>Masur</i>	Lentils	<i>Ervum lens.</i>
19	<i>Math or Matki</i>	Kidney Bean	<i>Phaseolus sconiifolius.</i>
20	<i>Mug</i>	Green Gram	<i>Phaseolus mungo.</i>
21	<i>Pavta</i> ... ..	...	<i>Dolichos lablab.</i>
22	<i>Rán or Shet Chavli</i> ... ..	...	<i>Dolichos catjang.</i>
23	<i>Tur</i>	Pigeon Pea	<i>Cajanus indicus.</i>
24	<i>Udid</i>	Black Gram	<i>Phaseolus radiatus.</i>
25	<i>Vál</i> ... ..	...	<i>Dolichos spicatus.</i>
26	<i>Vátána</i>	Peas	<i>Pisum sativum.</i>

14. *Dáng Chavli*, *Dolichos sinensis*, like but larger than *rán* or *shet chavli* *Dolichos catjang* (No. 22), is usually grown in gardens round the edge of other crops. It is a strong climber, with a pod some five or six inches long, and a rather dark seed.

15. *Harbhara*, Gram, *Cicer arietinum*, the most largely grown pulse in Poona, in 1881-82 covered 28,879 acres, 6398 of which were in Bhimthadi, 5020 in Indápur, 4770 in Junnar, 4329 in Khed, 2678 in Máyal, 2360 in Sirur, 1620 in Purandhar, and 1404 in Haveli. It is grown in the east of the district and very rarely in the west. It requires good black soil. It is sown in November and without either water or manure is harvested in February. The leaves are used as a vegetable. The grain is eaten green, is boiled as a vegetable, and is parched when it is called *hola*. When ripe it is split into *dál* and eaten boiled in a variety of ways and in making a sweet cake called *puran-poli*. It is slightly soaked, parched in hot sand, and called *phutánás*, which are sometimes flavoured with turmeric salt and chillies. It is also given to horses. The living plants yield a quantity of vinegar or oxalic acid called *ám* which gathers on the plants at night and soaks cloths which are laid over them. The dry stalks are good fodder. A light-coloured variety called *káli* is seldom grown in Poona.

16. *Kulthi*, Horse-gram, *Dolichos biflorus*, in 1881-82 covered 13,065 acres, 4056 of which were in Khed, 2934 in Bhimthadi, 2220 in Junnar, 2158 in Purandhar, 942 in Sirur, 645 in Indápur, and 110 in Haveli. It is grown throughout the district and is sown generally with *bájri* in separate rows in shallow light soil. It is sown in June and ripens in November without either water or manure. The pulse is boiled whole and is given to horses. It is also eaten in soup and porridge. The leaves and stalks are good fodder.

17. *Lákh*, *Lathyrus sativus*, is grown in small quantities in the west. It is sown in November or December in black soil or as a second crop after rice. It grows without water or manure. The seed is like a mottled gray pea. It is not eaten while green. The ripe pulse is boiled whole and eaten, and when split is cooked in various ways. The stalks and leaves are eaten by cattle.

18. *Masur*, Lentils, *Eryum lens*, in 1881-82 covered 836 acres, 440 of which were in Mával, 302 in Khed, and ninety-four in Junnar. It is grown throughout the district. It is sown in November or December in black soil or as a second crop on rice lands, grows without water or manure, and is harvested in February and March. The green pods are sometimes eaten as a vegetable, and when ripe it yields the most delicate split pulse in the Deccan. The boiled pulse is also eaten whole.

19. *Math* or *Matki*, *Phaseolus aconitifolius*, grown chiefly in the eastern plain, is sown mixed with *bájrí* in shallow black or light stony soils in June or July and is harvested in November. The pulse is split and eaten as *dál* in different ways. It is ground to flour and used with the flour of other grains in making cakes. It is also eaten parched or boiled whole with condiments. The grain is given to horses and cattle and the stalks are good fodder.

20. *Mug*, Green Gram, *Phaseolus mungo*, in 1881-82 covered 3900 acres, 2349 acres of which were in Khed, 687 in Junnar, 351 in Bhimthadi, 250 in Purandhar, 226 in Haveli, thirty-one in Indápur, five in Sirur, and twenty-one in Mával. It is grown chiefly in the east of the district. It is sown in June by itself in shallow, black, or light stony soils, and often as a first crop on rich lands in which a second called *dusota* or *bivad* crop is raised. It is neither watered nor manured, and is harvested in September. The green pods are eaten as a vegetable. The ripe green-coloured pulse is eaten boiled whole, or is split and used as *dál*. It is parched, ground to flour, mixed with butter and made into spice balls. It is also made into porridge. The leaves and stalks are good fodder. *Mugi*, a smaller blackish variety, is sown with *bájrí* or *argadi* in June and reaped in November. It is inclined to creep and remains longer on the ground than *mug*.

21. *Pávta*, also called Sweet *Vál*, *Dolichos lablab*, is sown sometimes in June mixed with *bájrí* and sometimes in November on the banks of rivers or in the west as a second crop after rice. Two varieties differ only in the colour of the grain, one is pale yellow the other black with a fine seam. It grows without water or manure, ripens in February-March, and goes on bearing for about two months. The boiled green seeds are eaten as a vegetable and the ripe pulse is split and eaten in many ways. The leaves and stalks are a fodder which is especially valued for milch cattle.

22. *Rán* or *Shet Chavli*, *Dolichos catjang*, is grown chiefly in the west lands. It is sown in June in shallow light soils and as the first of a double crop in rich soils. It grows without water or manure, and is harvested in September. The green pods which are about two inches long and the leaves are eaten as vegetables, and the pulse, which is pale yellow oval and dented on one side, is cooked in many ways, both split and whole.

23. *Tur*, *Cajanus indicus*, in 1881-82 covered 12,851 acres, 7830 acres of which were in Sirur, 1576 in Bhimthadi, 1399 in Khed, 769 in Junnar, 589 in Haveli, 356 in Indápur, 237 in Indápur, and ninety-five in Mával. It is grown chiefly in the eastern subdivisions mostly in shallow and sometimes in deep black soils, in the same field with *bájrí*, in the same or in separate

Chapter IV.
Agriculture.

CROPS.
Pulses.

furrows. It is sown in June-July, and, without water or manure, is harvested in January and February. During the eight months *tur* is on the ground, it is said to flower and seed eight times, all the pods remaining on the plant till harvest. It is a perennial plant, but is always pulled out after the first year. The green pods are eaten as a vegetable, and the ripe pulse is split and eaten boiled in a variety of ways. The yellow split-pulse or *dál* is in common use being made into porridge and mixed with vegetables, and is little less valuable than gram. The leaves and pod shells are excellent fodder, and the stem is in use for wattling house walls and roofs, and for making baskets and brooms. *Tur* or doll-bush that is *dál*-bush charcoal has long been famous for making gunpowder.

24. *Udid*, Black Gram, *Phaseolus radiatus*, in 1881-82 covered 1519 acres, 1031 of which were in Khed, 330 in Junnar, ninety in Purandhar, forty-seven in Haveli, and twenty-one in Mával. It is grown almost entirely in the east of the district. It is sown in June frequently with *bájri* or *argadi* or in rich soils when a second crop is to follow. It is neither watered nor manured, and ripens in September. The green pods are rarely used as a vegetable. The black ripe pulse is split into *dál*, and is a most fattening food. It is parched and ground to make different sorts of spice balls and is the chief element in the thin wafer-biscuits called *pápads*. The stalks and leaves are a good fodder. *Udadi* is a smaller and inferior variety which does not ripen till November.

25. *Vál*, *Dolichos spicatus*, is chiefly grown in the east and centre of the district, often round or mixed with garden crops, especially in the sugarcane fields where it is sown both as fodder and for shade. When grown with or in rows round *bájri* or early *javári* it is sown in July and without water or manure ripens in four months, and continues bearing for some time longer. The seeds are slightly bitter, smaller, and not so flat as *pávta* seeds, which is sometimes known as sweet *vál*. The green seeds are eaten boiled, the ripe pulse is used in many ways as *dál* or in soup, and the stalks and leaves are prized as fodder for milch cattle.

26. *Vátána*, the Pea, *Pisum sativum*, in 1881-82 covered 836 acres, 329 of which were in Junnar, 329 in Khed, 100 in Haveli, seventy-six in Mával, and two in Indápur. Peas are grown in moist places throughout the district. They are sown in October or November or later as a second crop after rice, and, without water or manure, are harvested in four and a half months after sowing. The seed is eaten green as a vegetable and when ripe is boiled whole or split and eaten in various ways. The leaves and stalks are good fodder.

Seven oilseeds are grown in Poona. The details are :

POONA OILSEEDS.

No.	MARATHI.	ENGLISH.	BOTANICAL.
27	<i>Ambádi</i>	Brown Hemp	<i>Hibiscus cannabinus</i> .
28	<i>Ehutmug</i>	Earthnut	<i>Arachis hypogæa</i> .
29	<i>Brandí</i>	Castor-seed	<i>Ricinus communis</i> .
30	<i>Javas or Aishi</i>	Linseed	<i>Linum usitatissimum</i> .
31	<i>Káris or Khurdant</i>	Nigerseed	<i>Verbesina sativa</i> .
32	<i>Kusumba or Kardai</i>	Safflower	<i>Carthamus tinctorius</i> .
33	<i>Tú</i>	Sesamum	<i>Sesamum indicum</i> .

Chapter IV.
Agriculture.

CROPS.
Oilseeds.

27. *Ambádi*, Brown Hemp, *Hibiscus cannabinus*, in 1881-82 covered 1375 acres, 659 of which were in Bhimthadi, 526 in Sirur, ninety-four in Indápur, eighty-nine in Purandhar, and seven in Mával. It is grown in small quantities in shallow black soils chiefly in Bhimthadi, Sirur, and Indápur. It is sown in June usually mixed with *báji*, grows without water or manure, and is harvested in December or January. The young sour leaves are eaten as a vegetable. The seed is sometimes given to cattle and in times of scarcity is mixed in bread. It is chiefly used as oil-seed and, before the oil is extracted, is always mixed with *kárle* or linseed. The bark yields a valuable fibre which is separated from the stalk by soaking. It is made into ropes for various field purposes either by the husbandmen or village Mángs.

28. *Bhuimug*, Earthnut, *Arachis hypogæa*, is grown both in the eastern plains and in the eastern fringe of the west lands. It is planted in June, and in the east with the help of water and manure and in the western plain with the help of manure, ripens in December, but is often dug in November and eaten raw or parched. The ripe fresh nut is sometimes boiled with condiments, and eaten as a vegetable, but is more frequently used as an oilseed. An edible oil is pressed from the nuts which are usually first mixed with *kardai* or *rála* seeds as the pure earthnut oil is said not to keep. It is a favourite food with wild pig, and along the Mutha canals has suffered so severely from their ravages, that the people have given up growing it.

29. *Erandi*, Castor-seed, *Ricinus communis*, is grown in small quantities chiefly in the black soils of the eastern plain, sometimes round other crops and more often in patches by itself. It is sown either in June or November, and without water or manure is harvested in November or February. Its stem and flowers are red. The oil, which is used more for burning than as a medicine, is drawn by boiling the bruised bean and skimming the oil that rises to the surface. The proportion of oil to seed is as one to four. The leaf is applied as a guineaworm poultice and the dried root as a febrifuge. A large variety of the castor-plant, probably *R. viridis*, is grown in gardens round other crops. Its stem and flower are green. Both varieties are perennial and would grow to a considerable size if they were not taken out of the ground at the end of the first year.

30. *Javas* or *Alshi*, Linseed, *Linum usitatissimum*, in 1881 covered only 152 acres, seventy-seven of them in Indápur, seventy in Bhimthadi, nine in Purandhar, and three in Sirur. It is grown in small quantities solely in rich black soils in the east either in gram or wheat fields in separate furrows or less seldom as a separate crop. It is sown in November and without water or manure is harvested in February. It does not grow more than two feet high. The seed is used in making relishes or *chatnis* and the oil which is produced from the seed in the proportion of four to one is used in cookery. No use is made of the fibre.

31. *Kárle* or *Khurásni*, Nigarseed, *Verbesina satiya*, erroneously called *kále til*, is grown in considerable quantities in shallow black and light soils chiefly in the west fringe of the plains and in the

Chapter IV.
Agriculture.

CROPS.
Oilseeds.

western hills. It is sown in June and without water or manure is harvested in November. The seed is eaten in relishes or *chatnis*, but it is chiefly known for its oil which is produced from it in the proportion of five to six, and is universally used by the lower classes in cooking. The oil-cake is much prized for milch cattle.

32. *Kardai* or *Kusumba*, Safflower, *Carthamus tinctorius*, is grown chiefly in the east lands with late *javari* or wheat either mixed or in separate furrows. It is sown in October or November, and, without water or manure, is harvested in February or March. The young leaves are eaten boiled as a vegetable and the oil which is produced from the seed is much esteemed in cooking. *Kardai* and *kusumba kardai* are grown indiscriminately. *Kardai* *C. tinctorius* has much deep red in the flower and elsewhere is used as a dye. *Kusumba kardai*, probably *C. persicus*, has a yellow flower and is more prickly than *C. tinctorius*.

33. *Til*, *Sesamum indicum*, of two kinds, *gora* or *havra* white *til* and *kála* black *til*, covered in 1881-82 29,449 acres, 12,381 of which were in Khed, 5806 in Junnar, 5403 in Mával, and 4392 in Haveli. It is grown throughout the district, but in considerable quantities only in Khed, Junnar, Mával, and Haveli. It is sown in June usually with *bájrí* either mixed in the same line or in separate lines, and is cut in November. It springs unsown in fallow lands. The seed is used in *shráddha* or mind-rites for the dead, forms part of many sweetmeats, and yields abundant oil which is used both in cooking and as a medicine. The oil-cake or *pendh* is given to cattle, and in times of scarcity is eaten by the poor with salt.

Three fibre plants are grown in Poona. The details are :

POONA FIBRE PLANTS.

No.	MARATHI.	ENGLISH.	BOTANICAL.
84	<i>Ambádi</i> ..	Brown Hemp ...	<i>Hibiscus cannabinus</i> .
85	<i>Kápus</i> ...	Cotton ...	<i>Gossypium herbaceum</i> .
86	<i>San</i> or <i>Tág</i> ...	Bombay Hemp ...	<i>Crotalaria juncea</i> .

34. *Ambádi*. See No. 27.

35. *Kápus*, Cotton, *Gossypium herbaceum*; in 1881-82 covered 4565 acres in Indápur. It is grown in black soil chiefly in the east, to a small extent in the western plain, and not at all in the hilly west. Several varieties are grown, most of which have been lately introduced. It is sown in July, is grown without water or manure, and bears in October or November. The crop, which is the woolly covering of the seed, is gathered from the growing plants in three or four pickings as the pods burst before November, when the plant ceases to bear. The seed is called *sarki* and is much prized as food for milch cattle. The stems are used in cheap basket-work and when the picking is over cattle are grazed on the leaves and shoots.

In 1821, the average price of cotton was about £8 10s. (Rs. 85) a *khandi* of 500 pounds or about 4d. (2½ as.) the pound. The Collector, Captain Robertson, was told that thirty or forty years before, in the time of Peshwa Mádhavráy (1761-1772) a large quantity of seed had been brought from the Berárs, but proved a

failure.¹ In 1830-31, Dr. Lush was successful in growing cotton in the botanical garden at Dápuri, about six miles west of Poona.² In 1841, the only parts of the district where cotton was grown in any quantity were in Bhimthadi and Indápúr, where the soil was better suited to its growth than in any other part of the district. In that year one landholder in the Bhimthadi village of Bolvádi grew cotton, which in the Bombay market fetched a price equal to the best Broach.³ Dr. Gibson, the superintendent of the botanical garden at Hivra, considered the cultivation of cotton unsuited to Poona.⁴ In 1842-43 the area under cotton was increased by not less than 2132 acres, chiefly in Junnar and Indápúr where the people were anxious to grow cotton. The plants throve for a time, but most of them failed from want of rain.⁵ In 1844, Indápúr was the only part of Poona where cotton was grown; there cotton was found in small quantities in every village mixed with *bájri* and other crops. The area under cotton was 4816 acres against 4636 in the previous year. The outturn was twenty tons (60 *khandis*) of which about sixteen tons (48 *khandis*) were sold in Poona and Sátára for £507 2s, or at the rate of £5 (Rs. 50) for a Surat *khandi* of 746 pounds, that is about 1½ *d.* (1 *a.*) a pound.⁶ In the next two years the area under cotton declined. In 1847, Indápúr was again the only cotton-growing part of the district. The quantity produced was about thirty tons (90 *khandis*) and the area under cultivation was 3359 acres against 1¼ *khandi* and 190 acres in the previous year.⁷ From 1841 to 1861 Government frequently tried to increase the growth of cotton, but without success. Both as regards soil and climate Poona was considered unsuited for foreign cotton and there seemed to be little prospect of any great increase of the cultivation of the local variety. The small quantity grown was almost entirely devoted to home use. The following statement shows the total area under cultivation, the area under cotton, and the area capable of producing cotton during the twenty years ending 1860-61:⁸

POONA COTTON, 1841-1861.

YEAR.	Tillage Area.	Cotton Area.	Area fit for Cotton.	YEAR.	Tillage Area.	Cotton Area.	Area fit for Cotton.
	Acres.	Acres.	Estimated at 100,000 acres.		Acres.	Acres.	Estimated at 100,000 acres.
1841-42 ...	962,600	2684		1851-52 ..	1,273,394	7015	
1842-43 ...	1,099,728	1846		1852-53 ..	1,316,767	6967	
1843-44 ...	1,055,232	4636		1853-54 ...	1,368,430	6712	
1844-45 ...	1,063,127	3808		1854-55 ...	1,393,980	4122	
1845-46 ...	1,102,088	190		1855-56 ...	1,447,006	602	
1846-47 ...	1,143,755	3359		1856-57 ...	1,534,473	2534	
1847-48 ...	1,228,304	3797		1857-58 ...	1,566,231	2904	
1848-49 ...	1,227,898	1693		1858-59 ...	1,598,885	8557	
1849-50 ...	1,196,719	4646		1859-60 ...	1,654,399	6934	
1850-51 ...	1,215,015	4682	1860-61 ...	1,664,801	8730		

¹ East India Papers, IV, 590.

² Chapman's Commerce, 51. See also Transactions of the Agri-Horticultural Society of Bombay, July 1843.

³ Bom. Rev. Rec. 1453 of 1843, 176-7.

⁴ Bom. Rev. Rec. 1344 of 1842, 71-72.

⁵ Bom. Rev. Rec. 17 of 1844, 75.

⁶ Bom. Rev. Rec. 1568 of 1844, 88.

⁷ Bom. Rev. Rec. 23 of 1849.

⁸ Cassel's Cotton in the Bombay Presidency, 87; Dr. F. Boyle's Culture of Cotton in India, 337.

Chapter IV. Agriculture:

CROPS.
Fibres.

Chapter IV.
Agriculture.

ROPS.
IBRES.

In 1862 the area under cotton rose to 30,049 acres in Indapur and large profits were made by the cultivators. In 1870-71 it stood at 17,072 acres. Since then, except in 1872-73, 1874-75, and 1882-83, when it stood at 10,170, 21,127, and 22,375 acres respectively, it has fluctuated between 100 acres in 1871-72 and 4565 acres in 1881-82.

36. *Tág* or *San*, *Crotalaria juncea*, grows in small quantities chiefly in the black eastern plain. It is sown in July, is grown without water or manure, and ripens in October. It is left standing for about a month after it is ripe that the leaves which are excellent manure may fall on the land. In gardens and occasionally in dry-crop lands it is grown solely for manure, the plants being ploughed into the soil when ready to flower. After it is soaked the bark yields a fibre which is considered the best material for ropes, coarse canvas, twine, and fishing nets. Almost the whole supply is used locally.

DYES.

Four dyes are grown in Poona. The details are :

POONA DYES AND PIGMENTS.

No.	MARATHI.	ENGLISH.	BOTANICAL.
37	<i>Halad</i>	Turmeric	<i>Curcuma longa</i> .
38	<i>Kusumba</i> or <i>Kardai</i>	Safflower	<i>Carthamus tinctorius</i> .
39	<i>Shendri</i> ... ..	... ..	<i>Bixa orellana</i> .
40	<i>Surunji</i> or <i>Al</i>	Indian Madder	<i>Morinda citrifolia</i> .

37. *Halad*, Turmeric, *Curcuma longa* is grown in good black soil chiefly in the central and western plain. It is planted generally in June or July from layers and with manure and a watering every eight or ten days matures in December or January. It is grown only by the class of men who are known as turmeric-gardeners or *Haldya Malis*. The root or *halkund* is boiled before it is sent to market. When steeped in a preparation of lime-juice, tincal and carbonate of soda or *pápadkhar* it is called *rava*. This yields a brilliant crimson dye which is used in painting the Hindu brow-mark. Men paint, putting the dye on wet, rubbing the root with water on a stone and applying the crimson with the finger; women powder, rubbing a small circle of wax on the brow and pressing red powder on the wax. The red powder is called *kunku* or *pinjar*. The root is in universal use as a condiment, being the staple of curry powder. *Ámbe halad*, probably *Curcuma ledoaria*, a variety of *C. longa* and grown in the same way, is used only as a drug.

38. *Kusumba*. See No. 32.

39. *Shendri*, *Bixa orellana*, is a shrub grown rarely and in small quantities in garden lands. The powder surrounding the ripe seeds yields a deep red orange dye which is the ornotto of commerce.

40. *Surunji* or *Al*, Indian Madder, *Morinda citrifolia*, is seldom seen in the west, but is largely grown in deep soils in the east. It is sown in June, often in fields overgrown with grass and weeds, and without water or manure grows for two years. In the third year the roots are dug from a depth of three feet. The roots yield a red dye.

Three narcotics are found in Poona. The details are :

POONA NARCOTICS.

No.	MARÁTHI.	ENGLISH.	BOTANICAL.
41	<i>Gánja</i>	Hemp ...	<i>Canabis sativa.</i>
42	<i>Nágvel</i> or <i>Pán</i>	Betel-leaf ...	Piper or <i>Chavica betel</i>
43	<i>Tambákkus</i>	Tobacco	<i>Nicotiana tabacum.</i>

Chapter IV.
Agriculture.CROPS.
Narcotics.

41. *Gánja* Hemp *Canabis sativa* is grown to a small extent in the best black soil in the eastern sub-divisions. It is sown in June or July, is grown with water and occasionally with manure, and is ready for cutting in December. When about two feet high the stem is twisted half round, a few inches above the root. This checks the upward growth and causes the plant to throw out side shoots. The fruit-yielding part is bruised just before the seed begins to ripen. When cut in December the plants are at once stacked and loaded with weights. The leaves fall when dry and the pods are used and known as *gánja*. The infusion made from the pods is called *bháng*. The pods or *gánja* are also smoked with or without tobacco, and several intoxicating drinks and a sweetmeat called *májum* are made. The fibre of this hemp is never used.

42. *Nágvel* or *Pán* Betel-leaf *Piper betel* is an important garden crop, especially in the Haveli villages of Kondvi Budruk, Kondvi Khurd, Undri, Muhammadvádi, and Phursangi. It is grown in light red soil and requires much manure and constant watering. It generally lasts fifteen or if well cared for twenty years. It is grown in a betel-vine garden or *pán mala* which generally covers about an acre of ground. The vines are trained up slender *hadga*, *pángára*, *shevri*, and *bakán* trees planted in rows one to four feet apart and having leaves only at the top. The vines are grown by layers. They want water every fifth or sixth day. The whole garden has to be sheltered from wind and sun by high hedges or screens of grass or mats. Vines begin to bear in the third year, are at their best from the fourth to the thirteenth year, and, under favourable circumstances, go on yielding till the twentieth year. Every year in March, April, and May, the upper half of the vine is cut and the lower half is coiled away and buried above the root under fresh red earth and manure. Portions of the garden are thus treated in rotation, so that those first cut are ready to bear before the last are cut. A betel-leaf garden wants a considerable capital to start, and in weeding, watering, insect-killing, and leaf-picking, wants constant labour and attention throughout the year. Still it is a favourite crop. The returns from the sale of the leaves come in monthly, and the profits are greater than from any other garden crop. The betel-vine is almost always grown from well water. The people say channel-water does not suit the vine. Mr. Fletcher thinks the probable reason is that from the division of ownership it is difficult to secure a constant supply of channel water. Mális and some well-to-do castes including Bráhmans rear the betel-vine, some with their own hands and some with hired labour. Tirgul Bráhmans, who cultivate the betel-leaf as a specialty, are considered inferior to other Bráhmans as they kill the flies that live on the vine. The betel-leaf is chewed by all classes with betelnut, quicklime, catechu, and some-

Chapter IV.
Agriculture.

CROPS.
Narcotics.

times with tobacco and several spices. Several varieties are distinguished.

43. *Tambákhu* Tobacco *Nicotiana tabacum* in 1881-82 covered 817 acres, 275 of which are in Junnar, 239 in Khed, 181 in Bhimthadi, eighty-four in Sirur, and thirty-eight in Váapur. It is grown to a considerable extent in rich soils in the western fringe of the plain country and to a small extent further east. The village of Ghode in Khed has more than 200 acres under tobacco. Low and alluvial land is generally preferred. It is sown in seed-beds in August and planted in September. It is seldom watered but is generally manured. The plant is not allowed to flower. All buds and branch shoots are nipped off as they appear, and only eight or ten leaves are allowed to remain. Because the buds of the plant have to be destroyed, Kunbis seldom grow tobacco themselves, but allow it to be grown in their lands by Mhárs, Mángs, and other low castes, who give the landholder half the produce. The plants are cut in January or February about four inches from the ground, spread in the sun till they are thoroughly dry, sprinkled with water mixed with *surad* grass or with cow's urine, and while damp closely packed in a pit or stacked under weights and covered for eight days during which fermentation sets in. When taken from the pit or stack the leaves are made into bundles and are ready for sale. Though the stumps left in the ground shoot again the leaves are almost valueless, and are used only by the poor. The quality is poor. The average acre-yield of tobacco is about 300 pounds (2.375 *mans*): The wholesale price of cured tobacco is about 2*d.* a pound (Rs. 7 the *man*) and the retail price about 3*d.* a pound (Rs. 10 a *man*). Tobacco is smoked and chewed by all classes and is made into snuff. In 1821, according to the Collector Captain Robertson, tobacco did not thrive. It does not appear in his list of crops.¹ Its cultivation was introduced before 1841. In 1841 Government forwarded to the Collector a box of Syrian tobacco seed to ascertain how it suited the soil and climate of Poona. The seed was distributed and sown in different parts of the district. Some sowings succeeded and others failed. At the Hafiz Bág, about two miles east of Junnar, Mr. Dickinson sowed it in good soil, and planted it in the usual way. When the plants were young, Mr. Dickinson thought they did not promise so well as the local plant. He thought they might thrive better in the richest alluvial soil.²

Eight spices are grown in Poona. The details are :

POONA SPICES AND CONDIMENTS.

No.	MARÁTHI.	ENGLISH.	BOTANICAL.
44	<i>A'le</i>	Ginger	<i>Zingiber officinale</i> .
45	<i>Badshep</i>	Sweet Fennel	<i>Anethum fonicatum</i> .
46	<i>Hatad</i>	Turmeric	<i>Curcuma longa</i> .
47	<i>Kothimbir</i>	Coriander	<i>Coriandrum sativum</i> .
48	<i>Bircht</i>	Chillies	<i>Capiscum annum</i> .
49	<i>Ova</i> .. ... ..	... ..	<i>Ptycotis ajowan</i> or <i>Linguaticum agiwan</i> .
50	<i>Shepu</i>	Fennel	<i>Anethum sowa</i> or <i>graveolus</i> .
51	<i>Us</i>	Sugarcane	<i>Saccharum officinarum</i>

¹ East India Papers, IV. 50.

² Bom. Rev. Rec. 1453 of 1843, 75-76.

Chapter IV:
Agriculture.CROPS.
Spices.

44. *Alé* Ginger *Zinjiber officinale* is grown in good black soil. It is raised from layers at any time of the year, and, with manure and water every ten or twelve days, is ready for use green in five and mature in six months. The dry root called *sunth* is eaten as a condiment and is a favourite cure for colds.

45. *Badishep* Sweet Fennel *Anethum fœnicatum* is sown in gardens at any time and on the edges of dry crops in July and August. It matures in two months. The seed is eaten in curry and used as a condiment and an infusion of it is taken as a cooling drink.

46. *Halad* Turmeric *Curcuma longa* is in universal use as a condiment and forms the staple of curry powder. Details have been given under No. 37.

47. *Kothimbir* Coriander *Coriandrum sativum* is grown in small quantities in good black soil with or without water and manure in the east and centre of the district. Among garden crops it is sown in any month and with *bājri* or other dry crops in July and August. The leaves are ready for use in three weeks and the seed or *dhane* in two months. The leaves and young shoots are much used as a garnish in curry and relishes and sometimes as a vegetable. The ripe seed is one of the most popular condiments.

48. *Mirchi* Chillies *Capsicum annum* in 1881-82 covered 8089 acres, 3708 acres of them in Khed, 1867 in Junnar, 1131 in Sirur, 724 in Bhimthadi, 264 in Indápur, 221 in Haveli, 140 in Purandhar, and thirty-four in Mával. It is grown in the western fringe of the plain country. It is sown in May in a manured seed plot and is planted after fifteen days or a month. It begins to bear at the end of two months more, and, if occasionally watered, goes on bearing five or six months. The plant lasts two years but is almost always pulled up after about ten months. The first yield is much the finest and is usually sent to market, the rest being kept for home use. Chillies are eaten both green and ripe by all classes and are as much a necessary of life to the people as salt. According to Colonel Sykes the leaves are eaten as a pot-herb. The two commonest varieties are *putomi* a long chilly and *motvi* about two inches long *Capsicum frutescens*. Other occasional varieties are *lavangi*, *C. minimum*, *C. grossum*, *C. ceraciforme*, and *C. purpureum*.

49. *Ova* *Ptycotis ajowan* or *Lingusticum agivæn* is sown in gardens at any time of the year and with dry crops in July and August. It matures in three months. The seed is used as a stomachic.

50. *Shepu* Fennel *Anethum sowa* or *graveolus* is sown in gardens in any month and with *bājri* and other dry crops in July and August. It is fit for use as a vegetable in six weeks and the seed ripens in two and a half months. The plant is eaten as a pot-herb and the seed is used as a stomachic. See No. 45.

51. *Us* Sugarcane *Saccharum officinarum* in 1881-82 covered 5502 acres, 2260 of which were in Haveli, 1022 in Purandhar, 968 in Junnar, 428 in Khed, 378 in Sirur, 311 in Bhimthadi, 113 in Indápur, and twenty-two in Mával. With the help of water and

Chapter IV.
Agriculture.

CROPS.
Condiments.

manure sugarcane is grown in deep black soils all over the district except in the extreme west; in the east it is one of the chief garden products. It is also much grown in Junnar, Khed, and Haveli, where, since the opening of the Mutha canals the area under sugarcane has considerably increased. In preparing land for sugarcane the plough is driven across it seven or eight times; village manure is thrown on at the rate of about six tons (20 large carts) to the acre; and the land is once more ploughed and flooded. When the surface is beginning to dry it is levelled with the beam-harrow and in December or March the sugarcane is planted. The layers, which are pieces of mature cane about six inches long, are set in deep furrows drawn by the plough. Sugarcane thus planted is called *nāngria us* or plough-cane to distinguish it from *pāvlya us* or trodden cane which is pressed on by the foot after the land has been ploughed, broken fine, and flooded. The treading system is usually followed with the poorer canes or in poor soil. Trodden cane or *pāvlya us* is manured ten or twelve days after the layers are put down by folding sheep on the spot. Trodden cane sprouts a month after planting; plough-cane being deeper set takes a month and a half to show but suffers less from any chance stoppage of water and reaches greater perfection. Sugarcane is either eaten raw or is made into raw sugar or *gul*.

The raw sugar or *gul* is extracted on the spot generally by the husbandmen themselves. A wooden press or *gurrhāl* worked by two or more pairs of bullocks is set up. The appliances used in making *gul* are: *chulvan* a large fire-place; *pāvde*, a wooden instrument like a hoe for skimming or for drawing the juice from the boiler into its receptacle; *shibi*, a stick with a bamboo bowl or basket for straining the liquid; *kāhil* or *kadhāi*, a boiling pan for thickening the juice; and *gurrhāl* or *charak* the sugarcane-press. The press is made entirely of wood and is worked by two pairs of oxen. Two upright solid cylinders, eighteen or twenty inches across called *navra-navri* or husband and wife, whose upper parts work into each other with oblique cogs, are made to revolve by means of a horizontal beam fixed to the *navra* in the centre and yoked to the oxen at its ends. The cane, stripped of its leaves and cut into lengths of two or three feet, is thrice passed by hand between the cylinders, and the juice is caught in a vessel below, which from time to time is emptied into the *kāhil* a shallow circular iron boiling pan. When the pan is full the fire beneath it is lighted and fed chiefly with the pressed canes. After eight to twelve hours' boiling and skimming, the juice is partially cooled in earthen pots and finally poured into round holes dug in the earth and lined with cloth, where, when it forms into lumps called *dheps* or *dhekuls* it is fit for market. The pressing is done in the open air or in a light temporary shed and goes on night and day till the whole crop is pressed. A sugarcane press costs about £2 10s. (Rs. 25) and lasts three or four years. The boiling pan either belongs to the owner if he is well-to-do, or is hired either at a daily or a monthly rate according to the time for which it is wanted. The daily hire of a pan varies from 2s. to 4s. (Rs. 1-2) and the monthly hire from 10s. to £1 (Rs. 5-10). Each cane-mill employs about twelve workers.

Chapter IV.
Agriculture.

CROPS.
Condiments.

Seven remove the canes from the field and strip their leaves; one cuts the canes into pieces two feet long; two are at the mill, one feeding the mill the other drawing out the pressed canes; one minds the fire and another the boiling pan. The last is the *gulvia* or sugar-man. He is supposed to know exactly when the juice is sufficiently boiled and thickened to form lumps. As most sugarcane-growers are without this knowledge a sugar-man is hired at 6*d.* (4 *as.*) a day or £1 (Rs. 10) a month. The two feet long pieces of cane are passed between the upright cylinders two or three at a time. To stop any leaks the pan is smeared with *lodan* a glazed preparation of *udid* or *náchni* flour. It is then put on the fire-place and the hollow between the pan and the fire-place is closed with mud. About 600 pints (300 *shers*) of juice are poured into the pan and the fire is lighted. The boiling lasts six or seven hours during which the juice is constantly skimmed and lime-water and *náchni* flour are thrown into the juice to keep it from being too much boiled. When the sugar-man thinks the proper time has come the pan is taken off the fire and the juice, with constant stirring, is allowed to cool for about an hour. When cool it is poured into cloth-lined holes in the ground two feet deep and a foot and a half across. It is left in the holes for a couple of days until it has hardened into lumps or nodules weighing fifty to sixty pounds (25-30 *shers*). When the lumps are formed they are taken away. If the sugarcane is of eighteen months' growth it yields *gul* equal to one-fourth of the juice boiled; in other cases it yields about a sixth. If the juice is allowed to overboil, it cannot make the *gul*; it remains the boiled juice of sugarcane which is called *kákavi*. The people believe that sugarcane fed with well water yields one-fifth more *gul* than the same cane fed by channel water. The correctness of this belief is doubtful.

As far back as 1839-40 the growth of Mauritius cane spread greatly in Junnar. The land was well suited to this cane, the supply of water was abundant, and the people were anxious to grow it. Mr. Dickinson, a planter of considerable experience in the West Indies, was employed in making sugar. But the produce did not find a ready market.¹ He turned his refuse sugar and treacle to account by manufacturing rum.² In 1841, besides fifty-seven acres planted by the people on their own account, about 100 acres were planted in Junnar under contract with Mr. Dickinson, the manager of the sugar factory at Hivra. The sugar was used only by the European inhabitants of Poona and Ahmadnagar.³ In 1842-43, the area under Mauritius sugar rose from 157 to 388 acres. The cultivation spread from Junnar to Khed and Pabal. Sugar-works were started at Hivra by a joint stock company, and were afterwards bought by Mr. Dickinson. In Bhimthadi a Musalmán planted some cane in the Chakar Bág with the view of making sugar and some husbandmen turned out sugar equal in grain to Mr. Dickinson's but not free from feculence. They also made *gul* which was sold at a higher price than that produced from the local cane. At first

¹ Bom. Rev. Rec. 1241 of 1841, 69.

² Bom. Rev. Rec. 23 of 1849, 149.

³ Bom. Rev. Rec. 1344 of 1842, 65-72.

Chapter IV.
Agriculture.

CROPS.
Condiments.

Mr. Dickinson was in the habit of contracting with the husbandmen to plant cane for him. He was afterwards able to obtain a sufficient supply at all times, chiefly from the gardens of Bráhmans, headmen, and well-to-do husbandmen. In 1842 Mr. Dickinson made 87,000 pounds of sugar worth £1500 (Rs. 15,000) more than the outturn of the previous year. Messrs. Sundt and Zebbe also planted about three acres of land with Mauritius cane in their garden at Mundhve, about five miles north-east of Poona, and made about 2½ tons (2826 *shers*) of *gul*, which was sold at 16s. (Rs. 8) the *palla* of 120 *shers*.¹ In 1844, the area under Mauritius cane rose from 388 to 547 acres. Mr. Dickinson's farming continued successful partly because he was able to dispose of his rum and sugar by Government contracts. Many husbandmen were willing to make sugar but from want of capital and of local demand were obliged to content themselves by producing *gul*.²

In 1847 Mr. Dickinson's sugar had a good year at Hivra. He made about five tons (330 *mans*) of Muscavado sugar and sold it to the families of the soldiers and other Europeans at Poona and Ahmadnagar. Among the natives the demand was trifling and this discouraged its more extended manufacture. The natives even in the immediate neighbourhood, preferred the soft blanched sugars sold by the shopkeepers; their objection to Mr. Dickinson's sugar was its colour, but to refine it would have caused a serious loss in quantity. In 1847 a committee which met in Poona to distribute prizes for the best specimens of superior field products, awarded a prize of £30 (Rs. 300) to two persons. One of the prize specimens was some grained Muscavado sugar, the other was sugar made by evaporation. Before crystallization had set in this sugar had been poured into pots with holes in the bottoms through which the treacle was allowed to pass. A prize of £20 (Rs. 200) was awarded to two other natives for the best brown sugar; and a third prize of £10 (Rs. 100) to two others for the best specimens of *rási* or inferior sugar. All the prize specimens came from near Junnar, and were due to the exertions and influence of Dr. Gibson.³

In 1881-82, in connection with sugarcane experiments, Mr. Woodrow, the superintendent of the botanical garden at Ganesh Khind, noticed that the soil of Poona had very little of the silica in combination with potash of soda and lime in the form known as soluble silicates. It was not difficult to reproduce these soluble silicates without which sugarcane cannot grow; but it would be expensive in India and could not be done in a short time.

To grow sugarcane without wearing out the land it was necessary to manure with two tons an acre of quicklime and ten loads an acre of woodash, and to sow and plough in a green crop such as hemp or black mustard.

After a crop of sugarcane the land should be manured for four years as usual and such crops grown as the soil and the markets suit, preference as far as possible being given to pulses and cereals

¹ Bom. Rev. Rec. 1568 of 1844, 83-84.

² Bom. Rev. Rec. 17 of 1846, 73.

³ Rev. Rec. 23 of 1849, 154-156.

being avoided. In no case should more than one corn crop be grown. At the end of the four years if the ground is treated in the usual manner for sugarcane an average crop may be expected. Poona sugarcane soil is usually rich in lime, in some cases lime is present in excess. It would often pay to make a kiln and burn the calcareous earth on or near the field where lime was wanted.

Twelve bulb vegetables are grown in Poona. The details are :

POONA BULB VEGETABLES.

NO.	MARATHI.	ENGLISH.	BOTANICAL.
52	<i>Alu</i>	Great leaved Caladium .	<i>Caladium grandifolium</i> .
53	<i>Batáta</i>	Potato	<i>Solanum tuberosum</i> .
54	<i>Gójar</i>	Carrot	<i>Daucus carota</i> .
55	<i>Kanda</i>	Onions	<i>Allium cepa</i> .
56	<i>Kangar</i> ... ..	...	<i>Dioscorea fasciculata</i> .
57	<i>Karsnda</i>	Bulb-bearing Yam ... ..	.. <i>bulbifera</i> .
58	<i>Kon or gordádu</i>	Common Yam ... ..	.. <i>alata</i> .
59	<i>Lasun</i>	Garlic	<i>Allium sativum</i> .
60	<i>Mula</i>	Radish	<i>Raphanus sativum</i> .
61	<i>Rájálu</i>	Arrow-leaved Caladium.	<i>Caladium sagitifolium</i> .
62	<i>Batalu</i>	Sweet Potatoe	<i>Convolvulus batatas</i> .
63	<i>Suran</i> ... ..	...	<i>Amophophallus campanulatus</i> .

52. *Alu* *Caladium grandifolium* or *Arum campanulatum* with the help of manure and abundant water is grown in marshy hollows chiefly in the hilly west. It is generally planted in early June. The leaf is ready to cut in three months and the plant continues bearing for years. The leaf and stalk are eaten commonly as a vegetable, the root or bulb more seldom and on fast days. Dr. Birdwood gives three species *C. grandifolium*, *C. ovatum*, and *C. sagitifolium*.¹ He says that the stem leaf and root of the first and third are edible, but only the leaf of the second. *Rájálu*, *C. sagitifolium*, has narrow pointed leaves and green instead of purplish stem and veins.

53. *Batáta* the Potato *Solanum tuberosum* is grown in Khed and Junnar.² Except close to the hilly west potatoes are generally watered and manured. The potato is cut into small pieces each with a bud or eye, is planted in June or July, and is ready between late September and November. The introduction of the potato into Poona is chiefly due to the exertions of the late Dr. Gibson who in 1838 brought potatoes from the Nilgiris and distributed them for seed. About 1841 potatoes and sugarcane were the chief products in the experimental garden at Hivra. Potatoes were already grown in Junnar, Khed, and Pábal in sufficient quantities to be exported to Dhulia, Aurangabad, and Bombay.³ They were sold at the rate of twenty pounds (10 *shers*) of the first sort, and thirty to forty pounds (15-20 *shers*) of the inferior quality to the rupee. The potatoes were large and equal to any then grown in any part of India.⁴ In 1844 the potatoes of north Poona supplied a very large portion of the Bombay market.⁵ In 1845 Dr. Gibson obtained a supply of good Irish potatoes. Since 1845 potato-growing has spread

¹ Graham mentions *C. ovatum* and *C. grandifolium*; and held that *C. sagitifolium* was probably the same as *C. ovatum*.

² These are generally known as Talegaon potatoes because they take rail at Talegaon station.

³ Bom. Rev. Rec. 1453 of 1843, 176-7.

⁴ Bom. Rev. Rec. 1344 of 1842, 72.

⁵ Bom. Rev. Rec. 17 of 1846, 72.

Chapter IV.

Agriculture.

CROPS.

Bulb Vegetables.

rapidly and there is at present a considerable area of garden as well as dry-crop land under potatoes. The potato is not grown to the east of a line drawn from Shikárpur to Vadgaon Pir. Though it was at first viewed with suspicion the potato is now a favourite food with Bráhmans, and the Kunbis also eat the smaller and less saleable roots. Of two varieties one with a smooth light brown peel is the best, being mealy when cooked and fetching a higher price. The other has a rough dark skin and both in size and quality is inferior to the smooth-skinned variety. Two potato crops are raised in the year. One is planted in dry-crop lands in July and dug in late September; the other is planted in December and dug in February. The second crop requires a weekly watering.

54. *Gájar* Carrot *Daucus carota* with the help of water and manure is grown in large quantities in good black soil in the east of the district. The carrot is sown in garden lands at any time of the year and in dry-crop lands in July or August. It is ready for use in three months. The root is eaten as a vegetable both raw and boiled. It is also slit and dried in the sun when it will keep five or six months. When sun-dried it is called *usris* and has to be boiled before it is eaten.

55. *Kánda* Onion *Allium cepa* of two varieties, a red and a milder and more popular white, with the help of water and manure is grown in good black soil. Onions are sown in seed-beds at any time during the rains or cold weather, and planted when about a month old. It is fit for use in two months after planting and takes two months more to come to maturity. It requires good black soil and should have water every eight or twelve days. The onion is eaten by all except by a few of the very orthodox and on certain sacred days. It is almost a necessary of life to the lower classes. The leaves are eaten as a pot-herb.

56. *Kanjar* *Dioscorea fasciculata* is a yam closely resembling the *kon* or common yam and the *karánda* or bulb-bearing yam. It is found in the hilly west. Its bulbs which form only below ground are like a small sweet potato in size and shape. The flesh is white and sweet.

57. *Karánda* is the bulb-bearing yam probably *Dioscorea bulbifera*. It is much like the common yam or *kon* in appearance and habits, and like it found in the hilly west. The *karánda* differs from the *kon* in having a rounder leaf and in bearing bulbs on the stems as well as on the root. Until it is boiled the flesh of the bulbs is slightly bitter.

58. *Kon* or *Gorádu* the Common Yam *Dioscorea alata* is grown in small quantities without water or manure in the hilly west round the edges of fields or in house-yards. It is planted in June or July and by October the root is fit to eat. If left till December the root grows two feet long and eight inches across. The plant, which is a creeper with longish pointed leaves; bears two to five tubes or roots which when boiled make an excellent vegetable.

59. *Lasun* Garlic *Allium sativum* according to Colonel Sykes is of two varieties a red and white. It is grown with the help of water and manure in good black soil and requires water once every ten or twelve days. Segments of the bulb are planted in any month, and mature in four or five months. All classes use garlic in their cookery. The leaves are eaten as a pot-herb.

60. *Mula* Radish *Raphanus sativum* according to Dr. Birdwood is of two varieties, *D. radicula* and *oblonga*, and according to Colonel Sykes is of four varieties, three of them the long, the short, and the turnip radish which are white and one which is red. Radishes are grown with the help of manure at any time of the year in garden lands and sometimes in dry crop land during the rains. The leaves are fit for use in six weeks, the root in two months, and the plant bears pods or *dingris* in a fortnight more, and continues bearing for a month and a half. The leaves are eaten boiled as a pot-herb and raw as a salad. The root is eaten as a vegetable both raw and boiled.

61. *Rájalu* Arrowleaved *Caladium* *Caladium sagittifolium*, according to Dr. Birdwood of three varieties, is grown with the help of water and manure. The leaves are narrower and more pointed than *alu* leaves, and the stem leaves and bulb are eaten in the same way.

62. *Ratálu* Sweet Potatoes *Convolvulus batatas* of two varieties a white and red, of which the red is the smaller and sweeter, are grown in the eastern sub-divisions. It is raised from layers put down any time in the rains or cold weather, and with the help of water and manure comes to maturity in six months. The young leaves and shoots are eaten as a pot-herb. The root is eaten boiled and roasted. It is also dried, ground to flour, and made into fast-day cakes. The mature vine is excellent fodder.

63. *Suran* *Amorphophallus campanulatus* is grown especially in the hilly west. It takes three years to mature. The root grows to a large size and though somewhat bitter is much esteemed as a vegetable. From a green tapering stem four or five inches in diameter at the base and about three feet long, five or six pennated leaves eighteen to twenty inches long shoot upwards and outwards. Every year the leaves and stem die and spring again.

Twenty fruit vegetables are grown in Poona. The details are :

Fruit Vegetables.

POONA FRUIT VEGETABLES.

No.	MARATHI.	ENGLISH.	BOTANICAL.
64	<i>Dhendshi</i> ...	Sharp-cornered Cucum- ber.	<i>Luffa acutangula</i> or <i>Cucumis</i> <i>acutangulus</i> .
65	<i>Dodke</i> ..	The Long White Gourd.	<i>Cucurbita longa</i> .
66	<i>Dudh-bhopla</i> ...	Watermelon ...	<i>Luffa petandria</i> .
67	<i>Ghosile</i> ...	...	<i>Cucurbita citrallus</i> .
68	<i>Kalngad</i> ...	...	<i>Momordica charantia</i> .
69	<i>Kárie</i> ..	...	<i>Momordica divica</i> .
70	<i>Kartoli</i> ...	Bottle Gourd, False Calabash.	<i>Cucurbita lagenaria</i> .
71	<i>Kashu-bhopla,</i> <i>Kashi-phal.</i> ...	Melon ...	<i>Cucumis melo</i> .
72	<i>Kharbui</i> ...	Common Cucumber	<i>Cucumis sativus</i> .
73	<i>Khara, Khra,</i> <i>Kákai.</i> ...	...	<i>Cucurbita alba</i> .
74	<i>Kohala</i> ..	Snake Gourd ...	<i>Trichosanthes anguina</i> .
75	<i>Padval</i> ...	...	Do. <i>dioica</i> or <i>cucu-</i> <i>merina</i> .
76	<i>Parvar</i> ...	Red Pumpkin ...	<i>Cucurbita melopepo</i> . Do. <i>pepo</i> .
77	<i>Támbda Bhopla.</i>	...	<i>Cucumis usitatissimus</i> or <i>Uti-</i> <i>lissimus</i> .
78	<i>Tarbut</i> ..	...	<i>Coccinia indica, Momordica</i> <i>monodelphia</i> .
79	<i>Tárbákái</i> ..	...	<i>Solanum melongina</i> .
80	<i>Tondli</i> ...	Egg-plant ...	<i>Lycopersicon esculentum</i> .
81	<i>Váluk</i> ...	...
82	<i>Vángo</i> ...	...
83	<i>Vei Vángo</i> ..	...

Chapter IV.
Agriculture.

CROPS.

Fruit Vegetables.

64. *Dhendshi* is sometimes grown round the edge of gardens but generally in river-beds. It begins to bear about three months after it is sown. The fruit is about the size of the two fists and is white both within and without. It is eaten cooked as a vegetable.

65. *Dodke* the Sharp-cornered Cucumber *Luffa acutangula* or *Cucumis acutangulus* is grown with the help of water and manure in rich land in the centre and east of the district round the edges of other crops. It is grown in gardens at any time. In dry-crop lands it is sown in June-July, grows exceedingly fast and to a great size, and begins to bear in two or two and a half months, and goes on bearing for one or one and a half months. The fruit, which is dark green and six inches to a foot long, is seamed with sharp ridges from end to end. The fruit is eaten boiled. No other part of the plant is used.

66. *Dudh-bhopla* the Long White Gourd *Cucurbita longa*, a creeping plant, is usually grown in garden lands round the edge of the crops. It begins to bear in two or three months. The fruit, which is sometimes thirty or thirty-six inches long, has soft white flesh. It is a common and favourite vegetable. The skin and seeds are used in *chatni*. It is also made into a sweetmeat called *halva*.

67. *Ghosále* *Luffa petandria* is grown and used in the same way as the *dodke* (No. 65). The fruit, the only part eaten, is smooth, the same size as the *dodke*, and marked lengthwise with light lines. If watered the plant bears for two years.

68. *Kalingad* Watermelon *Cucurbita citrallus*, a creeping plant, is sown in the cold and hot months in moist sandy spots in river beds, and manured when six weeks old. The fruit is smooth and round, dark green mottled and striped with a lighter green. The flesh is pink and the seeds black or white. It is eaten both raw as a fruit and cooked in different ways.

69. *Kárlé* *Momordica charantia* smaller both in plant and fruit, is grown and used like the *dodke* and the *ghosále* Nos. 65 and 67. The surface of the fruit is roughened with knobs and each seed fills the whole cross section of the fruit. It is slightly bitter and must be well boiled before it is eaten.

70. *Kartoli* *Momordica dioica* is a wild but saleable gourd like *kárlé*. The fruit is eaten as a vegetable after two boilings.

71. *Káshi-bhopla* or *Káshi-phal* that is the Benares Pumpkin *Cucurbita lagenaria* is grown in gardens and sometimes on river-banks. Except that it is roundish and thick instead of long, the fruit is like the *dudh-bhopla*. It is only eaten cooked.¹

72. *Kharbuj* Melon *Cucumis melo* is sown in the cold and hot months in moist sandy spots in river-beds, sometimes with the watermelon. The plant is manured when six weeks old and the fruit ripens in the third or fourth month. The fruit is round, green, or yellowish, the skin covered with a network of raised brown lines. It is eaten uncooked in a variety of ways.

¹ The names *Káshi-bhopla* and *Káshi-phal* are also given to a large white gourd of a flattened globular shape with depressed segmental lines.

73. *Khira* or *Khira Kákki* Common Cucumber *Cucumis sativus* of two kinds, green and white fruited, is sown in dry-crop lands in July and August round the edge of early crops or in garden lands at any time. It begins to bear in about two months. The fruit is ten to sixteen inches long and is much eaten both raw and cooked.

74. *Kohála* *Cucurbita alba* is grown round the edge of gardens at any time of the year. It begins to bear in three or four months. The fruit is larger than the red pumpkin and the flesh is white. It is never eaten raw but is much esteemed as a vegetable and is made into a sweetmeat called *halva*.

75. *Padval* Snakegourd *Trichosanthes anguina* except that it is never raised in dry-crop land, is grown in the same parts of the district and in the same way as the *dodke* (No. 65). The fruit, which is about three feet long and two or three inches thick, is marked lengthways with white lines. It is eaten boiled as a vegetable. The Maráthás use the leaves, stalk, and root medicinally.

76. *Parvar* *Trichosanthes dioica* or *cucumerina* is grown early in the centre and east along the edges of betel-leaf gardens. The fruit is small and green and is highly valued by the people as a medicine.

77. *Támbda Bhopla* Red Pumpkin *Cucurbita melopepo* or *pepo* is usually grown round the edges of garden lands. It is sown at any time of the year and begins to bear in about three months. The fruit is roundish and sometimes very large, about eighteen inches in diameter with reddish flesh. It is cooked as a vegetable, and the shoots and young leaves are used as a pot-herb. The seeds are also eaten. This pumpkin is called *dángar* in some parts of the Deccan.

78. *Tarbu*¹ is generally sown with *kharbu* the melon in the cold and hot months in moist sandy spots in river-beds. It is manured when six weeks old. The fruit is like the *kharbu* in the colour of its flesh and seeds, but is rather longer. It is eaten as a fruit and in salad.

79. *Tárkákki* *Cucumis usitatissimus* or *utilissimus* is usually grown in river-beds in the cold and hot weather. The seed is planted in the moist sand and the plant is manured when about three weeks old. It ripens in about two and a half months. The fruit, which is smooth and about two feet long, is much eaten both raw and cooked.

80. *Tondli* *Coccinia indica* or *Momordica monodelphia* is grown in the same parts of the district and in the same way as the *dodke*. (No. 65). The fruit is a little smaller than a hen's egg and when ripe is red. It is eaten as a vegetable, but is never given to children as it is supposed to blunt the faculties. There is a bitter variety which is useless. The vine sometimes lasts for years.

81. *Váruk* is grown during the rains round fields of dry crop and at other times in garden lands. It bears in about three months. The fruit is eight or ten inches long and is yellowish marked lengthwise by lines. It is sweet and is eaten raw and cooked.

¹ Sir G. Birdwood gives *tarbu* instead of *kalingad* as the vernacular of *Cucurbita citrallus* the watermelon. Mr. Fletcher admits that *tarbu* is sometimes used for *kalingad*. He thinks this a mistake and that the *tarbu* is more allied to the *kharbu*.

Chapter IV.

Agriculture.

CROPS.

Fruit Vegetables.

82. *Váangi* or *Báingan* the Egg-plant *Solanum melongena* is grown with the help of manure and water in considerable quantities in rich soil often on river-bank mud in the centre and east and in gardens over the whole district except the west. In gardens it is sown at any time of the year. In dry land it is sown in June in seed-beds, planted during July, begins to bear in September, and if occasionally watered goes on bearing for four months. Its oval egg-like and slightly bitter fruit is one of the commonest and best of Deccan vegetables. It is boiled and fried, made into pickle, and sometimes slit and dried in the sun and kept in store under the name of *usris*. The leaves are said to be good for cleaning pearls. Hindus hold it wrong to use the stem as fuel. Besides the oval-fruited *baingan* there is a sort called *bangáli* with fruit sometimes two feet long. There is also a wild variety called *dorli váangi* with a small and nearly round fruit.

83. *Vel Vángi* Tomato or Love-apple *Lycopersicon esculentum* with the help of manure and good soil is grown in small quantities all over the district and chiefly near large markets in the centre and east. It is grown in gardens at any time. In dry-crop land it is sown in June or July and fruits in October. The fruit is eaten both raw and cooked. The tomato was brought to India from Brazil by the Portuguese.

Pod Vegetables.

Four pod vegetables are grown in Poona. The details are :

POONA POD VEGETABLES.

No.	MARÁTHI.	ENGLISH.	BOTANICAL.
84	<i>Abai</i> or <i>Kharsámblí</i>	...	.....
85	<i>Bhendi</i>	Eatable Hibiscus	<i>Abelmoschus esculentus</i> or <i>Hibiscus esculentus</i> .
86	<i>Ghevada</i>	...	<i>Dolichos lablab</i> .
87	<i>Govári</i>	...	<i>Cyamopsis psoralioides</i> or <i>Dolichos fabaformis</i> .

84. *Abai* or *Kharsámblí*, a creeping plant, is grown without water or manure near houses or on the edges of garden lands in all parts of the district. It begins to bear in three months and in good soil goes on bearing three or four years. The pod when very young and tender is used as a vegetable.

85. *Bhendi* Eatable Hibiscus *Hibiscus esculentus* is of two varieties *gari* or early and *hali* or late. Both are grown in gardens in all parts of the district and all the year round. They are also grown without water but often with manure. As a dry crop the early or *gari bhendi* with large leaves and short thick pods is sown in June, grows about two feet high, and bears from early August to December. The late or *hali bhendi*, with small leaves and thin prickly pods, is sown in June or July along the edges of or among *bájni* crops, grows seven feet high, begins to bear in late September, and goes on bearing till the end of November. Both kinds are grown in garden lands all the year round. The green pods are eaten boiled as a vegetable or fried. The ripe seeds are used in curry and *chatni*. The bark yields a fibre which is seldom used.

86. *Ghevda* Dolichos lablab is of many varieties, the chief being the black-seeded, the white-seeded, the *bot* or finger-like, *pattáde* or the *hanumán*, and the white with curved white pods. It is grown with or without manure, and water. It is sown in June or July on the edges of dry crops, begins to bear in October, and goes on bearing till January. As a watered crop it is grown round gardens or in the yards and porches of houses, where it goes on bearing two or three years. The pods are eaten boiled as a vegetable and the grain is used as a pulse.

87. *Govári* Cyamopsis psoralioides is grown in gardens at any time and during the rains on the edges or in the corners of the early grain crops. It begins to bear within three months and if watered occasionally goes on bearing for some months. The plant grows about three feet high with a single fibrous stem from which the pods grow in bunches. The pod is eaten green and is much prized as a vegetable.

Twelve leaf vegetables are grown in Poona. The details are:

Chapter IV.
Agriculture
CROPS.
Pod Vegetables

Leaf Vegetable

POONA LEAF VEGETABLES.

No.	MARÁTHI.	ENGLISH.	BOTANICAL.
88	<i>Alvi</i>	Common Cress ...	Lepidium sativum.
89	<i>Chákvat</i>	Goose Foot	Chenopodium viride or album.
90	<i>Chandanbatva</i> ... ..	... ..	Chenopodium.
91	<i>Chavli</i>	Hermaphrodite Ama- ranth.	Amaranthus polygamus.
92	<i>Chuka</i>	Bladder Dock, Blister Sorrel.	Rumex vesicarius.
93	<i>Máth</i> .. ..	... ..	Amaranthus tristis.
94	<i>Methi</i>	Common Greek grass ..	Trigonella fœnumgræcum.
95	<i>Mohari</i> or <i>Rái</i>	Mustard	Sinapis racemosa.
96	<i>Pokla</i> ... ..	... ..	Amaranthus.
97	<i>Pudina</i>	Mint	Mentha sativa.
98	<i>Rajgra</i> ... ..	... ..	Amaranthus candidus.
99	<i>Tándulja</i>	Eatable Amaranth ...	Amaranthus oleraceus.

88. *Alvi* Cress *Lepidium sativum* is grown in gardens as a pot-herb and for the seed which is esteemed good for women after child-birth and is used in poultices for bruises.

89. *Chákvat* Goose Foot *Chenopodium viride* or *album* is usually grown in gardens, but sometimes in corners of early grain fields. It is ready to cut a month after sowing. The plant is much esteemed as a pot-herb.

90. *Chandanbatva* *Chenopodium* is grown in all garden lands at any time of the year. The plant stands twelve to eighteen inches high and has the new leaves of the upper shoot red. The leaves and stalk are eaten as a pot-herb.

91. *Chavli* Hermaphrodite amaranth *Amaranthus polygamus* is grown in gardens at any time of the year. It closely resembles *tándulja* but seldom grows more than six inches high and the leaves and stem are uniformly green. The leaves are eaten as a pot-herb.

92. *Chuka* Bladder Dock *Rumex vesicarius* is grown in gardens at any time of the year and is ready for use about a month after sowing. The plant is eaten as a pot-herb and has a pleasant bitter flavour.

Chapter IV.
Agriculture.

CROPS.
Leaf Vegetables.

93. *Máth* *Amaranthus tristis* of two varieties red and green, is grown in gardens at any time of the year and is fit for use five or six weeks after sowing.¹ The red variety stands three to five feet high, with a thick stem and has a small central plume as well as side flowers, and the leaves and especially the stem have a red tinge. The green variety is smaller. The leaves and young shoots are eaten boiled. A wild amaranth called *káte-máth* is much eaten by the lower classes.

94. *Methi* Common Greek grass *Trigonella foenumgræcum* is grown in gardens in all parts of the district. It is sown at any time of the year, and with the help of water and manure is fit to cut in about three weeks, and is mature in two and a half months. When young the entire plant is eaten as a pot-herb by all classes. The seed is given to cattle as a strengthener and is much used as a condiment in curry. The mature stalks are an excellent fodder.

95. *Mohari* or *Rái* Mustard *Sinapis racemosa* of two kinds, red and black, is either grown at any time of the year in gardens or during the cold season round fields of wheat or gram, or among wheat and linseed.² The leaves and green pods are eaten as vegetable. The seed is used in curries and relishes, a medicinal oil is extracted from it, and it is powdered and applied as a blister.

