

CHAPTER I

GENERAL

ORIGIN OF THE NAME OF THE DISTRICT

The district derives its name from its headquarters town Hisar. The town was founded by Firuz Shah Tughlak in the 14th century. He named it after him as 'Hissar Feroza', the fort of Firuz. The name was subsequently contracted to Hisar.

LOCATION, BOUNDARIES, AREA AND POPULATION

Location and boundaries.—The district of Hisar, lies in between 28°58' and 29°49' north latitude and 75°13' and 76°19' east longitude. It is bounded in the north and north-west by Bathinda district of Punjab, in the east by Jind district, in the south-east by Rohtak district, in the south by Bhiwani district, in the south-west by Jhunjhunu district of Rajasthan and in the west by Sirsa district.

Area.—With an area of 6,331 sq. kms., Hisar is the largest district in the State. It has four tahsils covering the area as shown below :¹

Tahsil	Area (Sq. Km.)
Hisar	1,938.30
Fatehabad	2,066.10
Tohana	613.03
Hansi	1,713.57
Total :	6,331.00

Population.—According to 1971 Census, the population of the composite Hisar district was 21,32,948 persons. The district lost Bhiwani and Loharu tahsils and part of Hansi and Hisar tahsil to district of Bhiwani in 1972 and Sirsa and Dabwali tahsils to Sirsa district in 1975. The population of the remaining portion of the Hisar district as worked out on the basis of 1971 Census was 11,60,835 persons and it continued to be first in 12 districts of the State.

1. *Statistical Abstract of Haryana, 1978-79*, p. 17.

HISTORY OF THE DISTRICT AS AN ADMINISTRATIVE UNIT

The first record of the administrative division of the district is found in *Ain-i-Akbri*.¹ Much of the area lying in the present Hisar district was covered by *mahals* of Agroha, Ahroni, Barwala, Bhattu, Tohana, Hisar, Fatehabad and Hansi. The *mahals* formed part of Hisar Feroza Sarkar of the Delhi Subah.

With the decline of the Mughal empire, the tract comprising Hisar district came under the control of Marathas. The whole of Delhi territory of which the tract formed part, was ceded by the Marathas to the British in 1810. The Delhi territory was divided into two districts, Delhi, directly under the Resident and the outlying district including Hansi, Hisar, Sirsa, Rohtak, Panipat and Rewari under the immediate charge of an Assistant to the Resident. Again in 1819, Delhi territory was divided into 3 districts namely ; the central which included Delhi, southern district comprising Rewari etc. and north-western district comprising Panipat, Hansi, Hisar, Sirsa and Rohtak. In 1820 the north-western district was sub-divided into 2 separate districts, the northern and the western. The western district included Bhiwani, Hansi, Hisar and Sirsa and its headquarters were at Hansi. In 1824, Rohtak which had previously been under the western district was constituted into a separate district to which Bhiwani was transferred. The headquarters of the district was shifted from Hansi to Hisar in 1832. The district was then divided into 4 tahsils of Hisar, Fatehabad, Hansi and Tosham. In 1837, Ratia and Tohana parganas were added to the Hisar district and were formed into a separate tahsil of Tohana. The Sirsa tract was detached in 1837 from the Hisar district and placed under a separate officer styled as the Superintendent of Bhatiana. The pargana of Darba and the pargana of Rori were transferred to Bhatiana in 1838 and 1847 respectively. In 1852, the pargana of Ratia was transferred from Tohana tahsil to Fatehabad tahsil and Barwala pargana was detached from Hisar tahsil and was formed into a separate tahsil of Barwala along with Tohana.

The whole of Delhi territory alongwith districts of Bhatiana and Hisar were transferred to the Punjab in 1858 and the district of Bhatiana was re-named as Sirsa.

