CHAPTER I-DESCRIPTIVE.

Section A.—Physical Aspects.

The name Gurgáon is a corruption of Guru Gáon or village of a spiritual leader. It is said that Judhistar, leader of the Pándavas, gave this village to his guru, Drona Cháraj, whose tank still exists on the west side of the road to the Railway Station. Another explanation of the name is that Drona Charaj gave spiritual instruction to Kairavas and Pándavas.

The total area of the district by the survey of 1873-76 is 1,946.87 square miles, and by the recent Settlement measurements 1,927.46 square miles.

Gurgáon is the southernmost of the seven districts of the Delhi Division, and lies between north latitude 27° 39' and 28° 31', and east longitude 76° 21' and 77° 35' forming the extreme south-east corner of the Province. Its shape is exceedingly irregular. It is bounded on the north-east by the Delhi district ; on the east by the Jamna which separates it from the districts of Bulandshahr and Alígarh of the United Provinces; on the south by the Mathra district of the United Provinces and by the State of Bhartpur; on the west by the Alwar State; on the southwest (that is south of the Rewári tahsil, by the Jaipur pargana of Kot Kásim, by the Báwal pargana of Nábha, and by Alwar; on the north-west by the Kánti pargana of Nábha; and on the north by Dujána, the British district of Rohtak, and the little State of Pataudi which it almost embraces in its clasp.

The Gurgáon and Rewári tahsíls, forming the northern and western parts of the district, are generally sandy,--the configuration. lands near the hills being very inferior and often cut up into a perfect net-work of ravines, while further from the hills, in some tracts, the soil is better, approaching a light loam in its character; in other places it is of very loose consistency. and some parts present a desolate appearance with high hillocks of sand. To the south-east and south-west of Gurgáon, the low-lying lands of a better character are found, which are benefited by natural irrigation; and on the north border of Gurgáon is the low basis of the Najafgarh jhil. The banks of the Jamna are generally high; but in the north-east corner of the Palwal tahsil there is a small tract between the main and a small branch channel of the river, low-lying and liable to inundation. From the Jamna and this tract westwards there is a stretch of country some 30 to 35 miles from north to south, and some 15 to 20 miles from east to west, of a level good loam, rising gradually from the Jamna and then sloping

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Physical Aspects.

Name and derivation.

A168.

Boundaries.

General

CHAP.I.A. to the east and south, and extending over most of the Palwal tahsil and the eastern portions of the Núh and Firozpur tahsils. **Physical** Between this plain and the range of hills mentioned as dividing Aspects. Gurgáon and Alwar, there is in Núh a low-lying tract of country. General configuration. There the prevailing soil is clay, but immediately under the hill and to the north-east of Núh and in the north-west of Palwal, the country is very sandy. The part of Núh which lies above the hills is a high-lying table-land of a consistent but sandy loam, inferior near the hills, but sloping down towards the somewhat better lands in its central and western parts; while the part of Fírozpur not contained in the plain abovementioned, consists of a valley between two ranges of hills, the lands of which are generally good, but are partly damaged by sand deposits; the soils near the hills are generally inferior, and the valley merges on the north in the Núh tract of depression.

. ÷ The hill ranges of the district form a marked feature in The hills. its physical characteristics: they are connected with the great Aravali chain, of which they are among the most northern spurs, and like that range their general direction is from S.-S.-W. to N.-N.-E. One chain forms the western border of the district from the south-western corner of the Fírozpur tahsil to a point about opposite the town of Núh. There the district boundary line turns off to the west, while the range runs on in the same course, and then sweeping off in a curve to the west, ends in three short spurs, two thrown out to the north and one to the west. Another range on the east of this one runs almost parallel to, but gradually diverging from it. After a course of 25 miles northwards from the southern border of the district, it becomes more and more broken, and for 20 miles its existence can only be traced by a line of detached rocky hillocks of various sizes, appearing here and there above the surface of the ground. Then it once more re-appears as a range, and, forming the north-eastern boundary of the district, runs with gradually lessening height past the northern boundary of the district into Delhi. These are the only chains of any unbroken length; but short broken ranges and detached hills are numerous in the south and west of Rewári, whence they just cross the border into Rohtak and are also found to the north-east of Rewari, the northwest of Núh, and in the eastern portion of the Firozpur tahsil, formerly known as the pargana of Punahána. The total hill area of the district is shown by the survey as 99.397 square miles. The hills are of inconsiderable height, generally lessening as you proceed northwards, of the same general character as the well-known ridge at Delhi, and frequently of considerable breadth at the summit; the range between Delhi and Gurgáon is in places more than three miles broad. The ordinary height

of the ranges above the plain is from 500 to 750 feet: the CHAP. I, A. hill above Meoli is marked on the map as 1,347 feet above Physical the sea, the elevation of the plain below being about 625 Aspects. feet. The isolated hill of Tánkrí is the highest in the district, and must reach quite 2,000 feet above the sea. \therefore

On account of the numerous hill ranges the scenery of the greater part of the district is pleasing, and escapes the monotony of the ordinary district of the Punjab plains.

Except the Jamna, the deep stream of which forms the eastern boundary of the district and the province, there is no streame, lakes river of permanent flow in the district.

Owing to the construction of the Western Jamna and Agra Canals the flow of water in the cold season is very small, but in the rainy season heavy floods come down. There are 27 riverain villages, but in only 20 is the area liable to inundation considerable. The khádar lands are not usually flooded except to a small extent, and the cultivation is dependent not on flooding but on the rainfall which is assisted by the high level of the spring water. In a normal year the lands are not flooded and the people do not want floods. It is only when heavy flood comes down that it sweeps over the country destroying the crops. These inundations are followed by a thick growth of dab and gander grasses, against which, with the depredations of wild animals, the peasant has a hard fight to wage. Total cessation of flooding on the other hand leaves the soil dry and infertile, as it consists of only a thin layer of alluvial deposit over river sand.