96. *Pokla* *Amaranthus* of two kinds green and red, grows one or two feet high in gardens at any time of the year. The leaf which is eaten as a pot-herb is ready for use in six weeks.

97. *Pudina* Mint *Mentha sativa* is grown in garden lands. It is a perennial and needs an occasional watering. The leaves are used as a garnish.

98. *Rággira* of two varieties red and green *Amaranthus candidus* is grown in gardens at any time of the year and sometimes among watered wheat.³ In the green variety the seed plume is deep crimson and the stem and leaves are tinged with crimson, otherwise the varieties do not differ. The plant stands three to five feet high and has a heavy overhanging central seed plume. The seed is exceedingly small and is usually trodden out by human feet or rubbed out by hand. It is much eaten on fast days either as *láhi* which is made into balls or in cakes made from the flour of the parched grain. The leaves are commonly eaten as a pot-herb.

99. *Tándulja* Eatable Amaranth *Amaranthus oleraceus* is grown in gardens at any time of the year and is fit for use five or six weeks after sowing. The plant grows a foot high and has the stem red near the root. It has no seed plume, but flowers at each of its side shoots. Only the leaves and top shoots are eaten as a pot-herb.

The Vine.

Dráksha the Vine *Vitis vinifera* is occasionally grown in the best garden land on the east border of the western belt and near

¹ Sykes mentions three varieties and gives *A. oleraceus* as the botanical name.

² Sir G. Birdwood mentions four varieties *S. ramosa*, *S. glauca*, *S. dichotoma*, and *S. jancea*.

³ Sir G. Birdwood names them *A. tricolor* and *A. viridis*. Bom. Gov. Sel. CXXIII. 204 gives *A. polygamus* or *pendulus*.

Poona. The vine is grown from cuttings which are ready for planting in six or eight months. It begins to bear in the third year and is in full fruit in the sixth or seventh. With care a vine goes on bearing for sixty or even it is said for a hundred years. The vine is trained in one of two ways. It is either supported on a stout upright often a growing stump which is pruned to a pollard-like shape about five feet high, or a strong open trellis roof is thrown over the vineyard about six feet from the ground and the vines are trained horizontally on it. The vine supported on living pollards is said to pay best; the trellis-trained vine is the better preferred by the rich for its appearance and shade, and is said to encourage growth to a greater age. The vine yields sweet grapes in January, February and March, and sour grapes in August. The sour grapes are very abundant, but are not encouraged as they are of little value; the sweet grape is tended in every possible way, but is apt to suffer from disease. After each crop the vine is pruned and salt, sheep's dung, and dry fish are applied to each vine after the sour crop is over. Vines are flooded once in five or six days, the earth being previously loosened round their roots. Blight attacks them when the buds first appear and is removed by shaking the branches by the hand over a cloth into which the blight falls and is then carried to a distance and destroyed. This operation is performed three times a day, till the buds are an inch long. Six varieties are grown: *káli* or black, a long fleshy grape of two kinds, *abhi* a large round white watery grape and *phákdí* a long somewhat fleshy white grape, *sahábi* or *kerni* a long white sweet grape, *bedána* the seedless a small round sweet and white grape, *sultáni* or royal a large round bitter white grape, and *sákhri* or sweet a small round white and very sweet grape.

Coffee was grown in 1839 by Messrs. Sundt and Webbe in their garden at Mundhve, five miles north-east of Poona. The Bombay Chamber of Commerce considered it excellent both in quality and cleanness, and said it would fetch the same price as the best Mocha coffee, or about 2d. the pound (Rs. 14 the Surat *man* of 40 pounds). To encourage the experiment, Government granted Messrs. Sundt and Webbe ten acres of land close to their garden. Red gravelly soil, according to Mr. Sundt, is the best suited for the coffee plant. The plant when young requires a great deal of shade. When about a year old it is planted in open ground where for at least four years, it must be screened from the extreme heat of the sun. To shade the coffee bushes Mr. Sundt grew castor-oil plants round the young trees. It wants no manure and water only fifteen or twenty days during the dry season. Mr. Sundt thought that much of the Poona soil was admirably suited to the coffee plant. He particularly recommended some spots of red gravelly soil between Khandála and Kárla.¹ In 1842-43 Messrs. Sundt and Webbe grew plants from seed furnished them by Colonel Capon direct from Mocha. They had 7000 seedlings in their nursery ready for planting, and several berry-bearing trees which were fair specimens of fine coffee plants. A sample of

Chapter IV. Agriculture.

CROPS.
The Vine.

COFFEE.

¹ Bom. Rev. Rec. 1241 of 1841, 75-76.

Chapter IV.
Agriculture:

coffee was submitted to the Chamber of Commerce who considered it equal to Mocha coffee.¹

SEN. ..

In 1842-43 the Senna plant was grown in the Junnar sub-division by Mr. Dickinson and Dr. Gibson who supplied trees to several landlords.²

Co. EAL.

About the year 1840 an attempt was made to introduce the cochineal insect into the Deccan. The attempt was unsuccessful, not because the climate was unsuited to the insect, but because the only insect that could be procured was of the very smallest and worst kind known as the Cochineal Silvester.³

SILK.

⁴In October 1829, Signor Mutti, a native of Italy, offered his services to the Bombay Government as superintendent of any establishment that might be formed for the cultivation of silk. Government declined his offer but gave him to understand that liberal encouragement would be given to any one who might wish to grow silk on his own account. Encouraged by this assurance Signor Mutti resolved to attempt to grow silk. On his application in April 1830 the Collector of Poona was directed to make over to him the Kothrud garden in the town of Poona free of rent for fifteen years, on condition that the ground should be applied only to the growth of the mulberry. To this in 1830, 1831, and 1832, several plots of land were added. Lord Clare, then Governor of Bombay, took a strong interest in the subject, urged the desirableness of supporting Signor Mutti, and made him an advance of £600 (Rs. 6000). The Collector was at the same time authorised to remit the rent for six years on land cultivated with mulberry and to make advances for wells. In consequence of some disagreement between Signor Mutti and his partner Sorábjí Patil most of the lands assigned to Signor Mutti had to be resumed; but he was left in possession of the Kothrud and Dhamdhare gardens.⁵ About the same time (1829) Mr. Giberne's experiments in growing silk in Khándesh attracted the attention of the Bombay Government, and the Bengal Government were asked to send to Bombay five convicts with their families who were skilled in the management of silk-worms and in the winding of silk. These men brought with them a quantity of eggs and were attached to the jail at Poona. But from want of careful supervision they appear to have done little either in the way of producing silk or of teaching. At the same time Mr. Owen, the surgeon at Sirur, began to manufacture silk upon a limited scale. The growth of his mulberries and the fineness of the fibre showed that the soil and climate of that place were most favourable. Excellent

¹ Bom. Rev. Rec. 1568 of 1844. ² Rev. Rec. 1568 of 1844. ³ Rev. Rec. 1241 of 1841, 71-72.

⁴ Silk in India, by Mr. Geoghegan, Under Secretary to the Government of India (1872), 30-43.

⁵ Mr. Jacquemont, the cynical French traveller and botanist, met Lord Clare at the Kothrud garden. Of several experts present each gave his opinion. Mr. Mutti for mulberry trees, and Dr. Lush, who had a botanical garden at Dápuri, for mulberry hedges. Each kept to the opinion he had brought with him and in the evening they left Kothrud as they came, Dr. Lush to grow mulberry shrubs, Mr. Mutti to plant trees, the Parsi to get rid of his investment, and the Government to think over it all, Voyages, III. 580.

silk was also produced at the Poona jail.¹ As the culture of silk was abandoned at Dhulia in Khándesh, Government determined to centre their efforts on Signor Mutti's experiments. In 1837 he was appointed temporarily on a monthly salary of £25 (Rs. 250) with a native supervisor on £5 (Rs. 50), and was allowed to spend not more than £10 (Rs. 100) a month in starting mulberry plantations. On the 21st of July 1838, Signor Mutti submitted his first report as superintendent of silk culture in the Deccan. According to this report, besides 567,081 slips and 4252 standard trees planted by husbandmen in the Deccan, Konkan, and Bombay, there were 49,850 slips in the Government nursery at Sásvad. Signor Mutti had also at Kothrud several persons whom he had instructed in all the branches of silk-making and had succeeded in making them smart, intelligent, and active.² He had also received the most satisfactory reports of his silk from London, Glasgow, and Manchester, where it had been valued as high as 23s. 26s. and 29s. though reeled independently by natives. Upwards of twenty natives were reported to be acquainted with the winding of silk, and the people were said to be ready to take to silk-growing. In 1838, a sample of silk produced by Signor Mutti was sent for report to Mr. Joseph Ewart, a Manchester silk-broker, who reported that the thread was very good, being clean and even, and in every way showed excellent management on the part of the grower; that the silks would always be saleable as they would command a decided preference over the Bengal silks then imported, and come into close competition with Italian silks. The 1839 report is not so flourishing. Drought, the incursions of cattle, and neglect had much injured the mulberry bushes. Still the superintendent was sanguine. The dislike of the natives to plant mulberry trees, rear worms, and wind silk had been overcome, and several were engaged in making proper mulberry nurseries and transplanting and pruning the trees. The system of planting the mulberry bushes without earth had succeeded well and proved economical; the quantity of eggs produced by the butterflies had increased; they were regularly hatched and the cocoons had grown to the size of the yellow and sulphur varieties. At Kothrud the cocoons were so large that 1000 would yield two pounds (1 *sher*) of silk, and the people had shown themselves able to wind superior silk. The value of the mulberry plantation had been shown by the sale of the leaves.³

Chapter IV:
Agriculture.
SILK.

¹ Malcolm's Government of India, Appendix A. 69.

² Mr. Mutti had collected many cocoons of a silk-worm probably *Bombax* (*Saturnia*) *mylitta*, said to breed wild near Poona of which he got basketfuls from the children at a very cheap rate. The green mucus of the animal made it very hard to clean. Still Mr. Mutti reeled it. It was a clear yellow, but with little gloss. Bengal Bráhmans were said to make beautiful stuff of it. Jacquemont's *Voyages*, III. 580-81.

³ The leaves brought for feeding the worms at Vadgaon had been purchased from the husbandmen at 1½d. (½ *a.*) the pound; the greater part were the prunings of mulberry plants under one year of age from the villages of Chinchuri, Vadgaon, Náráyan-gaon, Sávargaon, Gunjalvádi, and Málegaon. The people of Shivner and Pábal showed every inclination to plant the mulberry tree. The plantations were usually found in channel-watered places. The mulberry trees grew among plantains and sugarcane which did not appear to injure them and almost all kinds of produce could be grown under the trees which were usually ten to twelve feet apart. The people showed great anxiety to possess worms in order to produce cocoons. All dislike on the

Chapter IV.
Agriculture.
SILK.

In 1839, the advance of £600 (Rs. 6000) granted to Signor Mutti was written off in consideration of the benefit his exertions were calculated to confer on the country and of the loss to which he was subjected by ineffectual attempts to introduce the bush system of growing mulberries, a system afterwards abandoned by him in favour of standards.

In 1840 Messrs. Daniel and Co. started an establishment to plant mulberry bushes with the view of rearing silk-worms on a large scale. In spite of the opposition of the superintendent of silk culture they bought 533,800 cuttings with which they planted twenty-five acres of land near Náráyangaon in Junnar, besides 16½ acres (22 *bighás*) of land at Sásvad in Purandhar. They had also 500,000 cuttings in different gardens under their management. Mr. James on their behalf reared 25,000 worms at Náráyangaon, which gave thirty-five pounds (17½ *shers*) of cocoons. From some of their eggs he had nearly a *lakh* of cocoons in his garden. All this was done in four months. Mr. James spoke highly of the bush system, but by no means wished to discourage the planting of trees. He stated that if hedges were grown between the trees, it lightened the expense so much that the planter could afford to encourage their growth. Hedges he considered absolutely necessary to the success of any person rearing silk-worms and attributed Signor Mutti's failure to the want of hedges.¹ Messrs. Daniel & Co. also established three silk-winding places or filatures, one at Kothrud near Poona, a second at Sásvad, and a third at Náráyangaon. At Náráyangaon there were a number of worms and cocoons. The cocoons were inferior to Signor Mutti's cocoons both in size and softness. This was supposed to be due to the fact that bush leaves had not the same strength and nourishing power as tree leaves. A number of acres were grown with the bush, but its appearance was not healthy.² In 1840, Signor Mutti went to Egypt on sick leave, and an honorarium of £200 (Rs. 2000) was given him and £40 (Rs. 400) to Mr. Ramos his assistant. An increase of £5 (Rs. 50) to Signor Mutti's pay was also sanctioned by Government. In June 1840 Signor Mutti returned to India. Of his operations for the next three years distinct accounts have not been obtained. The Government seem to have been satisfied with his proceedings. In 1843 Sir G. Arthur, then Governor of Bombay, recorded a minute strongly advocating perseverance in silk-growing. In this year, according to Signor Mutti's report, in Poona, Sorábjí Patel had extensive plantations of several thousand mulberry trees two to ten years old and made a small quantity of silk. There were besides 1400 mulberry trees three to seven years old in the station of Poona, and 50,806 trees one to five years old belonging to 317 individuals in thirty-six villages. There were also mulberry hedge rows. In two villages

part of the Bráhmans to the making of silk was overcome. They were ready to wind the silk from the cocoons which could only be done by removing the cocoons in boiling water, thus depriving the grub within the cocoon of life. Many Bráhmans were thus employed. They were also ready to engage in rearing worms and in winding silk in their own houses. Bom. Rev. Rec. 1344 of 1842, 67.

¹ Bom. Rev. Rec. 1241 of 1841, 75-76.

² Bom. Rev. Rec. 1344 of 1842, 70.

two Bráhmans had reared worms and made good cocoons. One reared 61,000 worms with considerable success and a profitable result. Signor Mutti had mulberry plantations at Kásimbág Vadgaon, Chinchore, Chás, Nánuri, Sankora, Náráyangaon, Hárvi, Utur, Hudápur, Dingora, Junnar, Mañchar, and Ausri.¹ He also mentioned six breeding places under his superintendence. At one of these, Sáivargaon, there were 35,000 worms. Reeling was carried on at Vadgaon. It was asserted that worms could be reared with less risk and in a shorter time than in Europe and that the worms were as good as were required for the higher qualities of Italian silk. The introduction of the art of winding, it was thought, wanted careful supervision at the outset, and the Collector of Poona was directed to continue the office of superintendent for five years longer, to erect four buildings for rearing worms in the Junnar or Pábal sub-division at a cost not exceeding £500 (Rs. 5000) as public property, and to conduct the breeding of worms and the making of silk on account of Signor Mutti himself or some private individual. Houses for rearing worms were accordingly built at Poona and Kásimbág Vadgaon. The Collector was also authorised to advance £200 (Rs. 2000) as a loan without interest to Signor Mutti to be repaid by instalments of £10 (Rs. 100) a month and to place £300 (Rs. 3000) at the disposal of the superintendent to be advanced by him to villagers who were anxious to grow silk. Signor Mutti established permanent winding places or filatures at Junnar, Dingora, and Náráyangaon. He had 400,000 worms in these places, and had been able to wind 160 to 200 pounds of silk a year.² Shortly after this date Signor Mutti fell ill, and Mr. Ramos was appointed to act for him.

In 1845 doubts of the success of the silk-growing experiment began to be raised. In 1847 a committee was appointed to report on the subject. The two members Dr. Gibson and Mr. Davidson joined in the opinion that any further attempt by Government to grow the mulberry with a view to the making of silk in the Deccan was not likely to succeed. Dr. Gibson expressed the decided opinion that neither bush nor standard could be profitably grown in the Deccan, and that the results shown by Signor Mutti had been due to an artificial stimulation, which deceived both Government and himself. Mr. Davidson agreed with Dr. Gibson, and Government ordered that all silk operations should cease.

No further attempt was made to grow silk till in September 1875, a sum of £250 (Rs. 2500) was placed at the disposal of Major G. Coussmaker, the superintendent of the photozincographic office at Poona, to carry out tasar silk experiments.³ Major Coussmaker began the experiments on the 1st of August 1875. Pictures showing the moths, cocoons, and caterpillars were sent to the Collectors and forest officers and to their native subordinates. Descriptive circulars were also sent in English, Maráthi, Gujaráti, and Kánarese, offering to buy seed cocoons at 1s. (8 *as.*) and burst cocoons at 6*d.* (4 *as.*) the hundred. He asked the native officials to submit fortnightly reports on facts which came to their notice. He also from time to

¹ Bom. Rev. Rec. 1344 of 1842, 60.² Bom. Rev. Rec. 1569 of 1844, 81-89.³ Gov. Res. Genl. Dept. 2794, 15th Sept. 1875.

Chapter IV.
Agriculture.

SI. K.

time wrote and distributed fresh circulars as he found out new facts or drew fresh conclusions. By these means a general interest in the collection of tasar cocoons was aroused and at a cost of £16 8s. (Rs. 164), Major Coussmaker received 62,216 cocoons by rail, post, cart, and headloads. Most of these cocoons came from the Konkan forests. The trees on which they were chiefly found were, in the Konkan, *bor* and *guti* *Zizyphus jujuba* and *xylopyra*, *ain* *Terminalia tomentosa*, *kánchan* *Bauhinia parviflora*, *karvand* *Carissa carandas*, and *mál kángani* *Celastrus montana*; and in Poona, Sátára, Gujarát, and Khándesh, on these trees and also on *nándruk* *Ficus benjamina*, *pimpri* *Ficus tjiela*, *dhávda* *Conocarpus latifolia*, and *lendeya* *Lagerstræmia parviflora*. In the Panch Maháls they were also found on *halda* *Chloroxylon swietenia*. In the Konkan the men who collected them were to some extent Musalmáns, Mhárs, and Maráthás, but chiefly Kátkaris, Kolis, Kunbis, Várlis, and Thákurs, men who from February to May were in the habit of cutting branches to burn on their land. Major Coussmaker attempted to rear the worms in his office building, in some of the rooms of his house, and in the veranda. Some of the cases and feeding trays were hung from the rafters of the rooms, from hooks and trees; others were fastened to uprights driven into the ground. In this way with wire and string netting and with bamboo chicks, Major Coussmaker succeeded in restraining the wanderings of the caterpillars and in guarding them from their enemies. But the food failed and batch after batch died from starvation. Between the middle of August 1875 and the end of October 1876 Major Coussmaker was hardly ever without moths. The gathering of the cocoons from the trees and moving them, shutting them in the baskets and bags, and generally disturbing them had the effect of repeatedly bringing out the moths during the months of February and March. Upwards of 100 moths were out every night and whenever a fresh batch of seed cocoons arrived, whatever the temperature or the time of year, moths came out in large quantities. The first supplies from the district officials arrived in February and included both full and empty cocoons packed in baskets and bags. On arrival it was not easy to find how many of the cocoons were full and how many were burst. The shaking had so disturbed them that the consignments were found to contain many moths more or less damaged. Major Coussmaker had all the cocoons moved to open trays and put into a spare room. The details for the eight months ending September show that on an average 529 females paired and 21,329 worms were hatched every month:

POONA TASAR EXPERIMENTS, 1875-76.

MONTH.	Males.	Females.	Paired.	Worms Hatched.
February 10th-29th ...	855	419	48	No record.
March	1126	1217	399	...
April	573	636	299	20,770
May	539	553	115	14,781
June	504	523	424	38,572
July	430	443	372	43,097
August	423	340	309	43,854
September 1st-10th ...	142	120	89	7553
Total ...	4097	4231	2045	170,634

Before the supplies from the districts came in, Major Coussmaker's men had gathered some 300 cocoons near Poona. These cocoons and the moths that came out of them, as well as the caterpillars which were hatched, were mostly sacrificed in experiments. The result confirmed Major Coussmaker's former experience that the males require more liberty than the females, that the females rarely moved from their empty cocoons or from the twigs on to which they crawled when their wings were stiffening, while the males flew away as soon as their wings were stiff enough. As during the rainy season several male moths were generally flying about, females, when tied out, were soon paired, their talc-like disks shining like little moons and drawing the male like the light of the glow-worm. In this way Major Coussmaker succeeded in getting nearly all the females which came out during the monsoon of 1875 paired. His arrangements for rearing failed. His space was limited and his cages were badly aired, and though he hatched several hundreds he gathered only fifty cocoons. He afterwards moved into a larger house and gave the worms more room. He joined chairs and tables together with bamboos so as to make them form a succession of benches. On these benches he set bamboo mat trays and above the trays he hung twigs on strings, entirely giving up the indoor cage system. In some places he put rows of small pots with twigs in them, filling them with moist earth. This did not answer, as the caterpillars were more ready to crawl down the pots than up them and the free movement of the air was hindered. He therefore determined to trust to the strings alone. For a short time everything went well. Major Coussmaker had plenty of good fresh leaves; the worms were not crowded, and they grew considerably. But long before their fifty days of life were over, the leaves became hard or diseased, and though Major Coussmaker had abundance of leaves all were of inferior quality. During the whole season caterpillar after caterpillar pined and withered. Though from time to time the trees flushed and sent out fresh shoots, their efforts were spasmodic, and owing to the great scarcity of rain Major Coussmaker found it impossible to ensure a steady supply of suitable food. He found that many young worms crawled down the legs of the chairs and tables and disappeared. He accordingly changed his trays. He fastened ropes to the rafters and to hooks in the ceiling, and passing them through broken bottle fairleaders, so as to prevent the enemies of the worms climbing down or the worms climbing up, he made a succession of swinging trays, over which as before he set strings of twigs. This method greatly lessened the labour of tending; the worms were much more secure and the ventilation was good. But again as in the year before food failed. Major Coussmaker changed the place of the swinging trays. Some he tied to the boughs of trees, some in one veranda, some in another; but the food was no better. He let some loose on trees in the station, but there were no fresh leaves and they died or were taken by the birds, squirrels, and lizards. On a range of hills a few miles out of Poona he found a grassy tract with many bushes and saplings of *Terminalia*, *Lagerstræmia*, and *Carissa*. Here he turned out some thousand worms and set men to watch them during the day. For

Chapter IV.
Agriculture.
SILK.

some five weeks they did well. Then a very hot fortnight set in, the saplings and small bushes lost their leaves, and almost all the worms died. Major Coussmaker thought the failure was entirely due to the unprecedented drought. Although Major Coussmaker failed in rearing, he succeeded in breeding and in procuring fertile eggs. During the hot weather, when no wild males were flying, Major Coussmaker found it was little use tying out the females, but during the rains he was successful. From February to May he turned all the moths as they came into a bedstead shaded with mosquito curtains, and a fair proportion paired. After May he rigged the swinging trays as before, and in the mat trays resting on them he set the cocoons, covering the whole with bamboo chicks fastened like a pent-house about three feet high. After they came out of the cocoons the moths crawled up the chicks and there hung while their wings were expanding. Major Coussmaker found that several of the moths paired in these cages. Each morning he looked at them, and leaving the pairs inside the cages undisturbed, he put the rest of the moths into a large basket and covered them. About four in the afternoon he looked at them and found that several of them had paired. These were left undisturbed, and all the unpaired females were tethered to a small trellis-work. At dark, this frame was hung to a tree, and all the unpaired males were set free near it. In the morning most of the tethered females were paired. The frame was brought indoors and hung out of the way. Care was taken to use no force in separating the pairs. They were always allowed to free themselves. After they were free the females were put under inverted baskets to lay their eggs, and the males were put into a basket to be set free at sunset. By following this system, most of the females paired and their eggs proved fertile, but the average outturn of eggs was less than Major Coussmaker had formerly noticed, only 106 to each moth. Major Coussmaker did not have the eggs counted, only the number of worms hatched. Major Coussmaker's head silk-worm tender was a Marátha widow, who had been taught in the female normal school at Poona. It was chiefly from her that he received the figures quoted above. She made every effort to keep the worms alive, closing windows and doors, hanging up wet cloths, putting *khashas* tatties to the doors, sprinkling the twigs and dipping them in water; but all was of no avail. Death returns kept by Major Coussmaker showed that of the worms that died two-thirds were under a week old. Of 170,634 worms hatched between the 1st of April and the 10th of September only 2623 grew up and spun cocoons. This mortality in Major Coussmaker's opinion was due to the want of suitable food. Under the head tender, Major Coussmaker had five lads, some looking after the worms in his garden and some tending them in the bushlands on the hills near, and at odd times cleaning the burst cocoons and preparing them for the manufacturer. Most of the cocoons sent to Major Coussmaker were those of *Antheræa paphia* and belonged to the common variety of that moth. In September 1875, Major Bowie, Deputy Commissioner at Sambalpur, sent him some cocoons belonging to another variety called by the natives of the Central Provinces the Chhattisgad cocoon. These were larger, but much

thinner and softer. The moths, though slightly darker, paired readily with the small hard cocoon moth. As far as Major Coussmaker could judge the difference between the two was one of climate and feeding. The Chhattisgad moths were more delicate and limper. The remaining cocoons received from the Bombay forests were of *Attacus edwardsii* and of *Cricula trifenestrata*. Several moths of both these species came out, but none paired. *Attacus edwardsii* seemed to be distributed over the whole Presidency and was also in Maisur; *Cricula trifenestrata* came from North Kánara only.

The tree which Major Coussmaker used for indoor rearing was the *nándruk* *Ficus benjamina*. The leaves travel well and long keep fresh. The tree has constant flushes of young leaves and being planted for shelter in many places along the roadside was in every way the best suited for a large experiment. At the same time, as they were neither pruned nor watered, the *nándruks* failed to yield a trustworthy supply of suitable leaves. Major Coussmaker tried the *bor* *Zizyphus jujuba*, but it quickly withered. Still on it, on the *ain* *Terminalia tomentosa*, the *lendeya* *Lagerstrœmia parviflora*, and the *karvand* *Carissa carandas*, a few caterpillars grew to maturity out of doors. Mr. Woodrow, the superintendent of the Ganeshkhind Botanical Gardens, had also in the same year (1876-77) a small sum placed at his disposal by the Collector of Poona to make experiments in the growth of tasar silk. He laid down a great many cuttings of *Ficus benjamina*, and built a light roomy shed, with the sides and top of coir matting, a cheap and effective structure. Mr. Woodrow got a few seed cocoons and Major Coussmaker from time to time gave him fertile eggs. The result of his experiments was the same as of Major Coussmaker's. The moths bred freely in confinement and produced fertile eggs in abundance and in due course the caterpillars appeared. But of the number that entered on the worm stage only about five per cent lived to spin cocoons and these cocoons were decidedly inferior to what might be gathered all over the country. Every now and again the caterpillars thrived well, but when the quality of the leaves fell off, the caterpillars starved and died. At the close of his experiments he had 923 good cocoons. Mr. Lyle, an American employed on the Peninsula railway, tried a series of experiments in rearing silk-worms at his house near Dápuri. As he had no room or shed, he with great ingenuity made a set of large pens or cages fixed on uprights driven into the ground under some good shade-trees. The sides and tops of his cages were of bamboo chinks closely fastened together so that while sufficient air was admitted no caterpillar could escape, and none of the 'silk-worms' enemies could come at them; a coating of mixed tar and castor-oil prevented any enemy climbing the uprights. Inside his cages, Mr. Lyle stretched wires lengthways and hung the twigs on the wires. A good deal of light rain fell at Dápuri in the month of August when Mr. Lyle's cages were full, and the wind driving the moisture through the openings of the chinks kept the leaves fresh and the worms thrived as well as on the trees. He got some cocoons from trees along the line, and Major Coussmaker provided him with some fertile eggs. From these, which he began to rear on the 7th of August and which spun

Chapter IV.
Agriculture.

SILK.

by 10th of September, he gathered 1509 cocoons, the majority of which were as fine as any forest reared specimens in the neighbourhood. He had a greater choice of food than Major Coussmaker, and managed to secure a superior quality of leaf throughout the forty-five days. He fed the worms on *Ficus benjamina* and *Ficus tjiela* twigs eighteen inches long laid very close together. In his opinion the worms seemed equal fond of both kinds. One objection to *Ficus tjiela* was that when it dried or faded the leaf rolled up and, especially at moulting time, hurt the caterpillar resting on it. He also noticed that, if they had begun to eat one kind of leaf the caterpillars would not pass from *nándruk* to *bor* or from *bor* to *nándruk*. Mr. Lyle by accident found that the worms thrive well on *Lagerstræmia indica*, a leafy, ornamental, flowering shrub found in most gardens. Both he and Major Coussmaker put some caterpillars on these trees and found that they grew enormously and spun very large cocoons. The chief experience gained by the year's experiments was that seed cocoons should be moved as little as possible; that feeding worms on twigs gathered from unpruned roadside trees was a mistake, as eighteen inch twigs have only three or four suitable leaves; that plantations should be made of trees and shrubs and that the trees should be pollarded; that when worms are fed out of doors the trees should be guarded by cages or nets and when under shelter the worms should be kept either in coir-matting sheds or in portable pens or cages; that only the third, fourth, and fifth leaves from the end of the twig should be used, and that these twigs should be renewed three or four times a day; that the system of cages, baskets, and tethering ensures a supply of fertile eggs; that the eggs of the healthier moths should alone be kept for distribution or for home-rearing; that since the silk-mill in Bombay can work burst cocoons there is no need to kill a single chrysalis, all the moths should be allowed to come out of the cocoons; that after the moths come out the cocoon should be carefully cleaned, all pieces of leaf or twig brushed off, and all cast skins and chrysales picked from the inside; that the habits of the trees or shrubs used for feeding the worms should be carefully watched to find how best to ensure a steady supply of suitable food.

As regards the working of the tasar cocoons into fabrics Major Coussmaker carried on a correspondence with Messrs. Tápidás Varajdás and Co., secretaries and treasurers of the Alliance Spinning and Weaving Company Limited, of Bombay, and placed the whole matter in their hands. He sent them 112 pounds of cocoons cleaned as well as his labourers could clean them without boiling them. Messrs. Tápidás and Company found that the cocoons yielded about forty per cent of pure silk and about thirty per cent of noils and refuse. The remaining thirty per cent, which was lost in the boiling, in Major Coussmaker's opinion was the natural cement, the dirt, and foreign matter left by the cleaners. Some of the forty-five pounds of silk that remained was woven into tasar cloth, some into tasar poplin, and a considerable quantity was used in experiments made with the view of bleaching it. Messrs. Tápidás and Company were not able to put any value on the material either

in the form of cocoons, of yarn, or of piecegoods, as there was no demand for tasar. They could not use it unless it could be supplied as white or nearly as white and as capable of taking every dye as the *B. mori* silk.¹

In 1877, the Bombay Government sanctioned the payment to Major Coussmaker of £50 (to 500) as an honorarium.² At Ganeshkhind the first cocoons seemed fertile, but only about five per cent of the caterpillars lived to spin. The second generation did not come to maturity.

In the course of his inquiries Major Coussmaker got a sample of fibre much superior to any Indian specimen he had seen, though inferior to Italian silk. He found that this fibre was produced by a hybrid of the tasar moth with the *yama-mai* or oak-feeding moth of Japan. The Bombay Government, in communication with the British officials in Japan, procured some eggs of the oak-feeding variety. Boxes of this seed were sent to various official and private experimenters. Those kept by Major Coussmaker seem to have been all killed by the dry heat of Poona, nor did those kept in Bombay by experienced and generally successful silk-growers fare better. It has been suggested that the *yama-mai* breed should be introduced in the cocoon state, but it is extremely doubtful whether the true cause of their failure is not the absence of any leaf of the oak family which is their natural food. The only tree to which they seemed to show the slightest partiality was the *nándruk* *Ficus benjamina*, and even on that they fed for not more than ~~four days~~. That the journey is not the cause of failure seems clear from the success with which this breed of silk moth has been carried from Yokohama across the United States to England, a journey of more than forty days.

In 1879, Major Coussmaker resumed his experiments. He set aside fifty cocoons of the 1878 crop for breeding. He also got from others a good supply of moths, many of which he allowed to escape as he had not food for many caterpillars. He kept some 10,000 eggs hoping to find food for them in Poona. But he failed to get more than 500 good cocoons from them of which he kept only a hundred. As before the great difficulty was to secure an unfailing supply of suitable food. To improve his supply, with the first promise of rain in June, Major Coussmaker set aside about one-sixth of an acre in his garden with a southerly aspect. This he cleared of trees and bushes and laid it out in ridges four feet wide with side gutters. On these ridges he planted 340 feet of *dháytí* *Lagerstræmia indica*, 270 feet of *bor* *Zizyphus jujuba*, ninety feet of *karvand* *Carissa carandas*, 107 feet of *ain* *Terminalia tomentosa*, fifteen feet of *arjun* or *sádada* *Terminalia arjuna*, and forty-six feet of *nándruk* *Ficus benjamina*. He found *dháytí* the most suitable plant. With liberal water it constantly threw out shoots covered with leaves which the worms ate greedily. The plant could be easily grown from the root. The *bor* was liked by the worms but the

¹ Major Coussmaker's Report to Government, 20th November 1876.

² Bom. Gov. Res. 597, 22nd February 1877 (General Department).

Chapter IV.
Agriculture.

SILK.

leaves were small and thinly scattered and were soon eaten. The *karvand* was leafier but a slow grower. The *ain* and *arjun* had larger leaves but were slow growers. The *nāndruk* was a failure: it did not thrive and was not eaten. A *dhāyti* plantation with *bor* and *karvand* hedges would yield plenty of food after the beginning of its third rains. Major Coussmaker kept all his seed cocoons hung on a wall out of reach of rats. So long as they were left undisturbed the moths came out only during the regular season. Large numbers died when cold October east winds set in. But the chief causes of death were preventible, shortness of food and attacks of insects, birds, mice, and other enemies.

In 1880-81, Major Coussmaker's crop of cocoons failed. He thought this failure was the fault of the cages. These were tarred screens of split bamboo. They kept out rats, mice, birds, squirrels, and lizards, but they were too dark; the plants did not thrive and the worms were always trying to escape. He made the cages longer and put netting at the top and everything throve till some wasps and other insects punctured and killed most of the silk-worms. He had about 30,000 clean perforated cocoons weighing about sixty pounds. He thought it best to go on collecting until he got about a hundredweight. In 1881, though the results were better, Major Coussmaker did not succeed in gathering a full season's crop of cocoons of his own rearing. His food supply was perfect and the cages kept out all the larger enemies of the worm; still there was much sickness and many deaths. Only 1000 cocoons were gathered. His first batch of worms hatched on the 2nd of May and the first cocoon was spun on the 6th of June. The last batch of worms hatched in the middle of November, but they gradually dwindled and came to nothing; the last worm died on the 8th of December. The whole season's collection amounted to 60,000 cocoons double of the 1880 collection. It was chiefly received from the Forest Department who sent 58,000 cocoons. Major Coussmaker had all these cocoons cleaned of extraneous matter. The outturn for the two years, 200 pounds of clean cocoons, was sent to Mr. Thomas Wardle of Leck in England. This was sold to Messrs. Clayton Marsdens and Company of Halifax at 1s. 3d. the pound. The spinners reported that the fibre was somewhat coarser than most tassar waste and the cocoons had been opened; but this was not a serious drawback to its spinning qualities. At this time, in Major Coussmaker's opinion, the prospects of the tassar silk industry were promising, every year showing an improvement. Major Coussmaker laid out a sixth of an acre as a *dhāyti* or *gulmendhi* plantation. The land was laid out in ridges seven feet wide with a gutter of one foot between. The *dhāytis* were put into a trench of good soil mixed with manure in the middle of each ridge one foot apart. Where the ground was not filled with the cages, on each side of the *dhāytis* on the ridges vegetables were grown. Care was taken to lay out the ground in the way best suited for watering. The cages were tarred rectangular pieces of split bamboo screen-work, a cheap light material neither liable to be hurt by the weather nor to be gnawed by rats. In making the cages he tied the screens together, making the sides three feet high and the ends six feet wide. The cage could be put up over the whole length of the

hedge and was divided into twelve-foot sections. From side to side, arched over the top of the hedge, pieces of rattan had their ends fastened to the screens and the middle to a light ridge pole which rested on triangular screens. Over these hoops coarse open cotton was spread. By this arrangement nothing touched the shrubs which were uniformly cut to a height of four feet and nothing tempted the worms to leave their food. There were three screens under the triangles. The middle screen was fixed and the two smaller screens on either side were fitted with string hinges, allowing boys to go in and clean on both sides of the hedges without injuring the shrubs. When hatching, the worms were put on the plants near the door, and they ate away steadily crawling to the next when the first twig was stripped. As fast as they were eaten the bare twigs were cut off and fresh ones grew. After a few weeks the hedge was as thickly covered with leaves as when the caterpillars were put in, and this process went on as long as the rearing of the worms was continued. When the twigs in any section of the screen were stripped the screen was taken down and shifted along the hedge or to some new place. As a rule little water was required. In July 1882, Government held that the experiments conducted by Major Coussmaker proved that tasar silk could be grown with success in the Deccan. They proposed to continue the experiments, and hoped they would lead to the considerable growing of tasar silk. In 1882 Major Coussmaker increased his *Lagerstræmia* plantation to 1500 feet and his *Zizyphus* hedge to 300 feet. In February 1883, before retiring from the service, Major Coussmaker in a final report expressed his opinion that tasar silk-growing would not pay. Large imports from China had lowered the price of tasar waste in England, the Bombay cocoons were small and yielded little silk, and the gathering of wild cocoons or the rearing of worms were both costly. 6*d.* (4*as.*) a hundred was the cheapest rate at which forest cocoons could be gathered and this was too high to admit of profit. The people did not find it pay them to leave their regular work and gather cocoons. It was only by the personal exertions of the forest officers that so much had been gathered. Major Coussmaker had nearly every year tried to increase the size of the cocoons by bringing large cocoons from Sambalpur, Yamtara, Manbhum, and other places, but with no success. The moths had paired readily with the small Deccan variety, the worms had hatched, but there was no difference in the cocoons. Major Coussmaker believed that the smallness of the Deccan cocoon was due to the climate and perhaps in a less degree to the food. As far as outturn went the result of rearing the tasar silk-worm was satisfactory. Within six weeks Major Coussmaker had been able to gather three cocoons from each foot of hedge. In 1882 the first worm hatched on the 9th of May and the first cocoon was gathered thirty-two days later. The worms of this batch numbered 380 and 347 of them spun cocoons, beginning on the 7th and ending on the 24th of June. They consumed 110 feet of *Lagerstræmia*. Of 1800 feet of *Lagerstræmia*, one-half was sufficiently grown to yield a steady supply of food. From these 900 feet between May and October Major Coussmaker gathered 5678 cocoons. Of these only about half, which were almost all

Chapter IV.
Agriculture.

SILK.

gathered before the end of July, were sound and perfectly formed. Later in the season without any apparent cause he lost many hundreds of worms in all stages, some being the progeny of moths of the preceding year. Still many cocoons were spun, some of which were very fine, but the majority were weak and thin. These facts, his own former experience, and the information received in letters and printed reports showed that no reliance could be placed on any but the first crop of the season, the progeny of the moths which rest in their cocoons during the cold and hot seasons, and which emerge early in the monsoon when the first showers of rain fall. Throughout the whole monsoon and often at other times, when disturbed, moths continue to appear but with an unsatisfactory result and much loss of life. Enough cocoons were spun to ensure a supply of seed cocoons, but not enough to call a crop. Major Coussmaker's arrangements had succeeded in guarding the worms and ensuring a steady supply of food. The labour bill was reduced to a minimum; one woman and one boy could easily look after at least an acre of hedge and keep the enclosures in repair. At the same time if the south-west rains did not break early and heavily the hedges would have to be watered and the expense of enclosing would be very great. So long as tasar continued cheap this system could not pay. Crows, sparrows, squirrels, and rats gather near dwellings and must be kept out. Major Coussmaker succeeded in keeping the worms safe from their enemies, but the process was costly. Major Coussmaker having wound up his series of experiments, handed his plantation of Lagerstræmia and Zizyphus bushes, together with the bamboo screens and iron rods which he used for his enclosures, to the superintendent of the Central Jail at Yaravda. There is land attached to the jail and the head jailor took an interest in silk experiments.

✓ EXPERIMENTAL
GARDENS.

Shortly before 1841 an experimental garden was started at Hivra, about ten miles east of Junnar. In 1841 potatoes and sugarcane were the chief products. The market for the potatoes extended to Dhulia, Aurangabad, and Bombay, and the growth of sugarcane had greatly increased. Numerous other products were also tried. The chief were, American maize, *anotto* dye for which there was a large demand in Poona, hemp, and oil-plants. A valuable variety of rice the *kamod* was introduced into the district, and thirty-eight kinds of choice wheat were received from Edinburgh. Dr. Gibson, the superintendent of the garden, considered the cultivation of cotton, cassado or tapioca root, and coffee unsuited to Poona.¹ There was a similar garden at Government House at Dápuri, about eight miles north-west of Poona, for which Government did not incur any additional expenditure, and where several trees, including among others the India Rubber tree, were raised. In the nursery on the top of Shivner fort by the help of four Chinese convicts upwards of 200 exotic trees were grown and seemed likely to be useful. The olive and cedar flourished in some places in the plains, but at Dápuri the soil was not good enough for the olive.

¹ Bom. Rev. Rec, 1455 of 1843, 176-7.

About the same time (1841) Messrs. Sundt and Webbe, two enterprising and respectable Anglo-Indians, had a well cultivated garden at Mundhve, about four miles east of Poona. Besides growing oranges, grapes, and other fruit they turned their attention to the cultivation of the coffee plant. In 1847 they had about a hundred healthy trees from which they realized a good crop, besides a thousand young plants ready for putting out. They also grew a little Mauritius sugarcane and made raw-sugar or *gul* from its juice.

The botanical garden at Ganeshkhind was started in 1873, and along with the Hivra garden, has since been under the superintendence of Mr. G. M. Woodrow. The principal object of these gardens is to supply the Medical Department with drugs. In 1872-73 the outturn of the gardens included 700 pounds of senna, 1300 pounds of henbane, and 1036 pounds of dandylicon. During the same year the chief produce of the laboratory was 107 pounds of extract of colyacinth compound, fifty-six pounds of extract of hyoscyamus, 1621 pounds of groundnut-oil, 7190 pounds of castor-oil, and eleven pounds of croton oil. In that year experiments were made with various artificial manures, nitro-phosphate, citrate, dissolved bones, nitrate of soda, hop manure, and superphosphate. The income of the gardens amounted to £164 (Rs. 1640) and the expenditure to £154 (Rs. 1540). The laboratory receipts were £431 (Rs. 4310) and the expenditure £319 (Rs. 3190). In 1873-74 experiments were made with European artificial manures; the result was not satisfactory. It was proved that silt from the drains of Poona city is a valuable manure at least equal for one year's crop to dung from oil-cake fed cattle. Of the cork trees that were planted three years before, many had died and a few were struggling for life. One, which had grown six and a half feet high and four inches in circumference, appeared to be in perfect health. As this showed that the climate was not unsuited to the cork-tree, the Secretary of State was asked to arrange for the despatch of periodical supplies of cork-tree acorns. Many new ornamental plants were introduced, the most valuable of which was the *Exogonium purga*, the plant which yields the drug jalap. Experiments were also made for the growth of fibre for paper. The income was £352 (Rs. 3520) and the expenditure £1222 (Rs. 12,220) besides £558 (Rs. 5580) spent on the laboratory building from a fund set apart for the purpose. In 1874-75, the income was £842 (Rs. 8420) and the expenditure £1257 (Rs. 12,570). The area under tillage was fifty-seven acres, seven of which were watered. One fact was ascertained that prickly-pear made a valuable manure if it was left to rot in a cistern through which the water of an irrigation channel was led. Some new descriptions of tree were added. A fairly successful attempt was made to grow vanilla. Flax was also grown of fair quality but of excessive dearness. Unsuccessful attempts were made to get paper from *san* stalks and plantain fibre. Most of the cork acorns brought from England arrived dead. In 1875-76, the income of the garden amounted to £660 (Rs. 6600) and the expenditure to £1268 (Rs. 12,680). The most important new introductions were *Balsamocarpon brevifolium* a plant yielding pods useful in tanning and the Liberian coffee. Cereal crops were raised with a view to selecting the seed. 3000 half-standard roses

Chapter IV.
Agriculture.

BOTANICAL
GARDENS.

Chapter IV.
Agriculture.

were ready for distribution. A list of the medicinal plants was printed and indents became more frequent.

In 1876-77, the income of the garden amounted to £951 (Rs. 9510) and the expenditure to £1285 (Rs. 12,850). Experiments with the *Wagatea spicata*, a climbing shrub, a native of the Konkan, showed that its seed-pods contained a high proportion, fifteen per cent, of tannic acid. A satisfactory feature in the working of the garden was the extent to which its drugs, chiefly taraxacum and colocynth, were in demand. Experiments in the production of tasar silk were continued. In 1877-78, experiments were carried on with mahogany trees, the seed of which had been sent from Kew Gardens and planted in 1874. The results seemed to show that the tree could be acclimatised and established if well watered during the first two years. The blue gum tree, *Eucalyptus globulus*, was found to thrive well for four or five years and then to die off. The superintendent was of opinion that an exotic which like the gum tree did not go to rest at any time of the year was sure not to succeed. Cinchona, though it grew well in the conservatory, died in the hot season if planted out. Taraxicum was grown with success. The tasar silk experiments were not satisfactory. The income of the garden was £516 (Rs. 5160) and the expenditure £1290 (Rs. 12,900). The Ganeshkhind gardens, which were originally intended merely as a nursery for the growth of local medicinal plants, under the supervision of a scientific gardener had assumed a botanical character. In 1878-79, a committee was appointed to consider how the locality could best be developed for the purpose of botanical experiments and instruction. The suggestions of the committee were considered by Government and it was decided that the gardens should be constituted the recognized chief botanic gardens of the Presidency and that arrangements should be made for forming in them as complete a collection as possible of the local plants of Western India, a herbarium of which was to be kept permanently on the spot, along with a select library of diagrams and botanical works of reference. The manufacture of oil was discontinued and the superintendent was instructed to manage the gardens with the view of making them of purely botanical and scientific utility. Botanical teaching was begun at the end of February 1879 by means of lectures at the gardens and at the College of Science and at the Deccan College in Poona, with illustrations of specimens collected by the superintendent. The average attendance was fifty-one students.

Experiments with Nankin cotton showed that it could not be profitably grown in the Deccan. The sample sent to the Bombay Chamber of Commerce was estimated to be worth £5 (Rs. 50) less than the common samples of Dholera. The forage plant, *Reana luxuriens*, was found to be no better than sugarcane when grown in rich soil and irrigated, and worse than *javari* when treated as a dry crop. The income of the garden was £740 (Rs. 7400) besides £134 (Rs. 1340) the value of the oil on hand, and the expenditure £1282 (Rs. 12,820), that is a net cost of £408 (Rs. 4080). In 1879-80, the room formerly occupied by the oil-pressing machinery was

partially fitted as an herbarium and specimens of about 1700 species were arranged according to their natural orders. Some of these were identified and the rest were sent to the Royal Herbarium at Kew for comparison. Considerable additions were made to the library which was used by a large number of botanical and agricultural students. Botanical teaching was continued during the year at the gardens and at the adjacent Poona colleges. The average attendance at the gardens fell from fifty-nine to nineteen as the students were allowed to pass the examinations without attending at the gardens. Six trained native gardeners or *mális* were sent out during the year and the demand for trained men continued much greater than the supply.

Experiment with the thornless opuntia or prickly-pear, which can be easily skinned and is then a favourite food for cattle, showed that it grows freely as a fence and is not likely to prove troublesome as it does not grow from seed. The yield of the forage grass *Euchleina luxuriens* seemed nearly the same as that of guinea-grass. A crop sown in November and cut in April gave sixteen tons the acre of green forage at one cutting. Fifty mango trees of the finest varieties were planted for stock from which grafts could be taken for distribution. The demand for imported seeds had risen from £69 (Rs. 690) in 1875 to £124 (Rs. 1240). Experiments with lucern grass seemed to prove the French variety superior to the acclimatised variety. The plant was quite as vigorous, the stalk was more delicate, and the seed was only half the weight. The receipts of the garden amounted to £946 (Rs. 9460) and the charges to £1554 (Rs. 15,540). In 1880-81, additions to the herbarium brought up the collection to about 2080 species of which about 1080 were identified. Botanical teaching was continued at the gardens. A number of full grown specimens of *Albizzia procera*, one of the local trees which during the cold season of 1878-79 had been transplanted without soil on the roots, showed satisfactory results. *Euchleina luxuriens* was again grown for forage. It proved a vigorous grass when highly manured and watered, but not superior to sugarcane. Twenty mango trees of the finest varieties were planted out for stock, raising to 102 the number of trees whose grafts were suitable for distribution. The demand for imported seeds was about the same as in the previous year. The garden receipts amounted to £340 (Rs. 3400) and the charges to £768 (Rs. 7680). In 1881-82 the general condition of the garden was improving and the number of visitors was increasing. The receipts, derived chiefly from the sale of fruit trees, vegetable, and flower seeds, taraxicum, and some timber, amounted to £637 (Rs. 6370) and the charges to £1046 (Rs. 10,460). A mangosteen plant from Singapore died from cold in November. The local *koham* or wild mangosteen plants were in good condition. Potatoes received from the Secretary of State grew surprisingly well. In May 1882 the carob tree yielded a crop of fully thirty pounds weight of pods, the greater part of which were equal in size to the imported pods. An attempt to propagate this tree by layering failed, but by grafting was very successful. 447 mangoes were grafted with choice sorts at a cost of 10½d. (7½ *as.*) each. The herbarium building was altered and repaired

Chapter IV. Agriculture.

BOTANICAL GARDENS.

Chapter IV.
Agriculture.

BOTANICAL
GARDENS.

and numerous specimens were added. The superintendent Mr. Woodrow lectured on vegetable physiology and systematic botany and gave eleven garden demonstrations in systematic and economic botany. The average attendance was twenty students. Experiments were made in collecting the India rubber-yielding milky sap of the *Cryptostegia grandiflora*, a beautiful climber. The average yield was found to be twenty grains and the acre yielded twelve pounds. As the plants would not bear tapping more than twice a year, the yearly acre outturn would be twenty-four pounds of caoutchouc. The cost of collecting was 2s. (Re. 1) the pound, which might perhaps be reduced to 1s. (8 as.). The value of the India rubber may be estimated at 2s. (Re. 1) the pound. The result was therefore not encouraging. In 1883, 2001 mango trees were grafted with choice sorts at a cost of 10d. (6½ as.) each, and in 1884, 4000 more were prepared at a cost of 9d. (6 as.) each.

In the Bund Gardens, the Soldiers' Gardens, and the Railway Gardens in Poona plants and flowers are grown purely for pleasure and ornament. Details are given in the account of Poona City in the chapter on Places of Interest.

BLIGHTS.

The district is not subject to blights. As has been noticed wheat is occasionally affected by a disease called *tumbera* or rust when the ear turns copper-coloured and withers. It is also subject to another disease called *garva* or *khaira*. These causes of failure do not often occur on such a scale as to affect the general harvest.

FIELD PLAGUES.

Locusts.

The animal plagues from which the Poona crops are most liable to suffer are worms, locusts, and rats. The damage caused by worms is confined to gram and other pulses and is seldom serious. According to Sanskrit books locusts and rats are two of the six deadly plagues or *itis*.¹ Of loss from locusts before the beginning of British rule no instance has been traced. Since 1818, four years, 1835, 1878-79, 1882, and 1883, have been marked by swarms of locusts. Of the 1835 locusts except a general reference to the damage done no particulars have been traced.² In 1878-79, considerable damage was done by locusts to the early or *kharif* crops in parts of Bhimthadi and Purandhar. ³In 1882, as in other parts of the Deccan,⁴ locusts, probably the *Acrydium perigrinum*,⁵ appeared in Poona, but did comparatively little harm. During May, the locusts moved north and north-east from Dhárwár and North Kánara where they first appeared. They did not stay long in Poona and by the beginning of June most of them had passed north and were breeding chiefly in Násik and Khándesh. In the beginning of October 1882, young swarms came from Násik and Ahmadnagar. From Poona they crossed the Sahyádris and passed into the Konkan. The injury caused

¹ The six plagues are Excessive rain, Want of rain, Locusts, Rats, Parrots, and an Invading force.

² Bom. Gov. Rev. Rec. 772 of 1837, 33-31.

³ Mr. J. G. Moore, C.S.

⁴ In 1882, locusts appeared in Dhárwár, North Kánara, Belgaum, Sátára, Poona, Ahmadnagar, Násik, Khándesh, Kolába, Thána, and Ratnágiri.

⁵ It is said to have been identified in Bombay with *Pachifilus indicus*, a locust peculiar to India. Dr. Kirby of the British Museum thought it a variety of the *Acrydium perigrinum*. Mr. J. Davidson, C.S.

by the locusts was confined to the west of the district. There were no locusts in Bhimthadi and Indápur, and few in Sirur or Haveli. In Mával about 160 square miles or about three-sevenths of the sub-division suffered. Of 58 villages in Khed, Purandhar, Junnar, and the Mulshi petty division, 208 villages suffered more or less severely and in these 208 villages in about one-fifth of the area attacked the *khari*f or early crops were entirely destroyed. Elsewhere the injury was slight, and no special measures of relief were found necessary. They did little harm to the *náchni*, *vari*, and *sáva* crops, and here and there they touched a little rice, but the mischief caused was trifling. They seemed to be unable to eat the mature grain of rice and *bájri*, and they fortunately did not arrive until close on the early harvest. When the crops were reaped, the locusts disappeared drifting west. Nothing more was seen of them until May 1888, when, especially in the west of the district, they returned in swarms and through the whole of May and June, wherever they alighted, they turned fields, groves, and hill-sides pink. After resting three or four days they flew east leaving the trees as green as when they came. Heavy rain seemed to do them no harm. Towards the middle of June they were seen in pairs. After pairing the males died, and after laying their eggs during the end of June and the beginning of July the females also died. They laid their eggs in all kinds of places, from the dry slopes of bare hills to swampy marshes. The female works her tail about two inches into the ground and lays one hundred to 150 eggs. She gives out a glutinous fluid which in dry soil forms a crust round the eggs like an earthnut or *bhuimug*. In damp places the earth does not stick to the fluid and the eggs, like yellow pins' heads, are left open to the air but apparently do not suffer. As soon as the locusts were known to be laying, orders were issued to destroy the eggs and the young locusts wherever they were found. The villagers were told that they must take an active part in destroying the eggs and that if they failed to exert themselves and their crops suffered, they would get no remissions. Each sub-division was divided into circles of three to six villages. Over each circle an inspector was placed belonging to the Revenue, Police, Educational, Forest, Vaccination, or Public Works Departments, all branches of the administration zealously lending their aid. The inspector's duty was to urge the villagers to destroy the eggs and young locusts and to report daily whether the villagers were doing their duty. The efforts to destroy the eggs to a great extent failed. Where the ground was dry the holes were sometimes visible and eggs were found, but in most places the rain had washed away all trace of the hole and the search was fruitless. About the beginning of August numbers of newly hatched locusts began to appear like small grasshoppers. To spread a knowledge of what the newly hatched locust was like the precaution had been taken to have eggs dug out of holes just after the female locust had laid, and kept in a frame enclosed by mosquito netting. When the frame locusts were hatched specimens were sent to each mámlatdár and shown to the people. Various means were adopted to destroy the young swarms. The Cyprus screen, introduced by Lieutenant Bor, R.N., was tried, but, as Lieutenant Bor admitted, it did not

Chapter IV.
Agriculture.
FIELD PLAGUES.
Locusts.

Chapter IV.

Agriculture.

FIELD PLAGUES.

Locusts.

suit the conditions of the country and was next to useless. Millions of young locusts were caught by hand as they swarmed on the ground. Many were beaten to death by bush branches. Waist and shoulder-cloths or *dhotars* also proved very effective. A man at each end held the upper and lower corners of the cloth and ran along drawing the cloth through the grass and collecting numbers. A frame of wood with a long handle was next tried. Sheets of paper were placed on the frame and the outmost sheet was smeared with tar. A man set the frame on the ground before him, holding it at arm's length and dug up to it. The locusts, driven before him hopped against the tar and stuck to it. When the surface of the frame was covered the outmost layer of paper was pulled off, and the next layer tarred. This tar frame was not very effective. The last appliance used was a linen bag, like a large pillow case. It was dragged through the grass in the same way as the waistcloth and proved one of the most successful locust-collectors. The people worked zealously and millions of locusts were destroyed. According to rough calculations, which are far below the actual figures, for seven or eight weeks about 14,000,000 of locusts were destroyed weekly. The young locusts almost always stayed in the grass; they were scarcely ever found in the crops, and they did little or no harm. Unusually heavy rain in September and October washed away a large quantity of them, and this, in addition to the work of the villagers, enormously reduced their numbers. So complete was the destruction that in November 1883 scarcely a locust was to be seen. In November flights of full-grown locusts entered the district from the Konkan and Ahmadnagar, but after November no flights of locusts were seen leaving the district.

The people did not call the 1882 locust by the usual name of *tol* or the host-fly, but either *náktoda* that is nose-cutter or simply *kida* that is insect.¹ When born the 1882 locust was green and looked and acted like a cricket. As it grew, it shed its skin, became less green, and a brown streak appeared on its back and sides. It could almost always be known by its hammer head. When full grown it had a black streak from the bottom of the eye downwards. The wings were developed one above the other, the under wing was at first reddish and the upper wing gray, but the red tinge soon disappeared. About three months old, when they began to fly, the locusts were yellow. When full grown the body was about two and a half inches long and the folded wings, which had again turned pink, stretched nearly an inch further. In October and November on the backs of some of the full grown locusts between the wings small reddish tick-like parasites were found. It is not known whether these parasites caused suffering or mortality among the locusts. Another parasite found among locusts just coming to maturity was a stomach-worm like a guineaworm. This worm is said to have done the locusts no harm. No rewards were given for the destruction of locusts; the only expenditure was on screens and traps.

Rats.

In 1878 rats appeared in several places and severely injured the *rabi* or late crops in the east of the district. Crops which would

¹ Mr. W. Ramsay, C.S.

Chapter IV.
Agriculture.
FIELD PLAGUES.
Rats.

have yielded a full or a three-quarters harvest were reduced to one-fourth or even less. In many places the people gathered the green ears as the only means of defence. Even then, when the ears were placed in a heap, it was difficult to keep the rats off by constant watching day and night. In 1879 the rats again caused much damage in Indápur and Bhinithadi. A reward of 2s. (Re. 1) for every hundred dead rats was offered and about 350,000 rats were destroyed. The rats were of three kinds, the Jerboa rat, the Mole rat, and the Large-eared field mouse. The Jerboa Rat, *Gerbillus indicus*, comes between the Kangaroo-like jerboa and the true rat. From January to March 1879 the Jerboa rats proved most widely destructive, and destroyed more grain than all the other rats together. It is called the *haran* or antelope rat. Its colouring is like that of the female antelope, its ears are prominent, and its eyes are large and gazelle-like. It is fawn-coloured above and white below. It has long black whiskers and a tuft of black or blackish hairs at the end of its tail. Its head and body are about seven inches long and its tail is more than eight inches long. Its forefoot is half an inch and its hindfoot two inches long. It weighs six to seven ounces. It burrows among the roots of bushes or in the open ground and forms long galleries. These galleries have branches that end in chambers which are several inches wide and are carpeted with dried grass. They do not usually hoard their food, which consists of grain and roots, especially of the sweet roots of the *haryáli* grass *Cynodon dactylon*. The female brings forth eight to twelve and sometimes sixteen to twenty young. In the dusk of the evening these rats, which may be recognized by their fine large eyes, may be seen leaping about in places where there are many fresh rat-holes. In 1879 they climbed the Indian millet stalks and cut off the ears. The Mole Rat, *Nesokia indica*, *kála undir*, also called *koku* or *hoki* by the Vadars, may be known from the common Brown Rat, *Mus decumanus*, by its shorter body and shorter tail and also by being stouter and heavier. When chased it grunts like the bandicoot. In colour it is like the common brown rat, but there are fawn-tinted hairs mixed with the fur and it is lighter below. Its ears are small and round; its tail naked and short; its incisor teeth very large, flat in front, and orange yellow. Its entire length is about thirteen inches of which the tail is six inches. The palm of its forefoot is nearly half an inch long and that of its hindfoot an inch and a half. It lives alone and forms extensive burrows, sometimes fifteen or twenty yards in diameter. It stores large quantities of grain. The Vadars dig the ground and eat both the rat and its stores. The female brings forth eight or ten at a birth and drives her young from her burrow as soon as they can care for themselves. This rat is usually found near sugarcane fields. The people say that great numbers of these rats are yearly killed by the first heavy fall of the south-west rain. The black soil swells with heavy rain and the rats are caught in the holes and fissures and smothered. The great increase of these and of the *mettád* rats in 1879 is partly accounted for by the absence of any sudden burst of rain in 1878. Under the influence of gentle showers, the black soil swells gradually

Chapter IV.

Agriculture.

FIELD PLAGUES.

Rats.

and the rats escape suffocation. The large-eared Field Mouse, *Golunda mettada*, *mettād* or *mettangandu*, was one of the chief pests. It is a soft-furred mouse with a few flattened and spiny hairs among its fine close fur. Its colour is reddish brown with a mixture of fawn becoming lighter below. Its whole length is about ten inches of which the tail is 4.3 inches. It is distinguished by its large ears which are two-fifths of an inch in diameter. The female produces six or eight young at a birth. This rat has long been known as a plague. It lives entirely in cultivated fields in pairs or small societies of five or six, making a very slight and rude hole in the root of a bush or merely harbouring among the heaps of stones thrown together in the fields, in the deserted burrow of the *kok*, or in deep cracks and fissures formed in the black soil during the hot months. Every year great numbers perish when these fissures fill at the beginning of the rains. In 1879 these rats ruined some fields with their sharp incisors cutting cartloads of stalks every night and either eating the grain or dragging the heads into their burrows. Into other fields an army of rats suddenly entered and in a few hours ate up the grain like a flight of locusts.

FAMINES.

1397-1408.

During the last five hundred years, there is either traditional or historic mention of about twenty-five famines. The first is the awful calamity known as the Durga Devi famine which wasted Southern India at the close of the fourteenth century. The twelve years ending 1408 are said to have passed without rain. Districts were emptied of their people and for forty years the country between the Godāvāri and the Krishna yielded little revenue. The hill-forts and strong places, previously conquered by the Muhammadans, fell into the hands of local chiefs and robbers, and the country was so unsafe that the people who returned were driven from their villages. Dādu Narse and a Turkish eunuch of the Bedar court were appointed to resettle the land and call back the people. As the former village boundaries were forgotten, Dādu Narse greatly extended the new limits and threw two or three villages into one. Lands were given to all who would till them. For the first year no rent was required and for the second a *tobra* or horse-bag full of grain for each *bigha* was all that was asked.¹

1422.