In 1861, Bhiwani tahsil was detached from Rohtak and added to Hisar district. The Tosham tahsil was abolished and added to Bhiwani tahsil in the same year. The Hisar district gained 24 villages from Meham-Bhiwani tahsil of Rohtak district ; 18 villages including the town of Bhiwani were added to the Bhiwani tahsil and 6 villages to the Hansi tahsil. Besides, 5 villages confiscated from Nawab of Jhajjar and 12 villages received from the Maharaja of Jind, were added to Bhiwani tahsil and Barwala tahsil respectively. In

1. Abul Fazl, *Ain-i-Akbari* (English Translation by Col. H. S. Jarret) corrected and further annotated by Sir Jadunath Sarkar, Calcutta, 1978, Vol. II, pp. 300-301.

November, 1884, the Sirsa district was abolished and Sirsa tahsil with 199 villages and 126 villages of Dabwali tahsil were added to the Hisar district and formed the Sirsa tahsil. In 1889, 15 villages, forming a detached block known as Budhlada *ilaqua*, were transferred from Kaithal tahsil to Fatehabad tahsil. The Barwala tahsil containing 139 villages was abolished with effect from January 1, 1891 and its area was distributed between 3 contiguous tahsils, 13 villages going to Hansi, 24 to Hisar and 102 to Fatehabad.¹ At the same time 13 villages were transferred from Hisar tahsil to the Bhiwani tahsil and a sub-tahsil was established at Tohana in Fatehabad tahsil.

A village from Fatehabad tahsil and another from Sirsa tahsil were transferred to Bikaner in 1905 and 1906 respectively. Again in 1910-11, the district lost 2 villages to Bikaner. In 1923, the Tohana sub-tahsil was transferred from Fatehabad to Hisar tahsil.

No transfer of territory to or from the district took place till the passing of the Provinces and States (Absorption of Enclaves) Order, 1950, by which the erstwhile princely state of Loharu was merged in the district and 15 villages comprising Budhlada *ilaqua* were taken out of Hisar district and added to Bathinda district. In 1962, 3 villages were transferred from Dadri tahsil of Mahendragarh district to Bhiwani tahsil.

The entire area of the district was included in the new state of Haryana on November 1, 1966. In 1968, Sirsa tahsil was bifurcated into Sirsa and Dabwali tahsil and Bhiwani bifurcated into Bhiwani and Loharu. In 1969, a village was transferred from Dadri tahsil to Bhiwani tahsil. The above administrative arrangements continued till 1972 when whole of Loharu and Bhiwani tahsils, 32 villages of Hansi and 17 villages of Hisar tahsils were excluded and included in the newly formed Bhiwani district.² Tohana sub tahsil of the Hisar tahsil was upgraded to a tahsil in 1972. In 1974, 4 villages were transferred from Hansi to Hisar tahsil, 18 villages from Hisar to Hansi tahsil, 2 villages from Hisar to Fatehabad tahsil, 18 villages from Tohana to Fatehabad tahsil, 9 villages from Fatehabad to Tohana tahsil, 10 villages from Fatehabad to Hisar tahsil, 3 villages from Dabwali to Sirsa tahsil and one village from Hansi tahsil to Jind tahsil of Jind district. In 1975, Sirsa and Dabwali tahsils were excluded from the district and a new district of Sirsa was carved out.³ Thus by the end of 1978, the Hisar district comprised 486

1. *Hissar District Gazetteer*, 1915, p. 46. *Punjab Government Notification* No. 697 dated the 17th November, 1890.

2. *Haryana Government Revenue Department Notification* No. 6,050-E (IV)-72/45,723, dated December 22, 1972.

3. *Haryana Government Revenue Department Notification* No. 4,130-E (IV)-75/26,094, dated the 26th August, 1975.

villages, divided between tahsils of Fatehabad 166, Hisar 115, Hansi 119 and Tohana 86.¹

TOPOGRAPHY

The district is part of the alluvial or Ghagghar-Yamuna plain and its southern and western portions mark a gradual transition to the Thar desert. The topographic pattern of the district owes its existence to geomorphic processes having closer affinity with the climatic aridity, both of the recent and past geologic periods.

