

Muhammadan names generally consist of two words, the *alam* or name and *lakab* or honorary title, such as Muhammad Dīn, though, as above mentioned, the villager will as often as not be known by an abbreviation such as Mamdū. A combination of one of the 'comely' names of God with *abd* ('servant') is also common, such as Abdullah, or Abdul Ghafūr. About half the proper names of Muhammadans are of religious origin, and the rest differ in no way from those of Hindus. Besides the two regular names, both affixes and prefixes are found. Affixes generally denote the caste or clan, such as Ahlūwālia, Rāmgarhia, Seth, or Varma (a purely Khattrī appellation), or are honorific, such as the Muhammadan 'Khān.' This affix sometimes, but rarely, tends to harden into a surname. Prefixes are honorific and answer to the European Mr. or Monsieur: such are among Hindus, Bābā, Lālā, Sodhī, Rājā, and Pandit; and among Muhammadans, Munshī, Fakīr, Wazīrāda, and Makhdūm. In addition, a man may bear honorific titles, many of which, such as Rai Bahādur and Khān Bahādur, are given by Government, so that a Muhammadan's full style and title may run Makhdūm Abdul Azīz Khān Shams-ul-Ulama Khān Bahādur, or a Hindu's Bābā Raghunāth Singh Rai Bahādur Dīwān Bahādur.

The most common endings for place names in the Punjab are the Arabic *ābād* ('abode') and *shahr* ('city') and the Hindu *pur*, *nagar*, and *wāra*, all meaning 'town' or 'place,' and *kot* and *garh* meaning 'fort.' Many are in the genitive, meaning, like Mukeriān or Fāzilka, the place of a certain tribe or people; while the termination *wāla*, meaning 'belonging to,' is one of the most common.

Excluding the Himālayan and other hill tracts and the ravines of Rāwalpindi, Attock, and Jhelum Districts, the vast alluvial plain is broken only by the wide valleys of its rivers. Its soil is a sandy loam, interspersed with patches of clay and tracts of pure sand. The soils of the Himālayan and lower ranges resemble those of the plains, but both sand and clay are rarer, and the stony area is considerable. The quality of the soil is, however, of comparatively little importance, facilities for irrigation, natural or artificial, being the primary factor. The monsoon current extends only to the extreme south-eastern Districts. The rainfall is fairly sufficient for agricultural purposes in the hills and in the submontane tracts, but diminishes rapidly as the distance from the hills increases, being as little as 5 and 7 inches in Muzaffargarh and Multān.

Agriculture. Soils and conditions of cultivation.

It is only in or near the Himālayas that unirrigated cultivation can be said to be fairly secure.

Harvests.

The Punjab has two harvests: the *rabi* (*hāri*) or spring, sown mostly in October–November and mostly reaped in April–May; and the *kharif* (*sāwani*) or autumn, sown in June–August and reaped from early September to the end of December. Both sugar-cane and cotton, though sown earlier, are autumn crops. The spring sowings follow quickly on the autumn harvesting. To the spring succeeds the extra (*said*) harvest, chiefly tobacco, melons, and similar crops, harvested late in June. Speaking generally, the tendency, as irrigation develops, is for intensive cultivation in the *rabi* to replace the extensive cultivation of the *kharif*.

Ploughing.

The advantages of frequent ploughing are thoroughly recognized, especially for wheat and sugar-cane, for which a fine seed-bed is essential. The plough used is an implement of simple construction, made of wood with an iron or iron-pointed share, and drawn by a single yoke of oxen. When the soil has been reduced to a fairly fine tilth, a heavy log of wood roughly squared, called *sohāga*, is used to supply the place of a light roller. It breaks up any remaining clods, and also compacts and levels the surface.

Sowing.

There are three methods of sowing: by scattering the seed broadcast on the surface, by dropping it into the furrows by hand, or by drilling through a tube attached to the plough handle. The last method, if skilfully used, deposits the seed in the bottom of the furrow, and is employed when the surface is dry. The second is employed in moderately moist, and the first in thoroughly moist soils.

Manure.