In 1422, no rain fell and famine raged throughout the Deccan; multitudes of cattle died on the parched plains for want of water. King Ahmad Shāh Vali Bahmani (1422-1435) increased the pay of his troops and opened public stores of grain for the poor. The next year also there was no rain.² ³ In 1460 a failure of rain was followed by famine over the whole of Southern India. This famine is known as Dāmāji-pant's famine. Dāmāji was the keeper of a large store of grain at Mangalvedha, twelve miles south of Pandharpur in

1460.

¹ Grant Duff's *Marāthās*, 26, 27. See also Briggs' *Ferishta*, II. 349-50. King Māhmud Shāh Bahmani (1378-1397) employed 10,000 bullocks at his private expense going to and from Mālwa and Gujarāt and bringing grain which was distributed to the people at a cheap rate. He also established seven orphan schools.

² Briggs' *Ferishta*, II. 405-6.

³ Except where special references are given the details of famines from 1460 to 1868 are taken from Lieut.-Col. Etheridge's Report on Famines in the Bombay Presidency (1868), 87-96.

Sholapur. He used much of the store in feeding Bráhmans and was saved from punishment by the god Vithoba whom he worshipped. To save his worshipper Vithoba in the form of a Mhár went to the court at Bedar and paid the value of the missing grain. In 1472 and 1473 so severe a drought prevailed throughout the Deccan that the wells dried. No grain was sown for two years and in the third when there was rain scarcely any farmers remained to till the lands.¹

In 1520, the Deccan was so unsettled that no crops were grown and there was a famine. In 1629-30, no rain fell in the Deccan and famine and pestilence followed.² The year 1787 is mentioned as marked by a failure of rain and by famine. The year 1791-92, though locally a year of plenty, was so terrible a year of famine in other parts of India that the rupee price of grain rose to twelve pounds (6 *shers*). In the next year, 1792-93, no rain fell till October, some people left the country and others died from want. The distress is said to have been very great. The Peshwa's government brought grain from the Nizám's country and distributed it at Poona. The rupee price of grain stood at eight pounds (4 *shers*) in Poona for four months and in the west of the district for twelve months.

In 1802 the prospect of a good harvest was destroyed by the ravages of Holkar's troops. From July to September his followers the Pendhárís so utterly ruined the country that the rupee price of grain rose to two pounds (1 *sher*). The Peshwa's government encouraged the import of grain and distributed it free of charge. Large quantities of grain were brought by Lamáns and Chárans. Still the distress was so severe that numbers fled to the Konkan and Gujarát, and thousands died of hunger and cholera. The sufferings were so great that mothers are said to have eaten their children. Even as late as 1838 the people of Bhimthadi remembered Holkar's famine with horror.³ In the following year, 1803, the raids of Sindia's and Holkar's troops again caused a great scarcity. The rupee price of grain rose to half a pound ($\frac{1}{2}$ *sher*) and numbers died of starvation. Many left the country and the land lay waste. This famine affected the Poona district particularly. The river at Poona was covered with dead and rotting bodies. The Peshwa encouraged traders to import grain duty-free, granted remissions of revenue, and abolished land customs. The private charity of the rich did much to relieve the distress. A subscription of £4000 (Rs. 40,000), collected in Bombay under the patronage of Lady Mackintosh, was sent to Poona. Colonel Close, the Resident, who had already 15,000 people, arranged that each applicant for relief should receive 3d. (2 *as.*) to enable him to get a meal. About 5000 of the destitute were relieved in this way until the new crops were gathered.⁴ In Poona the horses in General Wellesley's army were for some time fed on Bombay rice.

In 1819-20, 1823, 1824, and 1825 Poona suffered greatly from cholera and from want of rain. So great was the panic that large

Chapter IV. Agriculture.

FAMINES.
1472-1473.

1520.
1629-30.
1787.
1791-92.

1792-1793.

1802.

1803.

¹ Briggs' Ferishta, II. 493-4.

² Grant Duff's Maráthás, 46; and Elphinstone's History of India, 507.

³ Bom. Gov. Sel. CLI. 41, 254.

⁴ Valentine's Travels, II. 123, 124.

Chapter IV.
Agriculture.

FAMINES.
1823-1825.

numbers left their homes. For many months parts of the district were almost deserted.¹ In 1823 the rupee price of grain in Poona was sixteen pounds (8 *shers*) and people died in the streets for want. In 1824, a year remembered as the year of *kharpad* or distress, rain again failed, especially in the country within 100 miles of Poona. The returns seem to show a slight fall of prices, the rupee price being twenty to twenty-four pounds (10-12 *shers*). Much bad grain was sold and sickness was so general that large numbers of people left the country. The loss of cattle was very severe. The distress continued till *Dasara* in October when a timely fall of rain brought much relief. Government offered employment by opening works to improve the Karkamb and Bápdev passes.

1832-1838.

In 1832 failure of rain was followed by much distress. The rupee price of *javari* rose from 120 to forty-six pounds and grain robberies were numerous. Orders forbidding grain-dealers unduly raising their prices are said to have done much to reduce the distress. 1833 was a year of scarcity in Indápur, 1835 was a bad season all over the district, and in 1838 Indápur again suffered from want of rain.²

1844-1846.

The next bad years were 1844-45 and 1845-46 when rain failed and there was much distress especially in the east.³

1862-1867.

Between 1862 and 1867 there was a succession of years of very short rainfall. In the east of the district during the five years ending 1866 the average fall was only seven inches. In 1864 the rupee price of *bájri* and *javari* rose to about seventeen pounds (8½ *shers*). The landholders were well off and were not reduced to distress, and the demand for labour and the high wages paid on public works in the Deccan prevented the spread of distress among the labouring classes. Still from want of grazing cattle had to be sent away or sold. There was sufficient distress to make it advisable to open relief-works in Sirur, Bhimthadi, and Indápur. About £1876 (Rs. 18,760) were spent on repairing about seventy-five miles of road and digging the Pátas reservoir and two wells in Supa. Grain compensation was granted to Government servants and in 1867 £8000 (Rs. 80,000) were remitted in Bhimthadi and Indápur and upwards of £6000 (Rs. 60,000) were held over till the next year.

-77.

The scanty and ill-timed rainfall of 1876, 20-76 compared with an average of about thirty inches led to failure of crops, which, joined to the bad crops in a small area in the previous year, spread distress amounting to famine over about half of the district.⁴ The east and

¹ Captain Clunes' Itinerary, VI. ² Bom. Gov. Rev. Rec. 772 of 1837, 50-31.

³ Bom. Gov. Sel. CVII. 32-37, 70-71, and 118.

⁴ The estimate was in area 2500 square miles of a total of 6647, and in population 318,000 out of 907,000. Within the affected area came the whole of the Indápur and Bhimthadi sub-divisions, twenty-three villages of Purandhar, six villages of Haveli, and thirty-three villages of Sirur, where the crops had entirely failed. In addition to these, twenty villages in Purandhar, twenty in Haveli, and thirty-three in Sirur were seriously affected. In the Khed, Junnar, and Mával sub-divisions outside of the famine area there was distress among labourers and travellers.

south-east suffered most. In three sub-divisions, Haveli, Khed, and Junnar, the early crops seemed good; in Mával and parts of Sirur and Purandhar they were fair; in the rest of Sirur and Purandhar and in Bhimthadi and Indápur there was no outturn. Besides this failure of the early harvest, in September and October, only a few slight showers fell, and, except in a small area of watered land, no cold-weather crops were sown. Millet rose from fifty-one to nineteen pounds and Indian millet from sixty-five to 20½ pounds the rupee. These high prices and the want of field-work threw into distress large numbers of Mhárs, Mángs, Rámoshis, and the poorer labouring Kunbis. The need for Government help began about the close of September. Government offered to transport people to waste lands in the Central Provinces, but no one took advantage of the offer. At the same time large numbers moved to the Gangthadi or Godávári valley. They found much distress in Gangthadi and as the usual markets for field labour were overstocked, some wandered across Berár to Sindia and Holkar's territories, others crowded into Bombay, and a few straggled to Gujarát. By the close of 1876 about 100,000 persons or 32·00 per cent of the affected population had left their homes. Most of the people who went belonged to the better class of Kunbis. To a great extent the movement was caused by the need of pasture. As a rule whole families went, but in many cases some member or members of a family were sent with the cattle. The villages whence fewest went were those near the Mutha canal works in the north-west of Bhimthadi, where whole villages flocked to the works. There was much distress, but grain prices were kept down by large importations, chiefly from the Central Provinces and to a less extent from Gujarát. The grain was brought to Poona by rail and thence distributed throughout the district.¹ In the hot months of 1877 prices ruled high and distress increased. A good fall of rain in early June caused temporary relief. Many emigrants returned and sowing was actively pushed on.² But, except in Indápur, in July and August no rain fell, prices rose, distress grew heavier, and many were again forced to leave their homes. A good rainfall in September and October removed much anxiety and suffering, and cold-weather crops were sown over the greater part of Bhimthadi. At the close of November the demand for special Government help ceased. At the same time some of the early crops never recovered the long stretch of fair weather in July and August, and in Bhimthadi the cold-weather crops, which at first promised well, were afterwards much injured by disease. The result was renewed distress in the hot season of 1878. In the east of the district, at least one-fourth of the people

Chapter IV.
Agriculture.

FAMINES.
1876-77.

¹ The municipality of Indápur purchased grain and sold it at something over cost price so as not to interfere with local enterprise; so did the Jejuri municipality but only in the end to re-sell at a loss. It is probable that the early action of Government in finding paid labour for a large portion of the distressed population on the Mutha canal saved grain from rising to panic prices.

² More sickness, suffering, and mortality was found among the returned emigrants than among those who had stayed at home and lived either on their own resources or on the relief offered by Government.

Chapter IV.
Agriculture.
FAMINES.
1876-77.

lived on wild grains or grass seeds, and Government had again to provide labour for the poorer classes. Even then the famine was not over. In the rainy months of 1878, and again in those of 1879, direct relief was once more found necessary at Indápur, Bárámati, and Dhankaydi near Poona.¹

The following details show month by month the phases through which the distress passed and the measures which were taken to relieve it. In the first two or three days of September 1876 good rain fell in the west, in Junnar Khed and Mával, and greatly revived the withering crops. Rain again held off and the crops began to perish. About the close of September slight showers fell in a few places. The early crops seemed well in Mával; they were withering in Junnar, Khed, and Haveli, and had completely failed in Bhimthadi and Indápur where for want of fodder large numbers of cattle were dying. The price of grain was rapidly rising. As rain held off the ground could not be prepared for the cold-weather crop. Especially in Indápur and Bhimthadi the want of drinking water was beginning to be felt. Fears were entertained that the poorer classes would become disorderly, and, about the close of the month, relief works were opened in Bhimthadi and Indápur. Except that about the middle of the month a slight shower fell in Haveli, October passed without rain. Even in the west the early crops were withering and were being cut for forage, and in the wells water was failing. Except in a small area of watered land no cold-weather crops were sown. Over the whole district, especially in the east, the want of water caused distress, and cattle were offered for sale at nominal prices. In several places the people had begun to leave their homes. Extensive relief works were started, and, by the 22nd of October, including those on the Mutha canal, some 6000 people were employed. For charitable relief a sum of £2500 (Rs. 25,000) was set at the Collector's disposal. As distress spread, besides additional assistants, the Collector was authorized to place on relief duty the mámlatdárs of the most severely affected sub-divisions. November passed with only a few slight showers. The early crops continued to wither and the small area of late crops was dying for want of moisture. The distress was great, but large importations of grain kept down prices. In Poona the stock of grain was large and the market was falling; in outlying towns prices were slightly rising. In the first half of the month *bájrí* rose from 19½ to nineteen pounds and *javári* from twenty-two to 21½ pounds the rupee; about the close of the month they again fell to 20½ and 20½ pounds. In the east the wells were drying and water was scarce. The average daily number of people on the relief works rose from 6160 in the beginning to 28,455 at the close of the month. Of 20,654, the average daily number for the month, 14,253 were able-bodied, expected to do a full day's work and superintended by public works

¹ In 1878, 77,068 people were relieved at a cost of £510 4s. (Rs. 5102); in 1879 21,803 were relieved at a cost of £153 8s. (Rs. 1534).

officers, and 6401 were aged or feeble expected to do two-thirds of a day's work and superintended by famine officers.¹

December passed without rain. Crop prospects remained unchanged, people and cattle continued to move west. During the month the importation of grain was large and *bājri* fell from twenty pounds in the beginning to twenty-three pounds about the close of the month, and *javāri* from 18½ pounds to twenty-two pounds. The numbers on public works rose from 14,253 to 23,498 and on civil works from 6401 to 16,752. The total sum spent on charitable relief up to the close of the year was about £200 2s. (Rs. 2011).

January passed without rain. Grain kept pouring into the district, and *bājri* fell from twenty-three pounds to 23½ and *javāri* from twenty-two to 25½ pounds. The numbers on public works rose from 23,498 to 23,764, and on civil works from 16,752 to 29,569. As the civil works seemed too popular, on the 19th of January Government reduced the rates of pay, and issued orders to enforce task and distance tests.² This caused a fresh emigration and a considerable fall in the numbers on the works. At the same time charitable relief was started and by the end of the month distributed to 1694 persons.

About the middle of February sixteen cents of rain fell at Poona. Grain continued to come in large quantities, *bājri* rose slightly to twenty-three pounds and *javāri* to twenty-four pounds. The numbers on public works fell from 23,764 to 23,034, and on civil works from 29,569 to 18,752. This decrease was chiefly due to the lowering of pay on the civil works, the transfer of the able-bodied from civil to public works, and the enforcement of task and distance tests. The number on charitable relief rose to 1766. During the month there was slight cholera in Bhimthadi and Purandhar. In the beginning of March about twenty-six cents of rain fell. Grain continued to pour in and the supply was plentiful. Except in the beginning of the month, when there was a small rise, prices remained at twenty-three pounds the rupee for *bājri* and twenty-four pounds for *javāri*. There was slight cholera in Bhimthadi and three other sub-divisions. The numbers on civil works continued to fall, from about 12,213 in the beginning of the month to 4876 about the close; public works showed a small rise from 23,034 to 26,603, and charitable relief from 1766 to 2290. About the middle of April eighty cents of rain fell at Indāpur. Grain was largely imported and the supply continued plentiful, with *bājri* slightly dearer at 21½ pounds and *javāri* at 20½ pounds. There were a few cases of cholera, and cattle-disease was prevalent in Sirur and Haveli. The numbers relieved rose on public works from 26,603

¹ The original wages were, for a man 3d. (2 as.) a day, for a woman 2½d. (1½ as.), and for a boy or girl capable of work 1½d. (1 as.). About the middle of November, when prices rose over sixteen pounds the rupee, a sliding scale was introduced which provided that the money rate should vary with the price of grain and that a man should always receive the price of one pound of grain in addition to 1½d. (1 as.).

² The new rates were: for a man the price of one pound of grain and ¾d. (½ as.) instead of 1½d. (1 as.); for a woman the price of one pound of grain and ¾d. (½ as.) instead of 2½d. (1½ as.); and for a boy or girl the price of half a pound of grain and ¾d. (½ as.).

Chapter IV.
Agriculture.

FAMINES.
1876-77.

to 31,678, and on charitable relief from 2290 to 4301; on civil works the numbers fell from 4876 to 4650. The first days of May brought slight showers in Purandhar, and about the close of the month good rain fell all over the district except in Junnar, Khed, and Mával. Small numbers were coming back. The grain supply continued ample, but *bájrí* rose to 19½ pounds the rupee and *javári* to 19½ pounds. The high prices caused much distress. During the month there was slight cholera over most of the district. The numbers relieved rose on public works from 31,678 to 40,177, and on charitable relief from 4301 to 7501; on civil works they fell from 4650 to 4612. In June an average of 6.78 inches of rain fell. Many landholders came back bringing their cattle. The sowing of the early crops was begun in the west; in the east sowing was much kept back from want of bullocks. Cattle-disease was prevalent in three sub-divisions and a few cases of cholera occurred. The supply of grain was sufficient and both *bájrí* and *javári* continued steady at 19½ pounds the rupee. The numbers on public works fell from 40,177 to 35,344; they rose on civil works from 4612 to 4625, and on charitable relief from 7501 to 12,729. July passed with little rain, an average fall of only 3.24 inches, and this almost solely in the west. Except in Mával rain was everywhere wanted, the crops especially in Bhimthadi and the east were withering, and in many places field work was at a stand. The supply of grain was sufficient, but *bájrí* rose to 14½ pounds and *javári* to 14½ pounds. This caused much distress and in the south and east many were again preparing to start for the Berárs. The numbers on public works fell from 35,344 to 26,786, on civil works from 4625 to 3552, and on charitable relief from 12,729 to 12,420. In August an average of four inches of rain fell, but it was chiefly confined to the west. Rain was wanted everywhere, particularly in Indápur, Bhimthadi, Sirur, and Purandhar. The rice crops in Mával were good, but in the east the crops were withering and in some places they had perished. In Bhimthadi and Purandhar, with some exceptions, the pulse was lost. The high prices, *bájrí* at 12½ and *javári* at thirteen pounds, caused much distress. ~~By~~ Bhimthadi landholders were preparing to leave their homes. Throughout the month cholera was prevalent. The numbers on relief works fell, on public works from 26,786 to 24,514, and on civil works from 3552 to 2003, on charitable relief they rose from 12,420 to 21,650. In September an average of 5.42 inches of rain fell. At first in the central sub-divisions, Junnar, Khed and Haveli, there were only slight showers, but, about the close of the month, there was good rain, and the early crops, which except in Indápur had suffered severely, were much benefited. About the middle of the month the late or *rabi* sowing was begun, the poorer landholders in Bhimthadi finding great difficulty in obtaining seed and cattle. *Bájrí* fell from 12½ to 14½ pounds and *javári* from thirteen to 15½ pounds. The people were improving, and cholera and small-pox were on the decline. The numbers on public works rose from 24,514 to 24,687 and on charitable relief from 21,650 to 24,474; on civil works the numbers fell from 2003 to 719. In October an average of 3.32 inches of rain fell. The

Chapter IV.
Agriculture.

FAMINES.
1876-77.

prospects of the early crops continued favourable and the late sowing was in progress. The Bhimthadi cultivators' seed and cattle difficulty disappeared. The moneylenders came forward; the better class of Kunbis had generally stocks of their own; and a large proportion of Bhimthadi, chiefly along the Bhima, was tilled by the people of the west of the district and of Sátára, who advanced seed and lent bullocks on the crop share or *batái* system.¹ About the end of the month the sowing in Bhimthadi was greatly kept back by heavy showers. *Bájri* fell from 14½ to 18½ pounds, and *javári* from 15½ to nineteen pounds. The numbers on public works fell from 24,687 to 15,461, on civil works from 719 to 122, and on charitable relief from 24,474 to 8209. The large decrease in the number on the relief works was mainly caused by people having left the works tempted by the better wages they could earn in the fields. Slight rain fell about the close of November. The *bájri* harvest was in progress and the late sowings were finished. In four sub-divisions the *javári* crops were slightly damaged by blight. In some parts, owing to the want of bullocks, the tillage had been slovenly, and in many places the *javári* crops were choked with weeds. On the whole the outlook was promising. *Bájri* fell to twenty-two pounds and *javári* to 23½ pounds. The numbers on public works fell from 9621 in the first days of the month to 1788 about the close, on civil works from 122 to fifty-three, and on charitable relief from 8209 to 1550. At the end of November all relief works were closed. December passed with a few slight showers. *Bájri* fell to 23½ pounds and *javári* to twenty-five pounds. Government continued to offer charitable relief, but on the 22nd of the month the number seeking relief had dwindled to 180.

The following statement of average monthly millet prices and numbers receiving relief, shows that, during the first quarter of 1877, grain kept pretty steady at twenty-three pounds the rupee or more than twice the ordinary rate, that its price rose rapidly till it reached 12½ pounds in August, and that it then quickly fell to 23½ pounds. As early as December 1876 the numbers on relief works reached 40,250, and in January 1877 rose to 53,333. In February, by lowering wages and enforcing task and distance tests, the total was reduced to 41,786, and in March it fell to 33,223. From that it rose to 44,789 in May, and then began gradually to fall. From June to September the decrease was slow, it was rapid in October, and in November the works were closed. The numbers on charitable relief rose steadily from 1694 in January to 12,729 in June; then with a slight fall to 12,420 in July they rose to 24,474 in September. In October they rapidly declined to 8209, in November to 1550 and in December to 180 when almost all the relief-houses were closed:

¹ In 1876-77 the tilled area in Bhimthadi was 101,730 acres; in 1877-78, 372,088 and in 1878-79, 335,319 acres. In Indápur for the same years the areas were 9400, 136,765, and 192,360 acres.

POONA FAMINE, 1876-77.

Chapter IV.
Agriculture.
Famines,
1876-77.

MONTH.	AVERAGE DAILY NUMBERS.				AVERAGE PRICES.		RAIN.
	On Relief.				Bágrs.	Jodri.	
	Civil	Public	Total.	Female.			
1876					Pounds.	Pounds.	Inches.
November	6401	14,253	20,654	...	19	20½	Slight.
December	16,752	23,498	40,250	...	20½	19½	...
1877.							
January	23,569	23,764	53,333	1694	23½	22½	
February	18,752	23,034	41,786	1766	23	24	·02
March	6620	26,603	33,223	2290	22½	23½	·26
April	4650	31,673	36,323	4801	21½	21½	·10
May	4612	40,177	44,789	7501	19½	19½	·80
June	4625	35,344	39,969	12,729	19½	19½	6·48
July	3567	26,786	30,343	12,420	14½	14½	3·24
August	2003	24,514	26,517	21,650	12½	13	4·00
September	719	24,687	24,406	24,474	14½	15½	5·42
October	122	15,461	15,583	8200	18½	19	3·32
November	53	4738	4791	1550	22	23½	·30
December ... ..	...	...	...	180	23½	25	
Total	98,435	314,537	412,972	98,764			20 03
Average	7572	24,196	31,767	8230			
Total Rs. ..			1,375,066	230,149			
			1,606,115				

Within the famine area carts could hardly be hired. When they took fodder and grain to the relief works from other parts of the district, the charges were seldom higher than the ordinary rates. Except in December 1876, when a cart cost 2s. 6d. (Rs. 1¼) and in January 1877, when it cost 3s. (Rs. 1½) a day, the daily rate for a cart was 2s. 9d. (Rs. 1⅓).

A special census, taken on the 19th of May 1877, when famine pressure was general and severe, showed that of 48,051 workers, 42,304 on public and 5747 on civil works, 30,030 belonged to the sub-divisions where the works were carried on, 11,641 belonged to other sub-divisions of the district, 4701 were from other districts, and 1649 were from neighbouring states. As regards their occupation, 2096 were manufacturers or craftsmen, 24,285 were holders or under-holders of land, and 21,670 were labourers.

In 1877 relief-houses were opened for the infirm poor. Thirty-three houses were opened and maintained at a cost of £22,838 (Rs. 2,28,380). Of twelve houses with a cost of £6949 (Rs. 69,490) in Bhimthadi, two at Bárámati and Pandare were opened in April; three at Supa, Pátas, and Jalgaon-Kharepathár, in May; one at Pimpalgaon, in June; four, at Párgaon, Khadki, Bombyál, and Shirsuphal, in July; and one at Yevat, in August. Of eleven in Indápur at a cost of £9551 (Rs. 95,510), eight, at Indápur, Kalas, Nimbgaon-Ketki, Varkute-Budruk, Madanvádi, Lasurne, Shetphal-Haveli, and Palasdev, were opened in July; two, at Bávda and Hingangaon, in August; and one at Akola, in September. Of seven, with a cost of £2865 (Rs. 28,650) in Sirur, there was one each at Ghodnadi, Ránjangaon-Ganpati, Talegaon, Nirvi, Mándavgaon, Karde, and Alegaon. Of two, with a cost of £2212 (Rs. 22,120), in

Haveli, one was at Dhankavdi and the other at Loni-Kalbhar. One with a cost of £1260 (Rs. 12,600) was opened at Jejuri in Purandhar. Except at Pátas in Bhimthadi, which had to be kept open till the 28th of February 1878, all the relief-houses were closed on the 30th of November 1877. As a rule the death rate in the Poona relief camps was low. It was highest in the relief camp at Dhankavdi close to Poona. Except at Dhankavdi no camps were built, the villages were almost deserted and the people were able to house themselves and to live in rest-houses. At Supa and Jejuri large empty houses were rented and a few cheap sheds were built. The relief-house at Dhankavdi was reopened for a few weeks in July 1878 when the rains held off.

The most marked features of the famine in Poona were the efforts of the landholders to help themselves, and the steady flow of grain into the market, so that, from about the end of October 1876 to the close of the famine in October 1877, no great difficulty was found in keeping the labourers supplied with grain at rates very slightly in excess of Poona rates. As soon as signs of scarcity began the Kunbis left their houses in large numbers to find fodder for their cattle and food for themselves. In contrast to the Kunbis, the Mhárs Mángs and Rámósms, from indolence and perhaps from the fear that if they left their villages they might forfeit their hereditary rights, would not leave their villages to go to the relief works. At first they were disinclined to take direct relief and clamoured for employment in their own villages. Later they became demoralized, and many capable of work swelled the numbers on charitable relief. It was customary to send large drafts to the public works, leading them at certain villages on the way. The low-caste labourers sent distances of forty to fifty miles started willingly, but after getting refreshed at the staging villages dispersed and made their way back to their homes.

Early in the famine, Bhimthadi, Purandhar, and Haveli were placed under the famine charge of Mr. A. Keyser, first assistant collector; Indápur was placed under Mr. W. M. Fletcher, of the revenue survey, who had sole charge of all relief operations in that sub-division, and subsequently of twenty-nine villages in the east of Bhimthadi; and Sirur, Khed, Junnar, and Mával were under Mr. E. C. Ozanne, assistant collector, of the first of which he had also the revenue charge. Mr. Keyser was assisted by Mr. H. L. Holland of the revenue survey, who was however sick and on privilege leave from November 1876 to March 1877 and again permanently invalided in July when he went home on sick leave, and also from February 1877 by Mr. W. P. Symonds, assistant collector, who, from its establishment in August 1877, was placed in charge of the Dhankavdi relief camp, until October when he relieved Mr. Ozanne. Besides these officers, Mr. A. L. P. Larken, assistant collector, was entrusted with the organization of the Mutha canal and Nira canal labour gangs and with settling land compensation cases. In October 1876 the mámlatdárs of Indápur and Bhimthadi, and, in November and December, those of Sirur and Purandhar were put on famine relief duty; and in August 1877, the mámlatdar of

Chapter IV.
Agriculture.

FAMINES.
1876-77.

Chapter IV.
Agriculture.

FAMINES.
1876-77.

Mával was placed under Mr. Symonds on the Dhankavdi relief camp.¹

In 1877 the famine area was divided into thirty-seven relief circles, each under an inspector. Twelve of these, Pimpalgaon, Yevat, Párgaon, Pátas, Supa, Murti, Panáre, Jalgaon-Kharepathár, Bárámáti, Rávangaon, Shirsuphal, and Malad,² of seven to fifteen villages, were in Bhimthadi; ten, Eevda, Vádápurí, Nimbgaon-Ketki, Lasurna, Kalas, Bhigvan, Púasdev, Kalthan, Agoti, and Hingangaon,³ of seven to ten villages, were in Indápur; eight, Mándavgaon, Nirvi, Karda, Kondhpuri, Malthan, Sirur, Pábal, and Shikrápur, of five to eleven villages, were in Sirur; four, Rájuri, Jejuri, Valha, and Guroli, of nine to thirteen villages were in Purandhar; two, Loni-Kalbhár of eleven and Ashtápur, of ten villages, were in Haveli; and one, Lákhanggaon of seven villages, was in Khed.

The difficulties in the way of effective relief were lightened by the tractable, and, in the case of the cultivators, the self-helpful character of the people. At first the village officers were directed to feed travellers in obvious need of food. In consequence of this order men wandered from village to village living as destitute travellers, so that it became necessary to modify the orders and limit the number of villages where travellers might be relieved to a few on the main thoroughfares. These adult malingers kept in fair condition, but their children were often painfully reduced. The wanderers were not confined to the low castes. Numbers flocked into Poona, where a private association dealt somewhat indiscriminate charity, and streamed towards Bombay from Poona, Sátara, and Sholápur. In August all beggars were turned out of Poona, a relief camp was established at the village of Dhankavdi about three miles to the south of the city, organized private charity was stopped, and those in need of relief were taken to the camp, whence when fit for work they were drafted to relief works or sent to their own homes. People were also collected in Bombay and Thána and sent by rail to the camp near Poona at Government expense. Another difficulty was, that, before the task or any other test was established, people rushed to the relief works in such numbers that it was difficult to deal with them, except at a great waste of public money. Works under civil agency had often no supervising establishment beyond one or more inexperienced and temporarily employed clerks. In some cases there were as many as 1500 to 2000 workers, and in one case for a short time more than 4000 workers on one civil agency work. The result was a pretence of work, insufficient return for large expenditure, and, very probably, some amount of fraudulent gains on the part of the clerks. With the establishment of the distance and task tests and

¹ The mámlatdár of Indápur was Ráv Sáheb Vishnu Vásvdev, of Bhimthadi Ráv Sáheb Ganesh Bhivráv, of Sirur Khán Sáheb Shamsudín Alikhán, of Purandhar Ráv Sáheb Sitáram Dádáji, and of Mával Ráv Sáheb Mahádev Pundlik.

² The last three, each of nine villages, were under Mr. Fletcher.

³ Indápur is omitted as it was managed by the municipality.

Chapter IV.
Agriculture.

FAMINES.
1876-77.

the opening of the Nira canal, the Dhond-Manmád railway embankment, and other large and well organized works under the Public Works Department, these difficulties disappeared and the civil agency works were entirely set apart for such persons as were incapable of hard work. The difficulty then was to find work which the weakly could do and to provide for the enormous preponderance of women. It was necessary to employ a few able-bodied men on civil agency works, while almost the only suitable employment that could be found was clearing silt from old ponds, and throwing gravel on roads and clearing stones from them. Next it was found difficult to enforce the tests without causing serious suffering and loss of life. The unwillingness of the low-caste people to leave their homes has been noticed. There was a natural unwillingness, on the part of all classes, to tramp long distances with their women and children, and work without much shelter at night or provision for the first few days, while in the case of those unaccustomed to continuous work there was sheer inability to perform even the moderate task required. Poona was singularly favoured in having many large and well-organized works in progress, and in almost all cases the difficulties were successfully overcome by a judicious system of advances, watchfulness on the part of the officers in charge of the works, the system of credit with the grain-dealer which soon sprang up, and the wearing off of the feeling of strangeness in the lives of a population, who, if not well-to-do, had no former experience of the actual pinch of hunger. The total cost of the famine was estimated at £160,611 (Rs. 16,06,110), of which £137,596 (Rs. 13,75,960) were spent on public and civil works, and £23,015 (Rs. 2,30,150) on charitable relief.

Except that the rice crops suffered from petty thefts in the harvest of 1877, and that small stores of grain were taken out of deserted houses, there was a striking freedom from crime. Compared with the former year the criminal returns showed a total increase of 1527 offences, which in the Commissioner's opinion, were due to the famine, being chiefly thefts and other offences against property and person.¹ There are no statistics of the numbers either of the men or of the cattle who left the district and did not come back. It is believed that fully a fourth of the emigrant population never returned, and about four-fifths of the cattle taken away were never brought back. Among the people the estimated special mortality was about 8300 souls, but compared with 1872 the 1881 census shows a fall of 20,732. The addition of the normal yearly increase of one per cent during the remaining seven years gives 85,223 as the loss of population caused by death and migration in 1876 and 1877. Of cattle, besides those that died, many thousands were sold at very low prices.² Though very great, the loss of stock did

¹ The chief details are, an increase under murders of 3; under attempt or abetment of suicide, 6; under robbery, 16; under lurking house-trespass or house-breaking, 154; under mischief, 31; under theft of cattle, 183; under ordinary theft, 1251; and under receiving stolen property, 95.

² The decrease of cattle through deaths and other causes arising from famine has been estimated at near 110,000.

Chapter IV.
Agriculture.

FAMINES.
1876-77.

not interfere with field work. The tilled area in 1877-78 fell short of the 1875-76 area by 7476 acres. Of a land revenue of £116,004 (Rs. 11,60,040) for collection in 1876-77, £70,321 6s. (Rs. 7,03,213) were recovered by the close of the year. In 1877-78, of a land revenue of £117,013 (Rs. 11,70,130) £17,147 14s. (Rs. 11,01,477) were recovered. Of £114,894 18s. (Rs. 11,48,949), the realizable land revenue for 1878-79, £104,030 10s. (Rs. 10,40,305), and of the balances, £12,091 2s. (Rs. 1,20,911) were recovered. By the 1st of January 1880 the outstanding balance rose to £46,488 of which in June 1880 about £42,981 (Rs. 4,29,810) were remitted. In the east of the district some villages were deserted and others were half empty. The cultivation was far below the average and the number of cattle enormously decreased. With ordinary harvests it seemed probable that at least ten years would be required to restore the country to its former prosperity.

1878-79.

In 1878-79, in Sirur, Purandhar, Bhimthadi and Indápur the *khari*f or early crops were almost entirely destroyed by too much wet. In Indápur they were also choked by an extraordinary growth of weeds. Half crops were obtained in Sirur and in parts of Purandhar and Bhimthadi, but in places considerable damage was done by locusts and other insects. The *rabi* or late crops promised well till as they began to ripen the rats committed fearful havoc.

The price of grain continued exceedingly high and at the beginning of the hot weather the poorer classes of Indápur showed signs of suffering. To relieve the distress at various places in Indápur work was opened on the Nira Canal. Piece-work was exacted from the able-bodied, and the weak and sickly received subsistence wages. During May, June, and July, nearly 10,000 people were daily employed. Between 200 or 300 who were unfit for work, were cared for in a relief-house in Indápur. The total cost was £663 12s. (Rs. 6636).

CHAPTER V.

CAPITAL.

IN 1872, according to the census, besides well-to-do husbandmen and professional men, 12,028 persons held positions implying the possession of capital. Of these 1464 were bankers, money-changers, and shopkeepers; 7608 were merchants and traders; and 2956 drew their incomes from rents of houses and shops, from funded property, shares, annuities, and the like. Under the head of capitalists and traders, the 1880-81 license tax assessment papers show 2460 persons assessed on yearly incomes of more than £50 (Rs. 500). Of these 1229 had £50 to £75 (Rs. 500-750); 429 £75 to £100 (Rs. 750-1000); 304 £100 to £125 (Rs. 1000-1250); 119 £125 to £150 (Rs. 1250-1500); 136 £150 to £200 (Rs. 1500-2000); 105 £200 to £300 (Rs. 2000-3000); sixty £300 to £400 (Rs. 3000-4000); twenty-seven £400 to £500 (Rs. 4000-5000); twenty-four £500 to £750 (Rs. 5000-7500); thirteen £750 to £1000 (Rs. 7500-10,000); and fourteen over £1000 (Rs. 10,000). Besides these the 1879 papers showed 12,976 persons assessed on yearly incomes of £10 to £50 (Rs. 100-500). Of these 6402 had £10 to £15 (Rs. 100-150); 3673 £15 to £25 (Rs. 150-250); 1923 £25 to £35 (Rs. 250-350); and 978 £35 to £50 (Rs. 350-500).¹

From 1750 to 1817 Poona was the capital of the Peshwás and the resort of the great officers and feudatories of the state with their numerous followers. During this time Poona was probably the richest city in Western India. In 1798 the exactions of the last Peshwa Bájiráv II. and, in 1802, of Yashvantráv Holkar stripped the people of Poona of much of their wealth. Still in 1817, when it passed under British rule, Poona was a rich city where skilled craftsmen centered and large sums were spent. The capitalists of Poona suffered considerably by the change from Marátha to British rule. About one-third of the capital was driven from the market. Poona ceased to be the seat of government and the residence of its numerous ministers and officers. The great purchases of jewels, shawls, embroidered cloths, and other valuable articles came to an end and trade declined. Under the Peshwás much of the revenue from their widespread possessions centered in Poona. The money came either by bills drawn from the districts upon the Poona banks, or if it was paid in cash it passed through as

Chapter V.
Capital.
CAPITALISTS.

¹ The 1879 figures are given because incomes under £50 (Rs. 500) have since been freed from the license tax.

Chapter V.
Capital.
CAPITALISTS.

hands of bankers, who profited by the exchange of coins before the collection reached the public treasury. Poona bankers had their agents in the districts and the ramification of the money trade in loans to the people and to the centers of villages created a wide circulation of specie, which returned to the coffers of the Poona bankers with an abundant accumulation of interest. Loans of this nature were usually repaid in grain which was received at a price much below the market rate, and thus brought great returns to the lenders. Under the British revenue system all these advantages to the capitalists disappeared. The trade in moneylending was still further hindered by the substitution of suits in courts instead of the former private methods of dunning debtors. The merchants were forced to be more cautious in their speculations and to look more to individual character and collateral security.¹ A few bankers failed from bad debts contracted by broken-down nobles and officials. About 1821 business was very dull in Poona. Many rich bankers had fallen into poverty.² Before 1850 the period of Poona's greatest depression had passed. It remained the residence of many of the pensioned Marátha nobles and the head-quarters of the district of Poona and a very large military station. About 1835 it became the resort of the Governor and Council of Bombay between June and October and the head-quarters of the Bombay army for part of the year. Since the opening of the southern branch of the Peninsula railway in 1858, Poona has continued to increase in size, trade, and wealth. At present (1883) in the city and cantonment of Poona, besides the branch of the Bombay Bank, forty to fifty firms have a capital of £10,000 (Rs. 1,00,000) and upwards, about eighty firms have £5000 to £10,000 (Rs. 50,000 - 1,00,000), and about 250 have £1000 to £5000 (Rs. 10,000 - 50,000). In Junnar, the place of next importance, the seat of Musalmán governors in the times of the Bahmanis (1347-1489) and of the Moghals (1637-1760), one firm has a capital of about £10,000 (Rs. 1,00,000), about five have £5000 to £10,000 (Rs. 50,000-1,00,000), and about forty have £1000 to £5000 (Rs. 10,000-50,000). In the rest of the district, in Bárámati Indápur Sásvad and Sirur, about seven firms have a capital of about £10,000 (Rs. 1,00,000), about seven have £5000 to £10,000 (Rs. 50,000-1,00,000), and 200 to 300 have £1000 to £5000 (Rs. 10,000-50,000). A large proportion of these firms lend money on mortgage and do not trade. The men of capital are chiefly Gujarát, Márwár, and Lingáyat Vánis, and local Bráhmans. A few Chámhárs, Kunbis, Mális, Maráthás, Mhárs, Sonárs, and Telis with small capital are scattered over the district, and in the city and cantonment of Poona are several rich European, Jew, Musalmán, and Pársi firms.

² Gujarát Vánis, of whom there is a large colony at Supa in Bhimthadi, are said to have come to the Deccan about 250 years ago when Surat was the chief centre of trade in Western India (1608-1658). They appeared as travelling dealers in foreign

¹ Deccan Riots Commission Report, Ap. C., 270, 271.

² Captain H. D. Robertson, Collector (1821), East India Papers, IV, 588, 589, 593.

³ Ráj Sáheb Narso Rámchandra, Secretary Poona Municipality.

spices and groceries, visiting the Deccan in the fair season. After a time they settled as grocers in different parts of the district, and taking to moneylending, soon grew rich. They are still considered foreigners, and except in dress keep all Gujarát customs and manners, and visit their native country every three or four years to perform marriage and other ceremonies. They have increased under the British, though of late years their number has been stationary. Except a few rich traders and bankers in the city of Poona, most Gujarát Vánis are petty shopkeepers, traders, and moneylenders. The Márwár Vánis came later than the Gujarátis, but were settled in the district in large numbers before the beginning of British rule. They were looked on with disfavour by the Maráthás as aliens who took hoards of money to their native country, and as Jain heretics their temples were often turned to the use of Bráhmanic or local gods.¹ Many have settled in the district within the last forty years.² In Poona as in Násik and other parts of the Presidency the great reductions in rent that were made between 1837 and 1850 left the landholder with a margin, of which before long the Márwári gained the chief share. They usually begin business as clerks and servants of established shopkeepers and lenders. While working as clerks, generally by buying old gold lace and embroidered clothing or broken glass bangles and by saving, they put together a little capital. When the clerk has gathered enough capital, he severs his connection with his master and starts as a shopkeeper and moneylender. In this way new shops are being continually opened. Rich and long-established Márwári firms are careful to do nothing to injure their good name. On the other hand, as a class, the small Márwáris are unscrupulous as to the means they use for making money. Still though harsh and unscrupulous to his debtors, even the petty and pushing lender and shopkeeper as a rule deals straightly with his own people and with other traders. The Márwári lender's chief characteristics are love of gain and carelessness of local opinion. He has much self-reliance and great industry. He has usually education enough to understand the law and procedure of the courts to which he often resorts. He is an excellent accountant and is generally quickwitted in all that concerns his business. Knowing that the people look on him as a stranger and a hardhearted usurer he holds aloof from them and has no sympathies with them. He burdens himself with as few permanent investments as possible, and like the Gujarát Váni goes to his native country for marriage and other ceremonies. Besides as a moneylender and general broker he is employed as a retail and wholesale dealer in groceries, grain, and cloth. Lingáyat or Karnátak Vánis are chiefly ironmongers and grocers and are seldom moneylenders. Bráhman capitalists who belong to the district are

¹ Deccan Riots Commission Report, 23.

² The head-quarters of Bombay Deccan Márwáris is the town of Vámbori in the Ráhuri sub-division of Ahmaónagar, about fifteen miles north of Ahmadnagar city. It is the seat of a large Márwári community and is the centre of their exchange and banking business. The proportion of Márwáris in Poona is not so large as in Ahmadnagar, where in some places they have almost a monopoly of moneylending. Deccan Riots Commission Report, 23.

Chapter V.

Capital.

CAPITALISTS.

mostly Konkanasth Bráhmans in towns and Deshasth Bráhmans in villages. Except a few in the city of Poona, who are printers, booksellers; and publishers of newspapers, the town Bráhmans who engage in trade are bankers and moneylenders, and the village Bráhmans who engage in moneylending belong to the village accountants' or *kulkarnis'* families. *Aunbis* and other smaller capitalists work in the fields and at their crafts besides engaging in moneylending. Pársi and Musalman capitalists are contractors, landholders, and traders, and the few Europeans are agents of Bombay firms trading in Poona, or are independent traders.

SAVING CLASSES.

Of townspeople, merchants, traders, shopkeepers, brokers, pleaders, doctors, contractors, and highly paid Government servants; and of country people, landlords, petty shopkeepers, and moneylenders, and a few rich cultivators save money.

Traders spend much of their savings in adding to their business. With all classes of natives, except Márwár and Gujarát Vánis, the favourite investment is ornaments and jewelry. Next to ornaments come land and house property and lending money on mortgage. Government savings banks and Government securities are resorted to by the higher classes of townspeople who cannot make a better use of their money and by others as a safeguard against loss and because they can take out the money whenever they want it. Formerly considerable sums were invested in private native banks, chiefly by friendless widows and others, who got six per cent interest. But savings banks and Government securities, though they pay only $3\frac{1}{2}$, 4, and $4\frac{1}{2}$ per cent, have greatly reduced this form of investment. Joint stock companies are not popular except with those who have business connection with Bombay. European Government officers have generally accounts with the Poona branch of the Bombay Bank or with Bombay firms. The twelve years ending 1882 show a considerable though not a constant increase in the advantage taken of the two forms of investment provided by Government savings banks and Government securities. In 1870-71 the deposits in the savings banks at Poona and other sub-divisional towns amounted to £12,278 (Rs. 1,22,780). They rose to £38,544 (Rs. 3,85,440) in 1873-74, fell to £22,352 (Rs. 2,23,520) in 1874-75 and remained with little change till they rose to £37,268 (Rs. 3,72,680) in 1879-80 and to £65,055 (Rs. 6,50,550) in 1880-81. This great increase was owing to the rise in the highest amount of a single deposit from £150 to £500 (Rs. 1500-5000). In 1881-82 as the amount of greatest deposit was again lowered to £150 (Rs. 1500), the deposits fell to £38,321 (Rs. 3,83,210); they rose to £41,468 (Rs. 4,14,680) in 1882-83. New savings banks have also been recently opened in connection with post offices. The depositors are Hindu traders, Government servants, and landholders. During the thirteen years ending 1882-83 the interest paid on Government securities has risen from £5755 (Rs. 57,550) in 1870-71 to £7512 (Rs. 75,120) in 1882-83. The increase, though considerable, has been far from steady. The amount dropped from £5755 (Rs. 57,550) in 1870-71 to £4131 (Rs. 41,310) in 1872-73, and from that rose steadily to £9116 (Rs. 91,160) in 1878-79. It fell to £6898 (Rs. 68,980) in 1879-80,

rose to £8805 (Rs. 88050) in 1880-81, and again fell to £7156 (Rs. 71,560) in 1881-82, and £7512 (Rs. 75,120) in 1882-83. The details are :

Poona Savings Bank and Government Securities, 1870-1882.

YEAR.	Savings Banks Deposits	Gov- ernment Sec- urities Int- est.	YEAR.	Savings Banks Deposits	Gov- ernment Securities Interest.
	£.	£.		£.	£.
1870-71...	12,278	5755	1877-78 ...	22,305	7179
1871-72 ..	20,353	5829	1878-79 ...	22,097	9116
1872-73 ...	24,820	4181	1879-80 ...	37,268	6898
1873-74 ...	38,544	5830	1880-81 ...	65,055	8805
1874-75 ...	22,352	6099	1881-82 ..	38,321	7156
1875-76 ..	24,847	6427	1882-83 ...	41,468	7512
1876-77 ..	26,194	6688			

A branch of the old Bank of Bombay was opened in Poona early in 1862. During the speculations, which accompanied the American War it carried on a large business in local advances and in the purchase of bills on Bombay. With the close of the war business collapsed and in 1868 the old Bank of Bombay was placed in liquidation. The Poona Branch was taken over by the new Bank of Bombay and shortly after the Government local treasury was made over to its care. Deposits are held by the Bank to a moderate extent; but there is little or no profitable employment for its funds in Poona, as the requirements of local traders are for the most part supplied by local native moneylenders, who afford facilities against which the Bank cannot compete. The branch has been of much use to Government in financing for the heavy requirements of the local Treasury, as well as to the European residents who use the branch freely for all purposes of ordinary banking.

¹ No native firms confine themselves to banking; all are also moneylenders and traders. The chief bankers are found in Poona and are generally Gujarát and Márwár Vánis and local Bráhmans. Some Poona bankers have dealings with Bombay; with Ahmadabad, Baroda, Broach, and Surat in Gujarát; with Ajmir, Jaypur, and Udepur in Rajputána; with Karáchi and Haidarabad in Sind; with Dhár, Gwálior, and Indur in Central India; with Akola, Nágpur, and Umrávti in Berár; with Ágra, Allahabad, Benares, Calcutta, Delhi, Kánpur, and Lucknow in Northern and Eastern India; with Aurangabad and Haidarabad in the Nizám's country; with Belgaum, Dhárwár, and Kárwár in South-Bombay, and with Bellári in Madras; and the main towns along the highway leading to the shrine of Rámeshvar in South India. Where there is no agency a bill or *hundi* is given on a banker in the nearest large town and is cashed by the bankers of the smaller places in the neighbourhood. Local payments are made in silver and beyond district limits in bills of exchange or *hundis*. The rates of commission for a *hundi* range from a quarter to four per cent, being high during the busy season October to May. When the firm issuing the bill has a large balance at the agency, as they tend to adjust accounts without the cost of

Chapter V.
Capital.
SAVING CLASSES.

BRANCH
BOMBAY BANK

BANKERS.

Chapter V.
Capital.
BANKERS.
Bills.

sending bullion, bills are issued at par. Under ordinary circumstances the highest sum for which a bill can be cashed in Poona without notice may be taken at £400 (Rs. 4000) and after notice at £2500 (Rs. 25,000), and in the other banking towns at about £100 (Rs. 1000).

¹ The two most usual forms of exchange bills or *hundis* are bills payable at sight called *darshani* and bills payable after an interval generally of less than nine days called *mudati*. Bills are of three kinds, personal or *dhanijog* when the grantee is the person to whom or to whose order the payment is to be made; on trust or *sháhájog* when payment is made to a nominee of the grantee known to the payer; and descriptive or *nishájog* where a description of the payee is embodied in the bill. It is not usual to draw bills in sets. A letter of advice to the agent or banker, stating the amount drawn, the number of the bill, and the name of the person to whom or in whose favour the bill has been granted, is considered enough. Bills before they reach the correspondent of the drawer are in some cases several times sold, and the purchasers endorse them each time with their signatures or *berhans*. When the amount of the bill is remitted in cash, by another bill, or in any other form, the bill is signed by the payee, returned to the grantor, and filed as a voucher or *khoka*. Unless the bill is *binájabti*, that is unless it requires no letter of advice, it is usual for the correspondent of the grantor to send a letter of advice, intimating the payment of the money to the payee. No days of grace are allowed. The bill, if demanded, must be cashed on the specified day. If the payer delays, monthly interest is charged varying from one-half per cent if the drawer is a banker to three-quarters per cent if the drawer is a merchant. If payment is asked before the bill falls due, discount at a similar rate is charged. If the bill is dishonoured and sent back uncashed, the grantor must pay interest at double the rate of current interest from the date when the bill was bought. He must also pay a non-acceptance penalty or *nakrái*, which varies in different places. Carriage was also formerly charged according to the distance the bill had travelled.

If the bill is lost or stolen a duplicate or *peth* letter stating the amount of the bill and asking for payment is usually granted. If the duplicate letter is lost, a triplicate or *parpeth* mentioning both the bill and the duplicate is issued; and, if the triplicate is not forthcoming, an advice or *jáb* mentioning the bill, the duplicate, and the triplicate; is sent to the same effect. The payer must satisfy himself as to the identity of the bearer of the bill and in doubtful cases should demand security before payment is made. If he pays the wrong man he has to bear the loss, and pay a second time to the holder of the duplicate and the triplicate. The payee in the case of an advice letter or *jáb* passes a separate receipt, while the bill, the duplicate, and the triplicate are simply endorsed. After payment the banker debits the drawer with the amount paid. If a drawer overdraws his account, and the bill is lost or dishonoured, he alone is

¹ Steele's Hindu Laws and Customs in the Deccan.

responsible. It is usual after endorsing them to sell bills to bill-brokers or *daláls*, who are paid brokerage at the rate of $\frac{1}{2}d.$ ($\frac{1}{2}a.$) on every £10 (Rs. 100) bill. As treasure is seldom sent, bills are generally adjusted by debits and credits and exchange bills or *badli hundis*, whose rates vary according to the conditions of the transaction. The drawer pays commission or *hokshái* to the correspondent who disburses cash to the payee, and both drawer and purchaser pay a brokerage or *daláli* for the sale of *badli hundis*. The interchange of bills has been greatly simplified by the introduction of a uniform coinage. Formerly the different rupees and the different rates of exchange made the system most complicated, and was the source of no small profit to local bankers.

Where there is an agent or *munim*, the clerk or *aumásta* acts under the agent. As a rule there is no agent, and the clerk, who is generally a Bráhmañ, is subordinate to his master alone and is treated by outsiders with much respect. He keeps the accounts, makes and recovers advances to husbandmen, superintends his master's establishment, looks after his lands and servants, and goes abroad to buy and sell goods according to his master's orders. ~~He also looks after the food and other charges and travelling allowance~~ the clerk's yearly pay varies from £5 to £30 (Rs. 50 - 300). At *Diváli* in October-November he is given a turban or some other article of clothing and small presents on weddings.

Bankers as well as traders and well-to-do moneylenders keep three books, a rough and a fair journal or *rojmel* and a ledger or *khátevahi*. Some traders keep only one journal. Where two journals are kept the transactions of the day are entered in the rough journal as they take place. At the end of the day they are corrected, balanced, and entered at leisure in the fair journal. A general summary of each man's dealings is posted in the ledger under its proper head and the pages of the journal which refer to the details are noted. Many village lenders trust to the evidence of bonds and keep no books.

In Shiváji's time (1674-1680) the following gold coins were known in the district: *Gádars*; *Ibhrámis*; *Mohars*; *Putalis*; *Satlámis*; *Huns* of fourteen kinds *Pádsháhi*, *Sangari*, *Achyutrái*, *Devrái*, *Rámchánararái*, *Guti*, *Dhárvádi*, *Shivrái*, *Káveripák*, *Pralakhati*, *Pála-Náiki*, *Adavani*, *Jadmáli*, and *Tádpatri*; and *Phalams* of twelve kinds *Afráji*, *Trimalári*, *Trishuli*, *Chandávári*, *Bildhari*, *Ulfkari*, *Muhammadshái*, *Veluri*, *Katerái*, *Devjavli*, *Rámnáthpuri*, and *Kungoti*.¹ The chief rupees that were current during the Peshwa's rule were the *Malhárshái* or *Rástia's* rupee, which was equal to fifteen annas of the present Imperial rupee; the *Ankushi* of three kinds, *Kora nirmal chhápi* or fresh from the mint and bearing a clear stamp, *Madhyam chhápi* or with a half-worn stamp, and *Náráyan chhápi*; *Belápuri* and *Bháturi* equal to fourteen annas; *Bodke surti* equal to $14\frac{1}{2}$ annas; *Jaripatki*, *Kolábi*, *Miráji*, *Phora Chándvadi*, and *Phulshahari*; *Shikka* of three kinds, *halli*, *shri*, and *vái*; and *Tembhurni*. The Peshwa's

Chapter V.
Capital.
BANKERS.
Bills.

Currency.

¹ Shiváji's Bakhar by Krishnáji Anant Sabhásad.

Chapter V.
Capital.
BANKERS.
Currency.

government used to add two per cent to all its collections to bring them to the *Malhárshái* standard. To raise the coins to the *Ankushi* standard the last Peshwa *Bájráv* took an additional percentage which varied according to the pleasure of the *mámlatdár*. In the beginning of British rule the percentage was fixed according to the intrinsic value of the coins.¹ Of the coins in circulation in 1821 about forty-nine per cent were *Náráya chhápi*, twenty-nine per cent *Kora nirmal*, and $7\frac{1}{2}$ per cent *Madhyam chhápi ankushis*, five per cent *Belápuris* and *Bháturis*, and $1\frac{1}{3}$ per cent *Halli shikkás*. The proportion of the other rupees varied from one-ninth to two-ninths per cent.

The *shikka* rupees were the most popular with bankers, who generally preferred them to other coins. The other rupees continued legal tender till about 1827, when they were superseded by the Company's coin, but the *shikka* rupee remained current till about 1857. Till about 1834-35 when it was finally closed, the *shikka* rupees were made in the Poona mint by the *ora* *Tánksále* or *Mint*-master family of *Deshasth Bráhmans* under the supervision of British officers, who allowed ten per cent copper alloy for remuneration. Experts were appointed to examine the coins as they issued from the mint, and were paid $\frac{3}{8}d.$ ($\frac{1}{4} a.$) as commission on every hundred rupees examined.² These rupees were generally exchanged at a discount of not more than $\frac{3}{8}d.$ ($\frac{1}{2} a.$).

At present, besides notes which are used only in the town and cantonment of Poona, the currency is partly silver partly copper. The silver coins are the Imperial rupee, half-rupee *adheli*, quarter-rupee *pávli*, and one-eighth rupee *chavli*. The ordinary copper coins are a half-anna piece *dhabru*, a quarter-anna piece *paisa*, and a onetwelfth-anna piece *pai*. Old copper coins called *chhatrapatis*, also called *shivráis* or the coins of *Rája Shiváji*, worth about a quarter of an *anna*, are also current. The *chhatrapati* contains 136 grains troy ($\frac{3}{4} tola$) of pure copper, or 45 grains troy ($\frac{1}{4} tola$) more than the current quarter-anna piece. Still it sells for less as one or two pieces have to be added in every rupee. The coinage of the *chhatrapati* or *shivrái* was stopped immediately after the beginning of British rule. But about thirty years ago large quantities of a counterfeit coin with an alloy of zinc were secretly coined and circulated in the markets near *Júnagar* and *Ahmadnagar*. Though gradually disappearing these false *shivráis* are still in use, and are so close a copy of the real *shivrái* that only an expert can tell them from each other. *Kavdis* or cowrie-shells from the *Malabár* coast are in use in making small purchases of groceries, vegetables, betel leaves, and oil. Four *kavdis*, equal to one-twenty-fifth of a *shivrái* that is about one-seventieth of a penny, is the smallest unit.

¹ Captain H. D. Robertson, Collector, in East India Papers, IV. 181, 580. For every 100 *Kora nirmal chhápi Ankushis* were demanded 100 $\frac{1}{2}$ *Madhyam chhápi Ankushis*, 101 $\frac{1}{2}$ *Náráya chhápi Ankushis* and *Phulshaharis*, 103 $\frac{1}{2}$ *Bháturis*, 105 $\frac{1}{2}$ *Vái shikkás*, *Belápuris*, *Kolábis*, and *Tembhurnis*, and 108 *Mirajis*. Ditto.

² Shortly before August 1822 the Poona mint was closed for some time owing to the discovery of frauds. As the want of currency caused inconvenience the mint was reopened. Mr. Chaplin's Report, 20th August 1822 (1877 Edition), 63. The mint seems to have been finally closed about the year 1834-35.

Insurance or *vima* was known before the time of the British. Valuable articles, jewels, bullion, coin, precious stones, cloth, cotton, silks, and shawls, and sometimes cattle grain and metal vessels, while being carried to and from Poona, were insured at Poona against loss by robbery, plunder by troops, fire or water, the carrier's negligence, his being carried off by a tiger, drowned in fording a river, or dying from epidemic disease. The work of insurance formed part of the business of one or more bankers acting as partners. As insurance agents they undertook to send goods from one place to another on receipt of transit cost and insurance fees, varying from one to ten per cent on the value of the goods, according to the distance, the danger of robbers, and the time allowed for the journey.¹ Insurance was not undertaken for a longer distance than 200 miles (100 *kos*) unless on property of a greater value than £100 (Rs. 1000). Within that distance the value of goods whose safe carriage was insured varied from £10 to £10,000 (Rs. 100 - 1,00,000). The agents employed armed escorts and camels to convey the articles, and every year had to pay blackmail to the heads of the robber gangs who infested the country. The insurance agents' escorts were Arabs, Rohillás, Patháns, or Rajputs. The camel-men who were Muhammadáns were called *sárváns*. Their wages were from fifteen to twenty per cent above those of ordinary messengers, and, in addition to their wages, they were paid rewards for each successful trip. They were noted for bravery and for their staunch regard for their employer's interests. They carried matchlocks, swords, daggers, and shields. They made very rapid journeys on trained camels, and if attacked by robbers made good use of their arms. Exclusive of the escort's wages the principal sums defrayed by the insurer were on account of loss and damage to the property injured. Interest from $\frac{1}{4}$ to $\frac{1}{2}$ per cent was also paid to the owner if the goods insured did not reach their destination within the appointed time.

Under British rule order and peace have made insurance against the risks of the road unnecessary. Insurance against fire has not

Chapter V.
Capital
BANKERS.
Insurance.

* ¹ Steele's Hindu Laws and Customs in the Deccan, 314-321. The chief details are ;

Poona Insurance Percentage, 1818.

PLACE.	Gold and Jewels.	Cash, Silver, Cloth, and other Articles.	PLACE.	Gold and Jewels.	Cash, Silver, Cloth, and other Articles.
Haiderabad ...	1 to 2½	3 to 5	Naráyanpeth ...	3 to 4	3 to 5
Benares and Oudh ...	5 to 7	No insurance.	Ahmadnagar and Sātára ...	½ to 1	½ to 1½
Jaypur and Ajmir ...	3 to 4½	4 to 5	Dhárwár and Hubli ...	1 to 2	1 to 3
Surat ...	1½ to 2	No insurance.	Bellári ...	1½ to 3	1½ to 3½
Ahmadabad ...	3 to 5	4 to 6	Madras and Máisur ...	2 to 3	2 to 5
Baroda ...	2 to 4	3 to 5	Surápur ...	2 to 3	3 to 5
Burhánpur ...	1½ to 2½	2½ to 3½	Machhli-Pattan ...	2 to 3	3 to 5
Indur and Ujain ...	2 to 3	3 to 4	Tanjor ...	2 to 3½	2 to 4
Nágpur ...	3 to 5	4 to 6	Aurangabad, Yeola, and Málegaon ...	1½ to 1½	1½ to 2½
Unarátvati ...	1½ to 2½	2½ to 3½	Bombay ...	½ to ½	1 to 1½
Miraj, Sholápur, and Násik ...	1 to 2	2 to 3			

Chapter V.
Capital.

been introduced. In Poona a branch of the Bombay Oriental Government Security Life Assurance Company Limited, has been open since 1874. A few policies have been effected on the lives of Europeans, Eurasians, Hindus, and Pársis, but the business done has been small.

MONEYLENDERS.