Throughout almost the entire district the dominant feature of topography is the occurrence of eolian sand of variable shape and thickness overlying the Pleistocene alluvium which becomes fewer as the eastern border of the district is approached. The only variation from this description is found in the north, a tract locally known as Nali. The mean altitude varies between 210 and 220 metres and it generally slopes from north-east to south-west with a gentle gradient of 1 in 4000.

The district can be sub-divided into following topographic units :—

- (i) Sub-Recent alluvial plain ;
- (ii) Late Quaternary to Sub-Recent sand dune areas ; and
- (iii) Plain with sand dunes.

Sub-Recent alluvial plain .—The plain locally known as Nali occurs principally as floodplain sediments along the courses of the Ghagghar and non-existent course of the Joiya. It is gently sloping, trending north-east to south-west in Tohana and Fatehabad tahsils. This part of the district experienced a demographic and agricultural revolution of significant magnitude during fifties.

Late Quaternary to Sub-Recent sand dune areas.—The sand dune areas can be classified into conspicuous topographic units having different genetic types of sand dunes-active, semi-active and fossil or fixed. The active and moving sand dune generally occurs along the western fringe of the district where the mean annual rainfall varies between 200 to 250 mm. The vegetal cover is scant and it resembles the treeless undulating desert, locally known as Bagar. Exceptionally strong uni-directional south-west winds winnow loose sand grains from the surface and transport the material to long distances in the direction of the wind. In this process

1. Two sub tahsils, one at Ratia of tahsil Fatehabad comprising 67 villages and the other at Adampur of Hisar tahsil comprising 32 villages were created in 1979 vide *Haryana Government Revenue Department Notifications* No. 7,195-E (IV)-79/46,999 and 7,195-E (IV)-79/47,001, Dated November 21, 1979.

the landscape configuration undergoes dramatic change and sand hills appear where yesterday was a cultivated field. Active sand dunes vary from uneven sand cover, sand hummocks to small transverse dunes, some rising to about 2 metres above the surrounding surface. At places, extensive grazing and deterioration of scant *Acacia* vegetation on the slopes of stable sand dunes has reactivated the dune building activity. The active and reactivated dunes are Sub-Recent in age.

Of great geomorphic significance are the fossil or fixed dunes which generally lie athwart the south-west winds. They occur as broad features in long narrow chains but assume intersecting, forked, spiral and many other complex forms. They represent the eastward culmination of an intense and wider influence of marked climatic aridity during the late Quaternary. In comparison to the other deserts around the world, the fixed dunes of Hisar district as also those of Thar desert are characterised by a finer composition of sand particles. The median grain size of the sand varies from 0.13 to 0.16 mm in diameter. Almost all the fossil dunes carry a buried soil profile. The deeply weathered soil profile, dark brownish to red in colour, is decalcified and faintly acidic in nature which suggests two extremely dry phases separated by a humid climatic phase in the late Quaternary period when the dunes were formed.

Fossil dunes show larger concentration in south and south-east of Hisar, Bhattu-Badopal-Seeswal triangle south of Fatehabad, and south and south-west of Tohana. The area south and south-east of Hisar represents the northern fringe of a system of fossil dunes best developed in Tosham area of the adjoining Bhiwani district. The dunes generally occur as transverse, broad-based ridges possessing highly variable morphology. The relative relief of individual features varies from under 3 metres to over 15 metres. Some fossil ridges can be traced continuously for 12 kms. and more. In area lying south of Fatehabad, fossil dunes generally occur in conjunction with active dunes of variable thickness and geometric form. Some ridges are up to 6 kilometres long and 15 metres high. A large number of dune and ridge crests are within 2 metres from the surrounding area but relief differences of 5-7 metres are also common. In the Tohana area, the sand forms occur in isolated small knobs, sand mounds and protuberances which do not show any definite pattern of alignment with the wind direction. A majority of dunes are up to 2 metres high but some, such as south and west of Jamalpur, have a relief of the order of 6 metres and above.