The worst part of the khádar is an island formed by a destructive nala called the Jahr, which flows out of the river near Chainsa in the Delhi district and rejoins it lower down in the Palwal tahsil. It runs in a deep, narrow and dangerous channel, and does a great deal of damage in years of heavy flooding; an unsuccessful attempt was made to dam this nála at its head, but the dam was swept away and has not been reconstructed.

The hardness of the life and the precarious nature of the cultivation cause the tenants, who are of the worst cultivating classes, to desert their villages, and there is a constant danger of the land falling out of cultivation : the lands which border on the river generally remain uncultivated and are covered with a thick growth of jhao (tamarisk) and pula (munj grass), which shelter destructive droves of pig and herds of deer.

The following account of the natural drainage of the district, lakes. which is abstracted from memoranda prepared by Messrs. Maconachie and Hallifax, contains information about all the important streams and lakes of the district, and shows their connection with the natural drainage system -----

"The total area of the Gurgáon district may be taken roughly as 2.00 square miles, of which perhaps one-fourth or 500 miles keep their

Streams and

Bivers, and natural drainage.

Scenery.

The Jamna.

Physical Aspects.

Streams and lakes.

CHAP. I. A. rainfall in situ, while the remaining 1,500 have a drainage slope which under flood causes a large proportion of their water to move. The two great places of exit are-(1) Najafgarh jhil for the Kasáoti, Sábibi, and North Gurgáon drainage systems, and (2) the Bhartpur *jhíl* of Pahari Kandla for the rest, which consists of South Gurgaon, Ballabgarh inflow, central Núh basin, Landoha floods with inflow from Alwar, South Núh flats and Luhinga valley drainage. The area of the drainage, which passes down into Najafgarh jhil through the Gurgaon district, may be guessed at some 700 square miles while the narrow passage down to Bhartpur provides the ultimate means of exit for the surplus water of about 1,000 miles including 100 miles of Alwar drained by the Landoha and 100 miles of Ballabgarh which send their waste waters down to Núh by Indri. The greater part of the bangar tract of Núh and Palwal has no dynamical drainage. •

Kasáoti drainsge.

Beginning at the west there is first the valley of the Kasaoti stream, a hill torrent which rises south of our limits in native territories and comes in at the south-west corner of Rewari tahsil from Nabha. This stream is not of great importance to us and flows only in heavy rainfall, but it marks off a portion of West Rewari, which, lying in its valley, presents differences of agriculture from the country in its immediate neighbourhood on either side. . .

At Nangal Patháni the stream passes under the Rewári-Fírozpur Railway, and thence flows away into Rohtak where it joins the Sáhibi before falling into the Najafgarh jhil.

Central Rewári.

In the neighbourbood of the Kasáoti, though quite distinct from its drainage, is a local flow of water from the hills of Khol towards the north and then east through Khaleta to the north-east.

Between the Khol and Khori ranges there is a considerable drainage coming in from the south which often reaches Batauri and even further.

East of Khori hills there is some drainage passing north towards Saháranwas.

There is no other drainage requiring notice west of Rewari. The country is practically speaking flat and rainfall stays in situ.

Sáhibi drainage,

East of Rewári the drainage falls into the Sáhibi, a powerful stream which comes into our district from Jaipur rising about 90 miles away to the south. Its western branch, the Sotha, has been 'banded' in the upper part of its course, but there is no perceptible decrease in its power and volume. It has a broad sandy bed in Rewari tahsil. After heavy rain in Jaipur, this stream sometimes came down with great force, and it has twice flooded the town of Rewari, in 1845 and on the 15th August 1873. On both occasions the water came from the south by Lálpur and Dawána having left the proper bed, which must gradually have been raised by the deposits of sand in the Alwar State. In August 1873, the water came at mid-night, and was some three feet deep in the city; it flowed away to the northwards in some three or four hours, but caused considerable damage in the city and outside, it utterly destroyed the railway bungalow and swept away large portions of the line; but owing to the construction of the band at Buchara in Jaipur excessive flooding has ceased, and the waters now never spread far beyond the river bed.

A section of the Sáhibi drainage which approaches it from the Táoru pargana of Núh tahsíl and joins it before reaching the long Railway bridges between Jatauli and Khalílpur deserves separate mention. The Indori is a stream which rises in Alwar, some 12 or 15 miles south of our border,

flows due north into the Táoru pargana and curving round to the CHAP. I, A. west receives all the drainage west of the hills overlooking Bhundsf, Sohna and Núh. There are 5 or 6 considerable drainages passing down into it through channels, which in many places are deep ravines in the good soil of Táoru, but which eventually debouch in flat levels between Unton age, and Bahora, and with the parent stream make a large drainage. . .

After receiving the Indori drainage in Pataudi State the Schibi passes through the Railway bridges between Jatauli and Khalilpur. There seems some foundation for the allegation made that the heading up of the combined streams here has disturbed their course, and has led to the deposit of sand. But the Sahibi has always been famous for its vagaries, and sand has always been more or less deposited. Any harm done in this way has on the whole been more than counterbalanced by the increase of moisture obtained by the practical heading up by the Railway embankment. The floods on the Sahibi in 1885 and in 1887 were enormous, while 1888 had heavy passages of water for some 4 or 5 days. Nothing ought to be listened to which urges a diminution of water either in the rainfall or by reason of the Jaipur band on the Lotha branch.

After passing through Pataudi the main Sáhibi goes into Rohtak, sweeping round with a wide curve to the north. A branch goes more directly to the north through the west of Farukhnagar tract running in a well defined and rather deep channel through soil for the most part of a stiff dark loam.