Much of the moneylending is in the hands of Márwár and Gujarát Vánis. A considerable number of local Bráhmans and a few Chámbhárs, Dhangars, Gosávis, Kunbis, Mális, Mángs, Maráthás, Mhárs, Musalmáns, Shimpis, Sonárs, Telis, Lingáyat and Vaish Vánis, and others having capital also engage in moneylending. The business done by local lenders, most of whom have other sources of income and are not hereditary moneylenders, is less than that done by outsiders from Márwár and Gujarát. Except of a few town firms moneylending is not the lender's sole pursuit. About sixty per cent are traders including grocers and cloth-sellers, thirty per cent are husbandmen, and ten per cent are pleaders and others.¹ Besides lending money Márwáris deal in gram, groceries, cloth, and oil, some having shops in villages and others in country towns and market places. Except in some Junnar villages, where they have dealings with husbandmen, Gujarát Vánis are chiefly cloth-dealers who are settled in the larger towns and who lend money to weavers and other craftsmen and seldom to husbandmen. Lingáyat moneylenders are chiefly ironmongers and grocers. The Bráhman moneylender is generally a land proprietor, a corn-dealer, and in the city of Poona a pensioned Government servant, pleader, or contractor, and a cultivator in Khed and Junnar. He is generally found in towns and seldom lends except to the better class of landholders. The Marátha or Kunbi moneylender is a husbandman. He is found in villages and towns. As a rule he does not lend except to people who belong to his village or with whom he is connected. The others are chiefly found in Poona and in large towns. Of all lenders the Márwári has the worst name. He is a byword for greed and for the shameless and pitiless treatment of his debtor. Some say Bráhmans are as hard as Márwáris, others say they are less hard. Almost all agree that compared with Márwár and Bráhman creditors, Maráthás, Kunbis, and Gujarát Vánis are mild and kindly. A Márwári will press a debtor when pressure means ruin. The saying runs that he will attach and sell his debtor's cooking and drinking vessels even when the family are in the midst of a meal. Bráhmans, whose position in society tends to make them popular, are shrewd and cautious in their dealings, and as a class avoid extreme measures for the recovery of their debts. A Gujarát Váni, a Marátha, or a Kunbi creditor will seldom run his debtor. It is not easy to make moneylending pay. Want of experience often leads to loss of capital. Except when their immediate interests clash moneylenders as a class are friendly to each other, avoid competition, and deal honestly among themselves.

¹ Mr. J. G. Moore, C.S.

Chapter V.
Capital.
MONEYLENDERS.
Interest.

The accounts of the rates of interest at the beginning of British rule vary. In 1821, according to the Collector Captain Robertson, the usual rate of interest was twelve per cent except in the Mávals where it was from twelve to twenty-four per cent. A $\frac{1}{4}$ *anna* per rupee a month or about eighteen per cent was an usual rate. When the interest was paid in grain the usual monthly rate was a *sher* the rupee or seventy-five per cent. If grain was borrowed for seed, the debt was cancelled by repaying double the quantity borrowed any time within a year; if the grain was borrowed for food one quarter to three-quarters more were paid in return.¹ About the same time Dr. Coats (29th February 1820) described the village shopkeeper as lending a few rupees to the villagers without security and charging $\frac{1}{2}$ *anna* interest a month or thirty-seven per cent. A good deal of their traffic with the villagers was by bartering grain and other field produce for groceries. The usual yearly rate of interest was twenty-four per cent. Loans of grain and straw were repaid at fifty per cent, and often at seventy-five per cent.²

At present (1883) the rate of interest varies with the credit and the need of the borrower, the habits of the class to which he belongs, the risk of the industry in which he is engaged, and the dearth of money. The interest charged is always higher in the country than in the city and presses more on poor than on well-to-do landholders. In small transactions where an article is given in pawn the yearly rate of interest varies from nineteen to thirty-seven per cent. In petty field advances on personal security the usual yearly rate is $37\frac{1}{2}$ per cent. ($\frac{1}{2}$ *a.* the rupee a month). When there is a lien on the crops the payment is generally in grain and the interest varies from twenty-five to fifty per cent. In large transactions with a mortgage on movable property, nine to twelve per cent are charged, and in mortgages of immovable property the rate varies from six to twelve per cent. Where loans are secured by mortgages on land, the average rate in the Haveli sub-division, where the conditions of landed property are specially favourable, varies from thirteen to nineteen per cent.³ In less favoured sub-divisions the rate not uncommonly rises to twenty-four per cent. Money invested in buying land is expected to yield a clear profit of nine to twelve per cent. Interest is now calculated according to the English calendar year in all transactions which do not take the shape of book-accounts. Book-accounts and merchants' accounts are generally regulated by the *samvat* year which begins at *Diváli* in October-November; Bráhmans and other non-professional lenders generally keep their accounts by the *shak* year which begins on the first of *Cháitra* in March-April. If payment is made within three years the extra or intercalary month is charged; if the account runs for more than three years the extra month is excluded. The Imperial rupee is the standard in all transactions. Shopkeepers not uncommonly have dealings

¹ East India Papers, IV, 580.

² Bom. Lit. Soc. Trans. III. 236.

³ Deccan Riots Commission Report, 66-67.

Chapter V.
Capital.
MONEYLENDERS.
Interest.

in *shikka* rupees. In such cases, if the settlement is private, it is made according to the market value of the coin. In disputed cases, when the parties come to court, the *shikka* rupee is turned into the Imperial rupee at a reduction of nearly $\frac{1}{2}$ per cent.¹ At seed time moneylenders usually advance grain for seed and for the maintenance of the landholder. Advances of seed and of food grain are repaid six months after in kind or in their money value at the rate of 125 per cent or *savai*, of 150 per cent or *bidhi*, or of 200 per cent or *dám dupat* of the grain advanced. Contractors, who of late years are a growing class, pay twelve to twenty-four per cent interest and at the time of borrowing allow a discount or *manuti* of three to five per cent. Their dealings are all in cash. They have fair credit and are well-to-do. They borrow money to help them to carry out their contracts and repay the loan as soon as the contract is finished. Moneylenders have good credit and borrow at six to twelve per cent a year. Traders and merchants whose credit varies with their personal position borrow at nine to eighteen per cent. *Khists* or small loans payable by daily or weekly instalments of a few *annas* are occasionally made in some parts of the district.

BORROWERS.

The chief borrowers of the district are land-owning *Knnbis*. Contractors of various kinds, who are a growing class, also borrow. Enterprising moneylenders borrow at low interest and lend at rates high enough to cover losses and leave a considerable margin of profit. Traders and merchants rarely borrow except when they make large purchases of the articles in which they deal. The few craftsmen who are free from debt act as moneylenders. Though most craftsmen are in debt they are not so deeply involved as landholders, partly because they have no security to offer, partly because they have no money rents to pay. In ordinary years, as a class, craftsmen are better off than husbandmen. Still, of late years, competition has closed many of the old callings, and craftsmen, who have not suffered from competition, are generally afflicted by a craving for some form of vicious indulgence. Except for their intemperate habits craftsmen are generally intelligent, able to care for their interests, and guard themselves from being overreached by false claims. Craftsmen borrow at twelve to twenty-four per cent. Besides the interest, they have to accept a five per cent deduction from the amount of the nominal loan. They are honest debtors and do their best to pay their debts repaying in small instalments. They dislike borrowing and do not borrow except under considerable pressure. They reckon indebtedness a burden and try to shake it off as soon as they can. Of the lower orders domestic servants and labourers are the only classes who are comparatively free from debt. House servants if forced to borrow repay the loan by monthly instalments. They are generally regular in their payments and careful to pay what they owe. Except during the few years before and after the close of the American war, when

¹ Gov. Res. 25th January 1883, allows a deduction of one rupee and fifteen *annas* for every 100 rupees.

the Peninsula railway and other local public works were in progress and when the wages of unskilled workmen in Bombay were exceptionally high, labourers were never better off than they now are. Fifty years ago a labourer could hardly earn wages enough to keep himself and his family and could save nothing. A labourer then was badly fed and clad; the cheapness of the articles of daily use alone kept him from starving. The first marked improvement in the labourer's condition was caused by the demand for labour to complete the great public works which were in hand both locally and in Bombay between 1862 and 1871. The Deccan Riots Commission estimated that £250,000 to £300,000 (Rs. 25-30 *lákhs*) of the whole amount spent in making the Peninsula railway within Poona limits remained in the district in payment of local labour. Just beyond the west limits of the district were the great Sahyádrí works where on a distance of fourteen miles 40,000 labourers were at one time employed by one contractor. At the same time the foreshore reclamation and other works in hand in Bombay caused so great a demand for labour that in 1863 the monthly wages of unskilled workmen rose from 15s. 6d. (Rs. 7½) to £1 7s. (Rs. 13½). Great public works in the Poona district continued to give the labourers highly paid employment till the year 1871. At present (1883) a labourer can command not only the necessaries of life for himself and his family, but ordinary comforts and even a few luxuries. He spends his gains on clothes, food, and liquor more than on ornaments. Labourers work in the fields from August to March; at other times they are employed on house-building and other public or private works. On his personal security a moneylender generally advances a labourer up to £10 (Rs. 100). Sometimes the security of a fellow-labourer is taken.

Since before the beginning of British rule the greatest borrowers in the district have been the landholders. The ordinary Kunbi is a simple well-disposed peasant content with the scantiest clothing and the hardest fare. Though unschooled and with a narrow range of intelligence he is not without many qualities and meets with a stubborn endurance the unkindly caprices of his climate and the hereditary burden of his debts, troubles which would drive a more imaginative race to despair or stimulate one more intelligent to new resources. The apparent recklessness with which he will incur obligations that carry the seeds of ruin has gained for the Poona landholder a character for extravagance and improvidence. The apparent recklessness is often necessity. His extravagance is limited to an occasional marriage festival, and his improvidence is no greater than that of all races low in the scale of intelligence who live in the present.¹ The want of forethought, which prevents the landholder overcoming the temptation to which the uncertainty of the seasons and the varying value of his produce give rise, is caused by a want of power to realize future troubles rather than by a spirit of extravagance or waste. In 1875, in the opinion of the members of the Deccan Riots Commission, the expenditure on marriage and

Chapter III.
Capital.
BORROWERS.

Husbandmen.

¹ Deccan Riots Commission Report, 22.

Chapter III.

Capital.

Borrowers.
Husbandmen.

other festivals was less the cause of the husbandman's indebtedness than was commonly supposed. Compared with his means the expenditure was extravagant, but the occasions seldom occurred. In a course of years the total sum spent was probably not larger than a landholder was justified in spending on special and family pleasures. The expenditure on family pleasures formed an important item on the debit side of many accounts but it was rarely the nucleus of a debt. Even at twenty-four per cent interest the £5 to £7 10s. (Rs. 50-75) spent by an average landholder on a marriage, with fairness on the lender's part and without the addition of other debts, could be rapidly paid. In the opinion of the Commission the bulk of the landholder's debt was due less to the large sums spent on ceremonies than to constant petty borrowings for food and other necessaries, to buy seed, to buy bullocks, and to pay the Government assessment. The Commissioners held that in a district with so uncertain a climate as Poona and with people whose forethought was so dull, the payment of a regular money rental, even when the rental was far below the standard of a fair season, must lead to borrowing.

When the country came under British rule, the bulk of the husbandmen were in debt. In 1819 in the township of Loni on the Ahmadnagar road, about ten miles east of Poona, Dr. Coats found that of eighty-four families of husbandmen all except fifteen or sixteen were indebted to moneyed men generally Bráhmans or shopkeepers. The total private debt was £1453 (Rs. 14,530) and there was a further village debt of £307 (Rs. 3070). The sums owed generally varied from £4 to £20 (Rs. 40-200), but some men owed as much as £200 (Rs. 2000). The interest was usually twenty-four per cent, but when small sums were borrowed interest was as high as forty per cent. The cause of debt was generally marriage expenses or the purchase of cattle and food. Each debtor had a running account with his creditor and paid sums of money from time to time. According to the accepted rule the interest of a debt could never be more than the principal. In settling disputes the juries followed the rule *dám dusar kan tisar*, that is double for money treble for grain. Few debtors knew how their accounts stood. Most of them believed that they had paid all just demands over and over again. About a fourth of the people were indebted to their neighbours for grain and straw and borrowed to support themselves and their cattle till next harvest. They repaid these advances in kind at fifty to seventy-five per cent interest. In ordinary times the whole of a husbandman's produce was mortgaged before it was reaped. In bad seasons the evil was much increased. If any of their cattle died they had no means of replacing them. If they failed to raise an advance they left their fields, and tried to save some money, as Bráhmans' servants or perhaps as soldiers.¹

² In 1822 according to Mr. Chaplin, owing to the oppression of

¹ Trans. Bom. Lit. Soc. III. 226.

² From the Deccan Riots Commission Report (1876).

revenue contractors, the landholders in many villages, though frugal and provident, were much in debt to bankers and merchants. Many of these debts were of long standing. They were often made of compound interest and fresh occasional aids so mixed and massed that the accounts were exceedingly complicated. A husbandman who fell in debt could seldom free himself. The husbandman's debts were of two kinds, village debts and private debts. The village debt usually arose from advances or loans made by bankers to the Marátha Government on the security of the revenues of certain villages. The private debts were the result of the revenue farming system under which the state dues were collected through bankers or *sávkárs* who usually received in kind from the villagers what the bankers had paid to the Government in cash and drafts. The mass of the husbandmen had not interest or title enough in their land to be security for a large debt. *Mirás* or hereditary holdings were sometimes mortgaged, but their selling value was estimated at not more than two or three years' purchase, and land yielding £20 (Rs. 200) of gross produce could seldom be mortgaged for more than £10 (Rs. 100). The ordinary dealings between the moneylender and the landholder were based on the teaching of experience rather than on any power of compulsion in the hands of the creditor. The recognized mode of recovering debt was for the lender to send a dun or *mohasal* whose maintenance had to be paid daily by the debtor. Another mode was to place a servant in restraint or *dharna* at the debtor's door, or to confine the debtor to his house or otherwise subject him to restraint. Against the humbler debtors severer measures were used. The landholder's constantly recurring necessity could not be relieved unless he maintained his credit by good faith. On the other hand the Government in no way helped the lender to exact more than a fair profit which considering his risks would also be a large profit. Honesty was the borrower's best policy and caution was a necessity to the lender. There was a considerable burden of debt and many landholders were living in dependence on the lender, delivering him their produce and drawing upon him for necessaries. The landholder's property did not offer security for large amounts. The debtor's cattle and the yearly produce of his land were the lender's only security. As immovable property was not liable to sale for debt, and as the hereditary or *mirás* title was of no value to a non-agricultural landlord, the mortgage even of hereditary or *mirás* land gave the lender a hold on the produce rather than on the land. Rates of interest were very high and much of the debt consisted of accumulations of interest. The causes of indebtedness were chiefly the revenue system and sometimes expenditure on marriages or similar occasions. The amount of individual debt was usually moderate. Most moneylenders were men of substance who had a staff of duns and clerks. In recovering debts the lender had little or no help from the state. At the same time he had great license in private methods of compulsion. Under British management the lender's power of private compulsion was curtailed and courts presided over by the Collectors were opened to suitors. At first the lenders did not go to the courts. This and

Chapter V. Capital.

BORROWERS.
Husbandmen.

Chapter V.
Capital.

BORROWERS,
Husbandmen.

other causes caused a contraction in the moneylender's dealings. Still the landholder's necessities compelled him to keep on terms with his creditor.

There are no records bearing on the relations between the husbandmen and their creditors in the years immediately following Mr. Chaplin's report. Later information shows that the burden of debt grew heavier rather than lighter before the introduction of the Civil Court Procedure in 1827. The first regular Civil Procedure was introduced into the Bombay Presidency by Regulations II. III. IV. and V. of 1827. Regulation IV. provided the procedure and Regulation V. the limitations for civil suits. In Regulation IV. the cattle and tools necessary for the support of the agricultural debtor were declared exempt from seizure on account of debt. Regulation V. limited the yearly rate of interest recoverable in a civil court to twelve per cent. When the new laws came into operation, except in hereditary or *mirás* land, the husbandman had no title to his holding, and on account of the fall in the value of produce the revenue demand left little margin to the landholder. Under these circumstances the lender had little security for debt.

As the courts gave the lenders the means of speedily realizing their claims they were soon resorted to. In 1832, when the extreme cheapness of grain was pressing with terrible weight on the agricultural classes, the French traveller Jacquemont, a somewhat unfriendly critic, described the cultivators all over India as owing instead of owning. They had almost always to borrow seed from the banker and money to hire plough cattle. Every husbandman had a running account with a lender to whom during all his life he paid the interest of his debt, which swelled in bad years and when family ceremonies came round. In no part of India did indebtedness cause more misery than in the Deccan. Formerly the law or custom prevented a lender from more than tripling the original loan by compound interest; neither personal arrest nor seizure of immovable property was allowed. The English law removing all such restraints caused much horror. To carry out the law judges had to strip old families of their ancestral homes.¹

The first detailed record of the relations between husbandmen and their creditors is the result of an inquiry made in 1843, by Mr. Inverarity, the Revenue Commissioner of the Northern Division. Mr. Stewart, the Collector of Poona, after premising that it was well known that all enactments to fix a lower than the market rate of interest had the effect of enhancing it, stated that money was frequently borrowed on mere personal security at thirty to sixty per cent. Considering that the borrowers seldom owned any property it seemed to him a matter of surprise that they had credit at all rather than that the rate of interest was so high. The views of Messrs. Frere and Rose his assistants were somewhat at variance

¹ Jacquemont's Voyages, III. 559.

with the Collector's views. Mr. Frere stated that there were few villages under his charge in which there was one landholder unburdened with debt and scarcely a single village in which three persons could be found not involved for sums of over £10 (Rs. 100). These debts were contracted on marriage and other social occasions. The interest varied from twenty-five to sixty per cent according to the circumstances of the borrower and the description of security given. Mr. Frere recommended some measure restricting interest. Mr. Rose observed that the usurious character of the village moneylender was notorious. He thought the poverty of the Deccan landholder was in great measure due to the lender's greed. He feared it would be difficult to cure the evil as the people looked on the moneylender as a necessity. Their thoughtlessness and ignorance would frustrate any attempt to check or put a stop to the lender's exorbitant gains. In cases where landholders were concerned, the interest was generally enormous and agreements were fraudulently procured. He also recommended that something should be done to limit the rate of interest. In summing this evidence the Revenue Commissioner seems to have shared the Collector's views against trying to lower interest by legal enactment. He noticed that the moneylender was frequently part of the village community. The families had lived for generations in the same village helping the people from father to son and enabling them to meet urgent caste expenses.

Chapter V.
Capital.

BORROWERS.
Husbandmen.

In this correspondence the attention of the reporting officers was usually fixed on the question of usury. It appears that as yet the operation of the law had not aggravated the burden of debt to any degree of severity. This was natural. The husbandmen had generally no title in his land except the title conveyed by the hereditary or *mirás* tenure and his stock and field tools were safe from seizure. Another notable point in this correspondence is that the moneylenders are spoken of as the village Bania, the village banker, and under similar terms which show that the old banker was the only lender with whom the landholders had dealings. It is also noteworthy that expenditure on marriages, caste rites, and similar occasions is generally assigned as the cause of indebtedness. One reason why social charges are noticed as the chief cause of debt may be found in the rapid spread of tillage which in different parts of the district followed the lowering of the rates of assessment in 1836 and the following years. The lowering of assessment gave the landholder a strong inducement to add to his holding and the lender was encouraged to make advances by the enhanced security and the ready machinery which was available for recovering debts. It was hoped that the permanent title and the light assessment guaranteed by the survey settlement would so increase the landholder's profits and stimulate his industry that by degrees he would free himself from debt. The increased production and the stimulus to agricultural enterprise did indeed follow, but debt instead of diminishing increased. The records belonging to the period between 1850 and 1858 bring to notice two marked features in the

Chapter V.

Capital.

BORROWERS.
Husbandmen.

relations between the lender and the husbandman which followed the changes in the revenue and judicial systems. These two features are the growth of small moneylenders and the operation of the laws to the disadvantage of the landholders. In 1852, Captain, the late Sir G., Wingate, then Survey Commissioner, wrote that the facilities for the recovery of debt offered by the civil courts had called into existence an inferior class of moneylenders who dealt at exorbitant rates of interest with the lower agricultural poor. As the value of the landholder's title under the survey settlements came to be recognized, his eagerness to extend his holding grew. A fresh start was given to the moneylender in his competition with the landholder for the fruits of the soil. The bulk of the people were very poor and the capital required for wider tillage could be obtained only on the credit of the land and its produce. Even under the reduced rates of assessment existing debt left the landholder little margin of profit. This margin of profit would not go far towards covering his increased needs to provide stock and seed and to meet the assessment on the additions to his holding. At the same time for the first year or two his return in produce would be nominal. Even the most cautious could not wait till their profits enabled them to take up fresh land because they feared that the more wealthy or the more reckless would be before them. In 1855 it had become well known that the Regulation restricting the rate of interest to twelve per cent was evaded by the moneylenders by deducting discount, or more properly interest taken in advance from the amount given to the debtor. The usury law had the effect of placing the debtor in a worse position by compelling him to co-operate in a fiction to evade the law. The bond acknowledged the receipt of an amount which had not been received. In 1855 an Act was passed repealing the restriction on interest. Another result of the enhanced value of agricultural investments caused by the survey settlement was the spread of the practice of raising money on mortgage of land and of private sales of land to moneylenders. Private sales of land were doubtless made in liquidation of debt and not for the purpose of raising money as no landholder would part with his land to raise money. It must therefore be presumed that in such cases the moneylender compelled the transfer by threats of imprisonment or by other terrors. Although moneylenders were adding to their land by private purchases the sale of occupancies under decree was rare. This was probably due to several causes. The people had not acquired full confidence in the title given by the survey settlement; they probably had hardly confidence in the stability of the British rule. The only land sold was hereditary or *mirás* which as it was held by a recognized title was reputed to be safe. It was seldom a creditor's interest to sell his debtor out of his holding. The landholder's stock and field tools were protected from sale and the creditor was likely to make more by leaving him in possession of his land than by lowering him to a tenant. The sale of immovable property for debt was opposed to custom and public opinion, and unless the land was directly made security the courts would be reluctant to have it sold if the claim could be satisfied by other means more consonant with native usage,

The judicial returns show how much more favourable the mode of disposing of business in the courts before 1859 was to defendants than the more strict procedure which was introduced in 1859. Under the earlier system about one quarter of the cases decided were adjusted without judicial action; in 1859 the proportion settled without judicial action fell to about one-seventh.¹ At this time (1850-1859) the returns show that the imprisonment of the debtor was a favourite method of procuring the settlement of a debt. The sale of land was rare and the sale of the debtor's house was an innovation. Imprisonment would therefore be more often used. During the three years ending 1853 there was an average of 530 civil prisoners in the Poona Jail, compared with an average of 204 in the three years ending 1863.

In 1858, when Lord Elphinstone was Governor of Bombay, he recorded his conviction that the labouring classes suffered enormous injustice from the want of protection against the extortionate practices of moneylenders. He believed that the civil courts had become hateful to the mass of the people because they were made the instruments of the almost incredible rapacity of usurious capitalists. In Lord Elphinstone's opinion nothing could be more calculated to give rise to widespread discontent and dissatisfaction with British rule than the practical working of the existing law.

Shortly after this the rise in produce prices improved the landholder's condition. Notwithstanding the pressure of debt and of injurious laws about 1860 the landholders were better off than they had been for years. The conditions of agriculture had been favourable. For nearly twenty years landholders had enjoyed a fixed and moderate assessment and large tracts of arable waste had been brought under tillage. Communications and means of transport were improved, the railway whose construction had enriched the district by about £200,000 (Rs. 20 lakhs) was within easy reach, and in spite of a series of good seasons produce prices had risen. Although the lender might take him to court, the landholder had a chance of being able to borrow from a rival lender and the court would give time. If a decree was passed against the borrower, his stock and field-tools were safe and his land was not in danger. He might be imprisoned until he signed a new bond; he was not likely to be made a pauper.

In 1859 two enactments aggravated existing evils. These were the Civil Procedure Code and the Statute of Limitations. Whatever facilities the law afforded the creditor in 1852 were greatly enhanced by the introduction of the 1859 procedure, and by the punctual conduct of judicial duties which was now exacted from the subordinate courts. At the same time the landholder's credit was enhanced by adding his land and his stock and field tools to the security which was liable for his debts. In 1865 the introduction of compulsory registration of deeds dealing with immovable property protected

¹ The details were; in 1850 of 8993 cases 2355 were settled without judicial action; in 1859 of 10,060 cases 1869 were settled without judicial action.

Chapter V.
Capital.
BORROWERS.
Husbandmen.

the creditor from attempts to repudiate or dispute a registered bond. In the meantime the landholder's estate had risen in value and new cultivation offered securities for new loans. His personal solvency was assured by the large demand for labour on the railway and other public works, and in 1865 his title in his land was recognized and secured by an Act which confirmed the rights vested in him by the survey settlement. Between 1862 and 1865 the American war, while on the one hand it poured money into the country to seek investment, on the other hand raised to an extravagant pitch the value of agricultural securities. To these causes tending to attract capital to the business of agricultural moneylending it may be added that in the dearth of other industries, with a population whose wants embraced little but the merest necessities, capital, which under other conditions would find employment in trade or manufactures, naturally turned to agricultural investment. Almost the only course open to the clerk or servant who had saved a little money in a village moneylender's employment, was to set up as a moneylender.

The most unscrupulous class of petty moneylenders increased considerably during the ten years ending 1875. It became the landholder's common practice to borrow from one lender to pay another or to borrow from two or three at a time. One result of this competition of low-class lenders was that even respectable lenders were obliged to resort to the methods of swelling the debt and coercing the debtor which the petty lenders had introduced.¹ In the process of swelling the account the lender was greatly helped by the Limitation Act of 1859. This Act was passed with the object of helping the borrower by making it impossible for the lender to bring forward old claims which the borrower could not disprove. The lender wrested the provisions of the Act to his own advantage by forcing the debtor, under threat of proceedings, to pass a fresh bond for a sum equal to the amount of the original bond

¹ Sir G. Wingate thus described the change in the relations between the lender and the landholder: The prosperity of the landholder is no longer necessary to the prosperity of the lender. The village lender needs no longer to trust to the landholder's good faith or honesty. Mutual confidence and goodwill have given way to mutual distrust and dislike. The ever-ready expedient of a suit gives the lender complete command over the person and property of the debtor. It becomes the lender's interest to reduce the borrower to hopeless indebtedness that he may appropriate the whole fruits of his industry beyond what is indispensable to his existence. This the lender is able without difficulty to do. So long as a landholder is not deeply involved the lender readily affords him the means of indulging in any extravagance. The simple and thoughtless landholder is easily lured into the snare. He becomes aware of his folly only when the toils are fairly round him and there is no escape. From that day he is his creditor's bondsman. The creditor takes care that the debtor shall seldom do more than reduce the interest of his debt. Do what he will the landholder can never get rid of the principal. He toils that another may rest; he sows that another may reap. Hope leaves him and despair seizes him. The vices of a slave take the place of a freeman's virtues. He feels himself the victim of injustice and tries to revenge himself by cheating his oppressors. As his position cannot be made worse, he grows reckless. His great endeavour is to spoil his enemies the moneylenders by continual borrowing. When he has borrowed all that one lender will advance, it is a triumph to him, if lies and false promises can win something more from another. The two creditors may fight, and during the fray the debtor may snatch a portion of the spoil from both. Deccan Riots Commission Report, 45-46.

together with interest and often a premium.¹ His inability to pay on account of the uncertainty of the seasons made this practice of passing new bonds at the end of every two or three years press specially hard on the Poona husbandman.

Though the landholders' gains from the high prices of produce during the four years of the American war (1862-1865) were to a great extent cancelled by the badness of those seasons, still the husbandmen drew large profits from the high wages of unskilled labour, which in Bombay rose from 15s. 6d. (Rs. 7½) to £1 7s. (Rs. 13½) a month. Besides in Bombay high wages were paid to the workers in the railway especially on the ascent of the Bor pass which was not completed till 1863. Following on this after a short interval came an increased expenditure on local public works, which in the Poona district alone in 1868-69 rose to about £310,000 (Rs. 31 lakhs). During the five years ending 1867, the cantonment of Poona was the scene of extraordinary activity in private house-building. The sums spent on ordinary labour in these works could not have been much, if at all, less than those spent by Government in the same area. Besides the advantage of high wages the agricultural population drew a more questionable advantage from their position as landholders. Through the immense stimulus given to the production of cotton and because of the cheapness of money, field produce and land had risen so high that the landholder's power as a borrower was that of a capitalist rather than of a labourer.

The increase in the value of land is illustrated by the rise in the number of suits connected with land from seventy-five in 1851 to 282 in 1861 and to 632 in 1865.² At the same time the increase in the landholder's credit is shown by the fall in the compulsory processes for the recovery of debt. Thus, though during this period of extremely high prices, the husbandman's land may have, on account of the badness of the seasons, brought him little actual income, it brought him the fatal gift of unlimited credit.

In 1865 with the close of the American war the inflow of capital ceased. Prices did not at once fall as 1866-67 was a season of severe drought, 1867-68 of partial failure, and 1870-71 of serious

Chapter V.
Capital.
Borrowers.
Husbandmen.

¹ On the 17th of May 1875, Mr. W. M. P. Coghlan, the Sessions Judge of Thana, wrote, 'In bonds founded on old bonds which have nearly run the period of limitation, it is impossible to estimate what proportion of the consideration was actual cash payment. The Limitation law, a statute of peace made for the protection of borrowers, became an engine of extortion in the hands of the lenders. When a bond is nearly three years old the creditor by threatening proceedings presses the debtor to pass a new bond for a sum equal to the principal and interest of the old bond and sometimes with an additional premium.' According to the Judge of the Small Cause Court of Ahmadabad, 1st September 1875, the short term which the Limitation Act introduced caused great hardship and furnished lenders with opportunities for cheating their debtors. The debtors are harassed every two years to pay the money or to pass a new bond. Creditors always leave a margin of one year as a measure of precaution. If the law makes three years they always make it two, because they may have to go to another place or the debtor may go elsewhere. Two years is not a long enough time to give a husbandman to pay money. Perhaps it was borrowed for his son's marriage, or for planting sugarcane, or making a garden, and will take him six or seven years to clear.

² The details are : 1861, 282 suits ; 1862, 591 ; 1863, 520 ; 1864, 580 ; and 1865, 632.

Chapter V.
Capital.

BORROWERS.
Husbandmen.

failure, and the very large sums which were spent on local works till 1871 further helped to keep up produce prices. After 1871 the expenditure on public works declined, the harvests were good, and the price of millet fell from forty-four pounds in 1871-72 to sixty-five pounds in 1873-74. From 1867 the settlements of land revenue made thirty years before began to fall, and the revision resulted in a considerable increase in the Government demand.¹ All these circumstances contributed to contract the landholder's means and materially reduced the margin available for the lender, while it is possible that the landholders did not contract in the same proportions the more costly mode of living which high wages had justified. Debts increased and the husbandmen began to mortgage their lands more deeply than before. In 1871 the failure of crops called for large remissions. Other causes prevented the rental actually levied from reaching the full amount of the revised rates, and in 1874, in consequence of the fall in produce prices, the revised rates were reduced. Still the effect of the new settlement was a large retrenchment from the landholder's profits.

The effect of the sudden fall in produce prices between 1871-72 and 1873-74 aggravated by other circumstances, was first to reduce the landholder's power of paying, secondly to make creditors seek by all means in their power to recover their debts or to enhance their security by turning personal debt into land mortgage, and lastly to check further advances to husbandmen.² During the same period there was a marked increase in the difficulty of ~~collecting the land revenue~~. Not only in the sub-divisions where the enhanced assessments pressed directly upon the moneyed classes, who were able to organize and sustain resistance to the demands of Government, but in others, the period from 1868-69 to 1873-74 was marked by an unusual amount of remissions and arrears. The business of lenders was also reduced to the last point. At the same time the area held for tillage considerably contracted.

The pressure on the landholder to pay what he owed and the unwillingness of the lender to make further advances were gradually increasing from 1869 to 1875. An order of Government in the Revenue Department,³ framed with the object of preventing the sale of land, directed that process to recover land revenue should

¹ The following table shows the results of the revisions :

Poona Revision Survey Results, 1869-1872.

Sub-Division.	Former Demand.	Revised Demand.	Increase.	Per-centage.
	Rs.	Rs.	Rs.	
Indápur	81,184	1,25,846	44,661	55.01
Bhimthadi	81,475	1,83,181	51,656	63.40
Haveli	80,475	1,43,174	52,699	65.48
Fábal	92,359	1,39,815	46,956	50.84
Supa,	89,926	73,788	18,862	21.47

² The lender's distrust in the borrower was shown by the rise in the number of registered deeds in Bhimthadi and Indápur from 752 in 1866 to 874 in 1869, 1195 in 1870, 1217 in 1871, 1374 in 1872, and 1414 in 1873.

³ Resolution 726, 5th February 1875.

issue first against the movable property of the occupant, and that the land should not be sold until after the sale of the movable property. This order the moneylenders turned to their own advantage at the expense of the landholders. In February and March 1875 the lenders refused to pay the second instalment of revenue on land whose produce they had received from their debtors. Landholders who found their movable property attached, after they had handed their creditors the produce of the land on the understanding that they would pay the rents, naturally felt that they were the victims of deliberate fraud. The feeling of ill will was strong and widespread.

In 1874 a band of Koli outlaws, on the western hills of Poona and Ahmadnagar, directed their robberies almost entirely against the lending class. So great was the terror that for many months a large tract of country enjoyed complete freedom from the exactions of Márwári creditors and their agents.¹ This fact and the story that an Englishman, who had been ruined by a Márwári, had petitioned the Empress and that she had sent orders that the Márwáris were to give up their bonds brought matters to a crisis. Even the more educated villagers believed that on a report from India orders had come from England that the Márwáris were to have their bonds taken from them. In some form or other this report was circulated and a belief established that acting under orders from England, the Government officers would connive at the extortion of the Márwáris' bonds. During 1874 the district officers had been called upon to furnish information regarding the people of the district for the compilation of the Bombay Gazetteer. Among other subjects the business of the moneylender, the leading characteristics of his professional dealings, and his relations to the landholding classes had been inquired into. This gave room for supposing that the Government, hearing of the ill-treatment of the landholders by the lenders, had caused inquiry to be made and had now given an order which would redress their wrongs. This resulted in the Deccan Riots of 1875.²

The first sign of open hostility to the Márwári moneylender among the orderly villagers of the Poona plain, was shown by the people of Karde in Sirur. A *deshmukh*, or district hereditary officer, named Bábásáheb, a man of good family and some influence, who had made a fortune in the service of His Highness Sindia, had settled in the village. He spent his fortune and fell into debt. Two of his creditors, Kálurám and Bhagvándás, both of them Márwáris, got from the Talegaon court decrees against Bábásáheb. Kálurám took out a warrant of arrest. Bábásáheb

Chapter V:
Capital.
BORROWERS.
Husbandmen.

Deccan Riots

¹ Between 1870 and 1874 moneylenders suffered in one case of murder, seven of robbery, eight of mischief, twenty-four of theft, twenty-nine of hurt, and eight of criminal force, or a total of seventy-seven offences in five years. Deccan Riots Commission Report, 9.

² The feeling of hostility between the landholders and their creditors which found expression in the riots had been increasing for some time, and had it not been for a transient period of prosperity, the crisis would have happened long before. Bom. Gov. Sel. CLVII (New Series), 2.

Chapter V.
Capital.
BORROWERS.
Husbandmen.

gave Kálurám personal ornaments and the warrant was not executed. About four months later some ornaments and property belonging to the temple of Vithoba at Bábásáheb's house were attached, but, at the instance of the villagers, Kálurám allowed the attached property to remain in deposit with a third party for two months. At the end of the two months, as Bábásáheb had not paid the value, Kálurám carried off Vithoba's ornaments. A third execution was issued on Kálurám's decree, and Bábásáheb's houses and lands were attached and sold to Kálurám for the trifling sum of £15 (Rs. 150). In December 1874 Kálurám began to pull down Bábásáheb's house, and refused to listen to his entreaties not to ruin the house. Enraged at Kálurám's conduct Bábásáheb gathered the villagers and persuaded them that as the Márwáris had begun to ruin them they must cease to borrow from them and refuse to work for them or to buy from them. The villagers agreed and one of them opened a grocer's shop at which all the village purchases were made. The Márwáris were put to the greatest inconvenience for want of servants. Besides refusing to serve them as water-carriers, barbers, or house-servants, the villagers annoyed the Márwáris by throwing dead dogs and other filth into their houses. These signs of hate so scared the Márwáris that they retreated to Sirur for police protection and represented to the Magistrate that they were in bodily fear of the villagers. At the same time the villagers submitted a petition to Government praying that as they had given their grain to the Márwáris, the Márwáris should not be allowed to leave the village until the Government assessment had been paid. The Magistrate reported to the Commissioner the dangerous spirit shown by the people. The example of the people of Karde was followed by other villages. Before any outbreak occurred the Márwár moneylenders had in several places been subjected to similar social outlawry and petty annoyance.¹

The first outbreak occurred at Supa, a large Bhimthadi village, on the 12th of May 1875. The victims were a large number of Gujarát Váni moneylenders. Their houses and shops were attacked by a

¹ The following is the substance of a *samápatra* or agreement executed by the people of Kalas in Indápur. Fields belonging to Gujars which may have been leased to villagers shall not be tilled. No man nor woman shall take service with a Gujar. Any one tilling a Gujar's field or working for him will be denied the service of the village barber, washerman, carpenter, ironsmith, shoemaker, and other village servants. Fields belonging to lenders other than Gujars shall not be taken on lease by any one. Fields already leased shall be given up. If the village Mhárs undertake to dun the villagers on behalf of the Gujars they shall be refused their usual alms and bundles of grain stalks. The villagers shall abide by these conditions. If the headman joins the Gujars and other lenders, his hereditary right shall cease and his authority be disregarded. If the village priest or accountant joins the moneylenders his dues shall not be paid. The villagers shall engage any priest they choose, and the claims of the hereditary priest will not be recognized. If the headman or the priest is put to any expense on behalf of the villagers the villagers shall subscribe the sum. All landholders shall behave in accordance with these rules; any one acting to the contrary will neither be allowed to come to caste-dinners, nor to marry with the people of his caste. He shall be considered an outcaste. He will not be allowed to join the community without their unanimous consent, and will have to pay the fine which the community may inflict on him and further will have to give a dinner to the community. Dated *Vaishákh Shuddh 2nd Shák 1787*, that is 7th May 1875. Afterwards under the influence and advice of the Superintendent of Police the villagers agreed to return to their old relations with the moneylenders.

mob recruited from the hamlets round Supa who had met nominally to attend the weekly market. One Gujar's house was burnt down, and about a dozen other houses and shops were broken into and gutted. Account papers, bonds, grain, and country cloth were burnt in the street. No personal violence was used. The chief constable of the sub-division with six or seven constables secured about fifty persons and recovered stolen property worth £200 (Rs. 2000). The loss was represented by the Gujars at £15,000 (Rs. 1½ lakhs); it was not really more than £2500 (Rs. 25,000). Within twenty-four hours of the riot at Supa, the leading Márwári lender of Kédgaon about fourteen miles to the north of Supa had his stacks burnt down and his house set on fire. During the following days riots occurred in four other villages of Bhimthadi, and were threatened in seventeen more.¹ The contagion spread to the neighbouring sub-divisions of Indápur and Purañdhar. In Indápur a disturbance, which from the numbers present would have been serious, was averted, as were the riots threatened in the seventeen Supa villages, by the promptitude of the police. A detachment of Native Infantry arrived at Supa, the police were relieved and available for other duty, and order was quickly restored.

About the same time riots occurred in Sirur. The first act of violence was committed at Navra, where a Márwári, who had left the village for safety, was mobbed and prevented from moving his property. An uncle of this Márwári some two years before had been murdered by his debtors. Other Sirur villages followed the example of Navra.² In fifteen Sirur and three Haveli villages

¹ In the village of Morgaon a crowd assembled, Vánis were threatened and bonds demanded, violence was prevented by the timely arrival of the police. At Dhond a Váni was severely treated because he would not give up his bonds, and a large crowd assembled. Five ringleaders were punished. At Ambekhurđ two Vánis' houses were forcibly entered, their account-books destroyed, and bonds taken away. Six of the ringleaders were punished. In Aligaon about two hundred men from the surrounding villages of Nargaon, Nandgaon, Andhalgaon, Kolgaon, Dolas, and Vadgaon, assembled, headed in some instances by their headmen and village police, and demanded their bonds from the Vánis threatening if they refused to treat them as the Supa Vánis had been treated. The police patel of the village, with the assistance of the Rámoshis Mhárs and other well disposed people, dispersed the assembly who threatened the Vánis with another visit. The inhabitants of Vadgaon again collected in numbers and compelled one of the Vánis of their village to give up his ~~bonds~~ went through his house, broke open the back entrance of the next house, illtreated the female Váni owner, compelled her to point out where the bonds were kept, broke open the box, and took the bonds, burning or otherwise destroying papers worth £100 to £1200 (Rs. 1000-12,000). A similar assembly at Mandgaon took possession of bonds of the value of £600 (Rs. 6000) and about half of them were destroyed. At Ráhu a Márwári who had been incessantly threatened fled to Phulgaon, and was not allowed to remove his property and family. A large stack of fodder belonging to him was destroyed. At Pimpalgaon, the villagers took away bonds from small moneylenders among whom was a Chámbháar who had only one bond for £3 10s. (Rs. 35). The police patel on his way to report the matter to the Police Superintendent was stoned.

² At Dháruře the houses of two Márwáris were simultaneously attacked, bonds worth £1200 (Rs. 12,000) were forcibly taken, and the owners were stoned. One old Márwári had his leg broken. He was confined in his house and the house set on fire. He was saved but his and the other Márwáris' houses were burnt. The chief constable was also threatened and was not allowed to carry on the work of investigation. This shows that everywhere the same influences had brought the villagers to the same readiness to resort to force. Subsequent inquiries leave no doubt that the rioters at Supa had the sympathy and countenance of some influential

Chapter V.
Capital.

BORROWERS.
Husbandmen.

riots either broke out or were threatened.¹ The regiment of Poona Horse whose head-quarters are at Sirur supplied parties to help the Magistrate and police in restoring and maintaining order. More or less serious disturbances took place in five villages of Bhimthadi and six villages of Sirur. They were threatened but averted by the arrival of the police in seventeen villages of Bhimthadi, in ten of Sirur, in one of Indapur, and in three of Haveli. Of 559 persons arrested, 301 were convicted and 258 discharged. Punitive police posts were established in the disturbed villages at the people's expense. The riot at Supa was singular in the wholesale plunder of property and the Damare riot in the murderous assault on the moneylenders. In a few other cases personal violence was used, and in several places stacks of produce belonging to moneylenders were burnt. As a rule the disturbances were marked by the absence of serious crime. In every case the object of the rioters was to obtain and destroy the bonds and decrees in the possession of their creditors. When bonds were peaceably given the mob did no further mischief. When the moneylender refused or shut his house violence was used to frighten him into surrender or to get possession of the papers. In most places the police interfered during the first stage of assembling and prevented violence. From many villages the Márwári moneylenders fled on the first news of the outbreak. In other villages they opened negotiations with their debtors for a general reduction of their claims, and in some cases propitiated their debtors by easy settlements. In almost every case inquired into, the riot began on hearing that in some neighbouring village bonds had been extorted and that Government approved of the proceeding. Almost the only victims were Márwáris and Gujars. In most villages where Bráhmán and other castes shared the lending business with Márwáris the Márwáris were alone molested. In some villages where there were no Márwáris, Bráhmáns were attacked. The last of the connected series of outbreaks occurred at Mundhali in Bhimthadi on the 15th of June. Afterwards two isolated cases in Poona showed that the long catalogue of convictions and punishments and the imposition of punitive police posts had repressed not quenched the people's rage. On the 22nd of July seven men of the village of Nimhhat in Bhimthadi, besides robbing papers, cut off the nose of a man who was enforcing a civil decree which had put him in

persons of their village, and the presence of these persons may perhaps account for the first occurrence of open violence at Supa. But the condition of the villages through the whole affected area was such that even had Supa not taken the initiative, some other places would doubtless have done so. The combustible elements were everywhere ready; design, mistake, or accident would have surely supplied the spark to ignite them. The ringleaders generally belonged to the cultivating classes, their only object being to escape from the hands of the moneylenders. When a riot began all the bad characters in the village took part in hopes of plunder.

¹ While these disturbances were going on in Poona similar outbreaks occurred in the neighbouring district of Ahmadnagar. During the fortnight following the Supa riot on the 12th of May riots took place in eleven villages of Shrigonda, six of Párner, four of Nagar, and one of Karjat and besides actual rioting there were numerous gatherings which were prevented from coming to violence by the timely arrival of the police or military. A detachment of Native Infantry was moved to Shrigonda and parties of the Poona Horse were active in patrolling the villages in the west within reach of their head-quarters at Sirur.

possession of land belonging to one of the men who attacked him. On the 28th of July the villagers of Karhāti in Bhimthadi broke into the house of a Márwāri moneylender and took a store of grain. The Márwāri had refused to advance grain except on terms to which they could not agree.¹

The most remarkable feature of these disturbances was the small amount of serious crime. A direct appeal to physical force, over a large area, was usually restrained within the limits of a demonstration. The few cases which bear the vindictive spirit usually shown in agrarian disturbances were probably due to the presence of other rioters besides the ordinary Kunbi peasantry. This moderation is in some measure to be attributed to the nature of the movement. It was not so much a revolt against the oppressor, as an attempt to accomplish a definite and practical object, the disarming of the enemy by taking his weapons, his bonds and accounts. For this purpose a mere demonstration of force was usually enough. Another circumstance which contributed to the moderation of the peasantry was that in many cases the movement was led or shared by the heads of the village. It was doubtless an aggravation of the breach of law that those who should have maintained order contributed to disturb it. Still an assembly of villagers acting under their natural leaders for a definite object was a less dangerous body than a mob of rioters with no responsible head. The chief cause of the moderation was the natural law-abiding spirit of the Kunbi peasantry. In so orderly and peaceful a people such a widespread resort to force proved the reality of their grievances.²

That the riots ceased was due not merely to the prompt action of the police and the military, but to the assurance of the civil authorities that complaints should be inquired into and proved grievances redressed. Accordingly in 1875 the Bombay Government appointed a commission to inquire into the causes underlying the outbreak. The members of the commission were Messrs. Richey and Lyon of the Revenue and Judicial branches of the Bombay Civil Service, Mr. Colvin of the Bengal Civil Service, and Rāv Bahádur Shambhuprasád Laxmilál a distinguished Gujarāti administrator. Subsequently Mr. Carpenter of the Bengal Civil Service took the place of Mr. Colvin whose services were elsewhere required. The Commissioners held inquiries in disturbed parts, recorded the statements of landholders and of lenders, and compiled other evidence obtained on the spot and in the records of Government. Their report, which was submitted to Government in 1876, contained a detailed history of the relations of the Deccan landholders and moneylenders since the beginning of British rule.

Chapter V.
Capital.
BORROWERS,
Husbandmen.

*Deccan Riots
Commission.*

¹ Beside these two cases in Poona, on the 8th of September in the village of Kukrur in the Válva sub-division of Sátára more than 100 miles from the nearest disturbed part of Poona, a riotous outrage was committed in all respects similar to the Poona and Ahmadnagar riots. About 100 or more villagers attacked, plundered, and burnt the house of a leading Gujar moneylender, gathered all the papers and accounts which they found in the house, destroyed them, and dispersed. The cause was declared to be the harsh proceedings of the moneylender against his debtors.

² Deccan Riots Commission Report, 7.

Chapter V.
Capital.
BORROWERS.
Husbandmen.

The result of the commissioners' inquiries into the relations between moneylenders and husbandmen in the Deccan was that the normal condition of the bulk of the landholders was one of debt. About one-third of the landholders were pressed by debt, averaging about eighteen times their yearly rents, and about two-thirds of it secured by mortgage of land. Of the two-thirds who were not embarrassed some were well-to-do. But immediately above the embarrassed was a class with little property to fall back on whom a succession of bad years or a fall in produce prices would plunge in debt.¹ The estate of an average Kunbi landholder, exclusive of his land and its produce, was estimated to have a sale value of little more than £20 (Rs. 200).²

The district lenders belonged to three classes. The first class included small traders and village moneylenders, mostly Márwár and Gujarát Vánis and a few Lingáyat and Vaish Vánis and Bráhmans chiefly village accountants. These advanced grain for seed and food and money upon pledge, mortgage, and good security. They were specially hateful to the people and on them fell the burden of the 1875 troubles. The second class were the rich bankers or traders of large towns. Among these, besides Gujarát, Lingáyat, Márwár, and Vaish Vánis, were many Yajurvedi Deshasth Bráhmans. The village accountants or *kulkarnis* who were small moneylenders were generally closely connected with these Bráhman bankers. They had also relations with pleaders and to some extent with local officials. They dealt much less in grain advances than the lower class of traders. In the same way as *kulkarnis* acted as agents to rich pleaders and other moneylending Bráhmans so small village Vánis were often the agents of their rich castefellows. The Bráhman and Váni lenders who worked through Bráhman and Váni village agents were less unpopular than the Márwár lenders. Those who were Bráhmans derived some advantage from their caste and community of country and religion. Still as a body they were bad

¹ In twelve villages, of 1876 holders of land, 523 who paid a total yearly rental of Rs. 10,000, were embarrassed with debt. The debt amounted to Rs. 1,94,242 of which Rs. 1,18,009 were on personal security and Rs. 76,233 on mortgage of land. In another 24 villages the number of occupancies held by lenders in the years 1854, 1864, and 1874, with their area and the assessment payable at each period, were :

ITEM.	1854.	1864.	1874.
Holdings ...	164	208	272
Acres ...	4001	5292	10,075
Assessment ...	1924	3721	7134

In noting these figures it must be remembered that during the latter part of the period embraced, there was little unoccupied waste and the increase in lenders' holdings implies a corresponding decrease in the holdings of the cultivating class. It will be observed that the increase in the assessment is greater than the increase in area showing that the better class of land was passing into the lenders' hands, and further that the increase in the number of holdings shows an increase in the number of lenders. Deccan Riots Commission Report, 33.

² The details are: live stock Rs. 125, tools and vessels Rs. 20, house Rs. 50, and miscellaneous Rs. 20; total Rs. 215. These items are subject to depreciation and imply yearly charges for maintenance and renewal.

landlords and most intriguing and scheming. The third class consisted of husbandmen who had kept out of debt and were able to make their neighbour small advances in money and grain. They were often grasping and dishonest, but their debtors dealt with them much more on an equality, and community of race and residence not only tended to kindly treatment but brought any unusual villainy under the sanction of the public opinion of the caste and village. Most of them were husbandmen and valuable landholders. Husbandmen lenders were sometimes threatened during the 1875 riots but in no case was a lender of this class injured.¹

Chapter V.

Capital.

BORROWERS.
Husbandmen.

A notable feature of the moneylenders' dealings was the system of retail business which reduced even the most trivial transactions to written contracts. The invariable use of bonds was probably partly due to the precarious character of the landholder's assets and partly to the uncertainty of the climate. The terms on which the moneylenders dealt were that every debit was to be protected by a bond giving them unlimited powers of recovery and that the credit side was to be left to their own honesty. Account current was hardly known. There was usually a debt of long standing, probably inherited, the interest of which made a yearly debit. Besides this debit there were the give-and-take or *devghev* dealings, in which the debtor delivered his produce, or as much produce as he was forced to deliver, to his creditor and the creditor supplied the debtor's needs, clothing, assessment, seed, food, and cash for miscellaneous expenses. Every now and then a larger item appeared on either side, a standing crop was perhaps sold after a valuation either to the creditor himself or another, the creditor in the latter case getting the price paid, or a pair of bullocks or a cow and calf were given to the creditor on account. Against this the debtor drew occasionally a considerable sum for a marriage, for the purchase of land or bullocks or a standing crop, or for digging a well. Bonds were continually passed as the account went on. Sometimes a bond was taken as a deposit and the debtor drew against it, or a small transaction was included in a larger bond and the debtor was to draw against the balance. Mārwāri moneylenders kept accounts, but often only in the form of a memorandum book. Moneylenders who did not belong to the trading classes often kept no accounts. With all the bond was the recognized record of the transactions. Bonds were never or very rarely made for large amounts. When a large debt was to be reduced to paper, several bonds were drawn. Thus a debt of £17 10s. (Rs. 175) would be represented by one bond of £10 (Rs. 100); another of £5 (Rs. 50), and a third of £2 10s. (Rs. 25). The chief object of this arrangement was that the moneylender might get a decree without much cost. A decree on the £2 10s. (Rs. 25) bond usually gave him power enough to force his debtor to meet demands on account of the entire debt of £17 10s. (Rs. 175). Again, interest usually ceased when a bond was turned into a decree, so that it was not to the bond-holder's

¹ Mr. W. F. Sinclair, Assistant Collector, Deccan Riots Commission Report, 25

Chapter V.
Capital.

BORROWERS.
Husbandmen.

advantage to take a decree to meet the whole debt. When the debt had reached an amount to meet which the borrower's personal security was not sufficient, it was commonly converted into a land mortgage. Where the debtor owned a well or a share in a well the well or share together with the water and land were preferred as security. Sometimes the joint security of another landholder was added to the personal bond. In such cases the joint surety usually had a direct interest in the loan, or as a near relation helped the debtor, or his security was obtained by private arrangement. Often before the mortgage of his land the debtor's house, bullocks, crops, and carts, or other movable property were mortgaged. When bullocks were mortgaged, the debtor had to pay for their hire which became the interest of the loan. When the mortgage of land was completed, the lender almost always began by leaving the debtor in occupation as tenant, and a form of mortgage existed in which the profits of the land were all that was mortgaged as the tenant was left in possession without any transfer or acknowledgment of the mortgagee's right, so long as the mortgager delivered the produce yearly.¹ If the debtor failed to deliver the produce the mortgagee usually took possession. Sometimes the produce of the land was made to represent the interest of the loan; more usually a specific rate of interest was cited in the bond. The debtor held as tenant on every variety of terms and conditions.² Another form of mortgage, which was usually entered into only when the parties had come to a final settlement, was the transfer of the land to be enjoyed for a certain number of years in satisfaction of the debt. When an agreement of this kind was made it usually happened that before the period ended, the mortgagee had established claims giving him a further lien on the land. A similar method of settlement by an instalment bond was gladly accepted by a debtor, but here again the failure to pay one instalment in a bad year usually

¹ The right of occupancy was not transferred to the creditor in the Government books as was generally the case in the neighbouring district of Ahmadnagar.

² These were often reduced to writing. They were either leases, deeds of partnership, or simple contracts in which a rent in money was stipulated. It would often be found that the rate was adjusted to cover the interest agreed on in the mortgage bond. As the amount of capital in the mortgage bond was usually more than the value of the land at twelve per cent interest, and as the rate of interest in the bond was usually at least eighteen per cent, it followed that the land would not yield the required sum and thus the mortgagee constantly received the full actual rent of the land and in addition exacted bonds for the yearly deficit. The rent was often settled in kind and the rates were mainly determined by the power of the mortgagee to grind his tenant. One mortgagee's tenant in his statement to the Deccan Riots Commissioners used the following words, 'I till the land, but I have no right to take for my use any of the produce.' Doubtless under the hardest conditions the tenant who was bound to hand over the entire produce of a field to his creditor did take something. On the other hand much land was held by mortgagee's tenants at the usual rental terms, that is, half of the grass produce of dry and one-third of watered land, the mortgagee paying the assessment, and the seed and expenses being shared in the proportion of their respective interests in the crop. When the tenant paid in kind, his payments might exceed the amount of interest stipulated in the mortgage bond; but he kept no account of such payments and was generally found to have no conception of his responsibility for accounts. As the responsibility could not be enforced by the landholder it practically did not exist. Doubtless most mortgagee landlords had an account, but the landholder could not get it without going to court which to him was out of the question. Deccan Riots Commission Report, 62.

gave the debt a fresh departure. The mortgagee landlord usually allowed the landholder to till the mortgaged land, and so long as the holder was left in this relation to his fields he accepted his fate without much bitterness. It often happened that owing to default in payment by the tenant, or to better terms being offered by another, or to the tenant's cattle and field-tools being sold in execution of decree, it ceased to be the interest of the mortgagee to leave the cultivation in the tenant's hands and the land was taken from him. Besides the security of the landholder's personal credit, stock, movables, house, lands, and the joint security of a surety, the labour of the borrower was also mortgaged to the lender. The terms of this form of bond were that the debtor was to serve the creditor and that his wages were to be credited at the end of the year, or that a certain sum was to be worked out by service to the lender for a certain period. Sometimes the wife's labour was also included in the bond. The labour was given either in house or field service. The labourer got his food and clothing, and a monthly deduction of 2s. to 4s. (Rs. 1-2) was made from the debt. The labourer's whole time was at the lender's disposal.¹

Chapter V.
Capital.
Borrowers.
Husbandmen.

The chief complaints made against moneylenders were that bonds usually ran at excessive interest;² that at every stage the borrower was defrauded by the lender and especially by the petty usurer; that the lender often declined to give accounts, refused receipts, omitted to credit payments or give interest on payments, and declined to carry out such stipulations in the bond as were in the borrower's favour. Forgery was sometimes practised and the landholder from his ignorance was unable to prevent his creditor from taking advantage of these nefarious practices. Another way in which the landholder suffered was by the reduction, under the Act of 1859, of the time during which money bonds were current to the small period of three years. A new bond must be entered into every three years and the interest being added up and a new account struck the amount of compound interest was swelled eventually to a very large sum. In addition to the compound interest the creditor usually took the opportunity of renewing a bond to extort fresh and burdensome stipulations under threats of suing his debtor in court, all of which added to the total of the debt.³

Besides these usual complaints of the cultivator against the moneylender he had the following grievances. When the cultivator was sued in court, at the outset he was met with fraud. From the creditor's influence over the subordinates of the court no summons

¹ Dr. Coats (Trans. Bom. Lit. Soc. III. 239) has the following notice of labour mortgage at Lonj in 1820. In return for an advance of money for a marriage, servants sometimes bind themselves to serve their masters for a term of years for clothes, board, and lodging. About six years would be wanted to clear an advance of £10 (Rs. 100).

² In many cases in which the less intelligent husbandmen were the borrowers, the interest charged was so excessive as to amount to fraud and oppression.

³ In the minute of Mr. Shambhuprasád who sat on the Commission of 1875, a case is cited in which an advance of £1 (Rs. 10) was made in 1863. Sums amounting to £11 (Rs. 110) were paid from time to time, and, at the end of ten years, £22 (Rs. 220) were still due. Bombay Government Selection CLVII. 13.

Chapter V.
Capital.

Borrowers.
Husbandmen.

was served and the court being told that the summons had been served gave a decree against the debtor in his absence. The distance he had to travel to a court prevented a defendant attending.¹ The defence of a suit took longer than the defendant could spare, and the judge had not time to go into the right of the defendant's case and make up to him for the want of counsel. The high costs of suits was another reason why the defendants declined to contest their cases. It was after the lender had gained his decree that the borrower suffered most. He might be arrested and imprisoned. Civil imprisonment was peculiarly open to abuse and was often made use of to impose on prisoners more severe terms than could otherwise be obtained. The next hardship to the landholding debtor was that movable property of all kinds and land could be sold without reserve. In spite of the harshness and the dishonesty of many of its members, the class of moneylenders was of the greatest service to the landholders. They helped them to meet their special family expenses and to enlarge their holdings and increase their stock, they tided them over seasons of scarcity and enabled them to pay their rents.

The Commissioners' chief recommendations were, with regard to the husbandmen's poverty, to improve agriculture by irrigation and to modify the Land Improvement Act so as to make the help which Government was ready to give more available to the husbandman; with regard to the revenue system, they advised the adjusting of the Government demand to the husbandmen's capacity and when the assessment was enhanced that the increase should be gradual; with regard to the defects of the law they advised that a Bill should be passed to prevent frauds, and to protect husbandmen in the first stages of debt before the creditor had gone to the civil court. The chief provisions of the proposed Bill were the appointment of public notaries and the enforcing of the delivery of receipts and accounts by creditors. To meet hardships incurred by the debtor through the excessive powers given to the decree-holder, the absence of all protection to the insolvent debtor, and the use of decrees as a threat, the Commissioners advised the passing of another Bill, the chief provisions of which were the abolition of imprisonment for debt, the exemption of necessaries from sale in execution, the protection of the judgment-debtor from the wrong use of a decree, making the decree the end of the suit, and the limitation of decrees. The Commissioners also recommended certain changes in the conduct of judicial business, the establishment of village courts, and the passing of an Insolvency Act.

Meanwhile the relation of the debtor and the creditor somewhat improved. The 1874-75 disturbances had opened the eyes of the creditors to the danger of treating their debtors too harshly, and the famine of 1876-77 turned the thoughts both of creditors and debtors into other channels. A new Civil Procedure Code (Act X. of 1877) came into force in October 1877. Section 266 of the Code made the

*Few Civil Procedure
Code (Act X of
1877).*

¹ In the majority of cases it was alleged that the reason why the defendant did not appear was that he had no defence to make, that he had no money to pay for a pleader, that he was unwilling to lose the time involved in defending a suit, or that he was afraid of the subsequent vengeance of the creditor whom he had opposed.

Chapter V.
Capital.
BORROWERS.
Husbandmen.

important change of exempting from attachment or sale in execution of decrees, tools, implements of husbandry, cattle enough to enable a judgment-debtor to earn his livelihood as a husbandman, and the materials of houses and other buildings belonging to and occupied by agriculturists. Under section 326 the Collector of the district is empowered to represent to the court that the public sale of land which has been attached in execution of a decree is objectionable and that satisfaction of the decree may be made by the temporary alienation or management of the land; that, therefore, the court may authorize the Collector to provide for the satisfaction of the decree in the manner which he recommends. Section 320 enables the local Government, with the sanction of the Governor General in Council, to declare that in any local area the execution of decrees of any particular kind in which the sale of land is involved, shall be transferred to the Collector, and sections 321 to 325 invest the Collector with powers to manage or to deal with the land as if it were his own and to adopt one or more of several modes of satisfying the decree without selling the land except in the last resort.¹ By section 336, the local Government may direct that every judgment-debtor brought before a court in arrest in execution of a decree for money shall be informed by the court that he may apply to be declared insolvent. Section 358 shows special consideration to the debtor if the debt is less than £20 (Rs. 200). Thus in several respects the new code improved the debtor's position. To place the relations of the debtor and the creditor on a better footing it was deemed necessary, To provide some safeguard against the moneylenders committing frauds in their accounts and obtaining from ignorant peasants bonds for larger amounts than were actually paid to or due from them; As far as possible to arrange disputes by conciliation, to increase the number of courts, and so to simplify and cheapen justice that husbandmen might defend suits; To insist that in suits against landholders the court shall in certain cases of its own motion investigate the entire history of the transactions between the parties and do substantial justice between them; and To restrict the sale of the debtors' land in execution of a decree and to provide an insolvency procedure more liberal to the debtor than that of the Code of Civil Procedure. To secure these objects the Deccan Agriculturists' Relief Act (Act XVII. of 1879) was passed by the Governor-General's Council. The principal object of legislation was to restore the dealings between lender and borrower to an equitable basis. The aid of the Government is withheld in the case of demands manifestly unfair and extortionate, and is rendered more speedy and effective in the recovery of just dues. As far as possible, credit is restricted within the limits set by the prospects of the certain recovery of the value of the amount lent. The first considerable change introduced by the Act was the appointment of village registrars before whom every instrument to which a landholder is a party must be registered before it can be used against him as evidence of his indebtedness. At first

*Deccan
Agriculturists'
Relief Act.*

¹ Poona was one of four districts to which this section was immediately applied. The other districts were Ahmadnagar, Sholapur, and Satara.