Land near a town or village is heavily manured, as also is land near a well, since it can be easily irrigated and valuable crops grown on it. Sugar-cane, maize, tobacco, and vegetables are always manured. Wheat, cotton, barley, and melons are manured only when manure is readily available. Spiked millet, gram, *tāra mīra*, and other inferior crops are never manured. Thorough manuring costs from Rs. 60 to Rs. 80 an acre, and is most common in the vicinity of the larger towns, the municipal boards of which make a considerable income by sales of refuse. In such localities two to four very rich crops a year are grown. Irrigated land is manured much more generally than unirrigated. Besides the sweepings of villages, night-soil, the dung of sheep, goats, and camels, the ashes of cow-dung, and nitrous earth are used for manure. The two last are applied as a top-dressing, especially for vegetables and

tobacco. The others are spread over the land after the *rabi* has been harvested, and ploughed in before the monsoon rains set in. A top-dressing of thoroughly decomposed manure is often applied to sugar-cane after the cuttings have germinated, the soil being then hoed by hand and irrigated. Cattle, sheep, goats, and camels are often folded in the fields for the sake of their manure, and in the hills shepherds derive much profit by lending their flocks for this purpose. The practice of using cow-dung for fuel seriously diminishes the natural supply of manure.

Weeding and hoeing are resorted to only for the more valuable crops. The crops are cut entirely by hand, and harvesting employs all the menials of a village. Grain is mostly trodden out by cattle. The implements in use, of a primitive type and simple construction, are well adapted to the cultivator's needs, but are capable of improvement. The iron sugar-press has now almost ousted the old cumbrous wooden type.

Agriculture affords the main means of subsistence to 13,917,000 persons, or 56 per cent. of the population, exclusive of 214,000 partially supported by it. The Punjab is essentially a country of peasant proprietors, landholders and tenants numbering, with their families, 13,452,000 persons. Of the total number supported by agriculture, 36 per cent. are actual cultivators, only 184,000 being rent-receivers.

Population
dependent
on agricul-
ture.

The principal crops in spring are wheat, gram, and barley. Wheat is the staple crop grown for sale. The development of canals in the past ten or fifteen years has led to a great expansion of the area under spring crops, especially wheat, which ordinarily covers about 10,000 square miles. In good years, such as 1894, 1895, and 1901, it covered more than 10,900, but in the famine years of 1897 and 1900 only about 7,800 square miles. Though best sown between the middle of October and the middle of November, it can be put in later; and in the Northern Punjab, if the winter rains are late, it may be sown up to the first week in January. There are many indigenous varieties, both red and white, bearded and beardless. Rather more than half the area under wheat is irrigated. The out-turn varies from 4 to 12 cwt. on irrigated, and from 4 to 7 cwt. on unirrigated land.

Principal
spring
crops.
Wheat.

Next to wheat comes gram, which usually covers more than 3,100 square miles, but the area fluctuates with the rainfall. Sown as a rule earlier than wheat and mainly in the poorer unirrigated lands, it is generally harvested a fortnight earlier,

Gram.

but is not infrequently sown and harvested with it. The yield is about 4 to 9 cwt. on unirrigated land, but may rise to 11 cwt. under irrigation.

Barley. Barley is often sown mixed with wheat and gram, as it matures even if the rainfall be not sufficient for the wheat. It is also useful as a catch-crop, since it can be sown later than wheat. It is grown extensively for the breweries and as fodder. Barley ordinarily covers about 1,600 square miles. On irrigated land the out-turn is from 5 to 11 cwt., compared with 3 to 9 cwt. on unirrigated land.

Principal autumn crops.
Maize. The staple cereals in autumn are maize, great millet (*jowār*), spiked millet (*bājra*), and rice. Of these, maize is the principal food-grain of the montane, submontane, and central tracts, and is cultivated extensively in all three. In 1904 it covered about 1,900 square miles. It is sown from the middle of June to the middle of August, and harvested between the middle of September and the middle of November. Maize yields from 4 to 11 cwt. on land dependent on rainfall, and from 7 to 13 cwt. where irrigation is available.