We come now to the last section of the Najafgarh jhil system, viz., the North Gur-North Gurgáon drainage. This itself consists of 2 parts according to its gaondrainage starting point :---

(a) the hills dividing Gurgaon from Delhi;

(b) the northern slope of the central hills of Gurgáon tahsúl.

Of the first the most important is the Bádshahpur nála which brings down the drainage of part of the Ballabgarh tahsil of Delhi, through a gorge in the range, dividing Delhi and Gurgáon; it formerly flowed southwards through the Bhundsi valley, but more than a century-and-ahalf ago it was diverted by the construction of a band by Bahadur Singh of Ghásera into its present course, falling into the Najafgarh *jhil*. In the heavy floods of 1875, part of its stream found out its old channel and swept down past Bhundsí. Of the second the chief drainages are the Manesar and Kásan nálas, which flowing almost in a north-westerly direction fall into the *jhil* at its western corner.

We now have arrived at the practical watershed of the district. From about 62 miles south of Gurgáon the country begins that slope to the gaon drainage south which takes all its drainage below this point down towards Bhartpur. The most important streams which feed the South Gurgáon drain. The Landoha age are the Mehndwára, the Báloj and the Landoha. Of these by far the most important is the Landoha which is formed by the union of two streams in Alwar, one flowing south from the direction of Tijárah and the other joi .ing it nearly at right angles from the west. After pursuing its southward course to a point nearly directly west of the southern end of the Firozour tahsil, it sweeps round in a curve, and, crossing the border, flows northwards up the Firozpur valley, and if left to itself would finally fall into the Kotla *jhil*. Considerable difficulty has always been experienced in maintaining fairly the respective rights of the Alwar and Gurgáon zamíndárs in its waters.

South Gur-

Physical Aspects.

Sáhibi drain-

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CHAP. I, A.

Physical Aspects.

Arrangements with the Alwar State about the Landoha.

At last Settlement, after a long and exhaustive enquiry, the arrangements detailed in paragraph 30 of Mr. Channing's Settlement Report were made with the Alwar State for securing to the zamindárs of the Fírozpur valley their fair share of the Landoha waters. The agreement arrived at may be briefly summarized as follows :--

- (a) The Alwar State admitted its responsibility to maintain an embankment called the Jat band, so as in all seasons to prevent any portion of the stream passing to the east at this point.
- (b) The entrance to the channel called E.E.E. in the correspondence of last Settlement was to be closed by a masonry dam 2 feet high, and, to prevent the bed of the stream at this point being lowered below its present level, a wall of masonry was sunk across it at right angles, so that the top of the wall should be flush with the then bed of the stream.
- (c) With reference to works situated bigher up the stream than the points referred to in (a) and (b) it was decided that no interference could be attempted under the principle accepted in 1836 on the following recommendation of Mr. Gubbins :— 'It would, in my opinion, allow the Alwar Raja an ample share of the water were he permitted to irrigate whatever lands belonging to him are situated higher up the stream than the point where in its natural course it enters our territory, obliging him at the same time to direct all the water he did not so use into its old channel before it reached us, and not allowing him, to turn any part of the naddi into the Tirbaini jhil, which is situate as regards the natura channel lower down the stream than our territory.'
- (d) The Gurgáon authorities were to have a right of inspection so as to assure themselves of the observance of the arrangements arrived at.

Since last Settlement the Alwar State, besides damming most of the tributaries of the Landoha, has converted the Atria band from a low earthen embankment a few chains long into a dam 6¹/₂ miles long, of which more than half is faced with masonry.

A further extension of the embankment to the north is contemplated. This action has almost certainly decreased the amount of flooding received in Fírozpur, but under the principle quoted at (c) no objection to it can be taken by Gurgáon.

Formerly a far more important stream, the Manasne (or Manasle i.e., man-taker). now generally known as the Rupareil, entered the district from Alwar and passed up the Firozpur valley along the Landoha channel. Babar in his autobiography mentions that it then fell into the Kotla lake, but later, it either was artificially diverted or naturally found out its present course into Bhartpur. The tradition as recorded by Mr. C. Gubbins is, that some Meos violated and then murdered some women in the bed of the river, then dry in the hot winds, and that a *fakir* who lived near by left it with the curse, that the streams should never again enter the polluted bed.

'The Mehndwára stream is a powerful drainage, mainly coming from the Rojhka hills. Joined by the unarrested water of the Sohna valley, its floods descend on to the flats north-east and east of Indri hill. They there meet the Sailáni drainage which brings in the overflow of about 100 square miles from Ballabgarh. There are, however, a series of hollows and depressions on the way which have to be filled before the water moves,

The Mehndwára.

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so that nothing considerable arrives in our jurisdiction till the rains have been in progress sometime, but when heavy floods move down, the collected mass of water is enormous. In August, 1885 there must have been 15 or 16 square miles of water east of Indri alone, without looking west of the hill, where the expense was if anything larger.'

The Báloj rises in Alwar territory in the hills which form the western boundary of the Fírozpur tahsil, and joins the Landoha at Nagina. It often flows with great volume and brings down large quantities of sand.

The movement of the South Gurgáon drainage is thus described by Mr. Hallifax, Deputy Commissioner, in his note on the Gurgáon Bands written in 1898 :---

"Four very considerable depressions in the level of the district are known as the Khalílpur, Chandaini, Sangel-Ujina and Kotla jhíls.

The Khalilpur *jhil* is situated in the north-east of Núh *tahsil* : it is Khalílpur the deepest part of a low piece of country about 10 miles in extent around jhu. Khalilpur, Indri and other villages, regarding which Mr. Maconachie has noted that "during ordinary rainy seasons the whole of this is flooded. A part of it just north of Khalilpur village has a more marked depression: water stands 4 or 5 feet deep here after the rains, and the land is a more or less permanent swamp. . . . Its area may be reckoned at about 1.500 acres."