Chapter V.
Capital.
Borrowers.
Husbandmen.

most of the persons appointed as village registrars were the hereditary village accountants of the larger villages, but, as their work was not satisfactory, special registrars have been substituted each being in charge of a circle of about twenty villages. The second notable point in the Act is the appointment of sixty-two conciliators, men of influence before whom the creditor must bring his claim before he can file a suit in the regular courts, and whose duty it is to assist in or bring about the compromise of money disputes. To compel litigants to have recourse to these conciliators it is enacted that a claim for money against a landholder is not to be entertained by the Civil Courts unless accompanied by a conciliator's certificate that he has attempted to effect a compromise. Such compromises are filed in the records of the Civil Courts and have the force of decrees. The next measure by increasing their number brought the courts more within reach of the people and made them less technical and less costly. The result is that only a few villages are more than ten miles distant from a civil court. Village munsiffs were also appointed and invested with summary powers extending to suits for the recovery of amounts not exceeding £1 (Rs. 10). Twenty-three village munsiffs' appointments were made, and the individuals are pronounced fairly competent. The office was purely honorary. They disposed of a large number of suits, but as few of these were brought by or against landholders their institution afforded little or no relief to the cultivating classes. A special Judge and assistant judge and special subordinate judges have been appointed for the Poona, Sátára, Sholápur, and Ahmadnagar districts to inspect and revise the work of the subordinate establishments instead of the ordinary right of appeal which has been withdrawn. Professional legal advisers have been excluded from the courts of the conciliators and village munsiffs and also from the courts of the subordinate judges when the subject-matter of a suit is less than £10 (Rs. 100) in value, unless for special reasons professional assistance seems to the subordinate judge to be necessary. This provision does not seem to have proved popular. In the absence of the agent or *vakil* frequent personal attendance is required of the parties, and the waste of time and money is said to be greater than the cost of retaining counsel. A very important section makes it binding on the court to inquire into the history and merits of every claim brought before it with a view to testing its good faith. This provision is unpopular with the lender and is believed to have greatly influenced the number of suits instituted since the Act came into operation. Interest, too, is not to be awarded to an amount exceeding that of the capital debt as ascertained on taking the account. The person of the agriculturist is exempted from arrest and imprisonment, nor can his land be attached or sold unless it has been specially mortgaged for the repayment of the debt in question. If the court so directs, the land may be made over for a period to the management of the chief authority of the district with a view to the liquidation of the debt. Again the limitation in respect of money suits has been extended, payment of amounts decreed may be ordered by instalments, and a landholder can now be declared insolvent and be discharged summarily when his debts do not exceed £5 (Rs. 50), and

in other cases after a procedure specified in the Act. The insolvency chapter continues wholly inoperative. The indifference of the debtor cannot be altogether explained on the ground of religious scruples or the fear of the loss of credit and social status. The Relief Act has conferred so many other privileges and immunities on the indebted landholders that the necessity of having resort to the extreme measure of seeking relief by insolvency has not made itself so much felt as might have been expected. The debtor's freedom from arrest and imprisonment, the exemption of his immovable unmortgaged property from attachment and sale, the large reductions in the amount of his debt effected by conciliation and the procedure under the Act, the privilege of paying the balance by easy instalments, and the consequent cessation from the perpetual worrying of his creditors, have given such real and substantial relief that the husbandmen sometimes declare that they want no more. They regard the resort to insolvency as a step into the unknown. No provision of the Act is more valued by the people than the rule which admits of a decree being paid by instalments. Whether a claim is admitted or contested the landholder rarely fails to put in a plea praying that the amount found due may be made payable by instalments. At the same time the circumstances of the debtor are inquired into, and instalments are not allowed indiscriminately.

The Special Judge believes (1882-83) that the Relief Act has done, and is doing, a vast amount of good. It has succeeded in effecting many of its principal objects. It has checked the downward progress of the landholders, and given them, what they so sorely needed, an interval of repose after a trying period of distress and famine. The landholding classes have never been so contented as they are at present (1882-83). They can reap the fruit of their labour; they are protected from the constant harassing to which they were formerly subject; they no longer live in ceaseless terror of rack-renting eviction and imprisonment. When the worst comes they are sure of obtaining a fair and patient hearing in the courts, and, if they have a good defence, they are in a better position to prove it. They are allowed to pay what is justly due by them in instalments, and this privilege they seem to value more highly than any other granted by the Act. The courts are now more accessible, more absolute, less technical, less slow, and less costly. The provisions of the Act have tended to soften the extreme severity with which the law pressed on debtors, and the judges are able to modify the contracts in an equitable spirit. The moneylenders complain of the Act, and middlemen lenders have suffered and are likely to suffer; nor can it be denied that to some extent the Act has checked the old system of agricultural loans. The husbandman's credit has been greatly curtailed. Still this is a gain as the system under which the husbandman used to obtain advances had no elements of soundness. The husbandman was not an independent borrower; borrowing was a necessity to him arising from the very faults of the system. The change has been wrought, not by the power given to the courts of going behind the bond, or of granting instalments, but by the provisions which exempt the landholder's person from arrest,

Chapter V.
Capital.
Borrowers.
Husbandmen.

Chapter V.

Capital.

BORROWERS.

Husbandmen.

and his necessaries and his immovable property from attachment. The powers which the creditor enjoyed under the old law were used, not to realize his loan, but to prolong indefinitely a state of indebtedness which enabled him to turn his debtor and his debtors' descendants into his family's serfs. A debt was a lasting and in the long run a safe and paying investment. The security on which the greedy middleman used to lend was the knowledge, that, with the aid of the rigid mechanism of the civil courts, he could gain and keep an hereditary hold upon the labour of his debtor and his debtor's family and grind them at his will. Hence it was that the creditors used to pay their debtors' assessment and help to keep them alive by doles of food during times of distress. They were actuated by self-interest not by benevolence. They could not suffer their investments to perish. The Relief Act has caused a great change. By withdrawing the special facilities which creditors enjoyed for putting all kinds of pressure on the debtor it has made the debtors more independent and self-reliant and the creditor less ready to make advances. As the husbandman can no longer depend on the moneylender he has for the necessities of life adopted a new rule of conduct, the consequence of which is that not only are moneylenders more disinclined to lend, but that the same necessity for borrowing no longer exists. Formerly the husbandman when his crops were reaped thrashed and garnered, carted them in lump to his creditor's house or shop. The creditor took them over and entered in his books very much what value he pleased, generally in satisfaction of arrears of interest. As he had parted with all his crop, the husbandman had to borrow fresh sums in cash or grain to meet the instalments of land revenue, for his own support, and for seed. For each fresh advance he had to execute a fresh bond. Now the husbandman carries the produce of his field to his own house, and, keeping what he thinks sufficient for his household purposes, sells the rest in the best market he can find. He has learnt in a measure to be thrifty and provident. He is no longer beset by the necessity of borrowing at every turn. For months beforehand the husbandman now begins to make preparations for the payment of the assessment by selling grass, butter, goats and cows, and last of all their grain. This seems to be the chief reason why loans to the poorer classes of landholders have so greatly diminished. This is the class who were formerly wholly dependent on the moneylenders. Now they are obliged, and somehow manage, to shift for themselves. The solvent and independent landholders form a class by themselves; the Act has improved their condition without in the least impairing their credit. Men of this class, if they have a character for honesty, can borrow money for necessary purposes at reasonable interest, and their borrowing powers have not been injuriously affected. To this class, unfortunately, but a small proportion of the people belong. The bulk of the landholders consists of men who have not, and who long have ceased to have, any credit in the true sense of the word. Though nominally perhaps owners of their land, they have actually been the rack-rented tenants of the village moneylender to whom belonged the fruits of their toil. If the moneylender can no longer squeeze

them, he will no longer help them. Hence the dislocation of the old relations, and the fall in loans to husbandmen. The change is a change for the better. The question arises whether the general body of landholders can get on without borrowing. Experience seems to show that they can and do get on. Since 1879, there have been no unusual difficulties in realizing the Government land revenue; there has been no large or sudden throwing up of land; there have been no extensive transfers, either by revenue, judicial, or private sales. The landholders seem to be better off than they were before the Relief Act was passed. The decrease in fresh loans has led to a diminution of indebtedness; old debts are being gradually worked off, compromised, or barred by time; a good beginning has been made towards clearing off the load of debt; the people as a rule, are sensible of the change, and in consequence show a growing desire to practise thrift and to combine for purposes of mutual help. Many experienced revenue and judicial officers hold that, if the present conditions remain unchanged, a few more years will see the landholders to a great extent free from debt and able to stand on their own legs. At the same time it is to be remembered that the last three seasons have been seasons of average prosperity and that the Act has not yet stood the test of a failure of crops. Matters are still in a transition state, and during a transition period it would be unreasonable to expect the Act to endure a severe strain. Once freed from debt the landholder will be able to get on without borrowing in ordinary years. In periods of scarcity or distress he will have to look to Government for help, unless in the meantime the relations of the lending and the borrowing classes are placed on a more rational footing than that on which they rested in times past. The Relief Act has done much to restore solvency to the most important class in the district with the least possible disturbance of the relations between capital and labour.

Under the Peshwás slavery was an acknowledged institution. In 1819 in the township of Loni in a population of 557 Dr. Coats found eighteen slaves, eight men seven women and three girls.¹ One of the families though not formally free had practically been set free by its master in reward for good conduct. This family lived in a separate house and tilled on their own account. The other slaves lived in their masters' houses. All were well treated. They were clad and fed in the same way as the members of their masters' families; almost the only difference was that they ate by themselves. If they behaved well, they had pocket-money given them on holidays, and their masters paid £5 to £6 (Rs. 50-60) to meet their wedding expenses. The men worked in the fields and the women helped their mistresses. Some of the girls were their master's concubines. All of the eighteen slaves were home-born; the mothers of some had been brought from Hindustán and the Karnátek. Slaves were sometimes set free as a religious act, sometimes in reward for good conduct, sometimes because they were burdensome. A freed slave was called a Shinda; they were looked down on, and people did not marry with

Chapter
Capi^t

BOREO 11. 1887
Husbandme

SLAVES.

¹ Trans. Bombay Lit. Soc. III. 194, 239. See also Steele's *Hindus Laws and Customs*.

Chapter V.
Capital.
SLAVES.

them. Traffic in slaves was thought disreputable and was uncommon. Boys were rarely brought to market. Sales of girls were less uncommon. If beautiful they were bought as mistresses or by courtezans, the price varying from £10 to £50 (Rs. 100-500). Plain girls were bought as servants in Brahman houses.

In 1821, the Collector Captain Robertson, reported that the only form of slavery in Poona was domestic slavery. A person became a slave who was sold in infancy by his parents, or who was kidnapped by Lamáns and thieves. Few slaves knew their kinspeople or were related to the people of the surrounding country. Children kidnapped in distant provinces were brought to Poona for sale and Poona children stolen or sold by their parents in times of famine were carried to other parts of India.¹ A man also became a slave to his creditor when he could not pay his debt, but this happened only when the debtor was a Kunbi or a Dhangar and the creditor a Bráhman. Only three instances came to Captain Robertson's knowledge in which creditors had chosen to enslave their debtors.² Slaves were treated with great kindness. The general feeling was that no one should ill use a slave. Cases sometimes happened in which slaves were severely beaten by their masters or had their powers of work overtaxed. In such cases the Hindu law officers generally recommended that the slaves should be set free. When male slaves grew to manhood their masters often set them free, but female slaves were seldom freed, and their children were also slaves. The slaves, especially the females, when they lost their freedom in infancy, became attached to their mode of life and had no wish to be free. They were generally fond of their master's family, or of some members of the family, and would have felt more pain in being separated from them than pleasure in gaining their liberty. Instances occurred in which female slaves complained of the cruelty of one member of the family, but when offered their liberty refused to leave the family either because of their love for other members of it or because they feared to be set adrift in the world.

WAGES.

Fifty years ago the daily wages of adult male city labourers ranged from 2½d. to 3d. (1½-2 as.), of field labourers from 1½d. to 2½d. (1-1½ as.), and of the artisan classes from 4½d. to 9d. (3-6 as.). The wages of women were two-thirds and of children one-half of men's wages. Between 1862 and 1869, owing to the American war and the construction of the railway and large Government and private buildings in Poona, wages considerably rose, being half as much again as at present. At present (1883) the daily wages of town and city labourers range from 4½d. to 6d. (3-4 as.); of field labourers from 3d. to 4½d. (2-3 as.); and of skilled artisans from 9d. to 1s. 3d. (6-10 as.) for bricklayers, 1s. to 1s. 6d. (8-12 as.) for carpenters and masons, and 6d. to 1s. (4-8 as.) for tailors. Cart-hire is 1s. 9d.

¹ East India Papers, IV. 589-90. In a country like India subject to severe famines the relief which was afforded by the inhabitants of a neighbouring province purchasing the children of famished parents, greatly counterbalanced the loss of freedom, especially as the state of slavery was soothed by kind treatment and regard.

² In 1821 many debtors could not discharge their obligations but the creditors almost never wanted to make their debtors slaves. East India Papers, IV. 589-90.

(14 *as.*) and camel hire 1s. (8 *as.*) a day. Field labour is partly paid in kind and partly in coin; town labourers are paid wholly in coin. In villages, wages are paid daily, and in towns by the week, fortnight, or month. Except field labour which is chiefly required from August to March, labour, both skilled and unskilled, is in greatest demand during the fair season, that is from January to June. The demand for unskilled or cooly labour in Poona city is greater than it used to be.

The oldest available produce prices are for twenty-nine years of scarcity which happened during the forty-eight years ending 1810.¹ During these twenty-nine years of high prices the rupee price of rice varied from forty pounds in 1788 to five pounds in 1804, of *bājri* from fifty-six in 1788 to nine in 1804, and of *javāri* from fifty-six in 1788 to seven in 1804. The details are :

Poona Produce Prices Pound the Rupee, 1763-1810.

ARTICLE.	1763.	1765.	1770.	1772.	1773.	1776.	1777.	1778.	1879.	1781.	1788.	1787.	1788.	1789.	1791
Rice	36	20	20	34	23	34	32	32	30	32	...	23	40	36	26
<i>Bājri</i>	40	28	32	35	44	40	44	44	36	54	50	48	56	44	32
<i>Javāri</i>	...	...	...	...	52	48	48	48	44	56	58	48	56	54	48
Wheat	21	23	58	23	26	86	40	32	37	50	42	22	48	28	22
Tur	16	80	18	...	40	32	32	32	40	46	52	24	26	32	24
Gram	21	24	16	37½	33	...	24	24	42	38	44	48	28	18	...

	1792.	1793.	1798.	1799.	1800.	1802	1803	1804.	1805.	1806.	1807.	1808.	1809.	1810.
Rice	8	9	36	40	24	20	8	5	14	14	14	32	32	32
<i>Bājri</i>	7	...	...	...	36	28	12	9	20	44	...	...	...	...
<i>Javāri</i>	8	...	...	...	48	29	12	7	12	20	...	...	...	...
Wheat	...	8	20	24	18	19	8	5	12	19½	25	32	32	44
Tur	6	9	17	20	24	...	8	3½	10	18	20	32	24	18
Gram	...	8	16	16	24	32	10	9½	13	20	26	28	29	20

During the twenty-nine years ending 1837 the prices of *javāri* and *bājri* are available only for Indápur. During this period, except a slight rise in 1811 and 1816, prices gradually fell from 48 pounds of *javāri* and 59 pounds of *bājri* in 1809 to 97 pounds of *javāri* and 80 pounds of *bājri* in 1817. In 1818 there was a considerable and in 1819 there was a still greater rise in produce prices to thirty-four pounds for *javāri* and thirty-one pounds for *bājri*, from an average of fifty-six pounds for *javāri* and fifty-five pounds for *bājri* during the ten years ending 1817. In 1820 the spread of tillage which followed the establishment of order, again brought down prices till in 1824 *javāri* was sold at 73½ pounds the rupee and *bājri* at forty-six pounds. In the famine year of 1824-25 *javāri* rose to twenty-five pounds. In 1826 and 1827 prices fell to eighty-eight and 128 pounds for *javāri* and sixty-eight and sixty-four pounds for *bājri*. They rose slightly in 1828, and in 1829 again fell to 130 pounds for *javāri* and 136 for *bājri*. In 1830 and 1831 prices rose slightly and in 1832 once more fell to 120 pounds for *javāri* and to seventy for *bājri*. This terrible cheapness of grain reduced the

¹ Lieut.-Col. A. T. Etheridge's Report on Past Famines (1868) Appendix D.

Chapter V.
Capital.
WAGES.

PRICES.

DISTRICTS.

Chapter V.
Capital.
PRICES.

husbandmen to poverty and caused Government very great loss of revenue. Though the year 1833 is remembered as a year of scarcity *javari* did not rise above forty-six pounds. The details are :

Inddpur Prices in Pounds the Rupee. 1809-1837.

ARTICLE.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.	1817.	AVER- AGE.
<i>Jvâri</i> ...	48	48	44	51	54	56	67	52	97	56
<i>Bâjri</i> ...	59	40	37½	40½	46	64	61	72	80	55
	1818.	1819.	1820.	1821.	1822.	1823.	1824.	1825. Fa- mine.	1826.	1827.
<i>Jvâri</i> ...	48	34	39	64	64	64	73½	25	83	123
<i>Bâjri</i> ...	32	31	25	32	...	48	46	...	68	64
	1828.	1829.	1830.	1831.	1832.	1833. Scar- city.	1834.	1835.	1836.	1837.
<i>Jvâri</i> ...	64	160	92	80	120	46	92	96	76	132
<i>Bâjri</i> ...	...	136	...	77	70	72	68	88	...	98

From 1838-39 to 1882 prices are available for several places in the district.

The forty-six years ending 1882 may be divided into four periods. The first period includes the twelve years ending 1849-50. This was a time of low and stationary prices without any more marked changes than were due to the succession of comparatively good and bad harvests. The average rupee price of *javari* was 108 pounds, almost the same as in 1837-38, a price too low to allow of any increase of wealth in the landholding classes. The second period, the eleven years ending 1860-61, especially the latter part of the period, is one of advancing prices probably due to the opening of roads and in the last years to the beginning of expenditure on railways. During the eleven years ending 1860-61 the average rupee price of *javari* was seventy-eight pounds and during the last five years seventy pounds. The third period is the ten years ending 1870-71. The first five years of this period was a time of extremely high prices, *javari* averaging thirty-six pounds the rupee. These high prices were due partly to the abundance of money caused by the inflow of capital during the American war, partly to a succession of bad years. With the close of the American war in 1865 part of the inflow of capital ceased. After 1865, though the inflow of capital connected with the American war ceased, until 1871 the district continued to be enriched by the construction of great public works. To this increase of wealth was added a scarcity of grain caused by the severe drought of 1866-67, and the partial failures of 1867-68 and of 1870-71. During the five years ending 1870-71 *javari* varied in rupee price from twenty-seven to sixty-eight and averaged thirty-five pounds. The thirteen years since 1871 may be described as a time of falling prices checked by the famine of 1876-77. The five seasons ending 1876 were years of good harvests and this together with the great reduction in the local expenditure on public works combined to cheapen grain. During the famine of 1876-77, that is from about November 1876 to the close of 1877, *javari* varied from thirteen to

twenty-five and averaged twenty pounds. Since 1877 large sums have again been spent in or near the district in public works, and the great increase in the trade and prosperity of Bombay have drawn large numbers of workers to Bombay and done much to replace the loss of capital caused by the famine. The seasons have been fair. The price of *javri* has varied from eighteen to seventy-six and averaged forty-two pounds. The details are :

Chapter V.
Capital.
PRICES.

Poona Produce Prices in Pounds the Rupee, 1838-39 to 1887-88.

ARTICLE	1838-39.						1839-40.						1840-41.					
	Indapur.	Yavat.	Poona.	Supa.	Talegaon.	Manchar.	Indapur.	Yavat.	Poona.	Supa.	Talegaon.	Manchar.	Indapur.	Yavat.	Poona.	Supa.	Talegaon.	Manchar.
<i>Javri</i>	134	...	...	...	...	...	88	...	...	...	...	...	128	...	...	88	...	...
<i>Bajri</i>	60	..	..	..	..	..	60	..	..	..	..	..	88	..	..	62	..	..
	1841-42.						1842-43.						1843-44.					
<i>Javri</i>	112	95	60	92	88	92	136	110	64	92	100	96	144	128	60	128	134	120
<i>Bajri</i>	80	72	42	68	70	84	84	69	66	70	76	68	88	96	60	80	78	86
	1844-45.						1845-46.						1846-47.					
<i>Javri</i>	120	100	54	89	68	92	72	60	42	50	54	56	39	31	32	31	48	66
<i>Bajri</i>	72	70	46	73	60	84	50	46	36	40	46	46	20	20	28	30	46	62
	1847-48.						1848-49.						1849-50.					
<i>Javri</i>	96	74	62	71	134	110	144	187	110	121	186	144	144	129	94	128	136	116
<i>Bajri</i>	64	60	54	60	110	88	112	105	82	100	132	116	113	104	74	104	106	84
	1850-51.						1851-52.						1852-53.					
<i>Javri</i>	76	72	60	64	68	68	80	72	66	72	80	68	112	74	74	79	104	88
<i>Bajri</i>	68	75	50	59	54	56	64	51	50	58	68	60	80	58	58	76	78	84
	1853-54.						1854-55.						1855-56.					
<i>Javri</i>	112	114	84	107	70	60	58	55	50	50	46	52	64	80	56	61	78	48
<i>Bajri</i>	72	60	50	50	52	54	52	46	44	47	44	46	52	62	50	56	70	44
	1856-57.						1857-58.						1858-59.					
<i>Javri</i>	64	52	50	45	62	68	78	66	52	57	62	60	64	52	54	52	74	70
<i>Bajri</i>	56	48	42	40	52	60	74	62	46	48	54	52	36	42	46	42	58	62
	1859-60.						1860-61.						1861-62.					
<i>Javri</i>	78	80	63	77	114	88	66	73	52	72	86	68	54	60	52	57	56	58
<i>Bajri</i>	62	65	50	64	80	68	46	56	42	53	52	54	38	47	38	44	46	46
	1862-63.						1863-64.						1864-65.					
<i>Javri</i>	32	42	40	38	30	34	26	31	22	27	30	32	32	22	24	24	24	26
<i>Bajri</i>	82	36	30	30	26	30	24	20	18	20	26	23	28	21	20	20	20	20
	1865-66.						1866-67.						1867-68.					
<i>Javri</i>	36	32	26	35	54	46	...	44	36	27	32	48	...	28	26	28	40	38
<i>Bajri</i>	30	24	22	23	40	34	...	39	32	28	30	38	...	24	22	26	32	24

Chapter V.

Capital.
PRICES.

Poona Produce Prices in Pounds the Rupee, 1838-39 to 1882-83—continued.

ARTICLE	1868-69.					1869-70.					1870-71.							
	Indapur.	Yavat.	Poona.	Supa.	Talegaon.	Manchar.	Indapur.	Yavat.	Poona.	Supa.	Talegaon.	Manchar.	Indapur.	Yavat.	Poona.	Supa.	Talegaon.	Manchar.
Jadra	65	46	64	40	68	...	30	32	47	44	38	..	36	34	37	38	42	
Bajri	39	32	43	44	42	..	27	26	27	34	28	..	30	28	31½	30	32	
	1871-72.					1872-73.					1873-74.							
Jadra	30	24	22	20	32	47	34	48	23	44	60	57	60	58	43	64	70	74
Bajri	24	20	19	12	24	43	24	40	20	38	50	52	50	44	34	48	55	66
	1874-75.					1875-76.					1876-77.							
Jadra	92	72	60	64	80	57	76	64	56	56	80	24	46	18	38	11	30	13
Bajri	70	56	44	64	60	47	68	52	42	44	45	22	40	18	30	10	25	12
	1877-78.					1878-79.					1879-80.							
Jadra	18	22	18	14	35	36	20	22	20	18	40	36	18	22	18	18	50	47
Bajri	18	20	18	13	30	24	20	24	18	16	35	24	18	20	18	22	40	31
	1880-81.					1881-82.					1882-83.							
Jadra	28	28	28	24	60	60	76	66	50	52	60	66	62	52	64	52	55	52
Bajri	20	20	24	18	50	50	48	42	38	40	45	47	46	40	46	40	46	43

WEIGHTS AND
MEASURES.

Articles are sold by weight, by measure, and by number. Pearls, precious stones, cotton, tobacco, raw and clarified butter, oil, spices, groceries, firewood in Poona city, opium, sweetmeats, and some vegetables and fruits are sold by weight. In the case of pearls and precious stones the weights used are grains of barley *jav*, rice *tándul*, wheat *gahu*, and *rati*. *Rati*, originally the seed of the *Abrus precatorius*, is now generally a small piece of copper or flint weighing $2\frac{1}{4}$ to $2\frac{3}{4}$ grains. The price of pearls is not fixed at so much the *rati* but at so much the *chav* a measure or standard obtained from a calculation based on the number and weight of the pearls, and divided into 100 *dokdás* or *parts*.¹ The table observed in the case of gold is eight *gunjs* one *mása*; $2\frac{1}{2}$ *gunjs* one *vál*; six *másás* one *sahámása*; two *sahámásás* or twelve *másás* or forty *váls*, one *tola*. The *gunj* is red and about the size of a small pea is the seed of a wild creeper and the *vál* which is also red and a little larger is the seed of the *chilhári* tree. The *mása*, *sahámása*, and *tola* are square, eight-cornered, or oblong pieces of brass and sometimes of China or of delf. The *tola* weighs a little more than the average Imperial rupee in use which is equal to $11\frac{1}{4}$ *másás*. In weighing silver and fragrant oils and essences the Imperial rupee is always used. But as owing to wear it is not always of uniform weight

¹ To reduce *ratis* to *chavs* the square of the number of *ratis* is multiplied by 55 and the product divided by 96 times the number of pearls. Thus if 11 pearls weighing 24 *ratis* are to be bought at Rs. 8 the *chav*, the price would be $\frac{24 \times 24 \times 55}{96 \times 11} \times 8 = 240$ rupees.

Chapter V.

Capital.

WEIGHTS AND MEASURES.

discount at the rate of eight per cent is allowed in wholesale purchases of silver. For cheaper metals and other articles sold by weight the unit of weight is a *sher* weighing seventy-six rupees, with its fractions the *naxtāk* or one-eighth, *pāvsher* or one-fourth, and *achher* or one-half. For quantities of over a *sher* the table for metals and other articles sold by weight is four *shers* one *dhadi* and sixteen *shers* one *man*. In the case of oils, raw and clarified butter, spices, raw sugar *gul*, groceries, and tobacco the table is forty *shers* one *man*, and three *mans* one *palla*. For firewood where sold by weight the table used is eighty pounds one *man* and twenty *mans* one *khandi*. Except in the case of firewood and similar heavy substances, where stone weights are used, all the weights are made of iron, generally English-made avoirdupois weights with the pound unit scooped out at the back to bring them to the exact weight. Grain is measured by wooden cylinders with narrow necks in the middle to admit of their being held in the hand with ease. The unit of measurement is also a *sher* having the same fractions as the weight unit. The contents of a *sher* measure, which is equal to $2\frac{3}{4}$ pints, weigh seventy-six to ninety-eight rupees. The table observed is four *shers* one *pāyli*, twelve *pāylis* one *man*, $2\frac{1}{2}$ *mans* one *palla*, and eight *pallas* one *khandi*.¹ Standard weights and measures are kept in every *māmlatdar*'s office, and, once a year, all weights and measures are tested and stamped by the police. Brass and copper pots serving as a quarter, a half, and a whole 76-rupee *sher* are used for measuring milk and small quantities of oil. Clarified butter when brought for sale in small quantities by the people of the western hills is also sold by these capacity measures. Leaf vegetables are sold by the bundle, grass and *javari* stalks are sold by the *pāchunda* or five bundles, firewood is sold by the headload or the cartload, and cowdung-cakes by number. Mangoes are sold wholesale by a hundred or *shekda* equal to 312. Betel leaves are sold by the hundred or the thousand. In measuring cloth either the *gaj* or the yard is used. In the case of the *gaj* the table used is eight *yavs* one *anguli* or thumb breadth; two *angulis* one *tasu* of $1\frac{1}{2}$ inches; twelve *tasus* one *hāt* or cubit of eighteen inches, and two *hāts* one *gaj* of three feet. Ready-made clothes, waistcloths or *dhotars*, and scarfs or *uparnās* are sold in pairs; other articles of clothing are sold singly except shoes and stockings which are sold by the pair. Bricks and tiles are sold by the thousand, rafters and bamboos by the hundred, squared timber by its cubic contents, and unsquared timber by the piece. Heaps of gravel or *murum*, of road-metal or *khadi*, and of sand earth and stone are measured by their cubic contents, the usual unit of mea-

¹ In 1821 there were three tables of grain measures. The *sher* was the same in all three and, taking the average of the whole, the weight of one measured *sher* of *bañri*, *math*, *mug*, *adva*, *javari*, *qūd*, *vātina*, wheat, and *māsūr*, was one-fourteenth of a pound more than $2\frac{3}{4}$ pounds avoirdupois. The first table was four *shers* one *pāyli*, twelve *pāylis* one *man*, and twenty *mans* one *khandi*. This *baroli* or twelve-*pāyli* *man* was the common *man* and the one in use in the town of Poona. The second table was four *shers* one *pāyli*, sixteen *pāylis* one *man*, and twenty *mans* one *khandi*. This *soloh* or sixteen-*pāyli* *man* was used in the village group of Sandus in Pātas and to the southward. The third table was $3\frac{1}{2}$ *shers* one *pāyli*, forty-two *shers* or twelve *pāylis* one *man*, and twenty *mans* one *khandi*. This was used in the Māvāls or hilly west. Captain H. D. Robertson, East India Papers, IV. 572.

Chapter V.
Capital.

WEIGHTS AND
MEASURES.

surement being a *barás* of 100 cubic feet. Cut stone is sold by the square *gaj* equal to eight square feet. Before the revenue survey the land measure was three *mushtis* or *fistás*, one *vit*, two *vits* one *hát*, $5\frac{1}{2}$ *hát*s one *káthi*, twenty *káthi*s one *pánd*, twenty *pánd*s one *bigha*, and five *bighás* one *rukka*, six *rukkás* one *shandi*, twenty-four *rukkás* one *cháhur*¹ or *takka*; and two *cháhur*s or *takkás* one *pakka*. The survey measurements are a chain of thirty feet one *anna*, sixteen *annás* one *guntha*, and forty *gunthás* one acre of 4840 square yards. Thirty *gunthás* are equal to one *bigha* or $1\frac{1}{2}$ *bighás* are equal to one acre.² *Partán* meaning two or four *bighás* is a word often used by Kunbis speaking among themselves. Twenty *partáns* make one *aut*.

The old table for measuring time is sixty *vipals* or winks one *pal*, sixty *pals* one *ghadi* of twenty-four minutes, $2\frac{1}{2}$ *ghadis* one *hora*, $3\frac{1}{2}$ *ghadis* one *cháughadi*, $7\frac{1}{2}$ *ghadis* one *prahar*, eight *prahars* one *divas* or day, seven *divas* one *áthavda* or week, two *áthavdás* one *paksha* or fortnight, two *pakshas* one *más* or month, twelve *más* one *varsh* or year. In former times the Hindus had neither watches nor sun-dials. Their time measure was the water-clock a copper pot filled with water in which floated a brass cup with a small hole in the bottom which took an hour to fill and sink. The water-clock, though never referred to in ordinary life, is still used at marriage and thread ceremonies. Besides by the water-clock time was calculated by the length of shadows. To tell the time of day from a shadow one plan is, in an open sunlit spot, to measure in feet the length of one's shadow, to add six to the number of feet, and divide 121 by the sum. The quotient gives the time in *ghadis* of twenty-four minutes after sunrise if the sun has not crossed the meridian, and before sunset if the sun has crossed the meridian. Another plan is to hold upright a thin rod eighteen *ánglis* or finger-breadths long, bend it so that its shadow will touch the other end of the rod on the ground and measure in *ánglis* the perpendicular height of the rod. This like the other plan shows the number of *ghadis* either after sunrise or before sunset.

¹ The area of the *cháhur* depended in many cases on the quality of the land.

² The *káthi* five cubits long by one cubit broad is said to have been carved in stone in the late Shanvár Váda at Poona. It was based on the length of the hand of Peshwa Mádhavráy II. (1774-1796). After a time the length of the Peshwa's hand became exaggerated and the hand was taken to mean the length of a man's arm from the elbow to the tip of the middle finger with an additional span. Hence arose some variations in the size of a *bigha*. Mr. J. Pollen, C. S.

CHAPTER VI.

TRADE.

COMMUNICATIONS.

THE history of Cheul, Kalyán, Supára, and Thána in the Konkan, and of Junnar, Násik, and Paithan in the Deccan shows that from early times several important trade routes passed through the Poona district. From at least as far back as the first century before Christ, Junnar, about a hundred miles west of Paithan sixty south of Násik and fifty north of Poona, had two main routes to the coast through the Málsej and through the Nána passes. In the Nána pass, inscriptions, steps, rock-cut rest-houses, and cisterns show that as far back as the first century before Christ much was done to make the route easy and safe. The fine Buddhist caves at Bedsa, Bhája, and Kárla, the large but plain caves of doubtful date on Lohogad hill, the rock-hewn Shiv temple at Bhámbruda and the small Ganeshkhind caves of uncertain date near Poona, and the groups of Buddhist caves at Ámbivli, Jámbrug, and Kondáne in Thána make it probable that the Bor pass was a highway of trade between B.C. 100 and A.D. 600. Of Poona trade routes and trade centres under the Hindu dynasties which flourished between A.D. 700 and A.D. 1300 few traces remain. Two great rock-hewn reservoirs on the top of Shivner show that the hill was held as a fort by the Devgiri Yádavs and make it probable that Junnar was a place of trade. Under the Bahmanis in the fourteenth and fifteenth centuries Junnar and Chákan were strong military posts and probably local trade centres. In 1499, after a brief stay at Junnar, Malik Ahmad, the founder of the Nizám Sháhi dynasty, moved his capital from Junnar to Ahmadnagar. During the sixteenth century, when the wealth of the Bombay Deccan was divided between the rulers of Ahmadnagar and Bijápur, probably no main line of traffic passed through the Poona district. About 1636, when it was made part of Bijápur, Poona probably rose in importance as a centre of trade, and at the same time Junnar gained in consequence as the southmost post of Moghal power. Shiváji's disturbances soon followed, and little trade can have centred in Poona till 1750, when it became the capital of the Marátha empire. After the country passed to the British, traces of pavement, steps, and water-cisterns showed that the Peshywás had attempted to improve the Nána, Málsej, Bhimáshankar, and Kusur passes.¹

Chapter VI

Trade.

ROUTES.

B.C. 100 - A.D. 1800

¹ Bom. Rev. Rec. 144 of 1819, 3317.

Chapter VI.
Trade.
ROUTES.
1779 - 1826.

The first road made by the British was the POONA-PANVEL road, from Panvel in Thána through the Bor pass to Poona. In the close of 1779 the leaders of the unfortunate expedition that ended in the Vadgaon Convention spent four weeks (23rd November-25th December) in making a path fit for Artillery up the Bor pass.¹ In 1804, General Wellesley constructed a good military road from the head of the Bor pass to Poona. The massive stone ramps or pavings, which in 1864 were visible in places for the entire distance a little to the south of the line which is now the old post road,² and traces of which may still be seen at the eastern foot of the Isápur hills, belong to General Wellesley's road. After the fall of the Peshwás in 1817, owing to its importance in joining Bombay and Poona, one of the first cares of the Bombay Government was to improve the road from Poona to Panvel in Thána. In 1819 it was proposed that the Nána and Kusur passes should be repaired.³ In 1825, though still steep, Bishop Heber considered that the Bor pass road was probably sufficient for the intercourse that either was or was likely to be between the Konkan and the Deccan.⁴ In 1826, according to Captain Clunes, the chief lines of communication in Poona lay through Poona and Junnar.⁵ The BOMBAY-AHMADNAGAR road of 148 miles from Panvel through Chauk, Khálápur, and Khopivli in Thána ascended the Bor pass and entered Poona near Khandála, and stretching through Lonávla, Kárla, Khadkála, Vadgaon, Kuvla, Tathavade Aund, Poona,⁶ Vágholi, Loni, Koregaon, Ganpati's Ránjangaon, and Kardalvádi, left it near Sirur and continued its course to Ahmadnagar through Hingni, Kadus, Ránjangaon, Sárole, Akulner, and Kedgaon. Besides the stone bridge over the Indráyani between Kárla and Khadkála, which had seventeen arches and a total length of about 400 feet, there were on this road two flying bridges one across the Mula near Poona, the other across the Bhima near Koregaon. From this road a new excellent military road branched to the right near Vadgaon and passed by the villages of Shelárvádi, Kinai, Chinchuli, Nigri, Akurdi, Chinchvad, Bhosri, and Dápuri. This was the shortest road to Poona if the traveller had no wheel carriages. It continued from near Bhosri, passing Kalas, and crossing the Kirkee bridge, making a difference of about two miles between Bhosri and the Sangam. The KALYÁN-AURANGABAD road of 185 miles, passing through Raháta, Murbád, Umbarpáda, the Taloli pass, and Kumbalpáda in Thána, and ascending the Málsej pass, entered the district near Karanjále, and stretching through Pimpalgaon and Junnar left it near Otur and continued its course through Bráhmanváde, the Sávarchur-pass, Sangamner, Ráháta, Bámangaon, Bhorgaon, and Tisgaon. This road had two branches from Junnar,

¹ Account of Bombay, 176-7.

² Deccan Scenes (1864), 330.

³ Mr. Marriott, 29th September 1819, Gov. Rev. Rec. 144 of 1819, 3317.

⁴ Heber's Narrative, II. 200.

⁵ Itinerary, 18-46.

⁶ From the travellers' bungalow near the entrance of the cantonment to the church was $1\frac{1}{2}$ miles and the continuation of the road to the ruins of Sindia's palace near which the cantonments ended was $1\frac{1}{2}$ miles further. Clunes' Itinerary, 10.

Chapter VI.

Trade.

ROUTES.

1826.

one of sixty-four miles through Ojhar, Pimpalvandi, and Belhe, leaving the district near Alkuti, and continuing its course through Párner, Supa, and Kedgaon to Ahmadnagar; the other branch forty-five miles through Náráyangaon, Hivra, the Utti pass, Párgaon, and Annápur to Sirur. The POONA-SURAT road of 254 miles through Chákan, Náráyangaon, and Hivra, leaving the district near Otur continued its course through the Váshera pass, Devthán, the Sinnar pass, Násik, Dindori, the Rahud pass, Umbarthána, the Nirpan pass, the Vágh pass, Gandevi, and Navsári. In the fair season this was a good cart road throughout except at the Váshera and Sinnar passes in Ahmadnagar and Násik. The Rahud pass in Násik offered no obstacles to carts. Another road of 290 miles, the usual line of march for troops from Poona to Surat, was through Rávet, Vadgaon, Kárla, and Khandála on the district border, and Khopivli, Chauk, Panvel, Ambagaund, Kalyán, Titvála, Láp, Vajrábái, Arna, Butna, Daisar, Mahagaon, Tárápur, Saunta, Jahye-Burdi, Umbargaon, Daruti, Bagváda, Párnera, Rola, Gandevi, Navsári, Lanchpur, and Sachin. From Panvel in Thána there was another road to Surat by sea and land of about 256 miles. The POONA-KALYÁN road of seventy-five miles through Rávet and Vadgaon, by the Kusur pass, continued its course through Neral, Badlápúr, Beluli, and Kansa. The POONA-KHANDÁLA road of forty miles passed through Banera, Kasarsai, Dhaman Khind, and Lonávla. The POONA-JUNNAR road of fifty miles passed through Chákan, Peth, Náráyangaon, and Khánápur. This road, though in places difficult for carts, was a fair road for pack-cattle. The POONA-DHULIA road of 201 miles through Chákan, Peth, Náráyangaon, Pimpalvandi, and Ále left the district near Bota and continued its course through the Ábora pass, Kikangaon, Korbála, Kopargaon, Yeota, Sávargaon, Manmád, Málegaon, the Darágaon pass, Arvi, and Laling. The POONA-AURANGABAD road of 144 miles, through Loni, Koregaon, and Ganpati's Ránjangaon, left the district near Sirur and continued its course through Náráyangaon, Supa, Ahmadnagar, Imámpur, Kevra, Toke, Dahigaon, and Jalgaon. From Ahmadnagar another road went through the Nimba-Dhera pass, Vámbori, and Kevra. From Aurangabad a branch led forty miles to Jálna, and a line of 105 miles went direct from Ahmadnagar through Paithan. The Poona-Sholápur road of 157 miles, through Hadapsar, Loni, Urali, Yevat, Pátas, Chicholi, and Indápur, left the district near Tembhurni, and continued its course through Savaleshvar and Kundi. Another road of 157 miles to Sholápur, through Urali, the Diva pass, Belsar, and Jejuri, and leaving the district near Nimbat, continued its course through Baneya, Nátáputa, Yallápur, Pandharpur, Dehgaon, Bábhulgaon, and Singoli. From Pátas a road of 136 miles branched towards Mominabad or Ámbejogái, passing through Pedgaon, Pimpalvádi, Khurdá, Beh, and Sávargaon. Near the Diva pass the road branched five or six miles to Sásvad, and, from Chincholi, a branch led to Sholápur through Tuljápur, making the whole distance from Poona 343 miles. From Sholápur the road was continued to Sikandarabad by

Chapter V.
Trade.

Naldurg, a distance of 192 miles. The POONA-BELGAUM road of 241 miles, through Jejuri, left the district near Nimbhat and continued its course through Rahimatpur, Usesavli, Tásgaon, and Edur where was a flying bridge and boat across the Krishna, Ghotgiri, Márehal, Ashti, and Kanbargi. From Edur a road led to Dhárwár through Pádshápur, Nese gi, Shidápur, and Gadag. Another road of 213 miles through the Kátraj pass continued its course through Kikvi, Shirval, Khándála, Surul, Bhuluj, Sátára, Miraj, Karád, Islámpur, Ichalkaranji, Sandalgi, Chikodi, Hukeri, and Yamkanmardi. From Karád a branch went to Málvan through Malkápur, the Anaskúra pass, and Khárepátan, and another through Battis-shirála, Kolhápur, the Phonda pass, and Janavti. The POONA-DÁPOLI road of ninety-seven miles went through Vadgaon, Khadakvásla, Khánápur, the Panba pass, and Torna-peth, left the district by the Dhoni pass and the Shevti pass, and continued its course through Mahád, Páli, and Máhlunga. A branch from Birvádi, seventeen miles from the Shevati pass, went to Ratnágiri through the Ghogra pass, Chiplun, and Mákhjan. The POONA-GOREGAON road, sixty-six miles through Khadakvásla, Gorha, and the Kuran pass, continued its course through the Kumbha pass. Another road fifty-seven miles branched from Kuran and went by the Devi pass. The POONA-NIPÁNI road of 211 miles, through Loni, the Khór pass, Morgaon (Chinchvad), and Gulunche, left the district near the Nira and continued its course through Támgaon, Rahimatpur, Hingangaon, and Edur-Mánjri. The POONA-NÁGOTHNA road of sixty-four miles through Chande-Nande and Akola, left the district by the Sai pass and continued its course through Vásunda, Jámbulpáda, Ranubgaon, and Chikni.

1876

Since 1826 all of these leading routes have been taken up and made into fair or good roads. In 1830 the Poona-Panvel road was greatly improved and was opened in state by Sir JOHN Malcolm, the Governor of Bombay. At that time the mail cart to Poona on this road was the only mail cart in India. Some years passed before the road was generally used for carriages. In 1830 hardly a single cart was met between Khandála and Poona, and long droves of pack-bullocks had possession of the road.¹ In spite of the improvements the Bor pass, though it did credit to the time in which it was built, was far from easy of ascent. The gradients were steep and the curves sharp and numerous. In 1832 M. Jacquemout described the road as makadamised and kept by Pioneers in such order as would have been considered good in France.² In 1836 the opening of roads and the improving of transit were among the points which received most attention from the early survey officers.³ A marked change in the number of

¹ Deccan Scenes, 33.² Voyages, III. 583.³ Among the improvements planned by the revenue survey officers the making of a new light cart was one of the greatest importance. In 1865, in a speech in one of the debates on the Survey Bill, Sir Bartle Frere, then Governor of Bombay, said that carts in 1836 were rarely seen beyond Poona. In five months he remembered seeing only three carts in the country between Poona and Shelápur, and these were brought from some Madras station. At that time the only local cart wheels were

roads took place in some parts of the district during the thirty years of the first survey (1835-1866).¹ In 1836 when the survey was introduced there was not a mile of road in Indápur. The construction of the Imperial line of road from Poona to Sholápur passing by the town of Indápur was the first great improvement. By 1850, five lines of made road passed through the district. The chief roads were the old Poona-Panvel road through the Bor pass about seventy miles, the Poona-Ahmadnagar road also about seventy miles, the Poona-Junnar road about fifty miles, the Poona-Indápur road ninety miles, and the Poona-Sátára road seventy-six miles. The POONA-PANVEL road, the chief road-work of the Bombay Government, was well metalled throughout. It had many long and some fairly steep slopes down which the superfluous surface water would have rushed with destructive violence but for a simple contrivance which broke its force and made it comparatively harmless. At about one hundred feet apart ridges of earth, three to four inches high and about a foot wide, were drawn slanting across the road. The ridges were formed by loosening the stones and earth with a pickaxe. Their object was, before it gained force or volume, to turn the surface water into one of the side ditches. This the ridges did very effectually when they were properly watched, so as to repair the breaches made in them by cart wheels. When they were kept in order no more water could rush down any portion of the slope than fell between two of the little ridges. When little rain fell, the spaces between the ridges were kept comparatively dry and firm, for the small quantity of water which was then to be disposed of soaked quietly into the ditch, along the loose stones and earth of which the ridges were made. Towards the close of the rainy season the ridges were allowed to be worn by the traffic to the level of the road. ~~In this way the road escaped the perils of the rainy season with comparatively little damage.~~² Within Poona limits the road was well bridged. The great obstacle to traffic was the Bor

Chapter VI.
Trade.
ROUTES.
1836-1850.

discs of stone, and carts were large lumbering contrivances which remained as heirlooms in families for generations. Lieutenant Gaisford applied himself to improve the country cart and the ordinary Deccan cart was the result of his labours. The new cart was to be as light and cheap as possible, and yet strong enough to be used in a stony country where roads were almost unknown, and where workmen able to repair the most simple wheeled vehicle were often not to be found within fifty miles. He set up a factory for these carts at Tembhorni in Sholápur, and not only made carts but trained workmen from the villages round to repair them. At first it was difficult to find any one who would buy the carts even at cost price, but in time their number considerably increased. In Indápur alone they rose from 291 in 1836 to 1165 in 1856. The carts which replaced the old stonewheel carts and the Vanjári bullocks have in their turn helped to improve old roads and open new lines of communication. Bom. Gov. Sel. CLI. 33-34.

¹ Lieutenants Wingate and Gaisford applied themselves to increase the facilities of transit in the Deccan. At first they had very small means at their disposal. Government gave small sums often as low as Ra. 5 a mile for the improvement of roads. Little could be done for such an amount beyond removing the most serious impediments to wheeled traffic along existing tracks. Sir. Bartle Frere, Gov. Sel. CLI. 33.

² Mackay's Western India, 379. Mr. Mackay adds: For about half its course the road runs through one of the wettest districts of Western India. The quantity of rain which falls during the south-west monsoon between Panvel and the Sahyádris, and, for about twelve miles to the east of Khandála at the top of the Bor pass, is about 50 per cent more than the average fall at Bombay.

Chapter VI.

Trade.

ROUTES.

1850.

pass, where the ascent from the low land to the high land, was a rise of 2000 feet by a zigzag and frequently precipitous course of about four miles. This was one of two points at which the Sahyádris could be ascended or descended by wheeled vehicles with anything like safety along a course of about 50 miles. Still so difficult of ascent or descent was the Bor pass that no one thought of driving up or down it in a carriage. Passengers travelling by the public conveyances were carried up and down in palanquins, there being different sets of coaches for the high and low portions of the road. Private carriages were pulled up or let down by numerous bodies of workmen, or they were carried up and down swung from a number of poles which rested on men's shoulders. Empty carriages had been pulled up by horses, but this was generally considered a good day's work for the animals. A man who had any regard for his horse would not even ride him up or down the pass, preferring to have him led, and betaking himself either to a pony or a palanquin. In the Konkan the road crossed a rich rice country; but its chief traffic came from above the Sahyádris. It was principally owing to the traffic of districts beyond Poona turning to this route, because there was no other means of easy communication with the coast. The country from the Sahyádris to Poona was generally of a poor, thin, light soil, which of itself could sustain no great traffic. The POONA-AHMADNAGAR road started almost at right angles to the Poona-Panvel road from which it differed simply in not being metalled. It was bridged and fairly ditched, the surface being covered not with broken stone but in some places with loose round stones or coarse gravel, and in others with small fragments of hardened clay. Occasionally the gravel and clay were combined and there the road was generally in the best condition. During the dry season it was practicable enough and could be driven over without difficulty; during the rains it was indifferent throughout and at many points bad. It was designed as a military road as Ahmadnagar was the head-quarters of the Bombay artillery. Like the Poona-Panvel road it had proved of advantage to the general traffic. Although it crossed a comparatively poor country it was the chief feeder of the Poona road. With its continuation through the Nizám's territory to Aurangabad, it drew to Poona much of the traffic of Berar out of what would have been its natural course had communications been open between that important valley and the coast. To gain this circuitous line of made road, much of that traffic turned south to Ajanta from which it could reach Bombay only by the made road, which it sought by traversing nearly three-quarters of the circumference of an enormous circle. The next of the made roads was the POONA-JUNNAR road. It was designed either to proceed by the Ale pass across several streams and several spurs of the Sahyádris, to Sinnar and Násik, with the view of uniting Poona with Málegaon the great military station in the north Deccan; or to take the more direct route from the Ale pass to Málegaon, avoiding Násik and flanking the spurs of the hills. The POONA-INDÁPUR road led south-east from Poona to Indápur about half-way to Sholápur. Of all the roads that converged on Poona this Indápur road was most in the direct

line of the Poona-Panvel metalled road, so that traffic directed by it upon the Poona-Panvel road with a view to reaching Bombay could scarcely be said, so far at least as the district between Poona and Indápur was concerned, to have been taken out of its course, as it must have been from other districts by any of the roads leading through Poona. The road was by no means as perfect a road as that leading to Ahmadnagar. Even the Poona end of it, after a little rain, was little more than passable for a carriage. It crossed a very practicable line of country, as nearly its whole course to Indápur lay along the right bank of the Bhima. If the traffic was not at first great it was because the country was poor. At Indápur the road crossed the Bhima and proceeded through a richer country almost in a straight line to Sholápur. The POONA-SÁTÁRA road was the best specimen of a made road in the Deccan. It was not bridged throughout, the only completed bridges had been built by native chiefs. The road surmounted two passes, one of them, the Bábdev pass about eight miles south of Poona, being one of the worst specimens of a pass in Western India. Its angles and gradients were frightful, its sharp turns being in some places flanked by low walls which afforded but a slight bulwark against the precipices which they crowned. The road in the steepest parts was constantly rough, being covered to some depth with loose round stones. This to some extent served to check the impetus of a descending load, but greatly increased the toil of dragging a load up. Beyond the crest of the pass the road entered a broad plain bounded on the south by the Sálpa range and watered by many streams. The first stream was at the village of Hivra past which it brawled over a somewhat wide and rocky channel; it was unbridged. The next was beyond Sásvad, a narrower but deeper stream with a fierce current during the rains; it was also unbridged. There was no other stream of consequence until the Nira was reached, one of the largest tributaries of the Bhima. The Nira bridge was a well-known point on the road. The bridge which was a long wooden one, resting on stone piers springing to some height from the rocky channel of the river, had been built by the Peshwás. There were several bridges within Sátára limits. Besides these main routes, as in the rest of the country, were several fair-weather roads practicable for carts, frequented tracks, and postal tracks. The fair-weather roads were natural tracks, merely showing the course taken by an irregular traffic over the open surface of the country. The best of them were practicable during the fair weather for carts, simply because at that time carts could pass over much of the surface of the country. The frequented tracks were numerous in every thickly peopled part of the country and were a grade lower than the fair-weather cart-tracks. The lines laid down as post tracks were no better, the mail being generally carried by foot-runners. All these roads were useful as showing the natural lines of traffic. Of the roads the Poona-Panvel and the Poona-Ahmadnagar roads were alone thoroughly bridged and available for traffic throughout the year. On the other roads, during the greater part of the rainy season, traffic was stopped by the streams which crossed them. The suddenness with which the streams stopped traffic was sometimes startling. A stream which at a place less than a quarter of a mile distant, was known to be

Chapter VI.

Trade.

ROUTES.

1850.

Chapter VI.

Trade.

ROUTES.

1863-1884.

practicable, by the time required to reach its banks, became a foaming and impassable torrent and remained impassable for days. To such interruptions even most of the main roads were liable.

Since 1863 when local funds were created the work of opening roads has been steadily pressed on and the district is now well provided with lines of communication. At present (1884) in the Poona and Kirkee cantonments and in the civil limits of the two stations, forty-two miles of Imperial roads and twenty-eight miles of provincial roads, all metalled and bridged, are kept in repair at a yearly cost of £1700 (Rs. 17,000) to Imperial and £1700 (Rs. 17,000) to provincial funds. Of district roads there are seventy miles bridged and metalled, 104 miles partly bridged and metalled, and 193 miles partly bridged and *murumed*. The old POONA-PANVEL road, entering the district at Khandála and passing south-east by Lonávla, Talegaon, Kirkee, Poona, Pátas, and Indápur, is a well made road metalled as far as Pátas and then *murumed*. The crossing of the Bhima at Hingangaon, where a ferry-boat is worked during the south-west rains, and the crossing of the Dalaj are serious obstacles to traffic during the rains. This road was of immense advantage to the district till the opening of the railway in 1862. It brought Poona, which is the great grain market of this part of the Deccan, within easy reach of grain and brought most villages in the neighbourhood of Poona in direct communication with Indápur which is midway between Poona and Sholápur. Dealers exporting produce to Poona and Sholápur naturally tried the half-way market of Indápur. Many cartloads of merchandise intended for Poona or Sholápur were often disposed of in transit at Indápur and the return carts were laden with produce which would command a better price in the respective markets. The opening of the railway in 1862 drove the cartmen from this road and considerably affected the importance of the Indápur market. Though the number of carts making use of the road has diminished those that have been driven off the line are probably such as came from long distances and the local traffic by the road is still considerable. The road is still of local importance in supplying the Indápur market with the produce of the sub-division. The POONA-AURANGABAD road is metalled forty-one miles as far as Sirur and, except at Koregaon on the Bhima and two or three unimportant streams, is bridged and drained throughout. The old POONA-SÁTÁRA road thirty-nine miles as far as the Nira, through the Diva pass, Sásvad, and Jejuri, is a fair road partly bridged and drained. It is at present kept as a local fund road. The new POONA-SÁTÁRA road of thirty miles, passing through the Kátraaj pass and Shirval, is a first class metalled and bridged road kept in good order. The POONA-NÁSÍK road, sixty-two miles through Khed, Manchar, Náráyangaon, and Ambeghargaon, is a *murumed* unbridged road. As the principal rivers are unbridged flying bridges are worked in the monsoon at Moshi on the Indráyani, at Khed on the Bhima, at Kalamb on the Ghod, and at Pimpalvandi on the Kukdi, and at Ambeghargaon on the Mula; an ordinary ferry-boat plies at Váki on the Bháma. A branch from this road goes from Náráyangaon to Junnar. The local fund roads besides the already mentioned old Sátára road are, the SIRUR-SÁTÁRA road fifty-four miles as far as the Nira bridge,

Chapter VI.

Trade.

ROUTES.

1884.

PASSES.

passing through the railway station of Kedgaon and crossing the Bhima at Párgaon by a flying bridge. The twenty-eight miles of this road from Sirur to Kedgaon are kept as a mail pony cart road. The POONA-SINHGAD road extends over twelve miles; the POONA-ALANDI road of thirteen miles runs parallel and close to the Násik road; the SÁSVAD-INDÁPUR road of fifty-four miles east and west passes through Bára-mati, Lurna, and Nimbgaon; the VADGAON-SHIKRÁPUR road of thirty-three miles through Chákan joins the Bombay-Ahmadnagar road at Shikrápur; the KHED-BHIMÁSHANKAR road thirty-one miles joins the Násik road at Khed; the KHED-SIRUR road through Pábal extends over thirty-two miles; the POONA-PAUD road extends over twenty-one miles; and the DIKÁSÁL-BÁRÁMATI road over seventeen miles. All these local fund roads are *murumed* and are more or less bridged, crossing some of the rivers by flying bridges. During the rains when the ground is wet many of the roads are difficult for wheels. Yearly repairs are made and improvements are being gradually introduced.

¹As in the rest of the Deccan the local hill passes or *gháts* belong to two leading systems, those that cross the Sahyádris and those that cross the spurs that stretch east and south-east from the Sahyádris. Down the Málsej pass about sixty-six miles north of Poona, a line for a cart road has been surveyed, and it is expected that in a few years the road will be begun. At present the only road down the Poona Sahyádris fit for wheels is the Bor pass. Except this and the Málsej and Nána passes the rest of the openings in the Poona Sahyádris are foot-paths and have no considerable traffic.² The Málsej and Nána passes have considerable Vanjári traffic carried on pack-bullocks. Of the Sahyádris passes, beginning from the north, the first is NISNI or the Ladder, a steep and difficult route from Tálemachi in Junnar to Divápánda in the Murbád subdivision of Thána; it is impassable for cattle and is little used by foot travellers. MÁLSEJ at the head of the Madner valley, 2062 feet above the level of the sea, is the straight route between Ahmadnagar and Kalyán. It descends about five miles from Khubi in Junnar to Thidbi in Murbád. In 1826 it was passable by camels and elephants, but was steep and in some places narrow with a precipice on one side.³ The descent, in which there is an excavation containing carved images of the Hindu gods Ganesh and Hanumán and a cistern of fine water, is paved with large stones. In 1850, when the engineers of the Peninsula Railway came to India, the Málsej pass first engaged their attention. On examination the route presented such formidable difficulties that it had to be abandoned, and with it the general system of line of which it was a feature. In 1882 connection with the proposal to open a cart road down the pass, l-bars were established for six months to ascertain the traffic. The

¹ Mr. John McLeod Campbell, C.S.

² These foot-paths are very intricate. It is with the greatest difficulty that people travel along them when loaded with the produce of their fields for the local markets. Where the rock is very steep they use a simple bamboo ladder with the help of which they can travel by the most direct routes. The ladder consists of a substantial bamboo shorn of its branches with a small stump at each joint or division to be used as a step.

Captain A. Mackintosh (1839) in Trans. Bom. Geog. Soc. I. 290-291.

³ Clunes' Itinerary, 16.

Chapter VI.

Trade.

PASSES.

returns showed a considerable Vanjári bullock traffic outwards in wheat, Indian millet, *tur*, gram, myrobalans, butter, oil, raw sugar, chillies, betel leaves, coriander seed, pyñse, turmeric, plantains, cattle including sheep, and country blankets; and inwards in rice, salt, *náglí*, *vari*, cocoanuts, dates, sesaum, metal, cloth, bangles, betel, fish, rags, paper, and timber. The export and import trade is with Junnar and other large villages in the Junnar sub-division. Besides the goods traffic there is a large passenger traffic chiefly husbandmen from Junnar and the neighbouring parts of the district on their way to and from the great labour market of Bombay. Six miles south-west of the Másej pass at the head of the Kukdi valley are two passes NÁNGAR-DARA and BHORÁNDICHA-DARA or RITHYÁCHA-DARA from Anjanvel in Junnar to Bhoránde in Murbád. These are steep and difficult, and are used only by Kolis. About a mile further south at the head of the same valley, is the NÁNA pass six miles in descent from Ghátgar to Vaiságre and Dhasai in Murbád. Next to the Bor pass this is the most used route between the Deccan and the Konkan within Poona limits.¹ At the top the road runs through a narrow gorge between two steep rocks, the rock on the north being known as Nána's Ángtha or thumb. The entrance to the pass is by a staircase cut deep through the rock and descending fifty to a hundred feet from the level of the plateau to a narrow terrace. Flanking the artificial staircase, in the precipitous rock which falls from the Deccan level to the terrace, are rock-cut caves which apparently were originally made, and which still serve, as travellers' rest-houses. The walls of the chief cave are covered with a famous inscription of the third Ándhrábhritya king Vedishri Shátakarni, whose probable date is B.C. 90. From the terrace a stair, partly built partly rock-hewn, descends through heavily wooded slopes into the Konkan. The lower portion is easy and runs along rounded hills. At several places in the pass are rock-hewn cisterns with excellent water whose Páli inscriptions show that they were cut about a hundred years before Christ. In 1675 the English physician Fryer, who had been asked to Junnar by the Moghal governor, returned by the Nána pass and found it shorter and easier than the Ávápa track up which he had been taken by mistake. At the top he was kept waiting by 300 oxen laden with salt, then so precious that the saying was whose salt we eat, not whose bread we eat. After standing for an hour he persuaded the bullockmen to stop and let him pass. Once past the salt bullocks, the road was feasible, supplied at distances with charitable cisterns of good water, and towards the bottom adorned with beautiful woods.² Ir

¹ Near the Nána pass the Poona boundary runs far into the Konkan. The story is that in a dispute between the neighbouring Thána and Poona villages the Mh of the Poona village pointed out from the top of the Sahyádris a line a long way west of the base of the cliff. The Thána villagers jeered at him telling him to go over the precipice and show the line. The Poona Mhár tied winnowing fans under his arms and to his legs, and throwing himself over the cliff floated down unhurt. On reaching the ground he began to run west to what he called the Poona boundary. The Konkau villagers seeing their lands passing away mobbed him to death, and fixed the boundary where his body lay. Mr. W. B. Mulock, C.S., Collector of Thána (1882).