Spiked millet. In the Rāwalpindi and Delhi Divisions spiked millet is the chief crop, but it is also grown throughout the Province. It ordinarily covers more than 2,500 square miles, but in years of good rainfall more than 3,100 square miles. It requires less moisture than great millet, but its stalks are of inferior value as fodder. The yield varies from 2½ to 10 cwt. per acre.

Great millet. Great millet, grown throughout the Province, ordinarily covers 3,000 square miles. This also is chiefly sown on unirrigated land. When sown as a food-crop, it still yields from 120 to 180 cwt. of green fodder per acre. Sown only as a fodder-crop, it is called *chari*. The out-turn of grain is from 3 to 5 cwt. per acre, increased by 1 or 2 cwt. if irrigated.

Rice. Rice is grown chiefly in Kāngra, Hoshiārpur, Karnāl, and Ambāla Districts, and throughout the Lahore and Multān Divisions. It ordinarily covers more than 1,100 square miles. There are many recognized varieties. Sowings extend from March to August, and the crop is harvested in September and October.

Other autumn cereals. Other important autumn cereals are *rāgi* or *mandwi* (*Eleusine coracana*), *chīnā* (*Panicum miliaceum*), and *kangni* or Italian millet (*Setaria italica*). In 1904 these covered more than 300 square miles.

Cotton. Cotton is increasing rapidly in importance as an export staple. The area sown now amounts to over 1,600 square miles. The crop is generally irrigated, except in the Delhi

Division. Sown from March to July, it is picked from October to December. Ginning mills are springing up in the chief cotton tracts. A hundred lb. of uncleaned cotton gives about 30 lb. of clean lint. The cotton is of the short-stapled variety known as 'Bengals,' but is in brisk demand.

Oilseeds are ordinarily sown on 1,000 to 1,300 square miles, but the area varies with the rainfall. The principal kind is *sarson* or rape-seed (*Brassica campestris*), sown from August to December on unirrigated land and ripening in March. Another kind, *toria*, is sown on irrigated land in August, and cut in November or December. Sesamum or *til* (*Sesamum orientale*) is an autumn crop, and a little linseed or *alsi* (*Linum usitatissimum*) is grown in the spring. Oilseeds.

Indian hemp or *san* is only grown sparsely for the local Hemp manufacture of rope. It covered 77 square miles in 1904.

Spices covered more than 40 square miles in 1904, generally on manured and irrigated lands close to the villages. Chillies are the most important crop of this class; ginger is grown chiefly in the hills. Spices.

Sugar-cane is an important and valuable crop in Rohtak, Delhi, Karnāl, Jullundur, Hoshiārpur, Amritsar, Gurdāspur, Siālkot, Gujrānwāla, and Jhang Districts. It ordinarily covers about 520 square miles, of which more than 80 per cent. is irrigated and the rest moist land. Usually propagated from sets laid down from the middle of February to the middle of April, the crop is seldom cut till December or even later, thus occupying the land for nearly a year. Sugar-cane.

The poppy is a spring crop sown in September–January, the juice being extracted in April and May. In 1904 it covered more than 14 square miles. Drugs and narcotics. Poppy.

Tobacco is grown more or less in every District as an 'extra' spring crop, sown in March or April and picked in June. In 1904 it covered a little more than 80 square miles, mostly manured lands near the villages. Tobacco.

Tea is grown only in Kāngra District, the States of Mandī and Sirmūr, and on a small area in Simla. In Kāngra there are 112 tea estates (15.5 square miles), of which 33 (with 3,500 acres) are owned by European planters. The out-turn in the latter varies from 150 to 250 lb. per acre, and the total output exceeds 1,000,000 lb. annually¹.

The area under indigo has greatly decreased of recent years, owing to competition with chemical indigo. The area in Indigo.

¹ This was written before the earthquake of 1905, which had disastrous effects on the tea industry.

1903-4 was a little more than 80 square miles, of which about 30 square miles were in Muzaffargarh District and 25 in Multān.

Garden
produce.

