DISTRICT GAZETTEER OF GAYA.

CHAPTER I.

PHYSICAL ASPECTS.

Location.

The district of Gaya lies between 24° 17′ and 25° 19′ north latitude and 84° and 86° east longitude and has a total area of 4,766 square miles. It is bounded on the north by the Patna district, on the east by Monghyr and Hazaribagh districts, on the south by Hazaribagh and Palamau districts and on the west by the river Son. The administrative headquarters of the district is located at Gaya which is the chief town of the district and is almost centrally located. The total population of the district according to 1951 Census is 3,070,499.

Gaya formed parts of Bahar and Ramgarh districts till 1865. When the Bihar subdivision was transferred to the Patna district in that year, a new district known as the district of Gaya with Gaya as its headquarters was created.

Origin of Name.

The name Gaya according to Bhagwat Purana owes its origin to a demon king Gayasur who dwelt in the town in the *Treta Yuga*. But according to Vayu Purana Gaya was the name of a demon whose story has been described in the chapter on History.

Gaya is one of the holiest spots for the Hindus and hardly a day passes when there is no Hindu pilgrim to offer *pindas* in the Gaya *kshetra* or *dham* as it is called. Situated seven miles south of Gaya town is Bodh Gaya, the most holy place for the Buddhists. Buddhists from different countries visit the spot almost daily. It is at Bodh Gaya that Lord Buddha achieved *nirvan* or enlightenment.

Topography (Physical Divisions).

The district of Gaya is broadly divided into two distinct physical units. The south is a region of broken undulating country merging into long ranges of hills, with a wide belt of brushwood jungle at their base. Much of this tract is high and barren and incapable of much cultivation; the soil has poor crops and the population is sparse. These high lands project into the alluvial plains to the north as spurs from the Chotanagpur plateau. The greater part of the district, however,

consists of the flat alluvial plain mentioned above which comprises the whole of Jahanabad subdivision and the northern portions of the headquarters, Aurangabad and Nawada subdivisions. This wide alluvial plain of the north forms part of the Gangetic depression with alluvial deposits of immense depth and is broken here and there by groups and low ranges of hills or isolated peaks arising abruptly from the level country at their feet. They gradually disappear the further north one goes, and the Jahanabad subdivision is almost entirely a level plain. The whole of this tract is drained by a number of rivers, which debouch from the southern hills and follow, more or less, in parallel courses towards the Ganges or Ganga river. During the rains they are subject to violent floods; and as the general slope of the country northwards is comparatively rapid, they flow swiftly when in floods, but in dry season they dwindle into trickling streams or lines of pools in the midst of long expanses of sand. The alluvial plain is protected from drought by a wonderful system of indigenous irrigation consisting of *ahars* (reservoirs) and *pains* (channels). It is, therefore, a region of great fertility when compared with the southern part of the district and is comparatively densely populated.

The northern portion, which is highly cultivated and extensively irrigated, was in very early times a civilized country and the home of Aryan races; it was part of Magadh, the nucleus of the first great empire in India and the centre of Buddhism for many centuries; in later years it was the arena of the conflicts of contending armies. The south was for long the shelter of aboriginal tribes and did not yield to the advance of civilization till a later period in the history of the district. It was comparatively untouched by Buddhism. It is still thinly peopled and has a small percentage of cultivated lands.

GEOLOGY.

The impact of the Himalayan compression caused a series of through faults in the northern part of the Chotanagpur plateau and down warping in the southern. The Gangetic alluvium now fills up this ' foredee ' between the Chotanagpur plateau and the Himalayan mountains. The northern and central parts of the district are occupied by this Gangetic alluvium, but older rocks rise above its level, chiefly in the south and east. The hilly tract of Chotanagpur gradually descends to the plains of South Bihar and outliers are found in both Gaya and Patna districts. The Gidhour Hills, which lie across the southern boundary of Gaya and Monghyr are composed of Dharwars, including micaceous and ferruginous schists so highly metamorphosed by intrusive coarse pegmatitic granites that they yield workable mica. The Rajgir Hills in the north-eastern part of the district are mainly quartzite and slate and very barren because of the lack of forest conservancy. The Vindhya rocks, spreading beneath the Son, but gradually overlaid by alluvium and volcanic rocks of the porcellanic group of the same formation, occur in a belt in the west of Gaya about Nabinagar.

The older rocks of the south and east are composed for the most part of a foliated gneiss, consisting of a great variety of crystalline rocks forming parallel bands and known in the geological nomenclature of India as the Bengal gneiss, a subdivision of the Archaean system which contains the oldest rocks of the earth's crust. Scattered at intervals amidst the Bengal gneiss, there are in the east of the district several outcrops of another very ancient series, resembling that described in southern India under the name of Dharwar schists, and constituting another subdivision of the Archaean system. Owing to the predominance of massive beds of quartzite, these beds stand out as abrupt ridges, the principal being the long range stretching from near Bodh Gaya to Rajgir and the hills in the south-east of the district. The well-bedded quartzites form the steeply inclined ridges and isolated hills, the best example of which is the Brahmayoni Hill in the vicinity of the town. Not only are these rocks everywhere altered by ' regional metamorphism ' caused by the great pressure that has thrown them into close-set synclinal and anticlinal folds as expressed by the elongated shape of the ridges, and high dips of the strata with the inducement of slaty clevage, but they have further been affected to a great extent by ' Contact Metamorphism ' from the intrusion of great masses of granite and innumerable veins of coarse granitic pegmatite, by which the slates have been further transformed into crystalline schists. In its more massive form the granite is relatively fine-grained and very homogeneous, and it weathers into great rounded hummocks that have suggested the name of ' donegneiss ', by which it is sometimes known, though the term ' dome-granite ' would be more appropriate. But it is the narrow sheets of the same intrusive group where they cut across the metamorphosed schists as excessively coarse granitic pegmatites that are of most practical importance on account of the mica which they contain, the south-east corner of the district being situated in the middle of the rich mica-bearing belt of Bihar. The Rajgir Hills, consisting of slaty schists and quartzites are less metamorphosed, but contact effects are well seen in the Maher Hill, and in the detached spurs forming the south-western continuation of the Rajgir range near Gaya, where idols and utensils are extensively wrought from the soft serpentinous rock of the converted schists.