The Chandaini *jhil* lies about 10 miles to the west of the Chandaini Khalílpur *jhil*, and is situated in the north-west of Núh tahsíl. ^{jhil}. Regarding it Mr. Maconachie writes :---

"Here is another permanent swamp, with standing water which very rarely dries up altogether. The area which comes under flooding here is about as large as the Indri jhil, the permanent basin is perhaps somewhat smaller, say about 1,000 acres."

The Sangel-Ujina jhil is in the south of Núh, it is not so Sangel-Ujina clearly defined a basin as the other *jhils*, but from this fact, *jkil*. when water stands in it, it spreads over a larger area than is covered at Khalilpur or Chandaini, and the lands of numerous villages near Sangel and Ujina are widely flooded, so that the damage caused to them is extremely serious.

"The fourth and most important jhil, that of Kotla, which is the largest in the district being 3 miles long and 21 broad, lies in both Núh and Fírozpur, where these tahsils adjoin each other at the foot of the Alwar Hills. . . These *jhils* are filled by the drainage coming down to them from all four points of the compass. The north drainage comes from the direction of Sohna and is that of the eastern slopes of the Táoru plateau and the spurs adjoining it. From the north-west the Mehndwara, a considerable torrent, and some smaller streams come down, bringing the drainage of 100 square miles between Bhundsi and the hills towards Rojhka on the Delhi-Gurgáon border.

The line of watershed separating the flow towards Kotla and that towards Najafgarh is found at about seven miles from Gurgáon. The reduced level of what may be taken to be the highest point being about 756 feet above the sea at Khadaka and the rainfall of all the country to

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Physical [] Aspects.

The Bá lo.

Kotla jhíl.

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CHAP. I, A. the south of this line is therefore thrown towards the Kotla jhil. The water of the Sohna, Mehndwara and other streams is joined in the flat Physical Aspects. country to the north-east and east of the Indri Hills by the Sailáni drainage, which brings down water from a catchment area of about 100 miles Kotla jhil. in the Delhi district towards Ballabgarh, and fills two small jhils at Khuntpuri and Samathla on its way to Sailáni. A small part of these north and north-west floods reached the Chandaini jhil direct, but they chiefly went to fill up the Indri-Khalílpur basin, whence they spilled over into Chan-The general level of both the Khalilpur and Chandaini basins, is daini. about 625 feet above the sea, though parts of the Chandaini basin are lower. After filling these basins the floods naturally overflow the higher ground by which they are surrounded and find an exit from Chandaini towards the south. Originally Chandaini discharged itself directly into the Kotla *jhil* and swelled the volume of water that collected there, thus increasing the difficulty of dealing with it. But the Chandaini cut was devised to prevent this, and if any overflow now occurs it is taken by the cut into the Sangel-Ujina flats which are generally lower than the Chandaini basin itself, being on an average elevation of about 620 feet above sea . . . But the most important drainage towards level. the Kotla *i*hil is that coming from the south along the Firozpur valley. The Landoha which has a catchment area on both sides of the Alwar Hills (from which the Jhir stream also joins it near Firozpur) as well as cn the hills from Bajhora to Ghata Shamsabad, collects an enormous volume of water during its course of over 22 miles. The drainage of the hills to the west particularly the Baloj stream-and of the Bangar to the east, also flowed into the Kotla basin, the character of which at an elevation of about 608 feet only above sea level, surrounded as it is by high land on all sides. prevented any outlet until the *jhil* was full. When this happened the whole country for many miles around was under a continuous sheet of water which finally escaped by flowing south-east between Bajhera and Kálinjar round the range of hills ending at Bajhera, and continuing its course by Sakráwa, Punahána and Lohinga, filling up and overflowing from numerous depressions on the way, till it ultimately reached the Bhartpur border of the district.

> The damage caused by the *jhils* was thus incalculable. The Kotla *jhil* before it was protected could never have been dry, the other *jhils* in wet years would always contain a large area in the lowest parts of their basins which was unculturable on account of floods : they kept good lands out of cultivation, and permanently flooded the low lands best suited for cultivation : they detrimentally affected the health of the tracts in which they were situated, which—and that of Núh in particular—was at one time a hot bed of fever : and they always, in times of flood, seriously endangered the position of the town of Núh and of all villages near them or the line of their overflow."

Drainage works, The above describes the course which the drainage of the district would take if not artificially controlled. As a matter of fact, the evils resulting from swamping and uncontrolled flooding have long been recognised, and attempts were made early in the history of the district to drain the swamps and control the floods by means of embankments. Those in existence 25 years ago have been supplemented by many new ones built since 1887 either by or on the initiative of Mr. Maconachie when Deputy Commissioner. A detail of these works is given in Chapter II, Section A. Here reference need only be made to their effect on the natural drainage.

CHAP. I, A. The North Gurgáon works have not of course succeeded in draining the Najafgarh jhil as it is fed mainly by the Sáhibi, and in years of heavy rainfall there is always a large area submerged throughout the year. (At the beginning of the hot weather of 1909 the area was 1,403 acres, and at the same period of 1910 it will probably be 500 acres.) But they have checked harmful ravining and levelled and improved inferior land, and have caused a more beneficial and profitable distribution of the avail. able moisture. The effect of the South Gurgáon bands is that the Khalilpur *ihil* is now never submerged and the Chandaini, Kotla and Sangel-Ujina jhils are in ordinary years dry by the autumn. It is true that at the end of the extra rabi crop inspection of 1909 the areas submerged in these basins amounted to 236,998 and 1,781 acres, but 1908-09 was an abnormally wet year and it would not be fair to take it as a test of the band system. The bands are imperfect and capable of considerable development, but even in their present condition have vastly improved the drainage and in consequence the agriculture and health of the district.