Plain with sand dunes.—The plain locally known as Haryana is the largest topographic unit. It is the most important area of the district

covering the southern part of Tohana tahsil, eastern part of Hisar tahsil and almost the whole of Hansi tahsil. Sand dunes and sand hills found scattered here and there in the plain give it a broadly undulating character. Patches of older alluvium are either exposed or occur at shallow depths beneath a veneer of sand in *tals* or topographic depressions enclosed by fixed dunes.

RIVER SYSTEM AND WATER RESOURCES

Ghagghar, the largest seasonal stream in Haryana, enters the district as deeply incised alluvial channel near Jakhal and makes an exit little to the west of Bira Badi (Fatehabad tahsil) covering the distance in a meandering course some 70 kilometres long. The river maintains a rough parallelism with most of the northern boundary, deviating from it by a margin of some 7 kilometres and at times delineating the northern limits of the district.

The Ghagghar is a misfit stream since the scant volume of discharge stands in marked contrast to its large channel width. The river drains large volumes of floodflow during the rainy season mostly between July to September and is generally dry in summer. However, the inflow of ground water takes place till as late as October.

According to different explorers and scientists, the Ghagghar was once an important river system of the north-western India during the Pleistocene period.¹ It is believed that the river began to dry up first in the 11th century and dried-up completely before the 13th century A.D. The hydrographic changes since the historic time resulted in the depletion of discharge into the Ghagghar channel. The Yamuna and the Satluj which formed the eastern and western tributaries of once mighty Ghagghar river system, deserted the parent river to join the Ganga and the Indus systems. There is, however, a snag as it fails to account for the five prominent non-cyclic terraces of the Ghagghar near Panchkula (Ambala district).

The Joiya takes off from the south bank of the Ghagghar about 8 kilometres north of the district boundary at Phulad (Sangrur district-Punjab). The channel makes snake like meanderings and its supply has been seriously lessened by silting up of the head. It is said that it was much bigger than the Ghagghar and used to flow through the district and on through Mansa tahsil (Bathinda district-Punjab) into Sirsa district where it rejoined the Ghagghar. Another dried up channel known as Sukar or Sakru is indicated to the south of Joiya channel. The

1. O.H.K. Spate, *India and Pakistan*, 1954, pp 485-86.

old dried up courses of these streams run parallel to the Ghagghar and can still be traced—the land between them is known as Sotar valley. The valley is 2 to 4 kms. wide and even more at places. From the appearance of the valley and numerous ancient mounds and remains of old settlements all along its both banks, it is evident that at one time it conveyed a much larger volume of water and probably was the channel of a perennial stream.¹ This may possibly be the dried up course of the Sarasvati of the Rigvedic fame.²

The Joiya stream had long ceased to carry water to Sirsa and onward and had become very much smaller than the Ghagghar. This is due in part to the silting up of the head of the former stream and deepening of the bed of the Ghagghar and it was only in high floods that water passed from the Ghagghar into the Joiya at Phulad. Initially, it is said, that Firuz Shah Tughlaq channelled this stream up to Fatehabad town. Later during the 19th century, a Rangoi channel to utilise flood flow of the Ghagghar was dug to connect the Ghagghar with the Joiya and it ran from Qasimpur to Kalandargarh beyond which it ran into the Joiya. Later, the old Joiya channel below Kalandargarh was also canalized. The Rangoi Inundation canal is now used for utilising flood flow of the Ghagghar for irrigating some areas in Tohana and Fatehabad tahsils.

There are two swamps, one at Musa Khera and the other below the town of Fatehabad. These are not perennial and get filled only in rainy season.