² Fryer's East India and Persia, 128-129.

1826 the pass was frequented by Vanjāris in the dry season, but in the rains the steps into which the rock had been cut were in places dangerous for cattle. Though this route saved a considerable distance in going from Ahmadnagar to Kalyán, people with baggage and followers preferred to go round by the Bor pass.¹ At present (1884) the pass is much used in the fair weather by market gardeners and oilmen from Junnar. These men loading their bullocks with packs of chillies, onions, and garlic, march from Junnar to Ghátgar at the top of the pass. Here they stop a night and next day their own pack-bullocks go down the pass unloaded and the packs are carried down the pass by special pass buffaloes belonging to the Ghátgar villagers. The buffaloes are paid $4\frac{1}{2}d.$ (3 *as.*) a trip. Besides this there is a considerable Vanjāri traffic in grain from Junnar to Murbád and Kalyán. Still the pass can never be more than a foot and cattle path. About ten miles south-west at the head of the Mina valley is AMBULI a small rugged pass leading from Ambuli to Palu, not a trade route. This though only a footpath is much used as it is the most direct route from Junnar to Kalyán. KUTE-DARA and TIRGUN-DARA, footpaths leading from Hatvij in Junnar to Sonávle in Murbád are used only by Kolis, and are so steep that in places steps are cut in the rock. GOVELI, also a footpath, leads from Khed to Ubrole in Murbád. It is steep and little used. ÁVÁPE, a descent of four miles from Ávápe in Khed to Khopivli in Murbád, is passable only for men, but is used to carry headloads of clarified butter into the Deccan and myrobalans from the Deccan coastwards. In 1675 the English physician Fryer on his way to Junnar being misguided had to climb the Sahyádris apparently by this path. The ascent was very difficult. There was no path and the breathless bearers threaded their way amid hanging trees, the roots of which were laid bare by the falling earth. To look down made the brain turn, and overhead pendulous rocks threatened to entomb the traveller. Intense labour drew tears of anguish from the servants' eyes and with much difficulty they carried their load to the top by a narrow cavern cut through rock.² Fryer returned by the Nána pass. SHIDGAD descending from Kondanvalin Khed to Narivli, is impassable for cattle, but is much used by foot-passengers. Three paths, GHAR, UMBRA, and GUNAR lead from the Shidgad fort. About one mile west of the temple of Bhimáshankar are two passes one to the village of Balhiner called RANSHIL and the other to the village of Khándas called BHIMÁSHANKAR. In 1826 the Bhimáshankar paths had much traffic in spices, oil, and raw-sugar from the Deccan to Panvel and a return of salt from Panvel to the Deccan. Along much of their length old curbing and in many places old paving remain. The paths are now out of repair and are used only by a few laden bullocks, horses, and travellers who are carried in litters from Khándas. Two other footpaths close to the Bhimáshankar pass are called HÁTKARVAT and SÁKHARTÁKI. AMBANALI two miles south of Bhimáshankar is not passable for cattle. VÁJANTRA a mile further is passable for unloaded

¹ Clunes' Itinerary, 145.² Fryer's East India and Persia, 128-129.

Chapter VI.

Trade.

PASSES.

cattle; NISNI, which is difficult even for men, is the continuation of VÁJANTRA. At the head of the Bhima valley is KOLAMB also called BHATI, two miles south of Kotelgad, now out of repair and fit only for foot passengers and unladen cattle. It had formerly much traffic in rice and salt from Kalyán. Close to Kolamb is a steep footpath by which a detachment of the 4th Regiment climbed to Englad in February 1818 and surprised a party of Kolis¹. About five miles south-west, at the head of the Ándhra valley, three passes PHENÁDEVI, ADKI, and SÁVLE lead from Sávle the first to Málagaon and the last two to Pimpalpáda. Sávle pass, which is paved but is in bad repair, was formerly used for dragging wood. In 1826 the yearly value of the timber dragged up this pass was estimated at £5000 (Rs. 50,000).² Four miles further south, and also at the head of the Ándhra valley, is KUSUR 2149 feet above the sea, a winding path leading 2½ miles from the village of Kusurgaon to Bhivpuri, and in good repair. The descent is at first easy passing under fine shady trees. After some distance it is a steep zigzag down the hill-side. Most of it is roughly paved with large stones which are said to have been laid by one of the Peshwás. At Bhivpuri there is a fine stone reservoir built at a cost of £7500 (Rs. 75,000) by Párvatibái widow of Sadáshiv Chimnáji of the Peshwa's family. The road is passable for mounted horsemen or laden bullocks, but not for carts. It is a great line of traffic from Talegaon to Karjat, Neral, Kalyán, and Panvel. The yearly toll revenue of about £200 (Rs. 200) is spent on repairing the pass. GALDEVICHA RASTA leading from Jambavli to Dák in Karjat and VALVANDI DÁRCHA MÁL leading from Valvandi to Khadvái are used by foot-passengers and unloaded animals. Nine miles south-west of Kusur, winding close under the slopes of Rájmáchi, is the footpath of RÁJMÁCHI known in Thána as the Konkan Dárvája or Konkan Gate, leading about five miles to the village of Kharvandi on the Uhás river in Karjat. It was formerly passable by laden cattle, but is now out of repair and is used only by foot travellers. HINDOL and MIRRA, both of them footpaths, lead from Nándgaon and Kune in Mával to Kondane in Karjat. Eight miles south of Konkan Darvája, at the top of the Indráyani valley about 2000 feet above the level of the sea is the Bor pass, a winding made road from Lonávla eight miles to Khopivli. At the close of 1779 the leaders of the unfortunate expedition which ended in the Vadgaon Convention spent four weeks (23rd November-23rd December) in making a path fit for artillery up the Bor pass. The track was improved in 1804 by General Wellesley. From its importance in joining Bombay and Poona the improvement of the Bor pass road was one of the first cares of the Bombay Government after the fall of the Peshwa. In 1825, according to Bishop Heber who passed through it, the road through the Bor pass though broad and good was so steep that a loaded carriage or palanquin could with difficulty be taken up. Every one either walked or rode and all merchandise was conveyed on bullocks or horses. To have carried a road over these hills at all was, Bishop Heber thought, highly creditable to

¹ Clunes' Itinerary, 146.² Clunes' Itinerary, 146.

Chapter VI.

Trade.

PASSES.

the Bombay Government, and the road as it stood was probably sufficient for the intercourse that either was or was likely to be between the Deccan and Konkan.¹ A few years later the pass road was greatly improved, and in 1830 it was opened in state by Sir John Malcolm, the Governor of Bombay. In 1840 the pass road was metalled throughout and completed with bridges and drains so as to be passable for carts during the rains. In this year the traffic yielded a toll revenue of £2774 (Rs. 27,740).² In spite of the improvement, in 1850 it was so difficult of ascent and descent that no one ever thought of driving up or down in a carriage. Passengers travelling by the public conveyances were carried up and down in palanquins, there being different sets of coaches for the high and low portions of the road. Private carriages were pulled up or let down by numerous bodies of workmen or else they were carried up and down swung from a number of poles resting on men's shoulders.³ At present (1884) it is a first-class metalled and curbed road twenty-two feet wide with masonry bridges, culverts, drains, dry stone retaining walls, and an easy gradient. It has considerable cart traffic from Poona to Panvel and Pen. Wheat, raw sugar, oil, clarified butter, millet, and cotton pass westwards, and salt passes inland. In 1881 the Bor pass toll yielded £790 (Rs. 7900). In 1860 the Peninsula Railway line to Poona was taken across the Sahyádris at the Bor pass.⁴ South of Khandála NÁGPHANI or Cobra's Hood leading from Kurvanda in Mával to Chavri in Karjat is used by foot passengers and unloaded animals. Two miles south, at the head of the Indráyani river, KORONDI passable for laden cattle, also leads west to Chavri in Pen. Further south are KEVNI five miles between Yekoli and Páchápur, DERYA four miles between Ghulka and Nenavli, AVLI five miles between Pimpri and Alvano used by foot passengers carrying no loads, and PIMPRI six miles between Pimpri and Patnus used by pack-bullocks carrying myrobalans salt and coals. Further south in the Mulshi petty division are NISNI AMBONE four miles from Maluste to Mángaon; AMBAVNE or KALAMBYA five miles from Ambavne to Kalamb; VÁRASDÁR four miles from Saltar to Kondgaon; TELBEJA SAVASNI four miles from Telbela to Dhondse; NIVE or SAVATYA four miles from Nive to Patnus; TAMNI or SÁHPÁYRI three miles from Tamni to Vile, all used by foot passengers who often carry head-loads of myrobalans, butter, coals, salt, and rice; GADLOT on the direct road from Pocna to Nágothna leading into the Pant Sachiv's state of Bhor; LENDH or LING, NISNI, and TAMHANA, in the extreme south and fit only for men, lead into Kolába. South of these connecting the Bhor state and Kolába are several passes DEV, KUMBHE, THIBTHABE, KÁVLYA, SHEVTYA, MADHYA, AMBOVAL, GOPYA, VARANDHA, and SHEVTA, all of which are useful for Poona traffic.

Of the passes over the spurs that run east from the Sahyádris the chief are in the Singhad-Bholeshvar range. Four cart roads

¹ Heber's Travels, 200. ² Mackay's Western India, 379.

³ Trade Reports, 1840-41, 380-81.

⁴ Details of the Bor pass railway are given below pp. 159-161.

Chapter VI.

Trade.

PASSES.

cross the Sinhgad-Bhōleshvar range at the Kátraj, Bábdev, Divá, and Bor passes. The KÁTRAJ pass is on the new Sátára road, a fine piece of modern engineering, crossing the crest of the range in a tunnel. The BÁBDEV, about ten miles from Sásvad and between Bhivari and Kondhve Budruk, is on the old Sátára road through Haveli and Purandhar. In 1803 Holkar brought his plundering bands up this pass. It was put in order about the year 1824, and for years afterwards was in a prosperous condition. Until 1853 it was used for wheeled carriages, but since the opening of the Diva and Bor passes in the same range of hills, it has been abandoned. In 1853, it was one of the worst specimens of a pass in Western India. Its angles and gradients were frightful to contemplate, its sharp turns being in some places flanked by low walls which afforded but a slight bulwark against the precipices which they crowned. The road in the steepest parts was constantly rough, being covered with loose round stones. This to some extent served to check the impetus of a descending load but greatly increased the toil of drawing a load up. At present it is impracticable for laden carts and is used by pack-bullocks and foot passengers carrying ~~headloads~~ of mangoes, figs, and ~~vegetables to Poona from Supa and the neighbouring villages.~~ The outward traffic is estimated to be worth about £200 (Rs. 2000) a year. The DIVA pass, between Diva and Vadki, seven miles further east and six miles north of Sásvad was made in 1853 at a cost of £8500 (Rs. 85,000) from Imperial funds to supersede the Bábdev pass. The pass is kept in good order by yearly repairs, and wheeled carriages can easily go over it. Considerable traffic, consisting of grain of every sort, fruit, especially mangoes and figs, vegetables, raw sugar, firewood, butter, oil, cloth and other articles of foreign manufacture, metal work, timber, sugar, and spices, passes by this route. The inward traffic is worth about £20,000 (Rs. 2,00,000) and the outward about £10,000 (Rs. 1,00,000). The BOR or SINDAVNE pass, nine miles further east, near the end of the spur, between Vághapur and Sindavne, is the oldest route across the Sinhgad-Bhōleshvar range. It was crossed by the Duke of Wellington in his famous forced march in 1803,¹ and by Peshwa Bájiráv when he fled from Poona in 1817. Though superseded by the Bábdev pass for traffic with Poona, the road is still kept in repair, as it is a line of communication between the Urali railway station and Sásvad, Jejuri, and other places on the old Sátára road. It was made in 1862 at a cost of about £100 (Rs. 1000) from local funds. At present the road is in good order and fit for wheeled carriages. The pass is chiefly used by pilgrims from the Urali railway station to Jejuri. The traffic chiefly in corn and other articles of daily use is worth about £2500 (Rs. 25,000) a year.

BRIDGES.

Besides four large bridges and one dam or *dharan* and several minor bridges in the town and cantonment of Poona and Kirkee, the district has forty-two bridges of not less than fifty feet long. Of the Poona and Kirkee bridges, the WELLESLEY Bridge

¹ The Duke's famous march of sixty miles in thirty-two hours was from Baramati to Poona on the 19th and 20th of April 1803. Grant Duff's Maráthás, 568.

Chapter VI.

Trade.

BRIDGES.

called after the Marquis of Wellesley over the Mutha river at the Sangam, 498 feet long, of stone and lime masonry throughout, with eight $52\frac{1}{2}$ feet span segmental arches and cut-stone parapet walls, including a roadway $28\frac{1}{2}$ feet wide and forty-five feet above the foundation or river-bed, was built in 1874 at a cost of £11,093 6s. (Rs. 1,10,933). The original bridge which was entirely of wood was built in 1828 and was removed in 1839. A stone bridge was then built which continued in use till it was removed in 1874. The new bridge keeps the name of the former bridge, the people changing the word Wellesley into Vasli. Not far from this bridge to the west is the railway bridge over the Mutha. The LAKDIPUL on the Mutha river at the north-west end of the city was built in 1847, at a cost of £2697 10s. (Rs. 26,975). Though of stone it is called the *Lakdi Pul* or Wooden Bridge, because it is on the site of a wooden bridge which was built by one of the Peshwás and gave way in the floods of 1840. The present bridge is 523 feet long, with nine forty-eight feet span segmental arches of stone and lime and parapets of coursed stone and lime masonry including a roadway $18\frac{1}{2}$ feet wide and $34\frac{1}{2}$ feet above the foundation or river-bed. The FITZGERALD Bridge over the Mula-Mutha river below the Bund Gardens, 1002 feet long, of stone and lime masonry throughout, with thirteen sixty feet span semi-elliptical arches and stone parapet walls, including a roadway $25\frac{1}{2}$ feet wide and $47\frac{1}{2}$ feet above the foundation or river-bed, was built in 1869, at a cost of £24,153 2s. (Rs. 2,41,531). HOLKAR'S Bridge over the Mula river at Kirkee, 548 feet long, is built of stone and lime masonry throughout, with nineteen seventeen-feet segmental arches, and a parapet of cut teak wood railing, including a roadway fifteen feet wide and twenty-eight feet above the foundation or river-bed. The KUMBHÁR VES or Potters' Gate *dharan* or causeway is the oldest crossing over the Mutha river near Kasba Peth to the north of Poona. The old causeway gave way in the beginning of British rule, and the present causeway was built between 1835 and 1840 at a cost of about £3000 (Rs. 30,000), paid partly by Government and partly by the people. It is built of solid stone masonry, and is 235 yards long and seven yards broad. It has twelve nine-feet wide sluices. During the monsoon floods it is under water and impassable. The other bridges in the town of Poona are: the HALÁLKHOR or Sweepers' bridge over the Mánik Nála sixty-eight yards long, a massive structure of cut-stone masonry with three five-feet broad vents or waterways leading to the Halálkhor quarters in Mangalvár Peth; it was built between 1835 and 1840. The JAKÁT or Toll Bridge, connecting the Mangalvár and Shanvár Peths, with three twelve-feet vents, was built between 1836 and 1840. Here the tolls were levied in the Peshwás' time. GOSÁVIPURA Bridge on the Mánik stream was built in 1870 at a cost of £300 (Rs. 3000). It is a double bridge at a point where the main road branches: The arches are single of twenty-two feet span. The DÁRUVÁLA or Fireworkers' Bridge on the Nágzari stream, joining the Ravivár with the Nyahál, Rástia, and Somvár Peths, was built in 1870 at a cost of £1500 (Rs. 15,000). It is fifty-eight yards long and has four twelve-feet side vents. The BHATTI or Brick-

Chapter VI.
Trade.
BRIDGES.

Kiln Gate Bridge on the Mánik stream joining Rástia's Peth with the Civil Lines was built in 1845. It is a small culvert of two seven-foot vents. The Pársi bridge or causeway on the Nágjhari stream joining Ganesh Peth with Rástia's Peth was built in 1830 by a Poona Pársi. It has three five-foot wide vents, and is occasionally under water during the rains when it becomes impassable. The GANESH Peth Bridge, joining the Ganesh and NÁNA'S Peths, was built in 1835. It is a cut-stone bridge with three sixteen-foot arches. The BURUD or Basket-makers' Bridge near the Buruds' quarters, joining the Ravivár and Bhaváni Peths, was built between 1840 and 1845 of solid cut-stone masonry. It has four nine-foot arches. The GHÁSHETI Bridge, joining Ganj. and Vetál Peth with Bhaváni Peth, was built in 1845 at a cost of £180 (Rs. 1800). It is of solid cut-stone masonry and has three eighteen-foot arches.

Of the forty-two other bridges in the district, twenty-three are on the Poona-Sholápur road, six on the Poona-Ahmadnagar road, three on the Poona-Násik road, six on the Poona-Panvel road, and four on the Poona-Sátára road. The bridges on the Poona-Sholápur road were built about the year 1836-37. Most are of coursed, one is of uncoursed, and four are of partly coursed rubble masonry. They are fifty to 175 feet long, with one to five ten to nity feet segmental arches and eighteen to twenty feet wide roadway from nine to twenty-one feet above the foundation or river-bed. The bridges on the new Sátára road which were built in 1856 are ninety to 162 feet long, of coursed rubble with three or four twenty to forty feet span segmental arches and twenty-four feet wide roadway from twelve to twenty-one feet above the foundation or river-bed. Of the three bridges on the Poona-Násik road, which were built between 1854 and 1856, two are sixty-five feet, and one over the Mina at Náráyangaon is 320 feet long of stone and mortar masonry. They have from one to nine, fifteen to fifty feet span segmental arches, and a roadway twenty to twenty-five feet broad and 10½ to twenty-five feet above the foundation or river-bed. The six bridges on the Poona-Ahmadnagar road, with the exception of the Ghod bridge, were built in 1842-43. Four are fifty-five to sixty-three feet long, one on the Vel river is fifty-two feet long, and one on the Ghod, which was built in 1868, is 800 feet long. They are built of stone and mortar masonry with two to sixteen eight to fifty feet span segmental or semicircular arches and a roadway sixteen to twenty feet wide and 7½ to 37½ feet above the foundation or river-bed. The Vel bridge cost £2205 (Rs. 22,050) and the Ghod bridge £10,359 16s. (Rs. 1,03,598). Of the six bridges on the Poona-Panvel road, the Indráyani bridge which is built of stone and lime masonry, has seventeen twenty-foot span two-centre arches and a roadway fourteen feet wide and fourteen feet above the foundation or river-bed. The Dápuri bridge, which was built in 1842, at a cost of £6858 (Rs. 68,580), is 994 feet long, partly wooden and partly of stone and lime masonry, with thirteen thirty-five feet span arches and a roadway twenty feet wide and twenty-six feet above the foundation or river-bed. The other bridges are fifty-seven to eighty-four feet long, of stone, or stone and brick and lime masonry, with two to

five ten to twenty-two feet span segmental arches and a roadway $17\frac{1}{2}$ feet wide and nine to $13\frac{1}{2}$ feet above the foundation or river-bed.

Of thirteen public ferries, one is a second class, one is a third class, and eleven fourth class ferries.¹ Two, one across the Ghod at Kalamb and the other across the Kukdi at Pimpalvandi on the Poona-Násik road, are in Junnar; two, one across the Bhima at Khed and the other across the Bhála at Váki on the Poona-Násik road, are in Khed; one, across the Indráyani at Induri on the Talegaon Station road, is in Mával; one, across the Bhima at Koregaon on the Poona-Ahmadnagar road, is in Sirur; two, one across the Indráyani at Moshi on the Poona-Násik road, and the other across the Mutha lake at Sangrun are in Haveli; one across the Nira at Pimpri Khurd on the Poona-Sátára road is in Purandhar; two across the Bhima, one a third class ferry at Khánote and the other at Párgaon on the Sirur-Sátára road are in Bhimthadi; and the remaining two, also across the Bhima, one a second class ferry at Hingangaon on the Poona-Sholápur road and the other at Chandgaon on the road to the Pomalvádi railway station, are in Indápur. Except the Sangrun and Induri ferries, which were established in 1877-78, at a cost of £116 (Rs. 1160) and £356 (Rs. 3560), all these ferries were established before 1875. The two ferries at Sangrun in Haveli and Chandgaon in Indápur work throughout the year, as the water there is always unfordable; the rest work during the rainy season only. In 1881-82, the thirteen public ferries yielded a revenue of about £388 (Rs. 3880) against £437 (Rs. 4370) in 1874-75. During the current year (1884-85) they have been farmed for £555 (Rs. 5550). Rules framed under the Ferry Act (II. of 1878) fix the fares for passengers, animals, carriages, and cradles.² Besides these there is one ferry at Netva in Junnar across the Pushpávatí. It is maintained by local funds and passengers are carried free of charge. There are several private ferries, which, except the ferry across the Mula-Mutha below the Sangam bridge near Poona, work during the rains only. The ferry boats are generally built in Bombay or in Thána, but some have been made by men brought from Bombay in the public works workshops in Poona. They are built on the lines of ordinary boats, of wood brought from Kalikat, and at a cost varying from £100 (Rs. 1000) for a small boat to carry about fifty passengers to £330 (Rs. 3300) for a large ferry boat to carry horses and cattle as well as passengers. The most successful form of ferry

Chapter
Trade.
FERRIES.

¹ There are four classes of public ferries: I. those that do not make more than six trips in a day of fourteen hours; II. those that do not make more than ten trips; III. those that do not make more than fifteen trips; IV. and those that make more than fifteen trips.

² The sanctioned charges are: Passengers exclusive of children in arms $\frac{2}{3}d.$ ($\frac{1}{2} a.$) in second and $\frac{3}{4}d.$ ($\frac{1}{2} a.$) in third and fourth class ferries; four-wheeled carriages, $1s.$ ($8 as.$) in second, and $9d.$ ($6 as.$) in third and fourth class ferries; two-wheeled carriages, $9d.$ ($6 as.$) in second, $6d.$ ($4 as.$) in third, and $4\frac{1}{2}d.$ ($3 as.$) in fourth class ferries; laden ponies, horned cattle, and mules, $3d.$ ($2 as.$) in second, and $1\frac{1}{2}d.$ ($1 a.$) in third and fourth class ferries; unladen ponies, horned cattle, and mules, and asses, $1\frac{1}{2}d.$ ($1 a.$) in second, and $\frac{3}{4}d.$ ($\frac{1}{2} a.$) in third and fourth class ferries; camels, $4\frac{1}{2}d.$ ($3 as.$) in second and $3d.$ ($2 as.$) in third and fourth class ferries; sheep and goats, $4\frac{1}{2}d.$ ($3 as.$) in second and $1\frac{1}{2}d.$ ($1 a.$) in third and fourth class ferries; palanquin with bearers $1s.$ ($8 as.$) in second and third and $6d.$ ($4 as.$) in fourth class ferries; and litters or *páinds* with bearers, $6d.$ ($4 as.$) in second and third and $3d.$ ($2 as.$) in fourth class ferries.

Chapter VI.

Trade.

FERRIES.

boat is two boats, each twenty-two feet to thirty-seven feet long by 5½ to ten feet broad joined together by a top frame. The boat-men are Kolis by caste. Ferry boats are in many cases worked by flying bridges. A wire rope is hung from bank to bank above water level with a pulley working on it to which the boat is attached, and, being kept at an angle to the run of the stream, goes across by the pressure of the stream water against the boat, the pulley sliding along the iron rope and so bringing the boat straight across the river.

REST-HOUSES.

Besides five European travellers' bungalows, ten district revenue officers' bungalows, and nine public works bungalows, there are 156 rest-houses or *dharmshálas*, for the use of native travellers, and five for the use of troops. Of the five European travellers' bungalows, four, at Lonikand, Kondhápuri, Sirur or Ghodnadi, and Dhond, are on the Poona-Ahmadnagar road, and one at Khandála is on the Poona-Panvel road. Of the ten district revenue officers' bungalows, one is at Otur in Junnar, one at Chákan in Khed, one at Sásvad in Purandhar, one at Loni Kalbhár in Haveli, three at Rávangaon Supa and Yevat in Bhimthadi, and three at Indápur Kumbhárngaon and Loni in Indápur. Of the nine public works bungalows, two at Kárla and Vadgaon are on the Poona-Bombay road; one near the Nira bridge is on the old Poona-Sátára road; one at Párgaon on the Sirur-Nira bridge road; one at Bárámati on the Indápur-Nimbat road; one at Vir on the Nira canal head-works road; one at Náráyangaon on the Poona-Násik road; and two at Pátas and Bhigvan on the Poona-Sholápur road. Of the 156 rest-houses or *dharmshálas* for the use of native passengers, all of which are not situated on high roads, nine are in Junnar, four at Khubi, Dingora, Rájuri, and Belhe on the Málsej-Ána pass road, and three at Kalamb, Náráyangaon, and Junnar on the Poona-Násik road; thirty are in Khed, none on any highroad; eleven are in Mával, five at Talegaon, Vadgaon, Khadkála, Valavhan, and Khandála on the Poona-Bombay road; eighteen are in Sirur, four at Koregaon, Shikrápur, Kondhapuri, and Ganpati's Ránjangaon on the Poona-Ahmadnagar road; twenty-six are in Haveli, two at Vagholi and Lonikhand on the Poona-Ahmadnagar road, one at Shivápur on the new Poona-Sátára road, one at Bhosri on the Poona-Násik road, one at Dápur on the Poona-Panvel road, and one at Urali Kanchan on the Poona-Sholápur road; seventeen are in Purandhar, two at Sásvad and Jejuri on the old and one at Kikvi on the new Poona-Sátára road; thirty-two are in Bhimthadi, five of them at Yevat, Kedgaon, Pátas, Dhond, and Rávangaon on the Poona-Sholápur road; and thirteen are in Indápur, five of them at Bhigvan, Daij, Loni, and Indápur, on the Poona-Sholápur road, and three at Nimbgaon-Ketki, Lasurna, and Sansar, on the Indápur-Bárámati road. There are also 354 village offices or *chávdís* which are used, by native travellers as rest-houses in villages which have no other resting places. Of the five rest-houses for the use of troops, two, at Vadgaon and Khandála, are on the Poona-Bombay road, one at Lonikand is on the Poona-Násik road, and two at Kondhápuri and Sirur (Ghodnadi) are on the Poona-Ahmadnagar road.

The district roads have nineteen toll-bars; thirteen of them on provincial roads and six on local fund roads. Of the thirteen provincial toll-bars, six at Khadkála with a sub-toll at Tákvi, Dápuri, Hadapsar, Yevat, Kumbhárgaon, and Indápúr, are on the Poona-Sholápur road; two, at Kátraj and Kikvi, are on the new Sátára road; two, at Lonil and with a sub-toll at Vágholi and Ránjangaon, are on the Poona-Sirur road; and three, at Kuráli, Peth, and Náráyangaon, are on the Poona-Násik road. Of the six local fund toll-bars one is at the Nira Bridge on the old Sátára road, one at Hingne-Khurd on the Poona-Sinbgad road, one at Bhugaon on the Poona-Paud road, one at Shetphal-gadhe on the Baramati-Khánoti road, one at Khalumba on the Vadgaon-Shikrápur road, and one at Aund with a sub-toll at Bánera on the Aund-Shelárvádi road. All the toll-bars, both on provincial and local fund roads, are sold every year by auction to contractors. In 1884-85 the auction bids amounted to £7430 (Rs. 74,300) for tolls on provincial roads and £2344 (Rs. 23,440) for tolls on local fund roads, or £9774 (Rs. 97,740) in all.

During the last quarter of a century communications have been greatly improved not only by making roads, but also by opening the Great Indian Peninsula Railway which for 106 miles passes through the district from west to east. It enters the district at Khandála near the crest of the Sahyádris which is about 2000 feet above the level of the sea. For about twenty miles the line runs through a rough and hilly country. It next passes through the fertile plain lying between the Indráyani and Pauna rivers twenty-one miles south-east to Poona. From Poona its course is east along the valleys of the Mula-Mutha and Bhima, forty-eight miles to Dhond, and then south-east, seventeen miles to Diksál, where it enters Sholápur. It has eighteen stations: Khandála seventy-seven miles from Bombay, Lonávla 79½ miles, Kárla 84½ miles, Khadkála 89½ miles, Vadgaon ninety-six miles, Talegaon-Dábháde ninety-eight miles, Shelárvádi 104 miles, Chinchvad 109 miles, Kirkee 115½ miles, Poona 119 miles, Loni 129½ miles, Urali 137 miles, Yevat 145 miles, Kedgaon 152½ miles, Pátas 159 miles, Dhond 165½ miles, Boribyál 172½ miles, and Diksál 183½ miles. The line was begun in 1856 and the section from Khandála to Poona was opened for traffic on the 14th of June 1858 and from Poona to Diksál on the 15th December of the same year. From Dhond, which is on the Poona frontier, runs the Dhond and Manmád State Railway, the chord line which joins the north-east and south-east sections of the Great Indian Peninsula Railway. This line from Dhond to Ahmadnagar was opened on the 16th March 1878. Dhond is the only station on the line within Poona limits. Throughout the district the Peninsula railway line was easily made. Khandála, which is provided with a safety siding, is the fourth and Lonávla is the fifth station on the Bor pass incline.¹ Besides ordinary buildings costing £250 to £1500

Chapter VI.

Trade.

TOLLS.

RAILWAY.

¹ The Bor incline begins at Karjat station near the village of Palasdhari, sixty-two miles from Bombay and 206 feet above mean sea level. As the crest of the ascent is

Chapter VI.
Trade.
RAILWAY.

(Rs. 2500 - 15,000) with quarters for a station-master and a booking office and waiting rooms, at Khandála, Khadkála, Talegaon, Kirkee, Poona, Urali, Kedgaon, Pátas, and Dhond, and refreshment-rooms

2027 feet, the height of the incline is 1831 feet and the distance fifteen miles, or an average gradient of one in forty-six. At Thakurvada the first station, about six miles from the bottom, safety sidings are provided, into which any train can be turned and stopped. The next station is at the Battery hill and the third is at the reversing station at the eleventh mile, where, by means of a siding, the train leaves the station in the opposite direction to which it entered. This change is very advantageous at this particular point. It allows the line to be laid in the best direction as regards gradients and works, and raises its level at the steepest part of the precipice. The fourth station is at Khandála at the thirteenth mile, where also a safety siding is provided, and the fifth is at Lonávla on the crest. Khandála and Lonávla are within Poona limits. On leaving Palasdhari or Karjat the line keeps to the western flank of the great Songiri spur. In the first four miles are very heavy works, which a second survey showed to be necessary to reduce the gradients that were first laid out. Some heavy embankments bring the line through the first mile. It then keeps round the Songiri hill, passing on its course through six tunnels of 66, 132, 121, 29, 136, and 143 yards. Then bending north with very heavy works the line climbs round the Máhukimalli and Khami hills to the station at Thakurvada, 6½ miles. In the last two miles there are eight tunnels of 286, 291, 282, 49, 140, 50, 437, and 103 yards, and five viaducts which though not very long are very lofty. All except the last are of masonry, with fifty-foot arches, one viaduct having eight, one six, and two four openings. The fifth viaduct, originally of eight fifty-foot arches, was replaced by two Warren girders of 202 feet span. The least height of pier is seventy-seven feet, two are ninety-eight, one 120, and one 143. Leaving this section of tunnels, for two miles beyond the Khami hill, the line runs along a natural terrace or case in the rock, without any obstacle, as far as Gambhirnath where the terrace is cut by two sheer rocky ravines. Crossing these ravines by two small viaducts, one with six forty-feet and the other with four thirty-feet arches, with piers forty-eight and eighty-eight feet high, the line keeps along the same case for two miles to the bold outstanding rock called Náthácha Dongar. In the last two miles are heavy works, nine tunnels of 81, 198, 55, 63, 126, 79, 71, 280, and 121 yards. Beyond this the railway enters on the long and fairly level neck that forms the link between the Songiri spur and the main range of the Sahyádris. At the end of this neck, 11½ miles from the foot, is the reversing station, which was considered the best arrangement for surmounting the last great difficulty on the incline, the ascent of the scarp of the Sahyádris face. By means of the reversing station the line is taken up the remaining five miles by gradients of one in thirty-seven, one in forty, and one in fifty, with two tunnels of 346 and of sixty-two yards, and with a viaduct of one sixty-feet and eleven forty-feet arches. The line leaves the reversing station by a curve of fifteen chains on a gradient of one in seventy-five, pierces Elphinstone Point by a long tunnel of 346 yards, keeps along the edge of the great Khandála ravine, reaches the hollow where is Khandála station, and then, following the course of the Khandála ravine, crests the Sahyádris at the village of Lonávla. Besides the leading viaducts the incline has twenty-two bridges of seven to thirty-feet span; and eighty-one culverts two to six feet wide. The total cutting, chiefly through rock, is two millions of cubic yards; and the greatest depth is, on the central line, seventy-six feet, and, on the faces of the tunnel through Elphinstone Point, 150 feet. The cubic contents of the embankments are 2½ millions of yards, the greatest height of bank on the central line being seventy-five feet, though many of the outer slopes are 150 and some of them are as much as 300 feet. There are in all twenty-six tunnels, of a total length of 3986 yards, or more than 2½ miles, six of them being more or less lined with masonry for a total length of 812 yards. There are eight viaducts. The length of the incline is fifteen miles and sixty-eight chains, of which five miles and thirty-four chains are straight and ten miles and thirty-four chains curved. The sharpest curves are one of fifteen chains radius for a length of twenty-two chains, and another of twenty chains radius for twenty-eight chains. Between a radius of twenty and of thirty chains there are curves of a total length of one mile and forty-eight chains, and the rest have a radius of between thirty-three and eighty chains. The steepest gradients are one in thirty-seven for one mile and thirty-eight chains, and one in forty for eight miles and four chains, the remainder being between one in forty-two and one in seventy-five. The only exceptions are one in 330 for twenty-three chains and a level of one mile and fifteen chains. The line is double throughout. It cost £68,750 (Rs. 6,87,500) a mile; or about

at Poona and Dhond, a large station has been built at Lonávla at a cost of £30,000 (Rs. 3,00,000) with large waiting and refreshment rooms. Workshops have also been constructed at Lonávla, as well as a church, a school, a library, and quarters for the engine-drivers and other servants of the company. As the water of the Indráyani, which runs outside the Lonávla station-yard, was insufficient during the hot weather, a reservoir was built at a considerable cost at Bhushi about two miles to the south of Lonávla from which an abundant supply of fresh water is now available. The water is carried by cast-iron pipes to Lonávla, Khandála, and to the reversing station. The company has lately agreed to supply the village of Lonávla with water, the cost of the connection being borne by Municipal and Local Funds.

Since it was opened large quantities of goods have been drawn to the railway. Much traffic which used to go down the rough tracks of the Sahyádris from Junnar and Khed now finds its way by the Násik highroad to the Talegaon railway station. Much of the export trade which used to go to Bombay along the old Sátára, Sholápur, and Ahmadnagar roads through Poona is now attracted to the nearest railway station. At the same time the ordinary roads are by no means abandoned. Bárámati and Indápur, the large markets in the east of the district, though only seventeen and twelve miles from the railway, have a direct road trade with Bombay and keep up the relatively high position they enjoyed before the railway. The railway has increased competition by throwing open the local trade as it were to the whole of India and has almost defeated combinations to keep up the price of grain or other articles of general

£1,100,000 (Rs. 1,10,00,000) in all. The tunnels were the most difficult part of the work. Nearly all were of very hard trap. The steep forms of the hills prevented shafts being sunk, and, as the drifts had to be made solely from the ends, much skill and care were required in setting out the work on the sharply-curved inclines, so as to ensure perfectly true junctions. The viaducts are partly of block in coarse masonry, as abundance of admirable building stone was every where at hand. But the masonry work was not good, and there have been some failures, chiefly the Máhukimalli viaduct which had to be rebuilt. Another cause of danger and trouble is the slipping of rain-loosened boulders. To ensure its safety all boulders had to be moved from the hill sides above the line. The land slips were particularly troublesome in the lower part of the incline. Shortly after the first engine passed, on the 30th March 1862, the whole of one of the open cuttings, near the foot of the incline, was filled and had to be pierced by a tunnel of arched masonry.

The incline took seven years and a quarter to complete. It was carried out entirely by contract. The contract was first let to Mr. Faviell in the autumn of 1855, and the works were begun on the 24th January 1856. In June 1858, two miles of the upper part of the incline, from Khandála to Lonávla were opened for traffic. In March 1859, Mr. Faviell gave up his contract; and, for a short time, the Company's engineers carried on the works. In the same year the contract was relet to Mr. Tredwell. But he died within fifteen days of landing in India, and the work was completed by Messrs. Adamson and Clowser, managers for the contractor Mrs. Tredwell. These gentlemen carried on the work with the greatest zeal and ability. Their good and liberal management collected and kept on the work a force of 25,000 men during two seasons, and in 1861 of more than 42,000 men.

The rails used on the incline weigh eighty-five pounds to the yard, and were made with special care so as to secure hardness and flexibility. Under the fish-joints a cast-iron chair, spiked to longitudinal timber bearers, is fixed so as to support the bottom of the rail and to give additional strength and security to the joint. The incline is worked by pairs of double-tank engines of great strength and power. Thana Statistical Account, Bombay Gazetteer, XIII. 326-9,

Chapter VI.
Trade.
RAILWAY.

local use. The merchants complain that though trade has greatly increased, profits have greatly fallen.

The making of the Western Deccan section of the Southern Marátha railway was sanctioned in December 1883, and the work was begun in March 1884. Of the whole length of 242 miles, 45½ miles lie within Poona limits. The line starts from Poona, 119¾ miles from Bombay, and for about ten miles runs almost parallel to the Peninsula railway at a distance of about three miles to the south. Near Loni, ten miles east of Poona, the line turns more to the south, and skirts the Sinhgad-Bhoshvar range, rising with a ruling gradient of one in a hundred till it crests the Bhor incline about twenty-one miles south-east of and about 675 feet above the Poona railway station. From the top of the pass the line turns south, and, leaving Sásvad about eight miles to the west, passes almost straight south to Jejuri thirty-two miles south-east of Poona. At Jejuri it crosses the Purandhar hills, and runs generally southwards till near Nimbat, 45½ miles from Poona, it crosses the Nira river about three miles west of the Poona-Tásgaon road and enters Sátára. The country over which the line passes is a series of parallel hills, running east and west, and divided by more or less wide valleys which slope from west to east. This section of the line will be difficult and costly. The great length of hill line involves heavy gradients, many curves and tunnels, and much bridging and walling. Not counting the terminus at Poona there will be four third class stations, Phursangi ten miles from Poona, Vághpur twenty-four miles, Jejuri 32 miles, and Vála forty-one miles. The ruling gradient will be one in a hundred throughout and the sharpest curve will be above 500 feet radius. As good stone is plentiful, all the bridges are intended to be arched. The important bridges will be the Karha bridge, twenty-nine miles from Poona, with five fifty-foot arches and an estimated cost of £7300 (Rs. 73,000), and the Nira bridge, 46½ miles from Poona, with eight fifty-foot arches, at an estimated cost of £8700 (Rs. 87,000). There will be two tunnels in the Bhor incline, one 500 feet long estimated to cost £11,400 (Rs. 1,14,000) and the other 600 feet long estimated to cost £13,700 (Rs. 1,37,000). There will be about 63,832 cubic feet of retaining wall on the Bhor pass, costing about £2820 (Rs. 28,200). The permanent way will cost about £1890 (Rs. 18,900) a mile. The estimated cost of the whole Western Deccan section is £8300 (Rs. 83,000) a mile.

POST OFFICES.

The district of Poona forms a part of the Poona postal division. Besides the chief receiving and disbursing office at Poona, the district contains thirty sub-offices, two of them in Poona, and twenty-four village post offices. The chief disbursing office at Poona is in charge of a post-master, who draws a yearly salary of £300 (Rs. 3000) rising to £360 (Rs. 3600). The two Poona sub-offices, one in the city and another in the New Bázár, and the twenty-eight sub-offices, at Dhond, Báraмати, Chákan, Chinchvad, Diksál, Ghoda, Indápur, Jejuri, Junnar, Kedgaon, Khadkála, Khandála, Khed, Kirkee, Lonávala, Mahálunga, Manchar, Náráyan-gaon, Pátas, Purandhar, Sásvad, Sirur, Supa, Talegaon-Dábháde,

Talegaon-Damdhera, Otur, Vadgaon, and Kirkee Bazar, are in charge of sub-postmasters drawing yearly salaries varying from £18 (Rs. 180) to £72 (Rs. 720). The twenty-four village post offices, at Ale, Alandi, Alegaon, Avsari, Avsari Budrukh, Belhe, Chás, Dávi, Kadus, Kalamb, Kikvi, Malthan, Morgaon, Narsingpur, Nimbgaon, Pábal, Parinch, Paud, Peth, Pimpalvandi, Rájuri, Váda, Vália, and Váphgaon are in charge of village schoolmasters who receive yearly allowances varying from £3 (Rs. 30) to £6 (Rs. 60). There are fifty-six postmen for delivery of correspondence. Of these, one receives £18 (Rs. 180) a year, eleven receive £14 8s. (Rs. 144) a year, and the remainder £9 12s. (Rs. 96) a year. Gratuities to runners for delivering letters at some of the villages vary from £1 4s. to £2 8s. (Rs. 12-24) a year. Seventy-one village postmen deliver letters at small villages. Of these twenty-four, receiving yearly salaries of £10 16s. (Rs. 108) each and thirteen of £12 (Rs. 120), are paid from Imperial, and eighteen receiving yearly salaries of £12 (Rs. 120) and sixteen of £10 16s. (Rs. 108) are paid from provincial funds. At the village post offices only money-orders are issued and at the other post offices both money order and savings' bank business is carried on. Mails for the district of Poona to and from Bombay are carried by the Peninsula railway. A ponycart post runs between Sirur and Kedgaon and another from Poona to Sátára, Kolhápur, and Belgaum. The disbursing post office and the town sub-offices are directly subordinate to the disbursing postmaster of Poona. The sub-office at ~~Poona~~ and the village post office at Narsingpur are under the supervision of the superintendent of post offices Ahmadnagar division, and the village post office at Kikvi is under the superintendent of the Deccan division. The remaining offices are supervised by the superintendent of post offices Poona division whose head-quarters are at Poona, and who is paid a yearly salary of £480 (Rs. 4800) rising to £600 (Rs. 6000) in five years. He is helped in the Poona district by an inspector whose head-quarters are at Poona and whose yearly salary is £120 (Rs. 1200) paid from provincial funds.

Besides the Peninsula railway telegraph offices there is one Government telegraph office at Poona.

SECTION II.—TRADE.

Of late years, except the development caused by cheap and rapid carriage, there has been no marked change in trade. Among the people there is a growing fondness for foreign articles of dress and comfort. Husbandmen also show more intelligence in meeting the demand for particular produce. Of late years the great increase in the demand for oilseeds and raw sugar has led to a large increase in their production and export. This increase has been made possible by the opening of canals and other water-works. The oilseeds go chiefly to Bombay and the raw sugar to Bombay and Gujarát.

Traffic passes from and to the Sirur sub-division by the Poona-Ahmadnagar road to Poona or to Kedgaon and so by rail to Bombay; it passes from and to the Indápur sub-division by the Poona-Sholápur road to Poona or by rail from Chandgaon or Diksál to Bombay; it passes from and to the Bhimthadi sub-

Chapter VI. Trade POST OFFICES.

CHANGES.

TRADE COURSE

Chapter VI.

Trade.

TRADE COURSE.

division by the Baramati-Nira bridge on the Jejuri road to Poona, by the Sholapur road to Poona, or by rail to Bombay from Dhond or Patas; it passes from and to the Purandhar sub-division by the old Satara road to Poona and thence by rail to Bombay, or by the new Satara road to Poona and thence by rail to Bombay; it passes from and to the Haveli sub-division by the Poona-Sholapur road, by the Poona-Ahmadnagar road, by the new Satara road to Poona, by the Poona-Panvel road and by the Paud road to Poona, and thence by rail to Bombay; it passes from and to the Malval sub-division by rail at Talegaon, Lonavla, or Khandala to Bombay; it passes from and to the Khed and Junnar sub-divisions by the Poona-Nasik road to Poona or by the branch from the Nasik road to Talegaon and thence by rail to Bombay.

TRADE CENTRES.

The chief agencies for spreading imports and gathering exports are trade centres, markets, fairs, village shops, and peddler's packs. The chief trade centres are: Junnar, Narayangaoon, and Ale in Junnar; Khed, Manchar, Ghoda, Ambegaon, Avsari, Vaghgaon, Pimpalgaon, and Mahalunga in Khed; Sirur and Talegaon-Dhamdhare in Sirur; Khandala and Talegaon-Dabhade in Malval; Poona, Charnoli-Budruk, Phulgaon, Paud, Vagholi, and Loni Kalbhar in Haveli; Sasvad and Jejuri in Purandhar; Supa, Baramati, and Patas in Bhimthadi; and Indapur. Of these Khandala, Talegaon-Dabhade, Poona, Loni Kalbhar, and Patas are on the Peninsula railway.

The leading merchants are Marwar Vanis, Gujarat Vanis, Bohoras, Parsis, and Brahmins, with capitals of £100 to £15,000 (Rs. 1000-1,50,000). Except Junnar, Ambegaon, Talegaon-Dabhade, Poona, Charnoli-Budruk, Sasvad, Baramati, and Indapur, which trade direct with Bombay and other large markets, the trade of the other centres is mostly local, not passing to places outside of the district. The merchants that deal direct with Bombay and other large markets are generally Marwar Vanis and Bohoras. They export grain and other produce, principally garden crops, and import hardware, country and European piece-goods, haberdashery, stationery, dried fish, salt, rice, and coconuts. The same merchants deal both in imports and exports. Though every branch of trade is open to all classes, Bohoras have practically a monopoly of the hardware trade, and most of the larger grain-dealers are either Marwar or Gujarat Vanis. In the different local-trade centres, though they do business only on a small scale, the traders are independent. Regular trading is not generally carried on through agents, but large traders occasionally make use of the services of agents when they are unable themselves to make purchases either in the villages or in Poona and Bombay. Field produce passes through several hands before it leaves the district. It goes to market generally through the village shopkeeper, who passes it on to a dealer in some large town, who sends it direct to Bombay or to some export merchant in Poona. Some rich landholders, but these are exceptions, themselves bring their produce to the large markets of Poona and Junnar. Tirgul Brahmins and Malis, who generally grow betel leaves vegetables and fruit, send the produce of their gardens to Poona or to Bombay. The village shopkeeper generally gathers articles of export in exchange for money advanced or lent.

Like exports, imported articles pass through several hands, the wholesale merchant in Bombay, the importer in Poona or other local centre, the dealer who buys from the importer, and the petty retailer who buys from the dealer and sells at his village shop or at some fair or market. In Poona itself imported articles sometimes pass through two hands only, the wholesale merchant in Bombay and the importer if he is also a retail merchant. The consumer, rarely buys from the importer. Occasionally another middleman the wandering peddler, comes between the consumer and the importer.

The brokers are mostly Lingáyats but a few are Gujarát and Márwár Vánis, Maráthás, Káchhis, and Muhammadans. Their number is small, perhaps about a hundred. They are usually paid three per cent. ($\frac{1}{2}$ a.) in bill transactions and $1\frac{1}{2}$ d. to 3d. (1-2 as.) on the *palla* of 120 *shers* in corn transactions. In cloth purchases their brokerage is as much as two per cent, and in dealings in gold and silver ornaments it is a quarter per cent. As a rule brokers carry on no other business, but there is no rule or custom to prevent their engaging in other business, nor are their transactions limited to any one branch of trade.

Next to the chief trade centres in the spreading and gathering of goods come the market towns, where a market is held on a fixed day in the week. Of forty-four villages where weekly markets are held, six, Ále, Anne, Junnar, Madh, Náráyangaon, and Otur, are in Junnar; nine, Ahire, Ambegaon, Chákan, Ghode, Khed, Mahálunge, Manchar, Váde, and Váphgaon, are in Khed; ten, Ambegaon, Chandkhed, Kárla, Nána, Nilshi, Shivane, Tákvi-Budrukh, Talegaon-Dábháde, Umbre, and Vadgaon, are in Mával; five, Bhámburda, Bhorikas, Ghotavde, Mulshi, and Paud are in Haveli; six, Ghodnadi, Kavthe, Kendur, Malthan, Pábal, and Talegaon-Dhamdhere are in Sirur; four, Kikvi, Parinche, Sásvad, and Valhe are in Purandhar; five, Bárámati and Dhond, and Pátas, Karkamb and Yevat on the Poona-Sholápur road, are in Bhimthadi; and four, Bhigvan, Indápur, Nimbgaon-Ketki, and Palasdev are in Indápur. Of these the most important are Bárámati, Bhámburde, Dhond, Ghodnadi, Ghotavde, Junnar, Manchar, Sásvad, and Talegaon-Dhamdhere, with an attendance of 150 to 700 sellers and 500 to 2500 buyers. In the rest the attendance varies from twenty-five to 150 sellers and from forty to 200 buyers. All these markets are distributing centres, and about one-sixth, Bárámati, Ghodnadi, Indápur, Junnar, Khed, Sásvad, and Talegaon-Dhamdhere are also gathering centres. The chief articles brought for sale are grain of all sorts, cloth, vegetable and fruit, groceries, spices, and other articles of daily use. Besides these articles, shoes, ropes, brooms, baskets, and blankets are offered for sale at Bárámati and Sásvad, and cotton at Indápur. The sellers are Vánis, Mális, Mominís, Káchhis, Tábats, Támbolis, confectioners, Mángs, Kolis, and others, some of them producers and others either dealers or dealers' agents, belonging to the market town or to some neighbouring village. The buyers are people of all castes in the market town and in the neighbouring villages. There is no barter except that small landholders and others, including Mhárs, Mángs, Chámbhárs, Rámoshis, Kolis, and Musalmáns, who have no

Chapter VI. Trade.

TRADE CENTRES.

MARKET TOWNS.

Chapter VI.

Trade.

money, receive oil, tobacco, vegetables, chillies, and fish in exchange for grain. Cattle markets are held at Ghodnadi, Manchar, Indápur, Bárámati, and Junnar once a week, and at Bhámburde near Poona a half-weekly cattle market is held on Wednesdays and Sundays. Horses, ponies, cows, buffaloes, sheep, and goats are brought for sale by Kunbis and others. The chief buyers are Kunbi and other landholders, and butchers at the Bhámourde market.

FAIRS.

Of sixty-five yearly fairs, seven, at Aile, Otur, Nimdari, Ojhar, and Náráyangaon, Belhe and Hivre, are held in Junnar; eight, at Nimbgaon-Ketki (twice), Kharpadi, Kelgaon, Chákan, Kadadhe, Dhamne, and Bhovargiri (Bhimáshankar) in Khed; two at Vehergaon and Vadgaon in Mával; eighteen at Bhámburde (twice), Páshán, Parvati (twice), Higne Khurd, Kondhanpur, Vádi, Bolhai, Dehu, Chinchvad, Rávet, Paud, Ghotavde, Shera, Tamanhi-Budruk, Vadgaon, Aksai, and Niva in Haveli; eleven, at Shirasgaon, Vadgaon, Mandavgan, Ránjangaon, Malthan, Mukhai, Pimple, Jambut, Kavthe, Talegaon-Dhamdhare, and Kanhur in Sirur; ten, at Sásvad (twice), Jejuri (four times), Pur, Vir, Málshiras, and Diva in Purandhar; eight, at Valki, Fargaon, Nángaon, Varvand, Supra, Dhond, and Morgaon (twice) in Bhimthadi; and one at Narsingpur in Indápur. All of these, except those at Belhe and Hivre in Junnar which are chiefly attended by Musalmáns, are Hindu fairs held in honour of some local deity. The attendance varies from 200 to 25,000. Large dealers do not attend and there is not much trade, the estimated value of articles sold generally varying from £1 to £40 (Rs. 10-400). At Dhond, Morgaon, Jejuri, Vir, Málshiras, Nimbgaon-Ketki, Bhovargiri, Vehergaon, Kondhanpur, Vadgaon, and Aksai, the transactions amount to not less than £100 (Rs. 1000), and sometimes to as much as £2500 (Rs. 25,000). The usual salesmen are sweetmeat-makers, gardeners, and grain-parchers, but coppersmiths, weavers, tailors, grocers, tassel-makers, and betel-leaf growers generally attend some of the larger fairs with stocks of metal vessels, cloth, bangles, blankets, groceries, oil, and clarified butter and spices. The buyers are consumers, villagers from the neighbourhood, and pilgrims. Occasionally Mhárs, Kolis, and some Kunbis exchange grain and fuel for oil, salt, and chillies. Otherwise there is no barter.

VILLAGE
SHOPKEEPERS.

Except small groups of huts in the hills every village has its shopkeeper. The village shopkeeper is usually a Gujarát or a Márwár Váni, but sometimes a Lingáyat Váni, a Telí, and occasionally a Kunbi or Musalmán. Except grain which he buys from local owners, the village shopkeeper draws his stock in trade from the large towns with which he has business relations, and where probably the moneylender, on whom he is often dependent, lives. His stock in trade generally includes grain, groceries, raw and refined sugar, salt, oil, and clarified butter *tup*, spices, cocoanuts, and all other articles required for daily use by the people. Though every shopkeeper does not keep a store of cloth, it is not necessary to go to the sub-divisional centre to buy cloth. In each sub-division ten or twelve villages have cloth shops. Except in the western hills cloth can be bought in one village out of every ten. Cloth can also be bought at all

weekly markets. Besides robes or *lugdás*, waistcloths or *dhotars*, and strong *dongri* cloth woven in the district at Baramati, Junnar, Sásvad, Kavthe, and Inápur, the cloth-merchants have stocks of Bombay and European cloth which they generally buy in Bombay. Cloth is bought by people of all castes from the village in which the shop is as well as from villages near which have no shop. Shopkeepers sometimes exchange their wares for grain to Kunbis and other poor people who have no ready money. The village shopkeepers have usually moneylending dealings with people of all castes, except Bráhmans, in the village as well as in the neighbourhood. They have no connection with large trading firms. They themselves or sometimes their agents or relations go to fairs and market towns.

Below the village shopkeepers come the travelling peddlers, who are generally Gujarát Márwár or Lingáyat Vánis, Shimpis, Mális, Bágváns, Kásárs, Sonárs, Sangars, Tábolis, Telis, Átárs, Báirágis, and Komtis. They have their head-quarters at Poona or some other large town where they buy or prepare the contents of their packs. They carry their goods on horse or bullock back and sometimes on their own shoulders. They go from village to village and visit the market towns and fairs within their circuit, and are known to their customers. Vánis take groceries and spices; Shimpis cloth and ready made clothes; Mális fruit and vegetables; Bágváns groceries, spices, and vegetables; Kásárs, Bairágis, and Komtis metal vessels and dishes, and the other Kásárs bangles; Sonárs cheap ornaments; Sangars blankets; Tábolis betel leaves and nuts; and Telis oil. Cloth is also hawked about by Musalmán peddlers who of late have been hawking perfumes and pearls. All these except the last sell their goods on credit or for cash to Kunbis, Musalmáns, Mhárs, Mángs, and others. The sale of perfumes and pearls is restricted to the higher classes and to cash payments only. Mális, Bágváns, and sometimes Vánis barter their goods with Kunbis and others for grain. Bairágis and Komtis sometimes exchange their goods for old clothes, lace borders of turbans, and other clothes. Except Mális and Bágváns, who travel throughout the year, the peddlers set out on their tour at the end of September or the beginning of October, and return before the rains.

Decrease in cost both of making and of carrying, and a larger margin of earnings among the bulk of the lower classes, have of late years led to a great increase in the amount of imports. The importers are chiefly Gujarát and Márwár Vánis. The chief imports are, grain including rice, *bájri*, *javári*, wheat, pulses including gram *tur hulga math udid* and *mug*, oilseeds including earthnuts and *khurásni*, cotton seeds, *moha* *Bassia latifolia* flowers, salt, fish, metals, raw and refined sugar, tobacco, timber, hardware, indigo, twist, piece-goods and silk, matches, kerosine oil, haberdashery, porcelain, and European liquor. Rice, which is used in small quantities only by the upper classes of Hindus, is brought from Ahmadnagar and Thána. *Bájri* is brought from Ahmadnagar and Sholápur, and *javári*, *hulga*, *math*, *udid*, *mug*, *tur*, and gram are brought from Sholápur. Wheat, especially the excellent *bakshi* or garden wheat, comes from the Nizám's country, Sholápur, Khándesh,

Chapter IV.

Trade.

VILLAGE
SHOPKEEPERS.

PEDDLERS.

IMPORTS.

Chapter IV.

Trade.

IMPORTS.

and Gujarát. Oilseeds are brought into Purandhar and the eastern subdivisions by Telis and the usual import traders, from Ahmadnagar and Sholápur, and by Maráthás, Musalmáns, and Lingáyat Vánis from Phaltan and Sátára. Cotton seeds which are used for feeding milch-cows are brought from Ahmadnagar, Khándesh, and Sholápur. *Moha* flowers come from Thána, Ratnágiri, Gujarát, and Jabalpur, and are sold to liquor contractors. Salt, which was formerly brought by pack-bullocks, now comes mostly by rail, and a little by the Nána and Málsej passes from Thána. Dry fish are brought from Bombay and Thána by rail, and by the Nána pass by Musalmáns, Bhois, and butchers. Under imported metals come gold, silver, copper, brass, iron, lead, zinc, and tin. During the American war large quantities of gold and silver found their way into the district. Most of the gold and silver were made into ornaments; the rest was hoarded. During the 1876-77 famine a large quantity of gold and silver ornaments left the district chiefly to Bombay. Since the famine year better harvests have again started the import of silver and gold. Copper and brass were formerly imported in blocks and worked first into sheets and then into vessels. Of late years ready made sheets have been largely imported from Bombay and considerably lowered the price of brassware. Copper and brass ready-made cooking and drinking cups, of which there is a growing manufacture in the city of Poona, are also brought from Násik. They are used by all but the poorest classes. The import of iron has of late greatly increased and it is made in considerable quantities into water pails and butter and oil cans. Iron is also much used for cart tires and axles. All of it comes from Bombay, brought chiefly by Bohora Musalmáns. Imported groceries, chiefly dates cocoanuts and spices, are largely used by all classes. They are brought by rail as well as on pack-bullocks by the Nána and Málsej passes, from Bombay, and by rail from Sholápur. Refined sugar comes from Bombay, and raw sugar, of which since the opening of the Mutha Canals a large quantity is produced in Haveli, is brought into Poona from Phaltan, Sátára, Kolhápur, and the Bombay Karnátek. In Poona city there is a large trade in raw sugar. During 1875-76 nearly 3750 tons (5260 *khandis*) valued at £45,236 (Rs. 4,52,360) were imported. A large proportion of the imports are exported chiefly to Ahmadabad. Tea and coffee which are used only by a few classes are brought from Bombay in small quantities. Tobacco is brought by Lingáyat Vánis and Támbois from Sátára, Sholápur, Miraj, Sánгли, and Kolhápur. Malabár teak comes from Ratnágiri and Thána. Other timber also comes from Bhor, Násik, and Thána. Indigo and silk are imported from Bombay by rail. English and Bombay cotton twist is brought by Bohorás and Gujarát Vánis and distributed over the district to handloom weavers. Of late the outturn of the Bombay factories has to a great extent taken the place of English yarn. Piece-goods are of two chief kinds, hand-made and steam-made. The hand-made goods, waistcloths, turbans, and women's robes, which are prepared in considerable quantities in the district at Sásvad, are also brought from Burhánpur, Yeola, Ahmadnagar, Paithan, Ahmadabad, and Nágpur. The machine-made piece-goods are

Bombay coarse strong cloth, chiefly for waistcloths, sheets, and towels from Bombay, and European finer fabrics and prints brought by Bohorás and Gujarát Vánis from Bombay. Of late years, except during the 1876-77 famine, the import of steam-made piece-goods has rapidly increased, the cheapness both of Manchester and of Bombay goods stimulating the trade. Silks, like piece-goods, are of two kinds, machine and hand made. There is little local demand for steam-made European silks, but the produce of the Bombay silk mills is gradually taking the place of hand-made silks. Hand-made silks, chiefly turbans, scarfs, and bodice-cloths, from Burhánpur, Yeola, and Paithan, and brocades from Surat and Ahmadabad, are brought into the district by Márwár and Gujarát Vánis, Bohorás, and tailors. The chief dealers in silks are Márwár and Gujarát Vánis, Bohorás, Momins, and Patvegárs. No class of merchants deals exclusively in silks, but almost all rich merchants keep silk fabrics in stock. Carpets or *satranjis* are brought from Ágra, Ahmadnagar, and Khándesh. Glassware chiefly China bangles are brought by Kásárs and other glass articles by Bohorás and other Musalmáns. European liquor comes from Bombay. Of late the import of matches and of kerosine oil has greatly increased; they are now found even in small villages. Well-to-do Musalmáns and Pársis have taken to use English furniture and China ware. The use of tea, coffee, and European liquor by wealthy Hindus has also become common.

Of Exports the chief are, of vegetable products, grain, cotton, raw sugar, vegetables, betel leaves, myrobalans, and roots and barks for dyeing; of animal products, honey, hides, and horns; and of manufactured articles, clarified butter, brassware, shoes, silk cloth, home-spun cotton cloth, ivory and wooden toys, and perfumes. Under grain, besides *bájri* and *juári*, come wheat and gram. Since the opening of the railway the export of perishable produce has greatly increased. Among the chief branches of this trade are the export of betel leaves, vegetables, and fresh fruit from the Haveli and Purandhar sub-divisions, and of potatoes from Junnar and Khed. The trade is rapidly growing on account of the impetus given to market-gardening by irrigation from Lake Fife. Plantains are sent from Ále, Otur, and Junnar to Bombay by Talegaon, also from Valha in Purandhar by the old Sátára road to Poona. Grapes are sent from Vadgaon, Kandáli, Rájuri in Junnar, and from Pábal and Kendur in Sirur. Figs are sent from Diva, Parincha, Sonávri, Gurholi, Mahur in Purandhar, and from Gogalvádi and Álandi-Choráchi in Haveli. Pomegranates are sent from Supa, Devalgaon, Gadag, Vadgaon in Bhimthadi, and from Álandi-Choráchi and Urali-Kánchan in Haveli. Mangoes are grown extensively at Khed Shivápur in Haveli, also at Sásvad, Chambli, Supa Khurd, Bhivri, and Bapgaon in Purandhar, and Ausari-Khurd and Kadus in Khed. In ordinary years small quantities find their way to Bombay. Oranges and guavas are grown at Kothrud, Yerandavna, Mundhva, Parbati, Mali, and Munjeri, and sent for sale to Poona. Limes are grown at Kurli, Parbati, Yerandavna, Vánavdi, and Mundhva. Potatoes are largely grown in the Khed sub-division, and from Khed as from Junnar they are sent by Talegaon. They are also sent from Talegaon-Dhamdhare and Pábal.