Geology. Geologically the district forms part of the Indo-Gangetic alluvial plain, but contains also the hills previously mentioned which are sedimentary rocks of Peninsular type. They belong to the transition age and form outlines of the Arávali rocks. They are composed of a lower group of slates and limestones, and an upper and much thicker group of quartzetes. The soil contains plenty of lime and kankar deposits are common everywhere.

I am indebted to Mr. J. McC. Douie, C.S.I., for the follow-Botany. ing classification of the more common or noteworthy trees and shrubs of the district :---

Class	3.		Botanical N	Local Name.			
Anacardiaceæ			Mangifera Indica	••••	•••		Am.
Apocynaceæ	•••		Carissa spinarum	•••	***	•••	Murelan.
Bignoniacea	•••	•••	Millingtonia Hortensis	•••	***	•••	Viláyati Bakáin,
			Tecoma undulata	•••	•••		Ruhíra.
Bixiniæ			Hacourtia sepiaria	•••	•••	•••	Kakero or Rahíra.
Bovaginaceæ			Cordia myxa	•••	•••	•••	Lesora or Lasaura,
Bursuraceæ	•••	•••	Balsamodendron mukul				Gugal.
Uapparideæ	•••		Capparis aphylla		•••	•••	Karil,
•		ĺ	Capparis horrida		•••		Hins.
			Cratæva religiosa		•••	•••	Barwa.

Physical Aspects.

Drainage work.

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GURGAON DISTRICT.]

[PART A.

	5.	Botanical Name.	Local Name	
Cinbretaceæ		Ausgeissus Pendula	Dhauk.	
Ebenaceæ		Diospyros montana (grows near tanks. A near relation of the well known fruit-tree in the hills called Amlok, Diospyros lotus).	Kaindu.	
Leguminosæ	•••	Butea Frondosa	Dhák.	
4		Cassia Fistula	Amaltás.	
	,	Albuzzia Lebbek	Siris.	
		Dalbergia sissu	Shisham.	
	di di tati i	Tamarindus Indica	Imli.	
		Parkinsonia acerbata	Viláyati Kíkar.	
		Prosopis spicigera	Jánt.	
		Асасіа Атаbica	Kíkar.	
		Acacia Senegal	Khair.	
		Acacia Jacquemontii	Bambúl.	
		Acacia Leneophloca	Nimbar or Raunj.	
Meliaceze		Melia azadirachta	Ním.	
		Do. Azedarach	Bakáin.	
Palmeæ	••• ••	Phœnix sylvestris	Khijúr.	
		Borassus Flabellifer	Tári.	
Rhauneæ		Ziziphus jujuba	Ber.	
		Ziziphus Rotundifolia or Nummularia	Jhárberi.	
Ruliaceæ	•••	Mitragyna Parirfolioa or Stephegyne	Kaim or Kadam.	
Salvadoreæ	••• •	Salvadora oleoides	Jál or Dongar.	
		Salvadora Persica		
Sunarubeæ	•••	Balaintes ægypteaca	Hingo.	
Tamariscineæ	•••	Tamarix dioica	Jháo.	
		Do. articulata	Farásh.	
Urticacem	••• •	Ficus glomerata	Gular.	
		Ficus religiosa	Pipal.	
		Ficus Bengalensis	Bar.	

The district is not well wooded, and some portions of it, such as the low-lying tract in Núh, are peculiarly bare of trees. In Rewárí the *farásh* is especially prevalent, and here the *farásh* trees in waste lands and along the village roads often form the

PART A.

CHAP. I. A. subject of an ownership, distinct from the ownership of the soil. The kikar is found all over the district; it grows in large numbers in some villages a few miles south-west of Gurgáon, and in the Palwal tahsil may be found kikar plantations carefully preserved by the village communities. The kabli k kar (Acacia Farnesiana) is also common. The nim is generally found growing in and around the village sites, where also the *pipal* and the bar are of frequent occurrence. In some parts of the district, particularly in low-lying flooded tracts, in which the soil is naturally sandy, as at Sultánpur in the Gurgáon tahsíl, and near Sailáni, the khijúr or date-palm grows abundantly; but the fruit is very inferior. In the east and south of the district there are a few scattered specimens of the tari or palmyra. The Palwal tahsil is by far the best wooded; there most Ját villages preserve a certain portion of their area sacred from the plough, and regard in a semisacrilegious light the cutting down of the trees growing there. The greater part of the vegetation ordinarily found in such banis or rikhias, as they are called, consists of the karil, the hins or jhokar, the jal or dongar, the raunjh and the khair; but there are also found the dhák, the gular, the phápri and the lasaura, as well as some of the other trees already mentioned. The kadam is fairly common towards Palwal and Hodal; the barwa and the imli are met with, but are not common. The ám is extremely The bakáin is of ordinary occurrence, and the amaltás is rare. not very infrequent. The ber is planted in orchards for the sake of its fruit especially near large towns, and is also found elsewhere. The shisham and the sirás are confined to the sides of the roads, where they have been planted by the District Officers; near Gurgáon a very successful experiment has been made in planting an avenue with the riláyati bakáin, a handsome quick-growing tree with a beautiful white flower. The special tree of the hill ranges is the *dhauk*, at one time the hills are said to have been very fairly covered with dhauk trees, but now, except in a few places where the villages preserve the trees, until they reach a size which fits them for sale, every sapling is at once cut down or grazed down by goats. On the Tánkri hill there are some gugal or balsam trees.