GEOLOGY

Hard rock geology of the district is concealed under alluvial and aeolian deposits. The alluvial deposits of quaternary age are divisible as newer and older. The former usually occurs in the active flood-plain of the Ghagghar river, in the northern part of the district and comprises sand, silt clay and occasional gravel. Calcareous concretions in various proportions are found mixed with other constituents. The sediments are heterogeneous in character, and are deposited on a basement of metamorphic and igneous rocks of pre-Cambrian age. The bed rock topography over which the alluvial deposits rest, slopes towards north-east. The maximum thickness of alluvium as encountered in a borehole at Jhalnian (Fatehabad tahsil) is 345.51 metres below ground level.

1. *Hisar District Gazetteer*, 1915, p. 8.

2. R.S. Bisht, Excavations at Banawali, 1974-77, *Proceedings of the Seminar on Harappan Culture in the Indo-Pak Sub-continent*, Srinagar, 1978.

The aeolian deposits comprising accumulations of sand blown from Thar desert of Rajasthan are mostly confined to south-western part of the district. These sand accumulations occupy vast stretches of land and occur in the shape of sandy flats, mounds and ridges at places attaining dunal shapes over the sandy flats.

Mineral Resources

Kankar.—*Kankar* occurs at several places in the sandy tracts of the district. It is used for road metalling and as building material.

Saltpetre.—Saltpetre occurs as very thin whitish yellow, brittle encrustations over the soil, and along the basement of *kacha* constructions in some old and deserted villages. The efflorescence normally appears during the hot months from April to June every year. After the rains, it completely disappears, being washed away in solutions, partly as run off and partly by percolation down into the sandy soils where the nitrates perhaps got denitrified. It is noteworthy that the nitrates are mostly concentrated in the top soil only. Many refineries exist in the district for extraction of saltpetre.

GROUND WATER

The sub-soil water of the district is overall brackish. The quality of water varies from place to place and from well to well. The sweet water is found from wells located in areas having ameliorating factors like existing or old stream courses, long-standing irrigation, seepage from *kacha* tanks, etc.

At some places wells situated on bare dunes of loose shifting sands yield good quality of water because most of the rain water unable to flow, sinks underground to improve the groundwater by dilution.

The extensive canal irrigation introduced by the Bhakra Nangal Project has caused rapid changes in water table configuration. The water level has risen by 2 to 7 metres in this area between 1974 to 1978. The water table is within 15 metres of the surface along the Ghagghar channel and in the command area of the Ratia branch system. Here the ground water is fresh to marginal in quality and extensively exploited for minor irrigation. The water level is up to 15 metres deep in the central part of the district. Elsewhere, the ground water is very deep, 20 metres and more from the surface. The water is saline and unfit for domestic consumption and agricultural purposes. With the lining of canals now in progress, seepage from canals will drastically reduce, resulting in the slower rate of accretion to ground water resources.

SEISMICITY

According to tectonic map, the district lies on Delhi-Lahore Ridge which is bounded by thrusts. No earthquake of any significance has originated in the zone in the past. It has, however, experienced earthquakes originating in the great Himalayan boundary fault and the Hindukush region. The notable Kangra earthquake of April 4, 1905 and Chamba earthquake of June 22, 1945 affected the district. The maximum intensity experienced was VI M.M.¹ and the district has been assigned to zone II in seismic zoning map of India where the maximum seismic intensity may reach VI MM. For important structures founded on consolidated soil, a provision of horizontal acceleration of 4 per cent gravity and its 50 per cent regarding vertical acceleration would ensure a reasonable amount of safety.

FLORA²

The forests of the district fall under the category of tropical desert thorn and comprise predominantly of xerophytes. Flora is scanty and sparse. Tree species found in forests, cultivated fields, waste lands and habitations are *jand*, *rohera*, *khairi*, *beri*, *reru*, *jal* or *van*, *barh*, *peepal*, *mesquite* or *pahari kikar*, *kachnar*, *amaltas*, *lasura*, *imly*, *banna*, etc. *Shisham*, *kikar*, *siris*, *neem*, *bakain*, *gulmohar*, *parkinsonia* *eucalyptus*, etc. have been planted along rail, road and canal strips and in other private areas. *Eucalyptus* is also planted in agricultural and under farm forestry scheme. The *jand*, *farash*, *khairi*, *castor*, *kana* and *ruhera* have been planted to check soil erosion by high velocity winds.