Chapter VI.

Trade.

IMPORTS.

EXPORTS.

Chapter VI.

Trade.

EXPORTS.

Onions are sent from the Talegaon-Dábháde station. Chillies are sent by the same route from Kahu, Gulani, Váphgaon, Chákan, Bhos in Khed, and from Khodad, Náráyanpáon, and Arvi in Junnar. Cabbages and other fresh vegetables, as green chillies, *ghevda* Dolichos lablab and *govári* Cyamopsis psoraliode, pods, and the young shoots of coriander or *kothimbir* go in considerable quantities to Bombay. In the village of Chárhóli-Budruk of the Indráyani, upwards of £4000 (Rs. 40,000) are said to be invested in growing betel leaves. Betel leaves are also produced, principally by Maráthás and Mális, in Belhe in Junnar, Parincha Mahur and Diva in Purandhar, Álandi and Dondi in Khed, Mahamadvádi and Vánavdi in Haveli, Nimbgaon-Ketki and Vihali in Indápur, and Vapanda in Bhimthadi. The trade in betel leaves is rapidly growing on account of the impetus given to market-gardening by irrigation from Lake Life. From the north of the district there is a considerable export of myrobalans to Bombay.

Colouring roots are prepared by Mhárs, Mángs, Chámbárs, and Musalmáns, and sold to Pársis, Dhors, and Musalmáns who send them by rail to Bombay, Poona, Ahmadnagar, and other places. *Bájrí* is sent from Haveli, Purandhar, Khed, and Junnar by cart to Poona by Márwár and Gujarát Vánis and cultivators. *Jvári* is sent from Indápur, Bhimthadi, and Sirur by rail and cart to Poona. Nearly three-fourths of the cotton grown is sent by rail from the eastern sub-divisions to Bombay by Bhátiás and Márwár and Gujarát Vánis. Raw sugar, which is imported in large quantities, is also exported to Ahmadabad. Junnar hand-made paper was formerly largely exported, but of late the trade has much fallen. In Haveli metal-ware is made in large quantities in the city of Poona by coppersmiths and others who send the articles by rail to Bombay and Sholápur, and by road to Sátára, Kolhápur, and other places. In Junnar the metal-ware suffices only for local use. Indápur, Sirur, Mával, Bhimthadi, Purandhar, and Haveli export hides, horns, and bones chiefly to Bombay and Poona, and Junnar, and Khed export hides and horns only. The dealers are generally Mángs, Mhárs, Musalmáns, and butchers. About 200 cartloads, each containing twenty hides, go every year from Junnar, and 100 cartloads from Khed each containing twenty-five to thirty hides. Indápur sends about 500 *man*s of these articles, Purandhar about 500 to 1000 hides and 200 to 500 horns, and Haveli five to seven thousand hides. A Pársi has started a bone store at Bhámburde near Poona. In Junnar, the export of hides and horns is on the increase.

A comparison of the Peninsula railway traffic returns, during the eight years ending 1880,¹ shows a rise in the number of passengers, from 767,186 in 1873 to 1,140,136 in 1880, and in goods from 69,290 tons in 1873 to 112,682 tons in 1880 against 125,245 in 1878. The chief passenger station is Poona with an increase from 462,145 in 1873 to 593,897 in 1880 against 608,039 in 1878. Other important passenger stations with a comparatively small goods traffic are Dhond, the junction of the Peninsula railway and the Dhond-Manmád State railway, with an increase from 24,673 in 1873 to

¹ Detailed traffic returns are not available from 1881 to 1883.

Chapter VI
Trade.
RAILWAY
TRAFFIC.

135,699 in 1880; Talegaon with an increase from 63,071 in 1873 to 98,085 in 1880 against 103,751 in 1878; Lonávla with an increase from 44,837 in 1873 to 57,209 in 1880 against 66,441 in 1878; Chinchvad with a decrease from 44,017 in 1873 to 25,355 in 1880; Kirkee with an increase from 30,224 in 1873 to 41,309 in 1880 against 42,739 in 1878; Khandála with an increase from 13,115 in 1873 to 28,925 in 1880; and Khadkála with an increase from 19,127 in 1873 to 26,921 in 1880 against 26,935 in 1878. In 1880 the passenger traffic at the remaining stations varied from 5115 passengers at Boribyál to 23,138 at Diksál. Poona is also the chief goods station showing an increase from 47,226 tons in 1873 to 84,345 tons in 1880. Other important goods stations but with a comparatively small traffic are Talegaon with an increase from 5944 tons in 1873 to 10,732 tons in 1880; Dhond with an increase from 4599 tons in 1873 to 4758 in 1880 against 25,975 in 1878; Diksál with an increase from 1532 tons in 1873 to 4062 tons in 1880 against 4285 in 1878; Kirkee with a decrease from 4152 tons in 1873 to 3414 tons in 1880; and Lonávla with a decrease from 1530 tons in 1873 to 1252 in 1880. The goods traffic at the remaining stations in 1880 varied from 339 tons at Loni to 783 tons at Urali. There was no goods traffic at Kára, Vadgaon, Shelárvádi, Yevat, and Boribyál.

The following statement shows for each station the changes in traffic during the eight years ending 1880:

POONA PENINSULA RAILWAY, PASSENGER AND GOODS TRAFFIC, 1873, 1878, 1880.

STATION.	MILES FROM BOMBAY.	1873.		1878.		1880.	
		Passen- gers.	Tons of Goods.	Passen- gers.	Tons of Goods.	Passen- gers.	Tons of Goods.
Khandála	77	13,115	2521	26,278	553	28,925	790
Lonávla	79½	44,837	1530	66,441	1132	57,209	1252
Kára	84½	..	..	8352	..	6188	..
Khadkála	89½	19,127	389	26,935	145	26,921	739
Vadgaon	96	..	..	..	6841	..	..
Talegaon	98	63,071	5944	103,751	4712	98,085	10,732
Shelárvádi	104	..	..	..	..	10,181	..
Chinchvad	109	44,017	824	28,474	881	25,355	586
Kirkee	115½	30,224	4152	42,739	3775	41,309	3414
Poona	119	462,145	47,226	608,099	81,775	593,897	84,345
Loni	129½	6,902	56	12,704	443	12,621	839
Urali	137	13,501	278	18,184	483	20,819	783
Yevat	145	..	..	12,817	..	12,014	..
Khedgaon	152½	13,229	133	17,768	560	17,802	489
Pátas	159	14,329	106	17,447	526	15,067	453
Dhond	165½	24,673	4599	81,044	25,975	135,699	4758
Boribyál	172½	..	..	4989	..	5115	..
Diksál	183½	18,016	1532	25,652	4285	23,138	4062
Total .. .. .	..	767,186	69,290	1,101,594	125,245	1,140,136	112,682

- In the goods returns the chief changes are, under exports, an increase in fruits and vegetables from 8760 tons in 1873 to 13,736 tons in 1880 against 7186 tons in 1878; in sugar both raw and refined from 716 tons in 1873 to 2080 tons in 1878 and to 3595 tons in 1880; in grain from 1019 tons in 1873 to 7514 tons in 1878 and to 1797 tons in 1880; in metal from 678 in 1873 to 1573 in 1878 and to 1419 tons in 1880; in firewood from 101 tons in 1873 to 770 tons in 1878 and to 1172 tons in 1880; in oil from 213 tons in 1873 to 728 tons in 1878 and to 630 tons in 1880; in hides and horns from 259 in 1873 to 506 tons in 1878 and to 587 tons in 1880; in tobacco

Chapter VI.

Trade.

RAILWAY
TRAFFIC.

from eighteen tons in 1873 to fifty-two tons in 1878 and 227 tons in 1880; in linseed and sesamum oilseeds from eighty-two tons in 1873 to 126 tons in 1878 and to 10½ in 1880; in cotton an increase from 1582 tons in 1873 to 2584 tons in 1878 and a decrease to 704 in 1880; a decrease in salt from 522 tons in 1873 to seventy-six tons in 1878 and to twenty-seven tons in 1880, and in timber from 225 tons in 1873 to 100 tons in 1878 and to thirty-three tons in 1880. The other exports besides sundries, which amounted to 8394 tons, varied in 1880 from two tons of Europe twist to seventy-six tons of country piece-goods. Under imports there was an increase in grain from 18,077 tons in 1873 to 41,856 tons in 1878, and to 47,222 tons in 1880; in metal from 1902 tons in 1873 to 3774 tons in 1878, and a decrease to 3276 tons in 1880; in sugar both raw and refined an increase from 1146 in 1873 to 1496 tons in 1878, and a decrease to 1224 tons in 1880 probably due to the large production of raw-sugar in the district consequent on the increased cultivation of sugarcane along the Khadakvásla canals, an increase in firewood from 128 tons in 1873 to 734 tons in 1878, and a decrease to 644 in 1880; in *moha* flowers from nothing in 1873 to 214 tons in 1878 and to 560 tons in 1880. There was only a slight increase in the imports of Europe piece-goods from 685 tons in 1873 to 742 in 1878 and to 774 tons in 1880; and in country piece-goods there was an increase from 721 tons in 1873 to 862 tons in 1878 but afterwards a decrease to 676 tons in 1880. In Europe twist there was a decrease from 364 tons in 1873 to 332 tons in 1878 and to 198 tons in 1880. In country twist there was an increase from 234 tons in 1873 to 342 in 1878 but afterwards a decrease to 244 tons in 1880. Other imports besides sundries, which amounted to 19,419 tons, consisted of cotton eleven tons and of wool ten tons. There was a decrease in fruits and vegetables from 1204 tons in 1873 to 1090 in 1878 and to 789 in 1880; in oilseeds from 1094 in 1873 to 680 in 1878, but afterwards an increase to 750 tons in 1880; in oil there was a decrease from 994 tons in 1873 to 806 in 1878, but a slight increase to 910 in 1880. The details are:

POONA PENINSULA RAILWAY GOODS TRAFFIC, 1873, 1878, 1880.

ARTICLE.	1873.		1878		1880.	
	Outward.	Inward.	Outward.	Inward.	Outward.	Inward.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Cotton	1582	14	2584	2	704	11
Fruit	8760	1204	7186	1090	13,736	789
Firewood	101	128	770	734	1172	644
Grain	1019	18,077	7514	41,856	1797	47,222
Hides and Horns	259	59	506	238	587	266
Oilseed	82	1094	126	680	104	750
Metal	678	1902	1573	3774	1419	3276
<i>Moha</i> Flowers			88	214	8	560
Oil	213	994	72	806	630	910
Piece-goods, Europe		635	2	742	3	774
" Country	17	721	33	862	76	676
Salt	522	1170	76	1304	27	697
Sugar, Raw and Refined	716	1146	2030	1496	3595	1224
Sundries	7824	16,676	9663	34,625	8394	19,419
Timber	225	2774	100	2721	33	2402
Twist, Europe		364	1	332	2	198
" Country	2	234	2	342	23	244
Tobacco	18	19	52	218	227	56
Wool		11	9	1	12	10
Total	22,018	47,272	33,213	92,032	82,554	80,128

At Dhond, the only station of the Dhond and Manmád railway within Poona limits, the traffic consisted of 29,264 in and 31,977 out passengers, and 610 tons of exports and 136 tons of imports in 1879 against 64,406 in and 61,440 out passengers and 4780 tons of exports and 112 tons of imports in 1880.

There are no trades-unions or *mahájans* in the district, nor is there any Nagarshet or recognized head in matters of trade. Dayarám Atmáram, a Váni, who died fifteen years ago and was the recognized head of the banking business, was the last Nagarshet of Poona. Disputes between traders are frequently referred to the whole body of traders in any one branch of trade. The chief members form a committee or *panch*, and their decisions are always accepted. Formerly a few recognized head traders formed the *panch* in each trade, but here as elsewhere the levelling tendency of British rule has had its effect, and, except that petty dealers are not consulted and do not expect to be asked to join a trades meeting, all the members of a trade have, and exercise, an equal right to appear at a meeting of a trade's *panch*. Regular strikes are unknown, but a falling market or scarcity of labour from time to time causes changes in wages. When any change has to be made the chief members of the trade meet the artisans and after discussion fix a revised rate. In this manner in 1881 a claim by the silk weavers for a rise in wages was settled in their favour after the matter was discussed with the silk merchants. The decisions of these committees have hitherto been accepted as final. At the same time there is no recognized means of enforcing them except that if an artisan refuses to work at the rate settled he receives no employment. So also traders will cease to deal with any member of their trade who refuses to abide by the decision of a trade committee or *panch*.

SECTION III.—CRAFTS.¹

Except cotton hand-loom weaving which to a small extent is carried on in thirty-seven towns and villages and some small metal work, silk weaving, and paper making at Junnar the industries of the district centre in the city of Poona. For Poona city details of twelve crafts have been collected. These are, in order of importance, the making of copper and brass vessels, the weaving of silk and cotton cloth, the making of gold and silver thread, glass bangles, ivory combs, clay figures, iron pots, felt and paper, tape weaving and wood turning. Of these the making of copper and brass vessels and the weaving of silk and cotton cloth with or without gold and silver thread are the most important and flourishing. Glass bangles, ivory combs, felt and tape are in good local demand. Poona clay figures are admired and are bought chiefly by Europeans. On account of their cheapness iron pots are taking the place of the large brass and copper vessels used for storing water and grain. Paper

Crafts.

¹ From materials supplied by Mr. B. A. Gupte, Head Clerk Sir J. J. School of Art and Industry.

Chapter VI.
Crafts.

BRASS WORK.
Workmen.

making is declining and none of the woodturners' work has more than a local sale.

The Poona brass industry supports (1873) about seventy dealers and 2320 workers. This number includes 810 Tábats or makers of large articles, 500 Jingars or makers of small articles, 50 Otáris or casters, and 960 Kásárs or brasiers. The hereditary copper brass and bellmetal workers of Poona, the Tábats, Jingars, Otáris, and Kásárs are quiet easy-going people. All speak incorrect Maráthi and live in one-storeyed houses of which seven belong to the Tábats, fifty or sixty to the Jingars, and thirty to the Otáris. They generally live on vegetable food, but are allowed to eat mutton and fish as well as to drink liquor which they take on holidays and special feasts. The Kásárs and Tábats dress like Bráhmans and the Jingars and Otáris like Maráthás. As the demand for brass ware is brisk and growing, no Tábats, Jingars, Otáris, or Kásárs have of late given up their hereditary craft. Within the last fifteen years their numbers have been more than doubled by local Marátha Kunbis whom the high profits of brass working have drawn from the fields and the labour market but who so far confine themselves to the rough parts of the work. The hereditary coppersmith classes work from seven to ten or eleven and again from two to six. In the busy season, that is between November and May, they work extra hours even till midnight. Like other local Hindu craftsmen, Kásárs stop work on the no-moon day or *amávásya* at the end of every lunar month, on *kar* the day after the *Mahásankránt* in January, for five days at *Holi* or *Shimgá* in March-April, for two during *Diváli* in October-November, and on the day after an eclipse either of the sun or of the moon. They also rest on *Ganpati's* Fourth in August and on *Gauri's* Day about the same time, and for ten days at *Dasara* in October. All rest on any day on which one of the community dies. They have no trade guild, but join in paying a half-yearly tax to the goddess Kálíka for whom they have built a temple in Kasba ward which costs 14s. to 16s. (Rs. 7-8) a month to keep up. The Kásár's Káli differs from other local Kális in having camel supporters on each side of her instead of elephant supporters. Also instead of offering her a goat or buffalo, on the eighth day of the *Navrátra* that is two days before *Dasara*, they offer her the false calabash gourd *kohola* Cucurbita lagenaria, which perhaps from its dark colour, is believed to be a transformed giant. Four pegs are driven into the fruit to represent legs and arms and it is cut with a sword, and thrown into the sacred fire. A little brass and bellmetal is smelted by the Jingars and Otáris but the bulk of the copper and brass comes in sheets about three feet by four by rail through Bombay chiefly from England and Australia. They are brought from Bombay by Márwár and Gujarát Vánis and given to be worked by Tábats. The sheets or brasiers are of three kinds, thick middle and thin, which differ little in price as they are sold by weight. The copper costs £4 8s. to £4 10s. (Rs. 44-45), and the brass £3 8s. to £3 10s. (Rs. 34-35) the hundred-weight, with two shillings extra one for brokerage and one for carriage. A coppersmith has fifteen chief tools and appliances.

to , or *dagad* about three feet above and two feet under ground on which the copper and brass plates made by melting old broken pots are beaten. As it has to stand very tough usage this stone is chosen of flawless black basalt very carefully smoothed. One of these stones is said sometimes to cost as much as £10 (Rs. 100). Since the import of metal sheets has grown so common the stone has almost fallen into disuse: Five hammers or *ghans* worth 8s. (Rs. 4) each: A pair of bellows or *bhátás* worth 12s. (Rs. 6): Four iron hooks or *orapnis* each worth 6d. (4 as.): Four pairs of tongs or *sándsí* worth 10s. (Rs. 5): An anvil called *sandhán* or *mekh*, a long upright iron bar polished at one end on which the pot is placed and beaten, worth about 4s. (Rs. 2): Twenty to twenty-five special anvils or *kharvais*, thick iron bars bent and smoothed at one end, together worth £12 to £15 (Rs. 120-150): Four ordinary anvils or *airans* together worth £2 (Rs. 20): About fifty small hammers or *hathodás* with which the pot is beaten when it is placed on the bar anvil together worth about £10 (Rs. 100): Two pairs of scissors for cutting the copper or brass sheets each worth 4s. (Rs. 2): A wooden stand or stool called *khodve* for supporting the bar anvil. This is a block of wood with two legs about 60° apart, and, in the angle between the legs, a solid block of wood with a pole in the middle. Through the hole in the block the bar anvil is passed slanting till its one end rests on the ground and the top end remains standing out about a foot from the hole. The coppersmith sits on the low end of the bar anvil puts the pot at which he is working on the top end of the bar anvil, and, holding the pot in his left hand, beats it into shape with a hammer held in his right hand: Two files worth 2s. (Re. 1) each which last for only a year: Two pairs of compasses or *kaivars* together worth 4s. (Rs. 2): Two hollow stones or *ukhals* each worth 8s. (Rs. 4) on the top of which the sheet is laid and rounded by hammering: Eight chisels or *chhanis* for cutting the metal together worth about 3s. (Rs. 1½).

Jingars or brass-casters have sixteen chief tools and appliances: An anvil or *airan* worth 10s. (Rs. 5): Four bar anvils or *kharvais* together worth 16s. (Rs. 8): Four hammers or *hathodás* together worth 8s. (Rs. 4): A pair of tongs or *sándsí* worth 1s. (8 as.): Two pairs of scissors together worth 2s. (Re. 1): Five yearly-renewed files or *kúnsis* each worth 3d. to 9d. (2-6 as.): A vice or *shagda* worth 8s. (Rs. 4): A pair of bellows or *bhátás* worth 1s. (8 as.): A saw or *karvat* worth 1s. (8 as.): An iron bar or *sandhán* with one end smoothed to serve as an anvil worth about 4s. (Rs. 2): A flat iron rasper or *rándha*, six inches by half an inch with one end bent and sharpened used for scraping and polishing pots, worth 1s. (8 as.): A borer or *sámta* worth 1½d. (1 an.): A twenty-four inch foot rule or *gaj* worth 3d. (2 as.): A square iron tray or *tás* worth 6d. (4 as.): A palm leaf fan or *hadjána* used in fanning the fire worth ¾d. (½ a.): And two or three crucible catchers or *chýáks*. The *chýák* is an iron ring about three feet round with two long iron bars fastened at equal distances apart. Over the ends of these bars a second ring about twenty inches across is passed and moved up and down the bars so as to increase or reduce the space above the base ring. In working

Chapter VI.

Crafts.

BRASS WORK.

the *chyák* the base ring is lowered into the furnace so as to surround the crucible, and the movable ring is forced down the bars till the crucible is tightly pressed between the bars and can be drawn out of the furnace.

Process.

In making brass, bellmetal or *káse*, and white metal or *pancharasi*, the alloy is smelted in a pit about three feet round and four or five feet deep. At the bottom of the pit bellows' tube is firmly fixed, and over the bellows' tube are laid three or four flat-bottomed dome-topped crucibles or pots, about eighteen inches high and a foot round. The crucible, which is called *mus*, is made by the brass workers themselves of powdered broken China, flint, and ashes. After putting some borax or *savági* into the crucibles to serve as a flux, if brass is to be made, they are filled with broken pieces of copper and zinc and closed by an air-tight plug. Charcoal, dried cowdung-cakes, and wood are heaped over the crucibles. The fire is lighted, and, with the help of the bellows, is blown to a white heat. The men know the time, generally four to five hours, which the alloy takes to form. When the metal is ready each crucible is grasped in the *chyák* and lifted out of the furnace. On taking it out the side of the crucible is bored by the point of a nail, and the molten metal flows into shallow clay troughs where it is left to cool. When cool the solid mass is dragged from the trough by a pair of tongs or *sándsí*, laid on the stone or *dagad*, and beaten to the required thinness. To form metal sheets, whether local or imported, into the required shapes, the sheet is laid on the floor and the workman traces on it with a pair of compasses, the pieces required for the upper and the under parts of the vessel to be made, and cuts out the two pieces with scissors or with a chisel. The metal is then softened in the fire and hammered, and again softened and again hammered, the alternate hammering and heating being repeated three or four times till it is beaten into shape. The two pieces are then soldered with brass, borax or *savági*, and chloride of ammonia called *navaságar*. The men work in bands of five or six dividing the labour. Some make the rough outline of the shape, others shape the neck, a third set form the lower piece, a fourth solder the shaped pieces, and a fifth polish the whole. All the polishing which the *Támbats* give is a rough scrubbing with a mixture of powdered charcoal and tamarind pulp, followed by beating with a small hammer till the whole surface is covered with hammer marks or facets.

Articles.

Poona copper and brass articles may be arranged under fourteen groups. Those used in the kitchen, those used in eating and drinking, those used in storing and carrying water, articles used in serving betel, musical instruments, measures, lamps, dishes and vessels used in worship, images, peasant jewelry, toilet requisites, appliances used in the dining hall but not for eating or drinking, miscellaneous ware and toys. Twenty pots are used in the kitchen. The *pátele* (1) a cylindrical copper or brass pot, with slightly rounded bottom, varying in size from two inches round to four or five feet across and two or three feet high. The *tapele* (2) a somewhat conical pot, with round bottom and narrow neck. *Tapeles* vary from three inches to four feet across the bowl, the

small ones being used for boiling rice and holding milk and the large ones for storing water. The *bahugune* (3) a cylindrical pot like the *pátele* (1) only with a more bulging bowl and seldom more than a foot in diameter. The *karanda* or *modak pátra* (4) a stew-dish for making *modaks*, *shengás*, and one or two other native dainties.¹ The *karanda* is made of three pieces; underneath a cylinder with flat side handles; in the middle a metal sieve with two hook handles; and at the top fitting the rim of the cylinder a dome with a cup-shaped handle. Water is boiled in the cylinder, the sieve is set in its place, the dainties are placed either on the sieve or on a piece of plantain leaf laid over it, and the lid is fastened down. Heat is applied to the lower part, and the steam gathering in the cover stews the dainties. The *paradi* (5) is another sieve or perforated dish used to carry off the surplus grease when *karanjis* or *anársás* are fried in clarified butter.² The *rovali* (6) is a cylinder six to nine inches across and nine to twelve inches high, with a sieve at the bottom, used for washing rice before it is boiled. It is sometimes shaped like the *tapele* (2). The *jhára* (7) is a long-handled sieve used for frying the gram flour paste required for *bundhis*. In making *bundhis* gram flour mixed with water is poured into this sieve which is held over a frying pan with boiling clarified butter and shaken. The gram flour paste falls into the pan in drops which become solid as soon as they touch the boiling clarified butter. The drops are then taken out in another sieve called *upasni* (8) which differs from the *jhára* (7) chiefly in not having a rim. The *chahádáni* or *killi* the English kettle is now in much use particularly among English-speaking natives. The *kadhái* (10) or frying pan is a hemispherical pan six inches to six feet across and one inch to two feet deep; it has two handles opposite each other and is used for frying. The *parát* (11) is a large dish two to five feet in diameter with a rim two to four inches high. It is used as a cover for a *pátele* (1) or other large pot when anything is being cooked in it. It also serves for carrying cooked rice or vegetables from the kitchen to the dining hall. A small *parát* about a foot in diameter and made of brass, called *pitali* is used in the same way as the *parát*, and in addition among Kunbis and other middle-class Hindus serves as a dining dish. The *pali* (12) is a spoon with a rounded body and a long handle. It is used as a stirring rod or ladle while vegetables or pulse are being cooked and as a distributing spoon in the dining hall. The *daba* (13) is a cylindrical box with a top for storing dainties. The *velni* (14) is a saucer-shaped dish-like pot, usually one or two feet in diameter and sometimes polished in which enough rice for two or three guests is taken from the *parát* or tray, and poured into the

Chapter VI.

Crafts.

BRASS WORK.

Articles.

¹ *Modaks* and *shengás* are made of rice flour and contain cocoa-kernel, sugar, cardamums, almonds, and saffron. Their only difference is in shape. *Modaks* are shaped somewhat like a flat-bottomed lotus bud and *shengás* are semicircular.

² *Karanjis* like *shengás* are semicircular and made of flour, cocoa-kernel, sugar, cardamums, almonds, and saffron. *Karanjis* differ from *shengás* in being made of wheat flour instead of rice and in being fried instead of being stewed. *Anársás* are made of rice flour, raw sugar, and poppy seed. They are round cakes about as big as the palm of the hand.

Chapter VI.

Crafts.

BRASS WORK.

Articles.

plate. This dish also serves as a cover to a pot in which vegetables or pulse are boiled. The *chamcha* (15) or spoon made of brass is used for pouring liquid butter on rice. The *káttan* (16) or *phiraki*, a tooth-edged circular plate fitted in a cleft handle is used for cutting the notched borders of *karanjis*. The *kisni* (17) or cocoa-kernel slicer is a sheet of brass about $\frac{5}{8}$ inches by four on four two inch high feet. The surface of the sheet is broken by several rows of long narrow hollow ridges with raised sharp-edged openings against which the kernel is rubbed and cut into long slices: The *látane* (18), a slightly tapering brass rolling-pin a foot to eighteen inches long used for flattening *polis*, a variety of *karanjis* and *amársás*: The *chálan* (19) is a brass sieve: The *panchámrit pátra* (20) is a set of seven brass cups, six cups ranged round a central one with a handle; it is used for carrying *koshimbirs* that is pickled fruit and vegetables from the kitchen to the dining hall. Fifteen eating and drinking pots are made: The already described *parát* tray (11) and the *velni* (14) come again in this group as they are used in serving rice and vegetables, and so does the *ográle* or *mudále* rice ladle (21); the *velni* is used for the second and later courses and the *ográle* for the first course only: The *tát* (22), a polished brass dining dish with bulging rim six inches to two feet across: The *váti* (23) a round-bottomed cylindrical brass cup one to four inches across is used to hold each man's share of curry and broth: The *gadva* (24) a polished narrow-necked copper or brass dinner pot, used to hold each man's supply of drinking water, varies from the size of a pear when it is called *apkara* to the size of a full grown pommelo; a spout-mouthed *gadva* is called *jhári*: The *vályácha támbya* (25) also made of copper or brass, is flatter than the *gadva* and like it is used as a water cup. The *loti* (26) is a pear-shaped pot like 25 and 26 in use size and material: The *kadi* (27) is a ring with a handle for the *gadva*, *támbya* and *loti*: The *manakarnika* (28) is a small brass drinking cup: The *chambu* (29) is a small water jar: The *panchpátri* (30) is a cylindrical water cup with a rim: The *jám* or *pyála* (31) is a drinking cup set on a round stand: The *rám pátra* (32) is a *jám* (31) without a stand: The *phulpátra* (33) is a cylindrical cup like the *panchpátri* with a thicker and broader rim. The seven chief vessels for storing and carrying water are: The *pátele* (1) and *tapele* (2) already described: The *hánda* (34) a short-necked cylindrical pot used both for carrying and storing water: The *ghágar* longer-necked and with a more sharply sloping lower part than the *hánda*; when small the *ghágar* is called *kalasi*: The *ghangál* or *gangálaya* (36), a copper jar ten to fourteen inches across, and four to nine deep, is used for holding hot bathing water and for steeping clothes: The *panchpátra* (37) is a large copper cylinder two to three feet across and three to four feet deep with a rounded rim and two handles; some *panchpátras* now have a stop-cork at the bottom and an iron stand: The *surái* (38) is a globular pot with a long narrow neck used by travellers for carrying water. The fifteen articles used in serving betel or *pán supári* are: The *tubak* (39) a round dish six inches to two feet across, with a rim half an inch to two inches high, the whole embossed with lotus flowers and other designs; it is used

for keeping the fourteen smaller articles belonging to the set of betelnut dishes: The *chauphula* (40) is a box with six or eight compartments and three or four legs; each compartment has a separate top or lid shaped like the petal of a lotus or like a mango and sometimes ornamented with a peacock which serves as a handle; all the lids close inwards where a screw shaped like a lotus bud, when turned into the central hole, keeps the lids tightly fastened; the *chauphula* is used for holding the cardamums, cloves, nutmegs, mace, saffron, and perfumed catechu pills which are eaten with betel: The *dabi* (41) is a cylindrical box for the slaked lime, catechu, and other spices which are eaten with betel: The *ádkita* (42) is the nut-slitter for slicing the betelnut; it is of three or four different shapes: The *pánpud* (43) is a square box for keeping the betel leaves: The *tambákuchi dabi* (44) or tobacco box, is a cylindrical box with a small hole at the top and a lid moving round an axis, with a similar hole, through which, when the two holes are brought one over the other, tobacco is poured to be chewed with the betel and spices: The *chunál* (45) is a box for keeping the slaked lime which is eaten with betel: The *pikdáni* (46) and the *tast* (47) are spittoons: The *atar dáni* (48) is a small cup fixed in the centre of a little dish for holding the *atar* or perfumed oil which is served after betel: The *guláb-dáni* (49) or rose-water bottle, is a bottle with a long narrow neck perforated at the end and fixed to the body with a screw, from which rosewater is sprinkled over the guests after the perfumed oil has been served: The *mor* (50) is a peacock-shaped box: The *daba* (51) is a square box, and the *pánácha-ganj* (52) is a long cylindrical box with compartments used for holding the ingredients which are eaten with betel: The *khal-batta* (53) is a small brass mortar and piston for pounding betel for the aged or toothless. The twelve musical instruments are: The bell *ghanta* (54), either plain or decorated with figures, has a handle either plain or shaped like Māruti the monkey god, or *garud* Vishnu's winged charger: The *jhánj* (55) a flat and the *tál* (56) a rounded cymbal, both used as an accompaniment by reciters of psalms or *ártis*, by hymn-singing beggars, and by sermon-and-song or *kirtan* preachers: The *chál* (57) a row of little bells worn round the ankles by dancing girls: The *ghungurs* (58) are bigger bells worn round bullocks' necks and round the waist of some low class begging devotees of Káli: The *chiplyás* (59) are two fish-shaped flat bars three to seven inches long and one and half inches broad each furnished with a ring; the ring of the upper bar is passed over the thumb and the ring of the lower bar is passed over the second and third fingers and the performer clashes the bars together by the motion of the thumb and fingers: The *kartúl* (60) is another pair of metal castanets which are sounded by shaking the hand instead of by moving the fingers: The *tásha* (61) or kettle drum is a hollow hemispherical copper pot with a thick rim and a small central hole; which is covered with goat's skin and beaten with a pair of rattan canes along with the *dhol* or wooden drum: The *theka* (62) is a small flowerpot-shaped drum covered with goat's skin: The *khulkhula* (63) is a child's rattle: The *larna* (64) is the large brass bass trumpet: And the *shing* (65) is the brass horn. The three

Chapter VI.

Crafts.

BRASS WORK.

Articles.

Chapter VI.
Crafts.
BRASS WORK.
Articles.

measures are: The *ádholi* (66) and the *sher* (67) copper cylinders used in measuring grain: The *pávsher* (68) is a small globular brass pot used for measuring milk or a cylinder with a small hook-shaped handle for measuring oil. The eight lamps are: The *samai* (69) and the *karídil* or *lámandra* (70) both flat saucer-like brass plates with hollows in the lip for wicks; the *samai* is laid on a high brass stand and the *karídil* on a shorter stand and has a brass chain by which it is hung from the ceiling or from a door lintel: The *diva lárne* (71) is of two varieties, a smaller an inch or two inch broad flat-bottomed saucer with a wick-hollow in the lip and a larger with a long flat hook-like handle: The *niránjan* (72) is a small cup set on a long or a short stand, for burning clarified butter before the gods: The *panchárti* (73) is a crescent-shaped pot on a stand with five wick-openings which is sometimes fixed in the hand of a female figure: The *divti* (74) is a hollow conical brass handle in which a roll of oiled rags is fitted and burnt as a torch, being fed with oil from a spouted oil flask; it is much used by the devotees of Káli or Bhávaní: The *máshál* (75) is a brass cylinder through which a roll of oiled rags is passed and burnt as a torch; the torch has to a great extent given way to the lantern, but is still used by the gentry in native states and it is burnt before Shankaráchárya, the Smárt Pontiff, when he travels during the day time as well as at night: The *chímnicha diva* (76) is the English lamp with a glass chimney. Twenty-six worship vessels and appliances are made: The *abhishekapátra* (77), a narrow-necked copper or brass pot is, somewhat like the *gadva* (24) except that its bottom tapers to a point, stands on a tripod with a ring at the top, and has a hole in the bottom through which water drips on the object of worship: The *sampusht* (78) a hollow cylinder two to six inches across and one to two high is used for washing images: The *chauki* (79) a low four-footed stool, round, square, or six or eight-cornered, is used as an image stand or as a support for an image stand: The *ádni* (80) is a stand on which the conch or *shankh* is placed; it is generally tortoise-shaped, and is about half an inch in diameter: The *ghanta* (54) is the already described long-handled bell; The *ekárti* or *halkárti* (81), is a two to four inches long fish-shaped pot for burning camphor before the gods: The *panchárti* (73) is the already described five-wicked lamp for burning clarified butter before the gods: The *dhupárti* (82), a stand with hemispherical top and bottom, is used for burning incense: The *niránjan* (72) is the already described lamp for burning clarified butter before the gods: The *arghya* (83) is a narrow cup half an inch to three inches long and a quarter of an inch to an inch broad, with a flat handle and long flat snout from which sacrificial water is poured. The *panchpále* (84) is a box with chambers for the various powders, turmeric *gulál*, *abir*, and *kunku*, with which during the worship the god and the worshipper are from time to time marked: The *kamal* (85) is a round lotus-shaped plate, sometimes fixed on the back of a metal bull, on which the gods are placed. The *támhan* (86) is a shallow bath, except for its slightly bulging rim not unlike the *tát* or dining dish (22) in which images are washed: The *simvásan*, literally lion throne, is a

four-footed low stool with plates on two sides and a decorated arched back in front of which the gods are kept: The *tabakdi* (88) is a small plate an inch or two broad for holding the brow-marking sandalwood paste and red turmeric: The *kachole* (89), a plate with three oval divisions for keeping the white and red sandalwood pastes and the moistened rice with which the brows of the gods are marked: The *sandhechipali* (90) is a small ladle-shaped spoon for pouring out the sacrificial water: The *váti* (23) is the already described small cylindrical brass cup with rounded bottom from half an inch to an inch across in which sugar or *naivedya* is offered to the gods: The *tulsi-rindávan* (91) is the ornamented square pot in which the holy *tulsi* *Ocymum sanctum*, the wife of Vishnu is grown: The *devhára* (92) or god shrine, is a dome with a stand on which the gods are arranged and worshipped: The *pujecha-daba* (93) or worship-box, is a round box with a tapering lid having a hole in the centre in which the gods are placed at night and the lid fastened; while worship is going on the lid is used as a sieve from which water is allowed to drop over the gods: The *gangájali* (94) is a small *gadva* (24) or water pot with a lid ornamented with the bust of a woman to represent the Ganges, whose water is kept in it and is worshipped along with the house gods: The *ghanáali pela* (95) is a handleless *ghanál* shaped (36) cup in which sugar or *naivedya* is offered to the gods at the close of the worship: The *tabak* (39), the *divelávne* (71) and the *divti* (74) are also used in worshipping the gods. Twenty leading brass images are made: Ganpati (96), the god of knowledge and lord of the spirits, a fat four-handed man with the head of an elephant; Shankar or Shiv (97), the destroyer who has a trident in his hand and a necklace made of human skulls round his neck, with his wife Párvati and his son Ganpati on his lap. Máruti (98) the monkey god: Rám the deified king of Oudh supposed to be the seventh incarnation of Vishnu, with his wife Sita, his two brothers Bharat and Shatrughna, and his general Máruti (58): Vithoba (100) with his wife Rakhmái, supposed in some places to be Baudhya or Budha the ninth incarnation of Vishnu: Bálkrishna (101) or baby Krishna, the eighth incarnation of Vishnu crawling like a child with a ball of butter in one hand: Murlidhar (102) or the fluting Krishna: Rádha-Krishna (103) or Krishna and his beloved Rádha: Bhaváni Devi (104) or Káli, an eight-handed female figure slaying the buffalo giant Mahishásur: Dattátraya or Trimurti (105), is the Hindu Trinity with three heads and six hands guarded by four dogs which mean the Veds and a cow which means the earth: Khandoba (106) the guardian of the Deccan is shown on horseback: Párvati (107), a seated female figure the wife of Shiv the destroyer is worshipped by the bride when the bridegroom is brought to the marriage bower and is given to the bridegroom who takes it home and puts it with his house gods: Gaari, the head of a woman is the goddess Bhaváni which is worshipped during the Ganpati festival in August: Sheshashái, or Vishnu (109) the protector sleeping on the coils of the thousand-headed snake with his wife Lakshmi shampooing his legs and Garuda standing in front with folded hands. Other brass figures cast in Poona are: A cow and a calf (109): A woman (110) holding *ud-battis* or incense-sticks: A Gosávi or religious

Chapter VI.
Crafts.

BRASS WORK.

ies.

Chapter VI.

Crafts.

BRASS WORK.

Articles.

beggar (111) holding a fly-whisk or *chauri*; Riddhi and Sidhhi (112) Ganpati's female fly-whisk bearers: The Nandi (113) or Shiv's bull: A pair of rampant antelopes (114) each holding an *ud-batti* or incense stick: A pair of *ganás* (115) or attendants of Shiv, one blowing a conch shell and the other a horn, to be placed on each side of Shiv. Thirteen articles of peasant jewelry are made: The *chandrakor* (116), the *ketak* (117), and the *phul* (118) for the head; *thusis* (119), *saris* (120), *vajratiks* (121), and *putlis* (122) for the neck; *velás* (123), *gots* (124), and *bángdyás* (125) for the arms; *pátlyás* (126) for the wrists; *chhalles* or *salles* (127) for the fingers; and *todes* (128), *váles* (128), and *painjans* (129) for the ankles. Five toilet articles are made: The *karanda* (130), a dome-shaped brass box for keeping red turmeric powder *kunku* or *kunkum*: The *menácha karanda*, slightly different from the *karanda* is used for keeping beeswax which women rub on their brows before they put on the red brow mark: The *ársi* (131) a burnished-brass mirror with a lid, is either round, square, oval, or heart-shaped: The *kairi* (132) a mango-shaped phial for keeping the *dátvan* or tooth-powder¹ which strengthens though it blackens the teeth, and is used by lying in women: The *phani* (133), a brass comb which has now almost entirely given way to ivory and sandal or blackwood combs: The *chankryás* (134), little round studs or spangles applied to the brow below the red mark: The *gandháchi dabi* (135), a cylindrical brass box with a looking glass fixed to the lid in which high class Hindu men keep the saffron pill which makes the red brow mark or *gandh*. Three articles used in the dining hall for other purposes than eating and drinking are made: The *rángole* or *kanále* (136), a hollow cylindrical roll pierced with leaves, flowers, animals and other designs in dotted lines; it is filled with powdered calcspar or *rángoli* and passed over parts of the floor which have been marked with red powder; before a dinner the seat of each guest is marked off with these lines, and on great days the *rángoli* is sprinkled on in front of the door step. The *ud-battichejhád* (137), a tree-shaped brass stand on which incense sticks are burnt; the *jhád* is generally placed near the plate of the bridegroom or other distinguished guest: The *phulyás* (138), circular pieces of brass, shaped like a flower with a hole in the centre which are nailed along the edges of the low Hindu dining stools.

Fifteen miscellaneous brass and copper articles are made: The *charvi* (139), *kásánda* (140), and *gundi* (141) globular milk pots: The *tavi* (142) an oval brass milk pot: The *bondle* (143) a spoon with a flat handle and a long snout used in giving milk to children: The *vajri* (144) is a metal plate with roughened surface and a handle used as a foot scraper: The *daut* (145) an ink bottle either round, square, six-sided, or eight-sided: The square or six-sided box (146) containing two ink bottles, one for red and the other for black ink, a sand box, and a square gum bottle is also called *daut*: *Abdágirácha kalas* (147) a bud-shaped ornament fixed at the top of the *abdágir*

¹ The ingredients of the tooth powder, or *dátvan* are: *Harda* and *bebeda* myrobalans, galls, *Quercus infectoria*, *bábhul* bark, *Acacia arabica*, and coppers or green vitriol.

or state wedding umbrella: The *kulup* (148) or padlock, the *bijāgre* (149) or hinge, the *tarāju* (150) or scales, the *gaj* a bar (151) or window rail, the *bolat* (152) the English bolt, and the *kadi* (153) a ring-shaped handle. Except the vessels and appliances used in worship the images of the gods and the miscellaneous ware all of these brass articles are made small as toys for children. In addition to these pots eight special toys are made: The *khurchi* (154) a small chair; the *patāng* (155) a sofa; the *pālāna* (156) a cradle; the English couch (158) which has been adopted into Maráthi under that name though pronounced more like coach than couch; the *mangāla* a single fire-place (159) and the *chul* a double fire-place; the table (160); and the *bānk* or bench (161).

The Jingars mostly do the finer kinds of brass work, making false jewelry, gilding clocks, turning metal, casting and polishing gods, making locks, and sharpening swords and knives. The Kunbis, who have lately taken to brass work, are of two classes Ghadnárs or beaters and Otnárs or casters. Of the beaters about five hundred are employed in twenty-five establishments and of the casters about four hundred are employed in twenty establishments. The first outsiders or non-hereditary workers who started a brass beating establishment in Poona were Khandu a Sátára Máli and Abdulla Billa an Ahmadnagar Musalmán. The present workers are all Poona Kunbis. They speak incorrect Maráthi, live in one-story hired quarters, eat coarse food chiefly vegetable food, dress in a cap or coarse Maráthi turban, a kerchief bound round the loins, a jacket and sometimes a scarf round the shoulder. They are labourers being paid by the outturn and earning $4\frac{1}{2}d.$ to $7\frac{1}{2}d.$ (3-5 *as.*) a day. They seldom suffer from want of work. They work from sunrise to sunset with only rest enough at noon to take a meal. They stop work on the last or no-moon day of each lunar month, on the day after *Sankránt* in January, for five days at *Shimga* in March-April, and on the day after an eclipse. They keep these days as days of rest from religious motives not from a love of idleness.

The materials which these Kunbi coppersmiths work up into rough pots are odd pieces of braziers left over by the Tábats in cutting out vessels; the remains of copper sheets punched at the mint or the cartridge factory; and broken pots. These materials on an average cost $5\frac{1}{2}d.$ to $7\frac{1}{2}d.$ a pound (Rs. $7\frac{1}{2}$ -10 the *man* of 32 lbs.). The material is supplied by the owner of the establishment who is either a Kasár or a Vánia, and sometimes a Kunbi, and more often by a dealer. The Kunbi coppersmith's tools and appliances differ slightly from those used by the Tábats although they sometimes go by the same names. Instead of a flint and Chinaware crucible the Kunbi brass-smith uses iron cups nine inches across and three to four inches deep. An establishment of ten workmen use 100 to 125 iron cups in the year as the cups burn off and break by constant heating. It is said that about every hundred pounds of brass smelted wear out an iron cup (4 cups in 250 *shers*). Two or three large tongs or *sándasis* about three feet long and eight to ten pounds in weight each worth 3s. to 4s. (Rs. $1\frac{1}{2}$ -2). Four to six bellows a year each worth 3s. to 5s. (Rs. $1\frac{1}{2}$ -2 $\frac{1}{2}$). Circular

Chapter VI.

Crafts.

BRASS WORK.

Articles.

Chapter VI.

Crafts.

BRASS WORK.

Articles.

wooden moulds or *sachás* with a handle each worth 3*d.* to 4½*d.* (2-3*as.*). Four to six iron bars, three to five feet long and an inch round, called *salagás*, together worth 2*s.* to 4*s.* (Rs.1-2). A large strong anvil fixed in an equally strong *libhul* block worth £1 to £3 10*s.* (Rs.10-35). Six strong hammer, with wooden handles each worth 2*s.* to 3*s.* (Rs.1-1½). Four or five four-inch square anvils each worth 4*s.* to 6*s.* (Rs.2-3). A second set of twenty to twenty-five hammers or *hathodás* to match the second anvil each worth 6*d.* to 1*s.* (4-8*as.*). Half a dozen bent bar anvils or *kharvais* five to six feet long, two inches square at one end, and four inches square at the other. Unlike the Tábats the Kunbis have no *khodva* or triangular wooden stand for their bar anvil, a small block is placed below the bar anvil and the workmen sits on the bar with his legs on either side of it. Four to five hammers to match the bar anvil or *kharvai* each worth 1*s.* to 1*s.* 3*d.* (8-10*as.*). Four to six small anvils two inches by three to four feet long called *paharai* each worth 2*s.* to 3*s.* (Rs.1-1½) which are fixed in small *bábhul* blocks buried in the ground, eight to twelve small hammers to match the *paharai* anvil together worth 6*s.* to 12*s.* (Rs.3-6). A pair of casks four feet high and three feet in diameter for holding tamarind pulp mixed with water each worth 4*s.* to 6*s.* (Rs.2-3). A hollow stone or *ukhal* worth 2*s.* (Re.1). The small pieces of braziers are gathered together and shaped into cylindrical lumps. A few pieces of copper and zinc are also put in the iron cup or tray and a small quantity of borax is added. The iron cup is set in the furnace which is a pit three feet round and two feet deep with the sides raised two feet above the floor. Dried cowdung cakes charcoal and wood are heaped above and around the cup. Two bellows are placed one on each side of the opening in the banked sides and worked till the alloy is melted and the parts thoroughly amalgamated. The cup is then lifted up with the large tongs and the liquid contents poured into a circular hollow struck with a wooden mould on a bed of clay. When solidified the rounded cakes of brass are taken to the large anvil or *banda* when one man holds the cake firmly with pincers while five or six labourers hammer it in orderly succession. When it is beaten to a given thinness the cake is put aside and another cake hammered in the same way. The cakes are afterwards taken in heaps of ten or fifteen and again hammered. When thin enough they are cut by scissors into circular pieces of the required size and taken to the second anyil and the hollow stone or *ukhal* to be shaped, and are passed from hand to hand and from anvil to anvil till they are completed. Each pot is shaped in two separate pieces an upper and a lower. When the two parts are ready they are dovetailed and beaten together at the joining. They are then again taken to the furnace and a composition of brass dust and borax is thrown over the joint, the pot is heated, and the joint is once more hammered. The next process is polishing. To polish them, a number of pots are steeped two to four days in a solution of tamarind pulp, rubbed with powdered charcoal and bricks, and hammered again till the whole surface is covered with hammer marks.

Poona brass making originally came from Ahmadnagar, all of whose coppersmiths have now moved to Poona. Pen and Revdanda in Kolába, which used to make considerable quantities of brassware, are almost entirely without work; Chándor is declining, and though the practice of pilgrims bringing away Násik brassware will probably serve to keep up the demand at least for the higher class of articles made at Násik, unless they change their system, the whole of the Násik trade in ordinary cooking and drinking vessels will pass to Poona. The Poona coppersmiths are able to undersell their rivals by adopting the union of combination among the workers and separation among the articles made which is the secret of cheap production. The cooking and water vessels made are all of one size and of one shape. And in making it each vessel is passed through a succession of groups of workmen whose whole attention is given to performing one stage of the work quickly and thoroughly.

Silk weaving in Poona city is at present (1883) flourishing, and to a great extent has eclipsed the silk weaving of Yeola in Násik. Of 700 to 800 looms, nearly two-thirds are owned by Momin and Juláha Musalmáns who have settled at Mominpura in the Juna-Ganj ward. The Hindu silk workers are found in Káchi-áli and near Someshvar. The Musalmán silk workers belong to two sections, Momins proper and Juláhás, and the Hindu workers to three sections, Khattris Koshtis and Sális. According to their own account most of the Musalmáns came about three generations ago from Haidarabad, Dhárwár, Naráyan Peth, and Gulmatkál in the Nizám's country, and the Hindu workers, according to their own account, came from Paithan and Yeola three or four generations ago. As a class both Musalmáns and Hindus are mild, hardworking, and sober, the Hindus being harderworking and thriftier than the Musalmáns. The home speech of the Musalmáns is Hindustáni and of the Hindus Maráthi. Many live in their own houses and the rest in hired quarters. The Hindus, though they eat mutton and fish on holidays, generally live on vegetable food; the Musalmáns use animal food almost daily. Both Hindus and Musalmáns wear a three-cornered turban, but the Musalmán turban differs slightly in shape from the Maráthi turban. Both classes wear long white coats reaching the knees. Round their loins the Hindus wear the *dhotí* or waistcloth, and the Musalmáns wear trousers. The demand for Poona silk is growing and the workers are well-to-do. Their busiest season is the Hindu marriage time between November and May. The Musalmán workers rest from the 5th to the 15th of *Muharram*, on the *Ramzán* and *Bakar-úls*, and on *Sábán* and *Waftán*. Hindu silk workers rest on the monthly no-moon day, on the day after the winter *Sankránt* which is called *Kar* in January, for two or three days during the *Shimga* holidays in March-April, during two days at *Diváli* in October-November, and on the day after all eclipses. Poona silk weavers work from seven to ten in the morning and from one to sunset. Their women and their children over ten help the men in sorting, reeling, and sizing. Since the 1876-77 famine, about twenty Kámáthi Koshti families have come from Naráyan-Peth in the Nizám's country and settled at Poona. They own about 100

Chapter VI.
Crafts.
BRASS WORK.
*Changes in
Trade.*

SILK WEAVING.
Workmen.

Chapter VI

Crafts.

SILK WEAVING.

Workmen.

silk looms and are harderworking and more successful than either the Musalmán Khatris or the local Koshtis. The only silk used is China silk. It is of four varieties *duem* or second quality, *sim* or third quality, *lankin* a variety of the second quality, and *sheval* or *sial*. All of it comes to Poona from Bombay as personal luggage. The *duem* is bought at 16s. 6d. a pound (Rs. 16½ a *sher*), the *sim* at 16s. a pound (Rs. 16 a *sher*), the *lankin* at 15s. 6d. a pound (Rs. 15½ a *sher*), and the *sheval* or *sial* at 13s. 6d. to 14s. a pound (Rs. 13½ to Rs. 14 a *sher*). The Poona silk weavers either borrow money from Shimpi and Márwár Váni silk dealers and buy silk yarn and gold thread, or they work as labourers receiving the materials from Shimpi and Márwár Váni dealers and being paid by the piece. When money is advanced the silk dealers do not charge interest but get 1½ per cent on the sale proceeds of the fabrics.

Tools.

Five tools and appliances are used in a Poona silk worker's or *rahátkari*'s, literally wheelman's, factory. These are three large cages called *phálkás* and one small cage called *phálki*, each worth 3d. to 6d. (2-4 *as.*); and fifteen or sixteen reels or *asáris* each worth 3d. to 6d. (2-4 *as.*);¹ a small wheel for winding the silk from the reels to the bobbins worth 6s. (Rs. 3); about 500 bobbins or *garolis* together worth about 7½d. (5 *as.*); and the large throwing² machine or *rahát* worth about £3 6s. (Rs. 33) including £2 10s. (Rs. 25) for the big driving wheels, 8s. (Rs. 4) for the upright wooden frame or *tát* on whose pegs the bobbins turn, and 8s. (Rs. 4) for the drum or *dhol* round which the twisted thread from each bobbin is rolled. To start a silk reeling and throwing establishment requires £3 to £4 (Rs. 30-40). On getting to Poona, the raw silk is made over to the reeler or *rahátkari* under whose care it is reeled, sorted, and twisted. It next goes to the dyer or *rangári* to be coloured, and when received from him is sent to the weaver or *mágvála* by whom it is warped, sized, and woven. At the reeler's or *rahátkari*'s the first thing done is sorting the silk. To sort it the silk is thrown round a three feet bamboo cage or *phálka*, with a central handle about two feet long. In front of this cage the sorter, who is generally a woman, sits, and, fastening the end of the hank to a reel or *usári*, fixes the central rod of the cage against her left foot, and sets it spinning rapidly by twisting the end of the rod between two of her toes. The quality of the fibres in the skein is uneven, varying through five or six gradations. It is the sorter's chief duty to watch these gradations and to wind all of each variety round a separate reel. With this object, before she begins to wind, she gathers near her five or six reels or *asáris*. On finding the end of the skein she knots it to one of the reels, and placing the cage against her left foot, spins it round between two of her toes. The

Process.

¹ To make a reel or *asári*, a piece of stick is passed through a hollow reed and fixed in the cleft end of a piece of bamboo.

² The throwing machine or *rahát* is in three parts. In the centre is the bobbin frame or *tát* with a central and two side uprights, on one side of the *tát* is the large wheel or *rahát*, six to eight feet in diameter, which gives its name to the machine, and in front of the *tát*, supported by two uprights, is the frame or *dhol* about two feet in diameter and six to eight feet in length.

fibre passes through her fingers, and as soon as its quality changes, she breaks the silk, picks up a second reel, knots the end to it, and winds till the quality of the silk again changes, when either a third reel or the first reel is taken up. If the new quality is the same as that on the first reel the sorter puts the ends of the silk into her mouth and knots them with her tongue with great neatness and speed. In this way even a young worker, without hitch or mistake, will sort a hank over five or six reels.

The sorted silk is ready for twisting. To twist it, with the help of a small wheel, the silk is wound from the reels on hollow reed bobbins or *garolis*. These bobbins are then arranged on the throwing machine or *tát*, and, by means of a wheel and axle, the fibres of each bobbin are twisted together and guided through a glass or metal ring round the drum or *dhol*, and then reeled on the smaller cage or *phálki*. This two-thread or *dontár* yarn is used in making some fabrics, but most of the yarn is again wound on a reel and from the reel to the bobbins, and a second time put through the throwing machine so as to make the regular or *chártár* that is four-thread yarn. The *rahátkari* or wheel man, who takes his name from the large wheel that drives the throwing machine, has now completed his work. Silk yarn is called *sheria*. In sorting and twisting it the raw silk loses about eleven and a quarter per cent in weight. To make good this loss a corresponding deduction is made in the standard weight, that is, the *sher* for weighing silk when handed over to the worker is reduced in weight by eleven and a quarter per cent, and is still called a *sher* for weighing the *sheria* or twisted silk. The *rahátkari* receives 15*d.* to 16*d.* (10-10½ *as.*) for each pound of silk that passes through his hands. His monthly income is said to range from 8*s.* to 10*s.* (Rs. 4-5). When the *rahátkari* employs labourers he pays them 8*s.* to 10*s.* (Rs. 4-5) a month.

After the silk is twisted it is bleached and dyed. In bleaching it the raw silk is steeped in a boiling solution of country soap, or in an alkaline ley called *ukhár* prepared by boiling together slaked lime and *pápadkhár* or impure carbonate of soda. While steeping in the boiling liquid the silk has to be carefully watched as it spoils if kept in it too long. All the Poona silk dyers are Hindus, whose forefathers are said to have come from Paithan about four generations ago. To compete with foreign silks they have given up their old processes and taken to the use of aniline dyes. The ease and speed with which aniline dyes can be used more than make up for their fleetingness. These cheap dyes, together with the inferior silk used, give the silks of Poona a great advantage in competition with the high class fabrics made in Yeola. A silk dyer is said to make 12*s.* to 14*s.* (Rs. 6-7) a month. On leaving the dyer, silk goes to the weaver or *mágvála* who performs three processes, sizing warping and weaving. For a silk weaver's establishment twelve appliances are wanted. They are: to prepare the warp the *tansála* or uprights with rings worth 16*s.* to 18*s.* (Rs. 8-9); 200 reed bobbins or *tikhadis* for winding the weft together worth about 1*s.* (8 *as.*); a small wheel or *rahát* worth 6*s.* to 8*s.* (Rs. 3-4); a large cage or *phálka* worth 6*d.* (4 *as.*), and five

Chapter VI.
Crafts.
SILK WEAVING.
Process.

small reels or *asáris* each worth 15*d.* (10 *as.*). For the loom a cloth beam or *turai* worth 3*s.* (Rs. 1½); the reed frame or shuttle-beam called *kátya*, used as a batten or lay, worth 7*s.* to 8*s.* (Rs. 3½-4); the treddles and heddles worth 10*s.* to 1*l.* (Rs. 5-6); *sándhs* or *kaichis*, rods laid flat between the threads of the warp to keep them from entangling, worth 1*s.* to 18*d.* (8-2 *as.*); the warp beam or *áta* worth 2*s.* to 3*s.* (Rs. 1-1½); three shuttles worth 1*s.* to 18*d.* (8-12 *as.*); and a piece of polished agate or *mogri*, used to rub the gold borders, worth 6*s.* to £2 (Rs. 3-20).

Silk is sized indoors, the warp silk in a different way from the weft silk. The warp silk is sized on the *tansálla*, a pair of upright wooden bars about eight feet high, with a row of glass or metal rings fixed to each bar through which the yarn is passed, drawn tight, and stiffened by brushing into it a dressing of size. In sizing the weft, the silk is placed on a cage wound on reels, and while on the reel it is moistened with size. The sizer, who in the case of the weft yarn is always a woman, sits with the reel on her left side, and, on her right, a small wheel, to whose axle is firmly fitted a piece of reed bobbin called *tikhadi*. She picks the end of the hank from the reel, fixes it to the bobbin, and by working the wheel with her right hand makes the bobbin spin quickly round winding the silk round itself. As the wheel turns, the worker damps the yarn on the reel with size, and passes the thread through her left fingers so that the size is evenly spread over the whole line. The warp is next made ready. Warping includes three processes, heddle-filling, joining, and arranging. The heddle-filler, according to the pattern of the borders, passes threads through the loops in the cords of the different heddles and between the teeth of the reed or *phani*. When this has been done, the joiner or *sándhnár*, connects the ends of the warp threads with the heddles, by tying the corresponding threads of the warp to those passed through the heddles and reed by the heddle-filler. The threads are finally arranged, through the whole length of the warp, in accordance with the position the joiner has given them. The silk loom is three to four and a half feet broad and eight to fifteen feet long. At one end sits the weaver with his feet in a large pit, and immediately in front of him is the square cloth beam or *turai* which supports the warp and round which as it is woven, the fibre is rolled. In the weaver's pit are two or four treddles or foot boards, by working which the weaver raises and lowers the warp threads. The two or four treddles are joined by strings with the heddles, two or four frames which hang from the roof across the threads of the warp each with a set of threads, the set of threads of the one heddle holding in their loops the lower, and the set of threads in the other heddle holding in their loops the upper threads of the warp. As the treddles are worked the heddles move the threads of the warp in turn up and down, while, between each movement, the shuttle loaded with the weft yarn is passed across the warp. In front of the heddles and like them hung from the roof, is the reed or *phani*, between whose thin slips of bamboo the warp threads have been passed. The reed is set in a heavy frame, the shuttle beam, which the weaver works to force home the threads of the weft after the shuttle has passed. Behind the heddles horizontal rods

are thrust between the upper and lower threads of the warp to keep them from entangling, and ten or twelve feet further, is the warping beam or *áta*, on which the warp is wound. This beam, about four feet long and two inches round, is fastened in the middle to a rope, which is kept tight by being passed round a post or pulley and fastened close to the weaver's side to a peg or to one of the uprights which support the cloth-beam. The weaver from time to time loosens the rope as the cloth is wound round the cloth beam. To weave silk with gold borders, besides the usual large heddles, two sets of smaller heddles are used. The first or large set of heddles governs the motion of the whole of the warp. The second set of four heddles controls the gold thread in the border, and the third, which consists of two heddles, controls certain gold threads which form a tooth or saw-shaped edging to the inner side of the border. The border-edging or third set of heddles are not connected with any treddles. They are simply worked by the weaver's hand and kept in their place by small sand bags hung as a balance. After two movements of the first or main heddles, the second or border heddles are put in motion by the weaver pressing the left treddle. The set of the three rods that support the edging heddles, is lifted by the weaver's hand, and, at every movement of the first or main heddles, one of the rods which support the edging heddles is lowered. When all three are lowered, they are again raised by the hand and again pressed down one after the other. In the Kámáthi's loom even the heddles of the second set which control the gold border threads have no treddles. These heddles are supported by small bags, the workmen lifting all of them, and pressing them one after the other, in the way the Sáli or Momin weaver moves his third or tooth edging set of heddles. When any silk design is to be worked into the body of the fabric the Kámáthi weaver takes a greater number of the large heddles and interposes them between the first or main set and the second or border set. The number of these extra heddles depends on the design. Like the second or border set of heddles they are supported by sand bags and moved up and down by the weaver's hand. The loom for weaving brocade, that is a silk fabric with gold flowers or other ornament woven into the body of the web, is very elaborate, the arrangement of heddles being very intricate and the work of weaving very tedious. The brocade loom, in addition to the three sets of heddles used in weaving a bordered silk fabric, namely the main heddles, the border heddles, and the heddles for the border edging, has a fourth set of heddles, for the ornament that is woven in the body of the web. The first or main set of heddles consisting of two heddles and two treddles comes close on the other side of the reed or *phani*. Then comes the second set of four heddles for the border. These border heddles are supported and balanced by bags of sand and for the heddle frames iron rods are used instead of the wooden rods used in the Sáli's loom. This set of heddles controls the gold thread in the border and is worked by the weaver's hand. Then follows the third or border-edging-heddles which are also fastened to iron rods supported by sand bags and are worked by the weaver's hand. Behind, that is further from the weaver than the edging

Chapter VI.