One of the most characteristic plants of the district is the zizyphus nummularia, ordinarily called pálá or jhar-beri. This is common all over the district, except in low-lying inundated tract; but it especially favours high-lying and sandy lands, such as are found near Táoru and in parts of Rewári; there in September and October the fields are often so thickly covered with this prickly shrub that it is not easy either to walk or ride over them. It is invaluable to the people : the leaves are threshed out and given as fodder to the cattle, the fruit is eaten or taken for sale to the towns, the thorny branches are used for hedges or fuel, and the root for dying leather. Hardly less useful is the munj grass

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(Saccharum sara), which is found all over the district, and seems to flourish both in high sandy lands, as near Bolni in Rewári, and in low flooded tracts, as near Palwal on the east. Its uses are too well known to require description here. Among the numerous other plants found in the district, the following deserve notice :---

The *ihao* covers the low alluvial lands along the banks of the Jamna; its twigs are used in basket-making and in the construction of temporary well-cylinders. The bansa (tephrosia purpurea) grows abundantly near the hills; the cylinders of temporary wells are ordinarily made by weaving together its branches. Kihp (orthanthera viminea) grows on salt land, and used to be used in the Núh salt-pans to quicken the crystallization of the salt. Bathua (chenopodium album) and chaulái (amaranthus ?) are common pot herbs: the former grows chiefly in irrigated lands. The seeds of the sánwak (panicum colonum) are also eaten by the The nali (ipomaea reptans), which grows in submerged poor. lands, is also used as a pot herb: and among the wild gourds the kachri (cucumis pubescens) and the bankarela (memordica charantia) are eaten by the people. In poor soils near the hills there often grow the kans grass (saccharum spontaneum) and the bhurt (cenchrus echinatus) with its troublesome and prickly burs; and in the flooded lands of some villages in the north of Fírozpur (especially in Goháná and Bahádri) is found the narsal (arundo karka), a most tenacious aquatic plant, which it is almost impossible to eradicate. Pipe stems are made of its reeds. The only other plant which it seems necessary to mention, is the nag-phani (Cactus Indicus), which forms a thick hedge round many villages in Rewárí, and other parts of the district.

Wild Animals,

The days when tigers abounded in Gurgáon on the then woody banks of the Jamna, are now long since gone by. The panther (taindwa) is now the largest representative of the feline family. They occasionally appear in the hills, wandering in from the adjacent hilly tracts of Alwar. A large wild cat (banbilla) is also commonly found in the jungles near the hills. Hyenas have a representative in the striped hyena (jarag) not common, and found only in the neighbourhood of the hills. Wolves (bheria), formerly numerous, are now only scarce, but foxes (lomri) and jackals (gidar) are common in all parts of the district. The mongoose (niola) is common. A larger animal of the same species is found in the hills. It is about twice the size of the ordinary mongoose, and instead of brown, has a dark grey fur. Hares are very plentiful in all parts of the district, and the porcupine is common, generally found in the neighbourhood of the hills. Rats and mice are very common, and the bandicoot infests some of the Dormice are found in all parts, but chiefly in sandy and towns. saline tracts burrowing in the ground and living in large communities, and frequently causing damage to extensive patches of In gardens and groves, the striped squirrel is always oultivation.

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to be found. Musk rats are common, and so also is the little hedge-hog. Flying foxes are chiefly seen about Gurgáon, where they infest some of the gardens. The common bat inhabits old ruins and *khángáhs* in great numbers. The sacred monkey is to be found in great numbers about Hodal, and there are also a few in Rewári and Gurgáon. The wild boar inhabits the low hills near Bhundsí and Sohná, and the khádar lands of the Jamna.

Ruminants are represented by the black buck and the ravine deer, both of which are fairly plentiful, the latter in the hilly and sandy parts, the former in the low-lands. The *nilgái* is also found in the west of the Palwal *tahsil* and in the Jamna khádar. Hogdeer are occasionally met with in the khádar. During the past five years rewards amounting to Rs. 1,667 were paid for the destruction of 27 leopards, 23 wolves, and 5,992 snakes. The species of snakes found are given below.

The *jhils* of this district attract great numbers and varieties of water fowl. During the cold months, wild geese, the grey and the barred, come in great numbers, arriving about the beginning of October. Also ducks of the mallard, pintail, and painted bill varieties; and pochards, sheldrakes, shovellers, red-heads, wigeons and teal swarm in all the marshes. With them also come a host of cranes, the common and the demoiselles; pelicans, spoonbills, flamingos, grey curlew, snipe, crakes, rails, and sand-pipers. All these winter visitants disappear about the end of March. The sáras, the largest of the cranes, is a permanent resident, and breeds in the rains. They are usually seen in pairs in the lowlands about Núh, and the neighbouring villages. The comb duck, or nakta, comes in the rains to breed, and builds its nest generally in old ruins. The painted bill-duck is also a permanent resident of these parts and breeds in the rains. Adjutants and several other cranes come in great numbers during the rains. The ibis visits these parts in the rains in great numbers. Peafowl are considered sacred generally throughout the district. They are very common, and are chiefly seen about villages. The wild or blue pigeon is very common, living in great numbers in ruins and deserted wells. Green pigeon are more rare, but are fairly plentiful. The wood pigeon, or stock dove, comes in great flocks during the cold season, and are chiefly to be seen near Bhadas in the Firozpur tahsil, and Jatauli between Gurgáon and Rewári. Grey doves, ring doves, and turtle doves are plentiful. There are four kinds of sand-grouse to be found in this district. The Imperial or black-breasted is a winter visitant and abounds in parts of this district, from November to the end of February. They are chiefly to be seen in the neighbourhood of Gurgáon and Farukhnagar. The common, the pintail, and the painted, are residents of the district. The painted are only to be found on the rocky hills, and are nocturnal in their habits. Grey partridge abound in every part of the district. The black is also plentiful

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Wild Animals.