Common shrubs found are *hins*, *bansa*, *panwar*, *babool*, *mallah*, *karir*, *phoa*, *kip* and *ak*. Medicinal herbs found in the district are *bansa*, *indirain*, *asgandha*, *glo*, *kharuthi*, *bhakhra*, *dhatura*, etc. Their collection becomes uneconomical because these are available in scattered form.

The important grasses found in the district are *anjan*, *dhaman*, *dub*, *kana* and *dabh*. *Anjan*, *dhaman* and *dub* which are palatable fodder grasses are dwindling on account of uncontrolled grazing. The grasses in waste lands are poor in quality and quantity.

Amarbel is a common parasite.

1. M.M. intensity according to Modified Mercalli Intensity Scale 1931 denotes; felt by all; many frightened and ran outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.

2. The botanical names can be seen in the table at the end of the chapter.

FAUNA¹

Mammals

The district is inhabited by a varied groups of animals. Primates are represented by the rhesus macaque or bander and the common langur.

Big cats like tiger and leopard once abundant in the district are no more seen. The carnivore found in the district are : the jungle cat; the small Indian civet; the common mongoose; jackal and the Indian fox.

The grey musk-shrew or *chuchunder* and two species of bats, the common yellow bat and the Tickell's bat are usually seen. The five striped palm squirrel or *gilheri*, the Indian porcupine or *sahi*, the Indian gerbille, the common house rat and the house mouse are the common rodents found. The Indian hare belonging to the order lagomorpha is also found in the bushes.

Chinkara or ravine deer is seen in the district but its number is decreasing. Blackbuck and the bluebull or nilgai are found in the district. These are more common near Bishnoi villages where the shooting or killing them is prohibited.

Birds

Game birds.—A large number of game birds, some of them residential are found throughout the year while others are winter visitors. Various types of ducks and geese such as eastern greylag goose, barheaded goose, Brahminy duck, common shelduck, pintail, common teal, mallard, gadwall, wigeon, bluewinged teal, shoveller, common pochard, ferruginous duck and tufted duck can be seen at the Ghagghar and tanks during winter. Some other ducks such as comb duck, cotton teal, spotbill duck, large whistling teal, treeduck are found throughout the year at suitable habitat. Dabchick is also a residential bird.

Other game birds like partridges and quails are also common in the district. Indian black partridge (the state bird) and grey partridge are common. Grey quail is a winter visitor, while black breasted or rain quail, jungle bush quail, whistler and rock bush quail, little bustard quail, Indian yellowlegged button quail, Indian bustard quail are resident species.

Sandgrouse, namely the Indian sandgrouse, has been noted as

1. The zoological names can be seen in the table at the end of the chapter.

resident bird while large pintail sandgrouse, spotted sandgrouse, Imperial or blackbellied sandgrouse visit the district in winter. Their flocks, large and small, regularly visit favourite waterholes.

Among pigeons and doves, Bengal green pigeon is found in the vicinity of villages chiefly on *figus* trees and blue rock pigeon occurs in almost all the villages. Western turtle dove is a winter visitor. Indian ring dove, Indian red turtle dove, Indian spotted dove, Indian little brown or senegal dove and Indian emerald dove are generally found in all cultivated fields.