Highly manured land near villages grows turnips, carrots, and similar produce, which occupy 578 square miles. Potatoes, already a valuable crop in the Kāngra and Simla Hills, are increasing in importance. Mangoes are a paying fruit-crop in Hoshiārpur, Jullundur, Multān, and Muzaffargarh; and in the two latter Districts and in Dera Ghāzi Khān the date-palm flourishes, there being nearly 1,500,000 female trees which produce about 33,000 tons of fruit annually. It is consumed entirely in Northern India. There is some export of pears, apples, and other European fruit from the Kulū valley, but inaccessibility hinders the development of the industry.

Rotations.

The successions shown below are generally recognized, but all depends on climatic conditions, soils, the means of irrigation, and the system of agriculture followed in any given tract: Maize, indigo, or hemp, followed by wheat; great millet, followed by *masūr* and gram; rice, followed by barley, *masūr*, and peas; turnips or cotton, followed by maize; cotton or maize, followed by *senji*; *senji*, followed by melons. Since annexation, the potato, tea, and English fruits and vegetables have been introduced. The first-named is so important that the people call it 'the hillman's sugar-cane.' Attempts made to acclimatize American maize have succeeded only in the hills, and even there the stock has deteriorated. It requires nearly five months to mature, and the heat of the plains ripens it too rapidly. In 1901 an experimental farm of 55 acres was started at Lyallpur in the Chenāb Colony. A 500-acre seed farm has also been opened in the Jhelum Colony.

Improvements in
agricultural
practice.

A combined Agricultural College and Research Institute is to be established at Lyallpur, with a staff which will include a Principal, a Professor of Agriculture, an Agricultural Chemist, an Economic Botanist, an Entomologist, and a Mycologist. The college will train men for the Agricultural department, and also as teachers of agriculture in normal schools. The present experimental farm at Lyallpur will be largely increased in size, and it is intended to establish similar farms on a smaller scale in localities selected as characteristic of the main divisions of the Province. As the scheme develops, it is hoped that an Agricultural Assistant will be appointed for each District. The Veterinary department is a part of the Agricultural department, under the control of the Director of Agriculture.

Loans. The working of the Land Improvement and Agriculturists'

Loans Acts varies from District to District. In some, borrowing from Government is unpopular, the cultivators preferring to take loans from the village banker, because, though the rates of interest charged by Government are low, it generally insists on punctual and regular repayment in fixed instalments, whereas the village bankers do not insist on punctual repayment, and often accept grain or cattle in lieu of cash. Moreover, the official formalities necessary before the cash reaches the cultivator's hands often deter him from applying for a loan from Government.

During the decade 1891-1900 about 2½ lakhs a year was advanced under the Land Improvement Loans Act, 3.4 lakhs being advanced in 1900-1 and 1.5 lakhs in 1903-4. Loans are made at 6½ per cent. per annum interest, and on the security of the borrower's holding. They are seldom misapplied, and are mostly taken for sinking irrigation wells, the number of which rose from 211,000 in 1890-1 to 276,000 in 1903-4. Allowing for the wells which fell out of use, more than 100,000 wells must have been sunk or renewed in this period, and of these a large proportion were made with the aid of loans from Government. Advances under the Agriculturists' Loans Act are made on the personal security of the cultivator, and practically only in or after drought, to enable him to replace cattle that have died and to purchase seed. Between 1891 and 1900 about 4.5 lakhs was advanced annually, 2 lakhs being advanced in 1900-1 and 1 lakh in 1903-4.

The indebtedness of the cultivators has long engaged the attention of Government, and the extent of the evil was illustrated by a special investigation into the conditions of certain tracts in Siālkot, Gujranwāla, and Shāhpur Districts. The measures taken to cope with reckless alienation of land are described below, under Land Revenue. The creditors are in the great majority of cases small Hindu shopkeepers. Agriculturist money-lenders are found in parts of the Punjab, such as Amritsar, Gurdāspur, Ferozepore, and Ludhiāna, where the Sikh, 'half agriculturist, half soldier, and wholly Baniā,' predominates; and they are said to be even more exacting than the trading classes. The ordinary rate of interest varies from 21 to 25 per cent., except in the case of loans on jewels, which are given at about 12 per cent. A Registrar of Co-operative Credit Societies has been appointed in the Punjab. The number of registered societies on March 31, 1906, was 151, of which 108 were in the Districts of Gurdāspur and Jullundur. Cattle.