Crafts.

SILK WEAVING.

Process.

heddles, are the brocade heddles. These are a fringe of loops of white thread which are passed round fibres in the web and rise about six inches above it. The tops of the loops are fastened to a belt of white cords, which, according to the pattern, vary from twenty to forty. These cords are closely strung at each end to a wooden bar about a foot and a half long which are fastened in a position level with the web to two upright poles at the sides. From the middle of this belt of cords, or the heddle back, rises above the centre of the web a bunch of white strings one for each heddle which are held upright by being fastened to a piece of cane which hangs from a cross bar. On the weaver's right of the bunch of upright strings a cord slants from the upright threads or *nakshás* to a cord that passes from side to side, a few inches above the belt of cords or heddle back. On this slanting string are strung a number of loose knotted loops or *pagiás* which are fastened to the upright threads. These loops are most difficult to arrange only one or two of the cleverest workers being able to prepare them. When a brocaded figure begins to be woven the weaver draws certain of the loose loops or *pagiás* down the slanting string, and, by drawing the loops down, draws up some of the upright threads or *nakshás*, which in turn raise the cords of the cord belt to which they are fastened, and again the movement of the cords raises the loops which hang from the cords and with the loops raises certain of the fibres of the web. To keep the belt cords raised the weaver inserts between them and the remaining cords of the belt two wooden wedge-shaped hooks which hang from the roof each about eighteen inches to the side of the central threads or *nakshás*. After the required set of fibres has been raised from the rest of the web, with the help of one or two boys, the weaver arranges across the breadth of the web a number of bobbins full of gold thread. The number of bobbins depends on the number of flowers in the breadth of the web. Then the weaver and the boys, at each of the brocade flowers, pass the bobbin of gold threads under the threads of the warps which have been raised above the rest. The wooden hooks are then drawn out and the brocade treddles are allowed to fall to the general level. The main and border heddles are then worked and one fibre of weft is added to the fabric. Then again certain of the brocade pattern loops are drawn down and certain cords in the brocade treddle drawn up and kept up by the wedge-shaped hook. Then under each of the raised fibres in the brocade pattern gold thread is passed, and then again the main and border heddles are worked and a second fibre added to the weft. Brocade weaving is very slow, a man and two boys in a day of nine hours weave only about nine inches of fabric or about one-third of the amount of plain silk which one man can weave. While the brocade heddles are being worked, the first or main heddles are slackened by unfastening them from an iron hook with which they are connected while in motion. When labourers are employed as weavers they are paid 1s. to 2s. 6d. (Rs. $\frac{1}{2}$ - 1 $\frac{1}{4}$) a yard of the fabric woven, which work he performs in a day. The owners of the looms state that their monthly earning average £1 10s. to £2 10s. (Rs. 15 - 25). *Pitámbar*s and *paithanis* that is men's and women's robes are the only articles woven. *Khans* or bodice pieces are cut out of

the robes. Unlike the Yeola women's silks the Poona silks are sometimes brocaded as well as gold bordered. When ready for sale the silks are taken to the local dealers and sold by the weavers on their own account, or, in rare cases when they are made for a dealer, are taken and paid for by him. The dealers sell them locally or send them to Bombay, Pandharpur, Sátára, Sholápur, and other trade centres. The demand, especially for the lighter and cheaper varieties, is steadily on the increase. The value of the yearly outturn of silks in Poona is said to average about £25,000 (Rs. 2,50,000).

Gold and silver thread making is a prosperous industry in Poona city. It is a long established craft, when or by whom started is not known. The forefathers of the present workers are said to have come from the Nizám's country and the fact that their family deity is Bhaváni of Tuljápúr in the Nizám's country to some extent supports this belief. Most of them are settled in the Shukravár and Áditvár wards of Poona city. Gold and silver thread making supports about 250 families or 800 people. Lád-Sonárs, Kokni-Sonárs, Khándesh-Sonárs, Adher-Sonárs and Vaishya-Sonárs, Láds proper, Maráthás, and Pardeshis. About twenty-five families are Pávtekaris or bar-makers, seventy-eight are Tárkasás or thread-drawers, and seventy to eighty families are Chápadyás or wire-beaters. There are also about 200 Valnárs or thread-twisters mostly women. All the Pávtekaris or barmakers are Sonárs. Of the thread makers or Tárkasás, the thread-beaters or Chápadyás and the thread-twisters or Valnárs most are Láds. The name Lád seems to point to a South Gujarát origin. But according to their own accounts they came to Poona from Aurangabad, Paithan, and Karanje in the Nizám's country. The Láds say their forefathers worshipped Párasnáth and Baláji and afterwards, they do not know how long ago, they forsook the Jáiñ faith for the worship of the goddess of Tuljápúr. The rest are Kunbis and other classes, including a few Deshasth Bráhmans, who took to thread making because it was flourishing. They are a contented and hardworking class. The Pardeshis speak Hindustáni at home and the rest Maráthí. They live generally in one-storeyed houses, some their own, others hired. The Láds, Pardeshis, and Bráhmans live solely on vegetables, the rest may eat flesh. All except the Bráhmans are allowed to drink liquor but all are moderate in its use. The different divisions of workers dress like other men of their own caste, the Bráhmans in the broad flat-rimmed Bráhman turban; the Maráthás in a three-cornered turban; and the Pardeshis in a cap. The shape of coat also differs slightly. As a class they are well-to-do. Their busy time is the Hindu marriage season between November and May. Their rest days are the monthly no-moon days or *amávásyás*, the day after the mid-winter *Sankránt* or tropic in January, five days at *Shínga* or *Holi* in March-April, two days at *Diváli* in October-November, and the day after every eclipse. The day after *Nággpanchmi* in August which is called *Shirálshet's Day*, is kept as a holiday and called *Kar*. Except in twisting, gold and silver thread makers get no help from their women nor from their children till they are over twelve. Most

Chapter VI.
Crafts.
SILK WEAVING
Process.

GOLD AND
SILVER THREAD

Chapter VI.

Crafts.

GOLD AND SILVER
THREAD.

of the gold and silver used in making the thread is brought to Poona by Mārwar Vāni and Shimpi dealers who buy it in Bombay either from European firms or from Mārwar Vānis near Khāra-Kuva in Mumbādevi ward. The metal must be perfectly pure *Shambharnambri* that is 100 per cent. Even the best metal, according to the thread makers, in the beating and purifying through which it has to pass, before it is fit for their work, loses a twelfth. When ready for use the gold is worth £2 1s. to £2 6s. (Rs. 22-23) a *tola*. Besides imported gold, during the last thirty-five years, a certain quantity has been produced locally by extracting with nitric acid the gold from left off gold-embroidered cloth. This has been practiced successfully with silver as well as with gold tissue. The metal obtained from embroidery is called *gotāchi* or ball-shaped. The man who started the idea was a Gujarāt Vāni, whose family made a fortune and gave up the industry. At present (1883) three rich Bohorās follow this craft. Four kinds of silver are used *pātāchi* or bar silver which comes from Europe and *pātāchi* which comes from China, *gāvthi* or local, and *gotāchi* or ball-shaped made in Poona from silver embroidery. Local or *gāvthi* silver is already mixed with a small proportion of alloy and is used without any change. Pure English silver has to be mixed either with ten to fifteen-fortieths of ball silver or local silver or with three-fortieths of copper. The silver is brought in ingots or balls and handed to the bar-maker or *pāntekari* who is also the gilder. A bar-maker uses twenty tools: Crucibles or *mushis* of which each establishment has about ten, together worth about 8s. (Rs. 4); a clay fire-trough or *shegdi* costing 1½d. to 3d. (1-2 as.), an iron sieve or *jhāra* two to three inches in diameter with an iron handle costing 1½d. (1 a.); three anvils or *airans*, one worth £2 14s. (Rs. 27), a second worth £2 8s. (Rs. 24), and a third worth 14s. (Rs. 7); three hammers or *hātodās* together worth about 4s. (Rs. 2); one iron bar or *otani* hollowed on one side to serve as a mould worth about 8s. (Rs. 4); tongs or *chintās* worth 6d. (4 as.); a stone water trough or *kundi* for cooling the heated bar worth 6d. (4 as.); a pair of bellows or *bhāta* worth 4s. (Rs. 2); a pair of files or *kānas* worth 1s. (8 as.); a winch or *lod* always of *bābhul* wood worth 14s. (7 as.); about fifteen draw plates or *jantars* each said to be worth 10s. to £5 (Rs. 5-50); three nippers or *vākas* costing 4s. (Rs. 2), 2s. (Rs. 1), and 1s. (8 as.); a chain or *sākhali* worth 2s. 6d. (Rs. 1½); two scales with weights *kāta* and *vajan* worth £1 to £1 10s. (Rs. 10-15); two nails or *bhārus* for cleaning draw-plate holes worth 3d. (2 as.); a pair of iron pincers or *karlis* worth 6d. (4 as.); two small cages or *phālkis* for winding the wire together worth 1s. (8 as.); and a pair of smaller reels or *asāris* each worth 6d. (4 as.) Under the bar maker's hands the metal passes through two main processes. The gold is purified by boiling it with lime juice in a pipkin and is then heated several times and beaten into gold foil. The silver is melted in a crucible, poured into a mould, and hammered into a short rough bar fifteen to eighteen inches long and one and a half round. It is then worked into a more perfect shape and the surface roughened with a file. Next gold foil is carefully wound round the silver bar so as to completely

cover it. The bar is wetted and rolled by the workman up and down his thigh till the gold foil clings to the silver. Then a thick soft coir is wound tightly round the bar and it is laid, with the edges of the gold foil underneath, in the clay trough filled with lighted charcoal which is fanned into a white heat. It is next drawn out and hammered on a highly polished four inch steel anvil. Under this heating and hammering which is repeated three times, the bar gradually lengthens but without disturbing the surface of the gold or exposing the silver which never again shows into however fine thread the metal may be drawn. The gilding is completed when the ingot has been beaten eighteen inches long. After the gilding the bar-maker or *pávtékari* turns the bar into wire by dragging it time after time through gradually smaller holes in the drawplate. For this the bar is again heated and pointed. The point is pushed through the largest hole in the drawplate which is set against two wooden uprights fixed in the ground. When it shows through the drawplate the point is caught in a pair of strong pincers whose handles are joined by a chain and ring to one of the spokes of a winch. This winch has a drum, a foot in diameter and three feet long, fixed inside sockets. At right angles to the drum it has three arms, each two and a half feet long, which work in a hole, about six feet by three, and three deep. When the end of the bar is firmly grasped by the pincers, a workman, laying all his weight on one of the arms of the winch, draws it down and drags the point of the bar through the hole in the drawplate. As it passes through the drawplates both the bar and the hole of the plate are smeared with a composition of beeswax and other substances. When the bar has been drawn through the plate, the point is again hammered, and, in the same way, is dragged through a smaller hole. This dragging is repeated about twenty times. The bar, which has now become a wire about six yards long for each *tola* of metal, is cut into lengths of fifty yards and made over to the thread-maker or *tárkas*. The *pávtékari*s or bar-makers for their bar-making and wire-drawing are paid 4s. (Rs. 2) for every *passa* or one pound (40 *tolás*) silver bar. Of the 4s. (Rs. 2) 1s. (8 *as.*) is paid to two labourers at 6d. (4 *as.*) a *passa* or one pound silver bar, 6d. (4 *as.*) goes in coal, and 2s. 6d. (Rs. 1½) are left as the bar maker's earnings for two days. Allowing for breaks in the work and for holidays the bar maker's average monthly income varies from £1 4s. to £1 14s. (Rs. 12-17).

From the bar maker the wire goes to the thread maker the *tanaya* or *tárkas* who uses fourteen tools. These are: The *paldá*, a wooden drum-shaped reel worth 4s. (Rs. 2); the *paldi* a smaller drum also made of wood worth 1s. (8 *as.*); the *khodsa* a stool on which the drums are fixed worth 2s. 6d. (Rs. 1½); a dozen drawplates or *jantars* varying in value from 1s. to 10s. (Rs. ½-5); the *thesni* a small sharp pointed hammer used for stopping old drawplate holes worth 6d. (4 *as.*); a small anvil or *airan* worth 3d. (2 *as.*); a pair of pincers or *sándsí* worth 4½d. (3 *as.*); a file or *kánas* worth 9d. (6 *as.*); a small hammer or *hátoda* worth 6d. (4 *as.*); a nail or *chaurasi* for enlarging the drawplate holes worth 6d. (4 *as.*); a sharpening stone or *kálipathri* worth 3d. (2 *as.*); a crank or *mákoda* to turn the drums worth 1½d.

Chapter VI.
Crafts.
GOLD AND SILVER
THREAD.

Chapter VI.

Crafts.

GOLD AND SILVER
THREAD.

(1 a.) ; a reel axis or *„bhongli* worth 1½d. (1 a.) ; and a small bobbin or *chakkar*. To draw the wire into a thread the *palda* that is the larger reel or drum seven or eight inches in diameter, and the smaller three inch reel or *paldi* are supported horizontally on two upright pivots about twenty inches apart. Between the big drum and the little drum a small drawplate is fixed to two upright iron rods. This small drawplate is a piece of an old sword blade pierced with holes of different sizes. The wire is wound round the small reel or *paldi* and its point is sharpened by two bits of China, till it is fine enough to pass through the largest of the drawplate holes. When it shows on the other side of the plate, the point of the wire is caught in small pincers and pulled through. The end of the wire is then fixed on the larger reel or *palda* which is turned by a metal handle, and drags the wire through the hole, then the whole is wound off the small reel. The wire is then wound back on the small reel, and drawn through the next largest hole. This drawing and winding is repeated till the wire has been drawn to the required fineness. To draw a *tola* of metal 250 yards, the wire has to pass through at least sixty holes. Elaborate as this is so great is the workman's skill and delicacy, that he is said to be able to make 900 yards of thread from one *tola* of metal. A thread maker *tanaya* or *tárkas* is paid £2 10s. (Rs. 25) for every 100 *tolás* of metal he draws. His average monthly income ranges from £2 to £2 10s. (Rs. 20 - 25). Some of the thread makers employ lads as apprentices, who at first work for nothing and are then paid 2s. to 12s. (Rs. 1-6) a month, according to their work. The thread is now handed to the flattener or *chápadya* who uses seven tools. The *masipati* a small board about a foot square, with ten upright nails to serve as bobbin axles; the anvil or *airan* about two inches square and the hammer or *hátoda* two inches square kept highly polished by emery, together worth about 10s. (Rs. 5); hones or *opanis* of lac and emery powder worth £2 to £7 (Rs. 10-70)¹; the *khodsa*, a buried block of *bábhul* wood, on which the anvil is fixed worth 4s. (Rs. 2); the *chippa* a piece of leather with small slits for the thread to pass through; the *ghodi* or *ranakháme* a hook fixed in the ground to guide the flattened thread, worth 6d. (4 as.); and the *asári* a small reel, worth 3d. (2 as.). In flattening the thread, ten full bobbins are set on the *másepati* or board, and the threads are gathered together and passed through the slits of a piece of leather or *chippa* which is placed in front of the stand and drawn across a highly polished steel anvil, fixed in a block of *bábhul* wood very little raised above the level of the ground. In flattening the thread the workman firmly grasps his hammer handle between the thumb and the forefinger, and, with his left hand, draws the threads over the polished steel, and begins to beat. The threads are passed steadily over the anvil and the hammer strokes fall at the rate of sixty to a hundred in the minute, and with such regularity that no particle of the thread is left unbeaten. As they are flattened the threads are drawn away by the flattener's left hand, and

¹ The workers say pearls and coral are mixed with the emery but this is doubtful.

when stretched to arm's length, are caught under some conveniently curved article such as a broken cup handle or a brass hook fixed in the ground, and a fresh grip is taken close to the anvil. When all the threads have been flattened, they are carefully separated, wound round a reel and sent to the twister or *valnár*. The thread flattener or *chápadya* is paid £1 10s. to £2 (Rs. 15-20) for beating 100 *tolás* of thread. If during the busy season he employs a labourer he pays him £1 8s. to £1 16s. (Rs. 14-18) the 100 *tolás*. The twister or *valnár*, who is generally a woman, is the last of the work people through whose hands the thread passes. She uses three tools. A hook or bangle called *ákada* of a nominal value; two spindles or *chátis* worth 1½d. to 6d. (1-4 *as.*), sometimes made by fixing a round piece of broken China to a nail; and a wooden cylinder or *gaj* with nails fixed at given distances worth 6d. (4 *as.*). Contrary to the practice in the other branches of gold-thread making the twister or *valnár* has to provide part of the material she works up. What she has to buy is the silk-thread which is twisted with the flattened gold-thread. The silk used in making gold-thread is twisted and dyed by a distinct set of workers called *dhureválás*, of whom there are twenty to twenty-five establishments at Poona, including sixty to eighty workers. They are either Maráthás from Paithan and Burhánpur or they are Pardeshis from Delhi and Agra. They are believed to have come to Poona three to four generations ago. They speak Maráthi or Hindustáni and live in one-storeyed houses of which five per cent are their own and the rest are hired. They generally live on vegetable food though they are allowed to eat mutton and fish and to drink liquor. They dress in a three-cornered turban, a long coat reaching to the knees, a scarf round the loins, and a second scarf round the shoulders. As a class they are fairly off. Their busy season, working hours, and holidays are the same as those of the bar makers and others employed in making gold thread. They use silk of three kinds, *sim*, *lankin*, and *bának*. All are brought from Bombay, at and about 1s. to 10d. the ounce (5-6 *tolás* the rupee). The silk is the property not of the thread-makers but of Márwár and Shimpi dealers who pay them by the outturn. A *dhurevála* or twister and dyer of the silk which is used in making gold and silver thread wants three tools for the twisting and no tools for the dyeing. The appliances for twisting the silk include half a dozen bamboo cages or *pháلكás* each worth 3d. to 6d. (2-4 *as.*); about thirty small reels or *asáris* each worth 3d. to 6d. (2-4 *as.*); and two or three spindles each worth 1½d. to 3d. (1-2 *as.*). The silk twister places a skein of silk on each of five different cages or *pháلكás*, and from them winds the silk on fifteen different reels or *asáris*. These fifteen reels are then arranged in a semicircle all facing the same way. The twister draws a thread from each reel, and sitting facing the point of the reels, fastens the threads to a spindle, and rolling the spindle sharply along his thigh, twists a yard or so, winds the twisted thread round the bar of the spindle, gives the spindle another smart roll along his thigh, and twists another yard of thread. The silk is sometimes twisted out of doors. In out of doors twisting, two couples of uprights are driven into the ground,

Chapter VI.

Crafts.

GOLD AND SILVER
THREAD.

the couples twenty-five to thirty feet apart, and the uprights in each couple four to six feet high and ten feet apart. A horizontal bamboo is fastened across between each pair of uprights and on the upper side of each of the bamboos pairs of pegs are fastened close together at the bamboo and gradually separating in a V shape. In out of door silk twisting the fifteen fibres from the fifteen reels pass through the hollow at the foot of the V. When the silk twister is as much as twenty-five to thirty feet from the reels he can twist a much longer piece of thread at a time that he can twist when he stands close to the reels. The twister is paid $1\frac{1}{2}d.$ (1 *a.*) for each *lad* of silk twist that is equal to $7\frac{1}{2}d.$ an ounce (8 *tolás* the rupee). When the gold thread twister or *valnár* gets a supply of the proper twisted silk he winds it off the reel on to a spindle. One end of the silk thread is then passed through a bangle or steel ring fastened to the ceiling of her house, drawn down, and tied to a second spindle. The flattened gold thread is then unwound from the reel or *asári* and dropped in a loose heap on the ground near the twister. The twister sits on a high stool or chair, and, fastening the ends of the gold and the silk thread together, rolls the spindle sharply along her thigh and gives it so rapid a whirl that it twists together two or three feet of the gold thread and the silk always keeping the gold on the surface. When the spindle stops the workman winds the finished gold thread round the rod of the spindle, draws down a fresh yard or two of the silk thread, and gives the spindle another whirl by sharply rolling it again along her thigh. The drawing down the silk, whirling the spindle, and twisting together the gold and the silk are repeated till the whole quantity is completed. The finished gold thread is then wound into hanks and skeins by passing it round two nails fixed to a rod or *gaj*. The *valnár* or twister is paid 1s. an ounce (5 *tolás* the rupee). Poona gold thread is chiefly used locally in ornamenting turban ends and the borders and fringes of robes and dining clothes.

COTTON GOODS.

Cotton weaving is carried on in thirty-seven towns in the district; Jasvad, Kavtha, Pábal, Bárámáti, Indápur, Pimpalvádi, Junnar, and Utur, are known for *lugdis* or women's robes; Bárámáti, Kavtha, and Jasvad for silk-bordered *dhotis* or men's waistcloths, and *uparnis* or silk-bordered shouldercloths; and Indápur, Palasdev, Lasurna, Nimbgavketki, and Kalas are known for *khádi* or coarse cloth. Of these the only important centre of cotton cloth hand-loom weaving is Poona city. Poona city has 400 to 500 cotton hand-looms, of which about 450 belong to Hindus, 300 of them Koshtis and 150 Sális, and the remaining fifty Musalmáns. Most Hindus weave women's robes or *sádis* and most Musalmáns weave turbans. Cotton hand-loom weavers are chiefly found in the Somvár, Vetál, Bhaváni, Ráste, and Shukravár wards. Besides in these wards one or two cotton looms are found in almost every part of the city. Except two families who have come from Madras, the Hindu weavers are said to have come about three generations ago from Paithan, Yeola, Sholápur, Indápur, and Naráyan Peth in the Nizám's country. The Musalmán weavers came to Poona only four or five years ago from Málegaon in Násik where they

form a large colony.¹ Except the two Madras families, whose home speech is Telugu, the Hindu weavers of cotton goods speak Maráthi, and the Musalmán weavers speak Hindustáni. All live in one or two-storied houses, fifteen to twenty of which belong to the occupants, and the rest are hired. The Hindus eat flesh and drink liquor and are a temperate class. The Musalmáns seldom eat flesh except on holidays. Many of them drink liquor but seldom to excess. Those Hindu weavers who belong to the Koshti and Sáli castes wear either the Deccan Bráhman or the three-cornered Marátha turban, a jacket, a long coat, a scarf round the loins and another over the shoulders. The Musalmáns wear a cap except a few who have taken to the Marátha turban, a jacket, a long coat, and trousers. The robes woven by the Hindus and the turbans woven by the Musalmáns are generally coarse and cheap. The Hindus work from seven to eleven and again from one to sunset; the Musalmáns work almost the whole day except a short time for their meals which they generally cook in the same shed or room in which they weave. The chief demand for their wares is during the marriage season that is between November and May. The articles they weave are intended for every-day use although they are used as marriage presents by Kunbis and other middle and low class Hindus. Hindu cotton weavers stop work on the last or no-moon day of every lunar month, on *Nágpanchmi* Day in September, on *Dasara* Day in October, on the day after the great *Sankránt* in January, during three days of *Shimga*, during four days at *Muharram* time, and on the day after every eclipse. The Musalmáns stop work only on three *Muharram* days in *Ramzán* and on the *Bakar-id*. Both Hindu and Musalmán cotton weavers get great help from their women, in reeling, dyeing, warping, and sizing. Some Hindu women even weave. With all this help cotton-weavers barely make a living. The articles they turn out are very inferior and are worn only by the poorer classes. The average daily earnings of a cotton weaver's family are said to range from 6d. to 7½d. (4-5 as.), and during the rains they are often short of work. All the yarn used in the Poona handlooms is steam-made partly from the Bombay mills and partly from Europe. The yarns generally used are twenties and thirties. To buy the yarn most weavers have to borrow at two per cent a month. The tools and appliances of a Hindu cotton weaver resemble those of the local silk weavers of which an account has already been given. The Musalmán weaver is satisfied with cheaper and simpler appliances. He has a smaller loom and has not more than seven tools. The shuttle-beam *hatya*, in which the reed or *phani* is fitted worth 6d. (4 as.), two bars or *athuyás* to keep the warp stretched worth 6d. (4 as.), a beam or *tur* round which the woven fabric is wound worth 1s. (8 as.), a pair of shuttles or *dhotás* worth 1s. (8 as.), a large bamboo cage or *phálka* worth 6d. (4 as.), a reed or *phálki* worth 3d. (2 as.) and a small wheel or *rahát* for sizing the weft yarn worth 8s. (Rs. 4). The foreign and Bombay yarn undergoes eight processes in being turned into robes or *sádis*. It is steeped

Chapter VI,
Crafts.
COTTON GOODS.

¹ Compare the Nasik Statistical Account, Bombay Gazetteer, XVI. 167.

Chapt. VI.
C.
COTTON GOODS.

in water and placed on the bamboo cage or *phálka*. It is changed from this cage to the reel or *asári* by a woman of the weaver's family who holds the end of the central rod of the cage in her toes, and with her right hand, drawing off the yarn from the skein, winds it on the smaller reel, which she holds in her left hand and whirls round in a small cup of smooth cocóanu shell. To make the skeins of a convenient size, the yarn is next wound off the reel or *asári*, on to a small conical reel called *charki*. The yarn is then transferred to the *rahát* or wheel to be twisted and wound round in bobbins or *kándis*. It is next worked by winding it, two threads at a time, in and out among the rows of bamboo rods about four feet apart. It is then opened on two bamboos, stretched tight between two posts and sized by a large brush dipped in rice paste. If it wants colouring it is dyed before it is sized. The weavers themselves dye the yarn either with German aniline dyes, or they have the yarn steeped first in the indigo vats of the local indigo dyers and then in safflower dye to make them green, a colour which quickly fades. The general practice is to buy dyed yarn. After the yarn is dyed and sized or sized without dyeing, it goes to the heddle-filler and joiner who is always the same man as the weaver. He joins the warp threads with the threads of an old used warp which he purposely keeps to save the trouble of passing threads in each case through the loops of the heddle, then through the bamboo slips of the reeds or *phani*, finally tying them to the *turai* or warp beam. After joining the warp threads, the weaver has to stretch the whole of the warp and to see if any of the strands of the warp are wrongly joined or are entangled. When all is ready the warp is stretched and the ends tied to its farthest end, passed round an upright, and brought back to the place where the weaver sits. It is there tied either to a peg fixed in the floor to the right of the weaver or to one of the uprights which support the cloth beam or *turai*. When the weaver has provided himself with a pair of shuttles and a small basket full of loaded bobbins, he sits behind the cloth beam, puts his legs in the pit below the loom and with one foot on each of the treddles begins to weave. He passes the shuttle with the loaded bobbin between the two sets of the warp threads which are by this time separated by heddles worked by the treddles under the weaver's feet. For the border a separate set of heddles hanging from the roof are balanced by sand bags and are worked by the hand. The Musalmán turban loom, except that it is not more than eighteen inches broad and has no heddles, is the same as the robe loom. The Poona cotton weavers take their robes and turbans to the local Shimpí dealers of whom about fifty have shops in Budhavár ward. The robes fetch 4s. to £1 (Rs. 2-10) and the turbans 3s. to 10s. (Rs. 1½-5). The local demand especially during the marriage season will probably keep up hand-loom cotton weaving for some time. Still it seems probable that, in a city where the price of grain and the cost of living is high compared with most parts of the Deccan, the hand-loom weavers of robes will be driven out of a living by steam-made fabrics. Hand-loom turban weaving will probably last longer, as, so far, it has been free from machine competition.

Glass bangles are made in the village of Shivápúr on the Sátára

Chapter VI.
Crafts.

GLASS BANGLE

road about seven miles south of Poona by a settlement of Lingáyats who are called Kácháris or glass makers. At present (1883) four establishments employ twenty-five to thirty men. They say that they came to this district from villages near Sholápur five or six generations ago, that they used to marry with other Lingáyats, but that since they have taken to bangle-making they form a separate caste marrying among themselves only. They speak Maráthi at home, live in their own one-storeyed houses, and never touch animal food. They say that they dress like Bráhmans, but when at work they wear only a dirty waistcloth and a rag round the head. They work from nine in the morning to nine at night, and stop work on all Mondays, on the great *Sankránt* in January, on *Maháshivrátra* in February, for four days during *Shimga* in March-April, on *Nágpanchmi* in August, on *Dasara* in October, and during five days of *Diváli* in October-November. Their women and children help in sorting broken pieces of Chinese glass-bangles which the men melt and work into new bangles. They buy these broken bangles from the *Kánch.bángdi phutáneválús* that is glass bangle collectors, Márwár Vánis of whom there are fifteen to twenty shops in the Bhaváni and Vetál wards in Poona. They gather the glass bangles by going from house to house selling parched gram in exchange for its weight in broken bangles which the children of the house carefully gather and keep. Kásárs or dealers in bangles, also ask for and gather broken bangles at any houses they may visit to put new ones round women's wrists. They sell the broken pieces to Kácháris. The current price of the raw materials is $1\frac{1}{2}d.$ (1 *a.*) the pound. Though so little money is wanted the Kácháris generally borrow it in Poona at one to two per cent a month. The glass is sometimes supplied by Kásárs or bangle dealers who pay the Kácháris $2\frac{1}{2}d.$ to $3d.$ a pound (3-4 *as.* a *sher*) to work it up. Round balls of country made glass used to be received at Poona from Gutur in the Nizám's country, but for the last eight or ten years no glass has been brought from Gutur as broken bangles furnish as much material as the trade requires. A Káchári's appliances are simple and cheap. Half a dozen bamboo baskets smeared with cowdung serve to store the sorted pieces of glass; six thin two feet long iron bars pointed at one end at $\frac{3}{4}d.$ ($\frac{1}{2} a.$) each; six home-made clay crucibles at a nominal cost. The mould called *mátra* or *sácha* an iron bar with a conical clay top worth about $3d.$ (2 *as.*). One end of this iron bar is supported by an upright peg near the fire-place or kiln, the peg having a looped piece of iron on the top to let the bar move round its own axis and the other end rest on a slightly grooved stone. Half a dozen six inch long flat iron paper-cutter shaped blades called *pattás* each worth about $3d.$ (2 *as.*). The *ákadi*, a wooden handled iron rod slightly bent at the point worth about $3d.$ (2 *as.*). Six to eight six inch nails or *chats* with handles each worth about $1\frac{1}{2}d.$ (1 *a.*). Six hammers worth $9d.$ (6 *as.*) each. Six flowerpot-shaped earthen pots or *kundis* each worth $\frac{3}{4}d.$ ($\frac{1}{2} a.$). A scale with weights or stones and bamboo basket pans worth $3d.$ (2 *as.*). Half a dozen long handled hemispherical iron spoons or *palis* each worth $2\frac{1}{2}d.$ (1 $\frac{1}{2} a.$). A Káchári's kiln or fire-place is also kept in a separate building or in a small wing of the building in which the workmen live. A separate bangle-furnace

Chapter VI.
Crafts.—

GLASS BANGLES.

consists of a shed, about twenty feet by twenty-five and ten high, with brick walls with two doors on the south and on the west, and six windows, two each on the north, the south, and the west. The east wall has neither door nor window. The roof is tiled, the central beam being about twenty feet from the floor. Nearly in the centre of the building is the furnace, a round pit three to four feet deep, with a dome-shaped clay top and arched windows each about four inches by six and a hole at the top of the dome provided with a clay lid. Inside the dome is a raised platform on which rest the crucibles or clay smelting pots each opposite its own window. In the space between each pair of windows and a little way from the kiln are six uprights which together with the cross stick form a six-cornered bower over which two to three feet of fresh cut branches are heaped to dry. In front of each of the kiln windows a pair of thick rag screens are hung on the cross sticks of the bower, to shade the workmen from the fire. In front of these shades sit the half dozen workmen each with his tools and a basket of broken bangles near him. When the crucibles filled with glass are set on the platform inside the dome of the kiln, the fire is kindled by bringing fuel into the pit through an under-ground passage. At the end of about an hour the glass melts and each of the workmen sits opposite one of the windows. He stirs the half fluid glass with the bent pointed iron rod or *ákadi* to see if it is uniformly melted. When it is properly melted the workman passes into the molten glass a second sharp pointed iron rod and with it picks out a drop of fluid glass. On taking the drop of glass out of the kiln with a jerk he makes the rod spin round and the spinning motion turns the glass drop into a globe. A sharp blow to the iron rod from the *patta* or iron blade shivers the globe and turns it into a ring on the point of the bar. Repeated blows with the blade on the bar by shaking it widen the ring into a long loop. As soon as the ring is big enough, it is dropped over the conical clay point of the mould or *sácha* and fitted into it with the help of the blade, the left hand all the time keeping the mould spinning in the grooved stone. All this is done with surprising cleverness and speed, less than half a minute serving to turn the glass drop into a finished bangle. If from any delay the glass cools and hardens out of shape, the mould or *sácha* is held in the kiln flames till the glass is softened and can be worked into the proper shape. The formed bangle is dropped on the floor, the sharp end of the iron bar is heated and hammered straight, and a second glass drop is brought out at the bar point, whirled into a globe, struck into a ring, widened by vibration, and finished off on the turning mould point. The Shivápur Kácháris make three kinds of bangles *bángdi*, *gol*, and *kaul* or *kárla*, the *bángdi* is slightly conical, the *gol* globular, and the *kárla* conical with a notched surface. Finger rings are made in the same way as bangles. The bangles are in great demand among the poorer classes of Hindu women, and the rings are bought by girls as toys who sometimes wear them round their own fingers and sometimes put them round their dolls' wrists. The Kácháris carry their bangles and rings to Poona. If the glass is supplied by a Kásár dealer the Káchári is paid 6s. (Rs. 3) for thirty-two pounds. If the glass is the Káchári's own he gets

Chapter VI.
Crafts.

about 10s. (Rs. 5) for the *man* of thirty-two pounds. In a day of about twelve hours' work a good bangle-maker can turn out four to five pounds of glass bangles. Deducting the cost of the glass and the fuel, this price represents a daily wage of 6d. to 7½d. (4-5 as.). The Kácháris' industry is declining under the competition of Chinese glass bangles.

Combs.

Savái Mádhavráv Peshwa (1790-1795) the tender-hearted sensitive youth, whom Nána Fadnavis' restraints drove to suicide, had scruples about Bráhmañ women using metal hair combs. It was against the sacred books; hair combs should be of ivory not of metal. To supply the new demand for ivory combs one Audutráv Dhandarpálkar came from Násik and opened the first ivory comb factory in Poona city. His example was followed by Abáji Ava of the carpenter caste. The family of Audutráv cannot (1883) be traced and is said to have died out. The original carpenters have also left Poona and again taken to wood-cutting. The present ivory comb makers are the descendants of the Kunbi servants of the original workers. They number about fifteen and keep five workshops opposite the temple of Ganpati in Kasba ward. They are a quiet people, speak Maráthi, live in their own one-storeyed houses, occasionally eat flesh, and dress like ordinary local Kunbi Maráthás. Comb making is easy to learn. Many Kunbis would have taken to the craft if it had offered a fair chance of making a living, but for many years, owing to the competition of cheap foreign bone combs, the industry has been depressed. Within the last ten years four shops have been closed and those who are left though above want are poor. The present small ivory-comb industry will probably long continue. Bráhmañ and other high caste Hindu women think bone combs impure, and three ivory combs always form part of the *váyán* or bride's outfit.

Comb-makers work from seven to eleven and from two to sunset. They stop work on *Kar* that is the day following *Mahásankránt* in January, and on *Nágpanchmí* in August. Their women and children give them no help. During the marriage season, between October and May, the demand is brisk, and sometimes a servant or two are employed to help in doing the rougher parts of the work. The servant is paid 8s. to 14s. (Rs. 4-7) a month according to the nature and quality of his work. The average monthly income of a comb-maker varies from £1 to £1 10s. (Rs. 10-15). As ivory is very costly ranging from about 8s. to about 11s. the pound (Rs. 150-200 the 33 lbs. *man*) the money required for buying it has to be borrowed. The usual rate of interest paid is one per cent a month. The advances are generally made by a moneylender named Jipa Márwári in whose hands the whole industry practically is. In addition to interest, he charges 1¼ to 1½ per cent as commission on the ivory he brings from Bombay. The workmen have to sell the articles they make on their own account and to pay the standing balance including interest and commission to the Márwári moneylender. What they are able to keep back is just sufficient to maintain themselves and their families. All are indebted to the Márwári. The appliances of a comb-maker are

Chapter VI.

Crafts.

Combs.

similar to those of an ordinary carpenter only a little finer. Each shop requires five to six saws of different sizes worth 9*d.* to 1*s.* (6-8 *as.*); half a dozen files worth 6*d.* to 7½*d.* (4-5 *as.*); four or five borers worth 3*d.* (2 *as.*) each; half a dozen vices each worth 10*s.* to £1 10*s.* (Rs. 5-15); a *vákas* or *dze* worth 2*s.* (Re. 1); a *khatávne* worth 1½*d.* (1 *a.*); and a compass worth 6*d.* (4 *as.*).

When the ivory is brought from the Márwári's shop, after he has weighed it and entered the price in his account book, it is steeped in water for two or three days. It is then cut into pieces of the required size and sawn through, keeping it vertical by holding it in the vice. It is then filed, rubbed and polished. Sometimes the ends and sides are decorated with carvings and the plain surface is broken by tracing on it a few curved and straight lines. Combs for the use of women are rectangular and have a double set of teeth, while men's combs are crescent-shaped and have only one set of teeth. The small pieces of ivory left over in cutting out pieces for combs are used in making dice. The price of a comb ranges from 6*d.* to 2*s.* (Rs. ¼-2) according to the size thickness and workmanship of each. The combs and dice are sold in the workshops by the workers on their own account. Their only customers are high class Hindus. Other classes use either wood combs or foreign horn combs.

CLAY FIGURES.

Among European residents and travellers a favourite product of Poona are clay figures six to eighteen inches high, with in their appearance colour and dress, all that is characteristic of the different castes and classes of Western India. These figures are known as Poona figures and are made nowhere but in Poona. At present (1884) there are only eight figure-makers in Poona city. The most famous makers of Poona figures have been Bápu Supekar a Jingar and Kálurám Gavandi a bricklayer. These two men were contemporaries and lived about forty years ago. The present workers belong to the Goldsmith, Jingar, and Marátha castes. They speak Maráthi, and generally live on vegetable food, but they eat flesh on holidays and special feast days. The goldsmiths dress like Bráhmans, in a rounded turban, jacket, long coat, waistcloth, and shoulder-scarf; the rest dress like Kunbis with a three-cornered turban, long coat, and waist and shouldercloth. Besides the eight workers who make the highly finished Poona figures, twenty to twenty-five Jingars, and about two hundred Kumbhárs make rough baked clay figures costing about 4½*d.* (3 *as.*) the dozen. The Jingars and Kumbhárs mould or shape these rough figures a little before the *Ganpati* holidays in August and the *Diváli* holidays in October-November, when, especially at *Diváli*, they are in great demand. Sháliváhan, the legendary founder of the *Shak* era, whose initial date is A.D. 78, is said to have led an army of clay figures from the Deccan north across the Narbada, and defeated Vikramáditya the chief of Málwá. In honour of this triumph for the Deccan during *Diváli* the children of lower class Hindus build small clay castles in front of their houses, and round them arrange an army of clay figures footmen horsemen and gunners. It is the opinion of many well informed people in Poona that this practice was introduced by Shiváji

(1627-1680) with the object of fostering a warlike spirit among Marátha children.

Chapter VI
Crafts.
CLAY FIGURE

The Poona figure-makers are perhaps the only workers in Poona who show artistic skill. The materials used by the Poona figure-workers are: White clay or *shádu* generally bought from Mhárs at 3d. a head-load (8 for Re. 1); Bombay *khadu*, a chalky clay which is bought from Poona Bohoras at sixteen pounds the shilling; torn country paper called *junarikágad* costing about 2½d. a pound (10 lbs. the rupee); finely ginned cotton worth a shilling the pound; orpiment or *hartál*, the yellow sulphide of arsenic worth a shilling the pound; ochre or *son geru, kávu*, worth 1½d. (1 a.) the pound; cinnabar or *hingul* red iodide of mercury worth two shillings the pound; verdigris or *jangál* green arseniate of copper worth its own weight in copper coin; white zinc or *sapheda* oxide of zinc worth a shilling the pound; indigo or *níl* worth its own weight in copper coin; English carmine worth its own weight in silver; lamp black collected at home; *gomutra pevdí* a yellow pigment obtained by steeping the powdered flowers of the *Butea frondosa palas* in cow's urine, worth its own weight in silver; glue or *siras*, worth 6d. the pound; isinglass worth a shilling a packet bought from European shops; lac bought from Bohoras at 9d. to 1s. (6-8 as.) the pound; copal varnish worth 3s. to 4s. the pound; blue vitriol, sulphate of copper, and rice flour. These materials are so cheap, and in most cases are required in such small quantities that, unless one customer wants a large number of figures, when some advance is required, even the poorest workers buy them on their own account. A figure-maker's tools and appliances are few and simple. There are five scoopers or gouges, namely *korane* which is flat and slanting at the end, *nakhurde* nail-shaped, *korni* spear-head shaped, *kesáche korne* flat and ridged on one side making hair-like lines in the clay, and *dolyáche korne* grooved on one side. Besides the gouges, they require a pair of pincers or *chimtás* worth a shilling; a drill or *sámta* worth 6d. (4 as.); half a dozen files or *kánas* worth together 2s. (Re. 1); and a pair of scissors worth a shilling. The brushes are made of the tails of the Indian squirrel which cost about ¾d. (½ a.) the piece and are bought from the wandering druggists called *Vaidus* or *Baidus*. The *shádu* or white clay, the *khadu* or chalky clay, and the torn paper are separately steeped in cold water for one day, apparently passed through a sieve though this the workmen deny, and pounded together with the ginned cotton. The proportion of each of these articles is not uniform, each workman using his own discretion on each occasion. When the clay is so thoroughly mixed as to lose all grit or grain it is ready for use. The workman shapes the head putting in a small peg to prop the neck. The arms are next shaped and propped on pegs at the shoulder joints. The trunk and legs are last shaped with two pegs passing through the soles if the figure is standing and one peg passing below the end of the backbone if the figure is sitting. These separate pieces are joined and the figure is left to dry two to six days in the sun. When dry the clay is painted a flesh colour and the eyebrows and moustache, and, if the figure is a Hindu, the brow marks are painted. The colours are made by

Chapter VI.
Crafts.
CLAY FIGURES.

washing the mineral pigments several times over and mixing them thoroughly with *ghee*-paste for a dark and with isinglass for a light-tint. When the paint dries the workman dresses the figure by gluing on pieces of different fabrics. Finally the figure is fixed into a stand brought from the local turner either with the help of the peg passing below the feet, or, sitting, by the peg which passes below the back. Of the Poona figures, which include almost all castes and classes, perhaps the most interesting and characteristic are: A fully equipped elephant with a native prince and his attendants in the car or *hauda*; groups showing how Hindus cook and dine; a scene at a public well; a dancing party; a Hindu spinner, weaver, and goldsmith at work; a European gentleman carried in a palanquin; a Koli, or other highwayman waylaying and extorting money from a Márwári trader; a tiger-shooting scene; a prince or princess attacked by a tiger; a native fruitseller's shop; a native woman carrying water; a milkmaid; a Gárodí or juggler with tame monkeys, snakes, goat, and mongooses; a Darweshi with a tame bear; a Gosávi or Hindu ascetic; a Fakir or Musalmán beggar; a Bráhmañ woman worshipping the sacred *tulsi* plant *Ocimum sanctum*; an astrologer telling fortunes; a Vaidú or wandering quack; a Pársi man and woman; a waterman with his bullock; a camel driver; a messenger; and the cholera or *jarimari* worshipper. The prices of these figures range from 18s. (Rs. 9) a dozen to 10s. (Rs. 5) each according to size and make. Among the figures required for the *tábut* or Muharram bier festival the most common are a dancing girl; a Marátha horseman; a chief on an elephant; a pair of Bráhmañ Marátha officers on horseback; a pair of gymnasts; a prince on an elephant attacked by a tiger; a Marátha officer on horseback helping a damsel to mount his horse; and a prince on foot struggling with a tiger. The figures required for the Muharram biers are the largest made in Poona ranging from two to three feet high and costing £2 to £50 (Rs. 20-500). The figures intended for sale among European and Pársi customers ordinarily range from six inches to eighteen inches in height and from 1s. (8 as.) to £1 (Rs. 10) in price. The average monthly income of the Poona figure-makers is said to vary from £2 to £2 10s. (Rs. 20-25). The figures are either made to order or are sold at the workmen's house. The larger figures required for Muharram biers are bought by Hindus. The demand for Muharram figures is not great as one figure lasts for years. The chief demand is from Europeans and from the Pársi owners of Bombay curiosity shops.

PAPER.

Paper-making is said to have been brought to Poona from Junnar four or five generations ago. The leader of the movement is remembered as Allíbhái, a Musalmán, as are all the workers in Poona. At present (1883) Kágdipura or the papermen's quarter a part of the Kasba ward has seven work-places or paper factories. According to the paper-workers the site on which they built their houses and factories was given free of charge by the Peshwa to encourage the craft. Of forty factories only eight remain, seven in Poona and one at Bhámburda just across the Mutha from Kágdipura. The paper-makers know Maráthi but speak Hindustáni at home. They can afford to eat flesh only on holidays, and drink liquor but not to excess.

They live in one-storeyed houses of their own. The men dress like Kunbis in a three-cornered turban, a long coat, a scarf round the loins, and one round the shoulders. Their women wear a robe and bodice like Kunbi women. Their paper is strong and lasting but has no special peculiarity or excellence. They earn barely enough to live on and are constantly borrowing. They work from seven to twelve and from one to sunset. They stop work on Fridays, *Bakar-Ids*, five days of *Muharram*, one of *Shabebarát*, and three days on the death of a member of the community. Their women and their children over eight help in sorting waste paper. Unlike the practice at Násik and Junnar where rags are used, at Poona paper is made solely from waste paper bought from Government offices at £1 to £2 a *palla* of 240 lbs. As the waste paper is generally bought at auction sales its price varies considerably. The £2 to £5 (Rs. 20-50) required for buying the raw material has to be borrowed from Márwári moneylenders at two or three per cent a month. The Poona paper-makers have stopped using ropes and gunnybags as they require more time and labour to pound and bleach. Six chief tools and appliances are used: The *dhegi* or great hammer, a long heavy beam poised on a central fulcrum worked in a long pit two or three feet deep. The head of the hammer is a heavy block of wood fixed at right angles to one end of the main beam, with its face strengthened by four thick polished steel plates. On the upper surface of the other end of the main beam two or three steps are cut, and the hammer is worked by three or four men together forcing down the beam and letting it rise by alternately stepping on the beam and on the edge of the hole. The cost of the *dhegi* including the cost of the paved pit or hole in which it is worked, is calculated at £5 to £6 (Rs. 50-60). Though every one of the Poona paper factories has a *dhegi*, they have not been in use for ten or twelve years as waste paper does not require heavy hammering. A rectangular teakwood frame or *sácha* two and a half feet by two, with eight cross bars; it costs 6s. (Rs. 3) and is used in fishing out films of paper from the cistern. A screen or *chhapri* made of the stalks of the white conical headed amaranth *Amaranthus globulus*, on which the film of paper rests, when the frame is brought out of the cistern and the water allowed to pass through it, costs 2s. to 4s. (Rs. 1-2). A soft date palm brush or *kunchá*, costing 1½d. to 3d. (1-2 as.), is used in spreading the sheets against the cemented walls of the room. This brush is not always required as the paper is generally spread in the sun on old scarves or rags. The polishing stones a piece of agate worth 2s. to 4s. (Rs. 1-2). Large shells *Cypræa tigris*, which are in use instead of polishing stones, cost 1s. to 1s. 6d. (8-12 as.) a dozen; smooth teakwood boards each about two feet by three, costing 2s. to 2s. 6d. (Rs. 1-1½), are required to lay the paper on while it is being rubbed with the polishing stone or shell. The process of making paper from waste paper is not so elaborate as the process of making it from sacking. In Poona the paper is torn to pieces, sorted according to colour, moistened with water, and taken to the river and pounded with stones and washed for three days. It is then taken to the cistern. A paper-maker's cistern is a cement-lined tank about seven feet by four and four deep half

ter VI.
rafts.
APPR.

filled with water. The paper pulp is thrown into this cistern. When it is thoroughly dissolved the workman sitting at the side of the pit, leaning over the water, takes in both hands the square frame which holds the screen which serves as a sieve, passes it under the water and draws it slowly and evenly to the surface, working it so that as the water passes through, a uniform film of pulp is left on the screen. The screen is then lifted up and turned over, and the film of paper is spread on a rag cushion. When layers have been heaped on this cushion nine to fourteen inches high a rag is spread over them, and on the rag is laid a plank weighted with heavy stones. When this pressure has drained the paper of some of its moisture the stones are taken away, and two men one standing at each end of the plank, seesaw over the bundle of paper. When it is well pressed the paper is peeled off, layer after layer, and spread to dry either on the cemented walls of the building or on rags laid in the sun. When dry each sheet is laid on the polished wooden board and rubbed with a shell till it shines. The paper made by this process though rough and of a dingy yellow is strong and lasting. The makers sell it to Marwári Váni, Bohora, and Gujarát Váni dealers. The price for each *gaddi* of 240 sheets ranges from 8s. to 10s. (Rs. 4-5). The cheaper varieties are generally bought by Government officials for envelopes, and the better kinds command a sale among native merchants who use them for account books for which their toughness and durability make them specially suitable. The retail price varies from 8s. to £2 (Rs. 4-20) the ream of ten quires. The paper-makers almost never employ outside labour. The men and women of the family work together, the men doing the heavier and the women the lighter parts of the work. From the much greater cheapness of machine-made imported paper the demand for the local paper is small and declining. The makers are badly off, barely earning a living. They have no trade guild.

ors.

Poona city has twenty-seven iron pot factories, four of which belong to Telis or oilmen, three to Bohorás, ten to Kunbis, and ten to Mális. The industry employs 150 to 200 workmen Bráhmans, Kunbis and Musalmáns. All the iron pot factories in Poona city are in the Áditvar ward. The whole of the iron used is brought in sheets through Bombay from Europe. When at work iron pot makers wear nothing but a waistcloth tied round the hips. On holidays the Bráhmans wear their own dress, and the rest the three-cornered turban, a long coat, and all the Musalmáns a waist and shouldercloth. They speak Maráthi, and live in one-storeyed hired quarters. Their every-day food is *bájri* or millet cakes and *dál* or pulse with a few ground chillies and some simple vegetables. Except the Bráhmans both Hindus and Musalmáns occasionally eat flesh and drink liquor though not to excess. The workers make little more than a living most of the profits going to the dealers. They work even on no-moon days. Their only holidays are *Kar* that is the day following *Mahásankranti* in January, five days during *Shimga* in March-April, Ganpatí's Day in August, and the day after all eclipses. Their busy season begins in *Bhádrapad* or July-August and lasts till *Chaitra* or March-April. The women and children do not help the men in their work. They work from sunrise to sunset with half an hour's

Chapter VI
Crafts.
IRON POTS.

rest at midday. The iron sheets are bought in Bombay near the Carnac Bridge at 11s. (Rs. 5½) the cwt. to which carriage to Poona adds 1s. 6d. the cwt. The dealers buy the iron sheets with their own capital. The iron pot maker uses nine appliances. Twenty to twenty-five chisels or *chani* each worth 1½d. (1a.); twelve to fifteen hammers of different sizes each worth 6d. (4as.); half a dozen pincers or *sándsís* each worth 3d. (2as.); two or three heavy iron cylinders each worth 4s. to 5s. (Rs. 2-2½); half a dozen compasses each worth 6d. (4as.); six to eight large English anvils each worth £1 to £1 10s. (Rs. 10-15); half a dozen thick rounded anvils about six inches across fixed in *bábhul* blocks and half buried in the earth each worth 6s. to 8s. (Rs. 3-4); about a dozen thick pointed nails for punching holes together worth 4½d. (3as.); half a dozen yearly renewed files at 1s. 6d. (12as.) each. In making the iron vessels the iron sheet is laid on the floor and the shape required for the pot is traced with compasses on the sheet and cut out with a chisel. The piece of iron thus separated is then hammered on a solid iron anvil or *bángdi*, and roughly shaped into a hemisphere. It is next hammered on the large and small anvils, till the shaping is completed. The pieces forming parts of a pot are then nailed together and the joint filled up with putty. Its brim is filed, and the handles, made of iron rods flattened at the ends are rivetted on. The articles made are: The *tava* a griddle for baking native dainties; the *pátele* a cylindrical pot with a slightly rounded bottom varying from a foot to three feet across and two to three feet deep; a *nagára* or large drum pot; tanks or *hauds* for storing water and grain; a *pohora* or cylindrical water-drawing pot nine inches to a foot across and seven to fourteen inches high; a sieve or *chálan* used by grain parchers or *bhadbunjás*; a *kadhái* or frying pan, a hemispherical pot one foot to six feet across and two inches to two feet deep with two opposite handles; the *káil* or large flat-bottomed sugar-boiling pan. Of these articles the *pátele* or round pot, the *nagára* or drum, the tank or *haud*, and the frying pan or *kadhái* used to be made of copper, but among the poor iron is taking the place of copper. The *tava* or griddle is used by all classes especially by the poor for cooking their millet cakes. The demand for iron ware is steadily on the increase. The yearly import of iron sheets into Poona ranges from 14,440 cwt. to 24,908 cwt.

Tape is woven in Poona city by one hundred to one hundred and fifty Rávals, who have come from Mohol and Sholápur. They are not permanently settled in Poona and visit their homes every year generally during the rains. In Poona they live in a part of the Ganj ward which is known as the Rával quarter. They look like Lingáyats and worship Shiv but do not wear the *ling*. Their home tongue is Maráthi. At Poona they live in hired one-storeyed quarters, eat no flesh, but drink liquor. The men dress in a *rumál* or headscarf, a short coat reaching to the waist, and a scarf round the middle. Tape weaving requires little skill. Most of the weavers are in debt to the tape dealers, and they keep hardly any holidays. They use machine-made yarn for the woof and hand-spun yarn for the warp. Tape is almost the only article in which hand-spun yarn is still used. The machine-made

TAPE WEAVING.

Chapter VI.

Crafts.

TAPE WEAVING.

yarn which is almost always twenties, is brought from Bombay by the tape dealers. It is sold or rather given to the weavers on credit at 10s. to 12s. (Rs. 5-6) the pound. The coarse hand-spun yarn comes from Sholapur into which it is brought from the Nizam's country. It is sold at Poona at 7½d. (5 as.) the pound. The tape weaver's appliances are simple. A bamboo cage or *phálha*, or large reel, worth 6d. (4 as.); a *vagin* or small reel worth 3d. (2 as.); a spindle or *phiraki* of nominal value; a bamboo shuttle or *kánde*; and a flat wedge-shaped piece of wood with which the woof is driven home, worth 3d. (2 as.) The tape loom is of primitive make. Between two uprights, from a foot to one foot and nine inches high, are placed two horizontal bars one joining the tops and the other the centres of the uprights. To the central horizontal bar are tied a row of loops, each loop two inches long. In arranging the warp, one thread is passed through a loop and the other over the upper horizontal bar, at a spot just above the space between two loops. The weaver sits in front of the uprights, and holding in his right hand a bundle of woof yarn, passes it across through the warp into his left hand and forces the woof home by a blow from the flat wedge-shaped *hátya*. As he weaves, he slackens the warp which he keeps tied to a peg or beam on the other side of the upright frame. The broadest and thickest tape woven, called *padam*, is six to nine inches broad and twelve feet long. It is sold at 9d. to 10½d. (6-7 as.) the piece. It is white with black and red bands. A smaller variety called *kácha*, two to six inches broad and seven to fifteen feet long, varies in price from 1½d. to 1s. (1-8 as.). The narrow tape which is less than half an inch broad, is woven by poor Musalmán women. It is believed that at present (1882) in Poona city as many as 150 Musalmán women weave narrow tape in their leisure hours earning a shilling or two a month.

FELT.

Felt or *burnus* is made at Poona by Pinjaris who are settled near the Nainsuk police station and near the temple of Someshvar. Eight or ten shops or rather families are (1883) engaged in making felt. They came to Poona three or four generations ago from Chákan, Khed, and Manchar in Junnar. They have been working in felt for generations and say they do not believe their forefathers ever did any other work. They speak Hindustáni at home and Maráthi out of doors. They live in one-storeyed hired houses and eat flesh though they generally live on a vegetable diet. The men wear a three-cornered turban, a short coat reaching the waist, and a scarf for the loins. They are poor. Their working hours are from seven to eleven and from one to sunset. They stop work on Fridays, *Bakar-Id*, and two days in *Ramzán*. The wool is brought from the shepherds or Dhangars of the villages near Poona in *Ashádh* or June-July and *Shrávan* or July-August. Goat's hair costs 1½d. to 2½d. the pound (10-14 lbs. the rupee) and sheep wool 3d. to 4d. the pound (6-8 lbs. the rupee). The tamarind seeds required for sizing are bought in Poona at 1½d. to 2½d. (1-1½ a. a *sher* of two lbs.). They generally borrow what money is wanted at twelve to twenty-four per cent a year. They work the raw material on their own account and pay their creditors out of the proceeds of the felt. The demand for felt is said to be on the decline on account of the

importation of cheap European blankets. The only instrument they require is the teaser which consists of three parts, the bow or *kamán* which is hung from the ceiling, the harp-shaped teaser or *dasta*, and the dumbbell-shaped striker or *muth* with which the worker strikes the thong or leather string. The whole teaser costs 8s. to 10s. (Rs. 4-5). Besides the dumbbell striker the worker has a stick about two yards long. The wool is first disentangled by the women of the house and teased on the *dasta* by the men. Men or women then spread it on planks or mats and the tamarind seed paste is spread over it. Another layer of wool is spread on the paste and a layer of paste on the wool till it is half an inch to an inch thick. It is lastly laid in the sun and dried. It is sold in the workmen's houses at 6d. to 4s. (Rs. $\frac{1}{4}$ -2) the piece, the price depending on the size of the article. The whole yearly outturn is not worth more than £200 (Rs. 2000).

Six Kátáris or hereditary Wood-Turners, ten Kunbis, and one Bráhmaṇ earn their living at Pooná by turning wood. They live in Aditvár ward near Subhansha's mosque and the Gujri market. They speak Maráthi, live in one-storeyed hired quarters, and except the Bráhmaṇ who lives solely on vegetable food, they occasionally eat flesh. The Bráhmaṇ wears a rounded turban, a long coat reaching to the knees, a jacket, a waistcloth, and a shouldercloth. The Kátáris and Kunbis wear a three-cornered turban, a long coat, and waist and shouldercloths. They work from seven to eleven in the morning and from one to sunset. They rest on all no-moon days, on the day after the chief or winter *Sankránt* in January, for two days of *Shimga* in March-April, and for two days after an eclipse. The women and children do not help the men. Their average monthly earnings range from 10s. to £1 (Rs. 5-10). The only kinds of wood they use are the *kuda* *Wrightia tinctoria*, and the *varas* *Heterophragma roxburghii*, which they buy from Mhár women who bring it from the forest lands near Pooná. A head-load of sticks one to two inches in diameter costs them 2s. to 3s. (Rs. 1-1 $\frac{1}{2}$). A wood-turner has two tools, the lathe and the chisel. The lathe or *thadge*, consists of two upright blocks of wood about two feet long six inches broad and six inches high, and two feet apart with a short iron peg or spike on the inner face of each. Of the two blocks of wood one is kept in its place by a heavy stone, the other is movable. The piece of wood to be turned is drilled at each end, the movable part of the lathe, always the left block, is taken away, the wood to be turned is slipped over the two iron spikes and the movable part of the lathe is put back in its place. The workman sits on a board opposite the lathe, and, with his left foot, keeps the movable block in its place. He takes his bow or *kamán*, a bamboo about three feet long with a loose string, and passing a loop of the string round the right end of the wood to be turned, tightens his bow, and, by moving it sharply at right angles to the lathe, makes the wood spin quickly on the two iron spikes. As it turns, the wood is worked into shape by the double-pointed chisel or *vákas* held in the left hand. When the wood has been shaped and smoothed, a piece of sealing wax is held close to it, and, by the friction, melted and spread over its surface. The final

Chapter VI.

Crafts.

WOOD-TURNING.

Polish is given by rubbing it with a leaf of the *kevda* *Pandanus odoratissimus*. The chief articles turned are: The *látne* or rolling pin used in kneading wheat bread, a plain wooden bar one to two feet long and two or three inches round; it costs $\frac{3}{4}d.$ ($\frac{1}{2} a.$) and is not lacquered. The *gudgūdi* or *hukka* is the hubble-bubble. This is of three parts, the bowl, the handle, and the pipe. The bowl is made of a cocoanut shell with a hole at the top, polished and smoothed on the lathe. The handle which is eight to twelve inches long and three to four inches round, is hollowed, and the outside carved and covered with lac. The pipe is a hollow round stick, nine to twelve inches long and one inch round, smoothed and lacquered. A hubble-bubble costs $4\frac{1}{2}d.$ to $9d.$ (3-6 *as.*). Clothes-pegs or *khuntis*, four to six inches long and two to three round, cost 2s. (Re. 1) a score or *kodī*. Children's rattles or *khulkhulās* a lacquered stick two to four inches long and half an inch round, with, at each end, a hollow lacquered ball three to five inches round with a few pieces of stone inside, cost $1\frac{1}{2}d.$ (1 *a.*); *kathulās* or balusters upright sticks six inches to three feet long, and half an inch to six inches round, lacquered, and varying in price from $1\frac{1}{2}d.$ to $6d.$ (1-4 *as.*) a stick. Rulers or *ākhanis*, one to two feet long and one to two inches round, are not coloured and cost $1\frac{1}{2}d.$ to $4\frac{1}{2}d.$ (1-3 *as.*). Walking sticks or *kāthis* are generally supplied rough by the customer and turned for $3d.$ to $6d.$ (2-4 *as.*). All of these articles are sold in the turner's shops. They have no special merit and are not in much demand. The women do not help the men.