Birds,

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Birds.
in some parts. Bush quail, both jungle and rock, are common, and when the wheat is about to ripen in March, the common quail appears in great numbers. The *ubara* is occasionally seen. The *lik* or painted florican comes here to breed in the rains in the sandy parts of the district. The Indian Roller, or blue jay, is common, and kingfishers of the blue and the spotted kind are plentiful near *jhils*.

Tortoises are found in the Jamna, and a small kind in some tanks and wells. The small tortoise is sometimes brought from long distances and put into wells and tanks to keep the water pure.

Snakes appear only in the hot and rainy season, the commonest are the cobra and the *krait* known here as the *Bissanda*. The *daboia* and the *afae* are also found. *Dhawan*, *domuhi*, *kalgandaith*, *padam*, Chamelia, *azdahá* (python) are occasionally seen.

The largest of the lizards is the goa, a smaller kind is the *biskabra*, supposed to be very poisonous. There are also, the house lizards, the sand lizards, the *sanda*, or the edible lizard, the tree lizard or chameleon, and the beautiful *bamni* lizard.

Besides the Jamna and the Agra Canal, there are few localities where fish are to be found. The Jhir stream in the hill pass above Fírozpur has a few species of small fish, and here and there some of the large tanks have fish of the ophiscipali (saol) and macrones (tengra) species peculiar to muddy and stagnant waters. There is a large tank at Hodal that contains some of the smaller kinds of river fish. This tank is fed from the Agra Canal. Of the *ihils* in the interior of the district, the Najafgarh lake is the only one where there are fish, and this is due to this lake being connected with the Jamna by the drainage canal. In the lake all the better kinds of fish can be caught, but fish, as food, are scarcely known in this district. A few are occasionally brought from the Najafgarh jhil into the market at Gurgáon. The following better kinds of fish are known:-rohu (labes rohita), kalbas (labes kalleas), mahsir (barbastor). Bhur, narani, bamcha, bam (eel), qwalli, singhi, moh, phapta, are the local names of the commoner kinds.

The following complete list of the game birds of the district has been supplied by Mr. R. Harrison, District Engineer :---

The Common Starling	•••	•••	. •••	Sturnus vulgaris.
The Rose-coloured Pastor or	Jowari	Bird		Pastor roseus.
The Large or Imperial Sand-	grouse		••••	Pterocles arenarius.
The Common Sand-grouse	•••			Pterocles exustus.
The Pin-tailed Sand-grouse	•••			Pterocles alchata.
The Painted Sand-grouse		•••	,	Pterocles fascia

The Common Peacock	•••	•••	•••		Paro cristatus.
The Black Partridge	•••	•••			Francolinus vulgaris.
The Common Grey Part	ridge	•••	•••		Ortygornis ponticeriana.
The Jungle Bush Quail		•••	•••		Perdicula Asiatica.
The Common European	or larg	e Grey	Quail		Coturnix communis.
The Black-breasted Rain	u Quail		•••		Coturnix coromandelica.
The Indian Button Quai	1	•••			Turnix Joudera.
The Little Button Quail			••	•••	Turnix dussumieri.
The Ubara Bustard	•••	•••			Houbara Macqueenii.
The Saras Crane	•••				Grus antigone.
The Demoiselle Crane	•••	•••	•••	•••	Anthropoides virgo.
The Common Crane	•••	•••	•••		Grus cinerea.
The Pin-tail Snipe	•••	•••	•••		Gallinago stenura.
The Common Snipe	•••			•••	Gallinago scolopacina
The Jack Snipe or Jude	ock	•••	- • •	•••	Gallinago gallinula.
The Painted Snipe	•••	•••		•••	Rhynchæa capensis.
The Black-tailed Godwi	t	••		•••	Limosa ægocephala.
The Pigmy Rail or Bail	lous Cr	ake	•••		Porzana bailloni.
The Spotted Crake	•••	••••	•••		Porzana maruetta.
The Ruddy Crake	• • •	•••	•••	•••	Porzana fusca.
The Brown or Ashy Cri	ske	•••	•••	•••	Porzana akool.
The Grey Leg Goose	•••		•••	•••	Anser cinereus.
The Pink-footed Goose		•••	•••	•••	Anser brachyrrhynchus.
The White-fronted or L	aughin	g Goos	e	•••	Anser albifrous.
The Dwarf Goose		•••		•••	Anser erythropus.
The Barred-headed Goo	80	•••	•••	•••	Anser indicus.
The Comb Duck	•••	•••		•••	Sarkidiornis melanonotus.
The Cotton Teal	•••	•••	•••	•••	Nettapus coromandelianus.
The Lesser Whistling	leal	•••		•••	Dendrocygna javanica.
The Larger Whistling	Feal	•••	•••		Dendrocygna fulva,
The Ruddy Shell-drake	or Bra	hminy	Duck		Casarca rutila.
The Shell-drake or Bar	row Du	ick	•••	•••	Tadorna cornuta.
The Shoveller	•••	•••	•••	•••	Spatula clypeata.
The Mallard	•••	• • •	•••	•••	Anas boscas.
The Spotted Billed Duc	k	•••	•••	•••	Anas pæcilorhyncha.
The Gadwall		•••			Chaulelasmus streperus.
he Marbled Teal			•••		Chaulelasmus angus tirostris.

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Birds.

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CHAP. I, A.	The Pintail	• ••• •••	Dafila acuta.
Physical Aspects.	The Wigeon	• ••• •••	Mareca penclope.
Birds.	The Common Teal	• • • • • •	Querquedula crecca.
L	The Gargruy Teal or Blue-winge	ed Teal	Querquedula circia.
	The Bronze-capped Teal		Querquedula falcata.
	The Red-crested Pochard		Fuligula rufilna.
	The Tufted Pochard		Fuligula cristata.
	The Pochard, Dun-Bird or	Great-headed	Fuligula ferina.
	The White-eyed Pochard or Terr	uginous Duck	Fuligula nyroca.
	The Golden Eye or Garrot		Clangula glancion.