The yak is found within the geographical limits of the Yak.

Punjab, but only in the Northern Kāngra hills. In summer it finds pasturage up to 17,000 feet, but in winter grazes below 8,000 feet. In the Higher Himālayas it is used for ploughing and pack-carriage. At lower elevations it is crossed with the ordinary cattle of the hills.

Kine. The Punjab kine are of the humped Indian type. In the Himālayas the mountain or Pahāri breed is dark in colour, becoming black or red as the elevation increases. The Dhanni or Salt Range breed is similar in size but lighter, tending to white, in colour. In the plains there are several breeds, the principal being those of Montgomery, the Mālwā, and Hariāna, and that of the Kachi, the country between the Chenāb and the Thal steppe. The best animals are reared in the southern Districts, Hissār, Delhi, Rohtak, Gurgaon, and Kamāl. Bulls and bullocks are used for ploughing throughout the Province.

Buffaloes. Wild buffaloes are no longer found in the Punjab, but the domesticated variety is common and highly prized. A good cow-buffalo yields from 25 to 30 seers of a white insipid milk, rich in fat, from which large quantities of *għī* (clarified butter) are made. The profit from *għī* is in some Districts very large. Hides are an important article of commerce, and bones are largely exported.

Cattle diseases. The most prevalent cattle diseases are foot-and-mouth disease, haemorrhagic septicaemia, rinderpest, black-quarter, and anthrax. Sheep and goats also suffer from the first-named. Though very common, the losses from it are slight, as only 2 or 3 per cent. of the animals attacked die. Septicaemia is also prevalent, especially during the rains, and the mortality is usually 90 per cent. Buffaloes are its chief victims, but it also attacks kine. Rinderpest is common, more especially in the hills, where it assumes a virulent form, killing 80 or 90 per cent. of the animals attacked. Cattle, sheep, goats, and even camels are subject to this pest. Inoculation, segregation, and other measures for combating cattle diseases are controlled by the qualified assistants who work under the Superintendent of the Civil Veterinary department and the Deputy-Commissioner. The prices of cattle vary considerably. A good milch buffalo fetches Rs. 100 or even Rs. 150. A pair of young Hariāna plough bullocks cost Rs. 120 or Rs. 140, and a cow from Rs. 50 to Rs. 70, but as a rule inferior and cheaper cattle are in demand.

Horses. The Baloch and Dhanni breeds of horses are the best known in the Punjab. Generally the Punjab stock has immensely improved during the last thirty years from the infusion

of the English and Arab blood of thoroughbred stallions. Large horse-fairs are held at Sargodha (in Shāhpur), Dera Ghāzi Khān, Rāwalpindi, Gujrāt, Amritsar, Multān, and Jalālābād (in Ferozepore).

Sheep are important in the South-West Punjab, where wool is a staple product. The *dūmba* or fat-tailed sheep is found in the Salt Range, but does not flourish east of it. In the Himālayas the variety found resembles that of Dartmoor or Exmoor, the *khādu* being the best breed. Goats are kept chiefly for milk and meat, but the hair is also largely used.

Camels are extensively used throughout the plains and in the Lower Himālayas, but the south and south-west supply the largest numbers. Mostly used as a pack-animal, the camel is also employed for draught, riding, and even ploughing in those parts. Camel fairs are held at Abohar and Bhiwāni (in Hissār).

Donkeys are miserable creatures in the Punjab, except in Rāwalpindi and the Districts west of the Chenāb. Mule-breeding from imported donkey stallions supplied by the Army Remount department is carried on in ten Districts and in both the canal colonies, and elsewhere by the Civil Veterinary department.