Birds of Economic Importance.—Scavengers like, pariah kite, Brahminy kite, whitebacked vulture, king vulture, tawny eagle, greater spotted eagle, white-eyed buzzard eagle, house crow, Indian jungle crow, etc. keep the district cleared of dead animals by feeding on them. The Indian scavenger vulture besides feeding on dead animals, consumes a large quantity of human excreta. Predators like blackwinged kite, Indian *shikra*, laggar falcon, shahin falcon, redheaded merline and kestrel are residential birds of the district. Others like booted hawk eagle, eastern steppe eagle, pale harrier, montagus harrier, marsh harrier, etc. visit the district in winter. These along with spotted owl, eagle owl and mottled wood owl keep a check on the population of not only rodent pests but also various insect pests by eating them.

The challenge of insect pests is also met with by various insect eating birds, both resident and migratory. Swifts, such as Indian house swift, Indian Alpine swift, Indian palm swift and swallows like western swallow, Indian wiretailed swallow and Indian striated swallow consume insects as their staple diet. Shrikes or butcher birds as they are popularly called, feed upon insects. Shrikes found in the district are Indian grey shrike, Indian bay-backed shrike and rufous-backed shrike. Other insect eating birds are king crow, Brahminy myna, Indian pied myna, Indian myna, bank myna and northern jungle myna. Babblers, warblers and flycatchers of various species feed on different types of insects. Larks and wagtails feed on a considerable amount of worms in addition to insects. Rosy pastor and common starling, both winter visitors may specially be mentioned for their role in destroying numerous insects including locusts on a large scale and thus help in saving crops to some extent.

Colourful birds.—The colourful birds add beauty to the varied wildlife of the district. The most common colourful birds are : blue jay, northern green barbet, coppersmith, northern goldenbacked woodpec-

kers, Indian golden oriole, large Indian parakeet, rose-ringed parakeet, pied crested cuckoo, *koel*, common crow pheasant, kingfishers such as small blue kingfisher, white breasted kingfisher, Indian pied kingfisher, redvented bulbul, whiterared bulbul, verditer flycatcher, Indian magpie robin, Indian purple sunbird, *lalmunia*, Indian spotted *munia* and crested bunting, etc. The national bird of India, the common peafowl is quite common and is seen in orchards, fields and gardens.

Besides, such attractive birds as hoopoe, Indian small green bee-eater, Indian white-eye or baboona are also seen in and around villages.

Besides, different types of storks, cranes, ibis and egrets, lapwings are also found in the district. In the river-bed, one can see various species of terns.

Reptiles

Snakes.—The poisonous snakes like common Indian krait, Russel's viper, *phoorsa* and other snakes like blind snake, Indian python, John's sand boa, wolf snake, rat snake and sand snake are found in the district.

Lizards.—The common lizards can be seen in the houses. *kirla* or *girgit* is found in the lawns and hedges and attracts the attention by changing its colours. *Sanda* is found in sandy areas. Besides, a few other types of lizards are found in bushes and areas of thick vegetation.

Amphibians

Tortoises.—Two species of tortoises are found in the district.

Frogs.—The common frogs found in the district are : Indian bull frog, Indian cricket frog, Indian burrowing frog and common toad.

Fish.—The different water courses of the district abound with many species of fish. The species important from the point of view of food and game are : the feather-back fish; *parri*, *katla*, *mrigal*, *chunni*, *bata*, *siriha*, *rohu*, *magur*, *singhara*, *ghally*. *mallee* and the snake-head fish, *dolla* and *curd*.

CLIMATE

The climate of the district is characterised by its dryness and extremes of temprature and scanty rainfall. The year may be divided into four seasons. The cold season from November to March is followed by the summer season which lasts up to the end of June. The

period from July to about the mid of September is the south-west monsoon season. The latter half of September and October constitute the post monsoon or transitional period.