Climate.

The climate generally is more temperate than that of the Punjab proper, the cold in winter and the heat in summer being both less extreme. Near the hill ranges, however, and in the Fírozpur valley, bounded as it is by hills on either side, the heat is very great; and in some villages which lie immediately under the hills, the people are accustomed to go out in the fields to sleep at night, so as to escape the heat radiated from the glowing masses of rocks.

The flooded tracts near Núh used to be terribly fever-stricken in years of abundant rainfall, and few men could stand a lengthened residence at Núh without injury to their constitution, but the embankments constructed since 1883 have greatly mitigated the unhealthiness of this part of the district. The higher parts of the district, and notably the Táoru table-land, are very healthy, and this remark used to apply to the high plain of Palwal and the east of Núh and Fírozpur, but the Agra Canal has brought fever into this tract.

Rainfall,

Table 3 shews for each rain-gauge station in the district, the average annual rainfall for the agricultural year ending May 31st and the actual rainfall from 1885-86 onwards. Table 4 shews the monthly rainfall in inches at the district head-quarters, while table 5 shews the seasonal rainfall at the head-quarters of each *tahsil*.

The rain-gauge stations given in table 3 are distributed among the five tahsils as follows: —

``	(Jatusána.
Rewári	∠ Rewári.
	Sháhjahánpur (moved to Khol in 1904).
Dolmal	Palwal.
raiwai	"'LHodal.
	Táoru.
Núh	🖌 Núh.
	Háthin.
Ffeeeman	(Fírozpur.
r trozpur	··· ¿ Punaĥána.
	(Farukhnagar.
Gurgáon	d Gurgáon.
μ.	Sohna.

[PABT A

Converting the average fall of each station (column 2 of CHAP. I, Al Table 3) into the average for the *tahsil* the figures work out as follows :--

						Inches.
Rewari		•••	• • •		•••	18.43
Palwal	•••	•••	•••		•••	23·21
Núh		•••	•••	•••		2 3·3 3
Fírozpur	•••	•••		•••	•••	23.63
Gurgáon	•••	•••			•••	22.80

These averages compare as follows with the average given in (Statement I of the *tahsil* assessment) reports, with the average of the years 1885-86 to 1909-10 and with the average assumed in the last Gazetteer:—

							Average of Statement I of assessment reports.	Average of 1885-86 to 1908-09.	Average on page 7 of last Gazetteer.
Rewári	•••	•••		•••	•••		18.3	18.34	22'4
Palwal	•••	••••	•••	•••	•••		22.8	2 3•46	25*5
Núh		•••		· •••	•••		23.0	23· 3 1	24.0
Fírozpur	•••	•••	."` •••	•••	•••	•••	24.6	22 [.] 86	22.3
Gurgáon	•••	•••	•••	•••	•••	•••	21.4	21•26	26.6

The average assumed in the last Gazetteer was based on the returns of only 18 years, and now that we have the figures of a much longer series of years is seen to be too high in all *tahsils* except Fírozpur. On the other hand the averages of the assessment reports and of the years from 1885-86 to 1908-09 are too low owing to the long series of dry seasons since 1895. The true averages may be taken to be—

					Inches.
Rewári	••	•••	•••	 •••	18
Palwal		•••	•••	•••	231
Núh		•••	•••		23]
Fírozpur	•••			 	23]
Gurgáon	•••	•••	·	 •••	23

It will be observed that the rainfall decreases as it passes westward and that nearly the whole of it falls between June and September (Tables 4 and 5), but, as noted by Mr. (now Sir James) Wilson in his Revision Report, the most marked feature of the returns is their variableness. This has been

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Rainfall.

CHAP. I, A. especially noticeable of recent years—in fact since 1899 years of scanty and heavy rainfall have tended to alternate. "Moreover," to quote the same authority, "the success or failure of the crops depends more on the distribution than on the mere amount of the annual fall; and while the figures showing the total rainfall are well worth discussion, they are only a very rough index to the nature of the seasons as favourable or otherwise to the crops."

Another characteristic of the local rainfall is its extreme partiality. Heavy rain is often received at one place, while at another a few miles away much less or none at all is received.

All these vagaries are due presumably to the situation of the district at the tail end of both the Bay and the Arabian Sea currents, but, whatever the cause, the resulting precariousness of the cropping is deplorable. Table 5 shews that nearly the whole of the annual fall is received between June and September, and that the winter rains are both scanty and uncertain. In consequence the kharif is almost everywhere the important harvest, and the rabi harvest on unirrigated land is exceptionally precarious. The few tracts in the district which are more dependent on their rabi than on their kharif crops, such as the Dahar and Chiknot circles of Núh and Fírozpur, the Khádar circle of Palwal and the Sáhibi circle of Gurgáon, are notoriously unprosperous.

In the ideal year from the agricultural point of view the monsoon commences by or before the middle of June, as the yield of the cotton crop depends largely on early rains. The first showers must not be too heavy or the seed in sandy lands is washed out and has to be resown. Good showers alternating with sunshine are required in July and August. Continuous cloud and rain during these months causes the crops to mildew and prevents weeding, while if there is too little rain or a strong west wind the crops dry up. The first half of September is the critical period of the whole year, as on the rainfall of this period the ripening of the kharif and the sowing of the rabi harvest depend. The showers must not be too heavy or they will cause the grain of the jowar and bajra to blacken and rot, but they must be heavy enough to leave sufficient moisture in the soil for rabi sowings, and they should continue up to the middle of September. The success of the rabi crops depends on adequate showers falling between December 15th and January 15th. A shower in the last half of February is also very beneficial, but after this rain is not desired, as there is always danger of hail falling.

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