Cattle are largely stall-fed. Every village has its grazing-grounds; but the grass is never abundant and fails entirely in years of scanty rainfall, when the cattle are driven off in large numbers to find pasture along the rivers and below the hills.

The principal cattle fairs are those held at Amritsar, Jahāzgarh (in Rohtak), Gulū Shāh (in Siālkot), and Hissār.

The extent to which cultivation is dependent on irrigation may be gauged from the fact that 41 per cent. of the cultivated area is irrigated, mainly from wells and canals, and that 7 per cent. more is subject to inundation from the rivers. Hence only 52 per cent. of the cultivated area is wholly dependent on the rainfall. Of the 41 per cent. irrigated, 22 per cent. is irrigated from canals, 14 from wells, 4 from wells and canals combined, and 1 from streams and tanks.

The necessity and demand for irrigation vary with the climatic and physical conditions. Speaking generally, the necessity for perennial irrigation varies inversely with the amount of the rainfall, being therefore greatest in the south-west and least in the north-east submontane tracts. The two principal means of irrigation are canals and wells, the latter including various indigenous kinds of lift, and the area in which each can be used is determined by the depth of the spring-

level. Perennial canals are beneficial where the spring-level is not less than 20 feet below the surface ; but where it is higher, wells are used in the cold season and the canal is reserved for irrigating the autumn crop during the summer months, to prevent the soil from becoming waterlogged.

Canals.

Native rulers were not blind to the possibilities of irrigation in the Punjab ; but, at annexation, the only canals open in the Province, as it stood before the addition of the Delhi territory after the Mutiny, were the Hasli (since merged in the Bāri Doāb Canal) and a good many inundation canals in the south-western Districts. Thus the present canals are almost entirely the creation of British rule. These canals fall into two classes : the perennial canals, with permanent head-works ; and (2) the inundation canals which run only in the flood season, and irrigate the lowlands along the rivers. Of the former class there are now six canals : the WESTERN JUMNA, SIRHIND, BĀRI DOĀB, CHENĀB, JHELUM, and SIDHNAI, though there is seldom enough water in the river for a cold-season supply to the last-named. These great canals serve four-fifths of the total area irrigated from Government works. There are six series of inundation canals : the UPPER and LOWER SUTLEJ, CHENĀB, INDUS (right bank), MUZAFFARGARH (from the left bank of the Indus and right bank of the Chenāb), SHĀHPUR, and GHAGGAR. Besides these, numerous small inundation canals are owned by private individuals or District boards. Of these the GREY CANALS in Ferozepore are the chief. The total length of main channels and branches in 1890-1, 1900-1, and 1903-4 was 3,813, 4,644, and 4,744 miles respectively.

Canal
revenues.

Canal revenue is direct or indirect. The former is paid by the cultivator according to occupier's rates fixed for different crops. It is assessed on all the great perennial canals by the canal officers, and the rules provide liberal remissions for failed crops. The indirect charges (owner's or water-advantage rate) aim at taxing the landowner for the rent or profits derived by him from the canal. The gross receipts averaged 50 lakhs between 1881 and 1890, 102 lakhs between 1891 and 1900, and amounted to 162 lakhs in 1900-1 and 200 lakhs in 1903-4. In the same periods the expenditure (excluding capital account) was 26 lakhs, 42 lakhs, 60 lakhs, and 66 lakhs. The net profits in 1903-4 were 134 lakhs, and, deducting interest on capital expenditure, 94 lakhs, or 8.7 per cent. The most profitable canal was the Chenāb Canal, which yielded 19.6 per cent. The return on capital has decreased greatly in the case of 'minor' works. This is due to the expenditure of

10 lakhs of capital during the ten years 1881-1890 on protective works, which produced no direct return. The returns from inundation canals fluctuate enormously. For example, on the Upper Sutlej Canals the dividend was only 1.95 per cent. in 1900-1 and as much as 43.2 per cent. in 1901-2.