Rainfall.—Records of rainfall in the district are available for five stations for sufficiently long periods. The details of the rainfall at these stations and for the district as a whole are given in tables I and II. The average annual rainfall in the district is 395.6 mm. The rainfall increases generally from the west towards the east and varies from 339.1 mm at Fatehabad to 428.4 mm at Hisar. About 71 per cent of the annual normal rainfall is received during the short south-west monsoon period, July to September, July and August being the rainiest months. There is significant amount of rainfall in the month of June, mostly in the form of thundershowers and in the rest of the year, there is very little rainfall. The variation in the annual rainfall from year to year is very large. In the 50 years period (1901 to 1950), the highest annual rainfall which was 235 per cent of the normal was recorded in 1977. The lowest annual rainfall amounting to only 33 per cent of the normal was recorded in 1938. In the same 50 year period the annual rainfall was less than 80 per cent of the normal in 16 years and two consecutive years of such low rainfall occurred twice. Considering the annual rainfall at the individual stations, such low rainfall in two consecutive years is quite common in the district. Such low rainfall has been recorded 4 times at Fatehabad and Hansi, three times at Hisar and twice at Tohana for two or more consecutive years. Even 4 consecutive years of such low rainfall occurred once at all stations in the district except Tohana. It can be seen from table 2 that the annual rainfall in the district was between 200 and 600 mm in 43 years out of 50.

On an average there are 24 rainy days in a year. This number varies from 21 at Tohana to 26 at Hisar.

The heaviest rainfall in 24 hours recorded at any station in the district was 346.7 mm at Hisar on August 16, 1926.

Temperature.—There is a meteorological observatory at Hisar and the records of this observatory may be taken as representative of the meteorological conditions prevailing in the district in general. There is rapid increase of temperature after February. The mean daily maximum temperature in May, which is the hottest month is 41.6°C. On individual days the maximum temperature during the summer season may rise up to about 47° or 48°C. The hot scorching winds, which blow in summer add to the discomfort. Afternoon thundershower which occur on some days bring welcome relief, though only temporarily. With the advance of the monsoon by about the end of June, there is appreciable

drop in the day temperatures and the weather becomes cooler during the day time, but the nights are even warmer than those during the summer season. With the added moisture in the monsoon air, the nights are often uncomfortable. After the withdrawal of the monsoon in the latter half of September, the temperatures begin to decrease. The decrease in temperature is rapid after October and the drop in temperature after nightfall is particularly trying. January is generally the coldest month with the mean daily maximum at 21.7°C and the mean daily minimum at 5.5°C . In the cold season, the district is affected by cold waves in the wake of passing western disturbances and the minimum temperature drops down to about 3.0°C occasionally.

The highest maximum temperature recorded at Hisar was 48.3°C on May 30, 1944. The lowest minimum temperature was 3.9°C on January 31, 1929.

Humidity.—Relative humidity in the mornings is generally high during the monsoon season and during December to February, usually being about 70 per cent or more. Humidity is comparatively less during the rest of the year, the driest part of the year being the summer season with the relative humidity being about 30 per cent in the afternoons.

Cloudiness.—During the monsoon season, the skies are mostly moderately to heavily clouded. In the rest of the year, the skies are generally clear or lightly clouded. Cloudy skies prevail for brief spells of a day or two in association with passing western disturbances in the cold season.

Winds.—Winds are generally light in the district with some strengthening in force during the late summer and monsoon seasons. During the south-west monsoon seasons while winds from the south-west or west are more common, easterlies and south-easterlies also blow on some days. In the post monsoon and winter season while south-westerly or westerly winds are more common in the mornings, northerlies and north-westerlies are predominant in the afternoons. In the summer, winds are more common from the west or south-west in the mornings. In the afternoons, they are mostly from directions between west and north-west.

Special weather phenomena.—Some of the depressions which originate in the Bay of Bengal in the south-west monsoon season, and which move across the central parts of the country reach the district during the last stages of activity and cause widespread rain before dissipating. An occasional post monsoon storm or depression also affects the dis-

trict. Thunderstorms occur throughout the year but the highest incidence is during the monsoon season. Duststorms occur often during the hot season. Occasional fogs affect the district in the cold season.

Tables III to V give the temperature and humidity, mean wind speed and special weather phenomena respectively for Hisar.