The efficient distribution of the water depends largely on the telegraph system by which canal officers are kept in constant touch with the gauge stations. Control of the distribution is secured by a systematic devolution of responsibility. The Chief Engineer receives a weekly report on the state of the crops, and is thus enabled to supervise the general distribution of the water throughout the Province; the Superintending Engineer controls its distribution among the divisions of his canal, and so on. Within the village the policy is to leave the distribution of the water in the hands of the cultivators, who see that it is divided in accordance with the share lists based on the area to be irrigated in each holding. On inundation canals the supply depends on the rise of the rivers, and these rarely do more than supply water for sowing a spring crop, which has to be matured by well-irrigation.

A vast irrigation scheme was sanctioned in 1905. It will comprise three new canals: the Upper Jhelum, Upper Chenāb, and Lower Bāri Doāb. Of these, the first will take off from the Jhelum in Kashmīr territory, 18 miles from the British border, and, skirting the Pabbi hills, pass close to Gujrāt town and tail in above the head-works of the existing Chenāb Canal. It will have only one branch; but its distributaries, 562 miles in length, will irrigate the southern part of Gujrāt and a part of Shāhpur District, which is not supplied by the Jhelum Canal. The Upper Chenāb Canal will take off from the Chenāb river opposite Siālkot, and will irrigate a large part of Gujrānwāla and Lahore Districts and a little of Siālkot; then, crossing the Rāvi river by a siphon 16 miles below Lahore, it will feed the third canal in the series. This, the Lower Bāri Doāb Canal, will run parallel with the Rāvi river through the whole length of Montgomery District and end in Multān District, the northern portion of which it will also irrigate. These projects are estimated to cost 782 lakhs, and will take nine years to complete, provided that sufficient labour is forthcoming. The total length of the three canals will be 230 miles, with 2,714 miles of distributaries.

The only navigable canals are portions of the Western Jumna and Sirhind systems. The former is navigable from its head to Delhi. A portion of the Hānsi branch is also

navigable, the total length of navigable channels being 207 miles. The Sirhind Canal is navigable for 180 miles from its head at Rūpar, and from the town of Patiāla to Ferozepore, where it connects with the river Sutlej, whence there is a continuous water-way to Karāchi. The boat traffic is insignificant, the boat tolls on both together amounting to less than Rs. 5,000 per annum; but there is a considerable raft traffic, &c., particularly on the Western Jumna Canal, where the dues average about Rs. 40,000 per annum. The rafts consist principally of timber, sleepers, scantlings, and bamboos, which are floated down the hills to the canal head, and are thence passed into the canals.

Wells. Almost all the irrigation carried on by indigenous methods is from wells. In 1903-4 the Punjab contained over 276,000 masonry wells and 38,000 unlined and lever wells and water-lifts. In that year the total area of the crops matured under well-irrigation was about 5,400 square miles. Masonry wells are worked by cattle, the Persian wheel or a rope and bucket being used. Unlined wells are chiefly found in riverain lands, but small unlined wells are also used in submontane tracts with a high water-level. They are mostly worked by a lever. Masonry wells cost from Rs. 150 to Rs. 750 or more according to depth. Unlined wells cost only about R. 1 per foot, but seldom last more than three years.

Other forms of irrigation. In the Salt Range and the hilly tracts of Gurgaon and Dera Ghāzi Khān, torrents are embanked and the water spread over the fields as required. In the hills and submontane tracts a considerable area, chiefly under rice, is irrigated by small channels (*kūhls*) taken out of a river or stream and often carried along the hill-sides.

Fisheries. Fish are plentiful in most of the rivers and canals of the Province. In certain Districts the fisheries are leased by Government to contractors, and in 1904-5 the total income from this source was Rs. 4,342. In accordance with the provisions of the Indian Fisheries Act (IV of 1897), certain methods of fishing, such as the use of the drag-net, have been prohibited in some of the streams of Rāwalpindi District, and in the Jumna for a mile above and a mile below the Okhla weir at the head of the Agra Canal, while in Sirmūr and the hill-country of Patiāla the fish in the Giri and other streams are strictly preserved in the interests of anglers.

Rents, wages, and prices. Rents. The state under native rule took all, or nearly all, the produce of the land which was not required for the subsistence of the cultivators, and it is only since the value of land has risen