The central and northern portions of the district, which are now occupied by the Gangetic alluvium, are dotted with remnants of Dharwar rocks and this leads us to think that this portion must have been a region of Dharwar Hills, forming the cover of the batholithic intrusion. But due to age-long denudation it was eroded. Later the alluvium of the Ganges was deposited on their eroded surface, but the high hills remained exposed and rose abruptly like islands above a sea of alluvium.

Hill System.

In the midst of alluvial ocean are dotted here and there islets of Archaean rocks of small hill ranges which are the outcrops of the

Chotanagpur plateau. The most remarkable of these long low outlying ranges are the Ganjas, Bhindas and Jethian ranges, which extend from near Bodh Gaya north-eastward for a distance of 40 miles with only two breaks and rises at the Hadia Hill to a height of 1,472 feet. The other ranges seldom exceed 1,000 feet and few of the isolated peaks are of any great height, the highest being the Maher Hill which rises to a height of 1,606 feet. Of the hills that are isolated and scattered the most noticeable are the Barabar Hills, the Hasra, Pahra and Chirki Hills, the Brahmayoni Hill and a host of others.

The view from the Brahmayoni Hills at Gaya presents a striking picture of a low land country dotted with hills. On a clear day in the rains one could see the rugged ravines and rocks overlooking Gaya to a country green with crops and groves of palm trees, with hills rising on all sides from the level plain. The town of Gaya has a ring of hills round her, the Ramshila Hills (715 feet) on the north, Katari Hill (454 feet) on the west, and Brahmayoni Hill (793 feet) on the south. To the north-west of the town is the Pretshila Hill (873 feet). About fifteen miles to the north of the town can be seen the outline of the Barabar Hills (1,023 feet) and close by them the solitary peak of Kauwadol. Kauwadol is a huge perched boulder and according to the legend it rocks even when a crow sits on it. All these hills are bare of vegetation and have apparently suffered destruction at the hands of natural and human agencies. The Barabar Hills, however, are covered with open scrub. To the south-east is a long range of red rock stretching to the north-east and sinking to the plain near Bodh Gaya. This range is not very high but further east the hills are higher reaching to a maximum of 1,606 feet in the Maher Hills. To the west the landscape shows the imposing contours of the Pahra Hill (1,192 feet) and beyond it one detached hill succeeding another as far west as Dwarpar Pahar (917 feet) and Ranidih Pahar (897 feet).

The hills on the southern border of the Gaya district are merely the northern scraps and outliers of the Palamau and Hazaribagh plateaus. The lower plateau of Hazaribagh (over 1,000 feet) forms an undulating tableland with many high peaks, some of which are near about 2,000 feet sloping down on all sides till it reaches the *ghats* (step-like descend) in the north above the plains of Gaya (Sherghati and Rajauli). The southern edge of the Gaya district which is cut up by a number of ridges and spurs projecting from the Chotanagpur plateau, attains an altitude of more than 1,800 feet in a few places, the Durva Sahi and Mahabar Hills in the Nawada subdivision being respectively 2,202 and 1,832 feet above sea level; the former is the highest hill in the district. Other notable hills in the south which are the outliers of the Chotanagpur plateau are Murgara Pahar (1,349 feet), Satgharwa Pahar (1,145 feet), Bazari Pahar (1,359 feet), Loharowa Pahar (1,114 feet), Songa Pahar (1,000 feet), Harla Pahar (1,033 feet), Thari Pahar (1,189 feet), Gidha Pahar (938 feet) and Charkahi Pahar (1,010 feet) in the Sadar subdivision, Sringirikhi (1,850 feet) in the Nawada subdivision and Pawai, Dugul and Pachar

Hills in the Aurangabad subdivision. It is said that the old saints like Durvasa, Lomas, Gautam and Sringi lived on the hills in Nawada subdivision and it is after them that the hills are known as Durvasarhi, Lomasgiri, Gotmi and Sringirikhi.

The appearance of the different hills furnishes some striking contrasts. The hills on the southern edge of the district are completely covered with a soft clothing of vegetation, chiefly of *sal*, *kend* and other trees. On the hills scattered over the remainder of the district, the vegetation has gradually been cut down or lost owing to the erosion of the clay and the rocks and the boulders are in many cases left completely bare. The effect is almost equally picturesque as the hills stand out in rugged bareness. They are strangely different in colour and form. Some like the Barabar Hills are composed of giant black boulders piled one above the other leaving great caverns beneath; others, like Maher, are of red rock, much weathered, with rounded side and easy slopes, and others again, like the Jethian range, have steep rocky sides mounting to a knife like ridge at the summit.

WATERFALLS.

As the hills in the south slope down to the plains of Gaya in the form of step-like arrangements several picturesque waterfalls are noticeable, the most beautiful of which are the falls of the Mohana and the waterfall at Kakolat in the long ridge running from east to west ten miles south of Nawada. In this connection it may be mentioned that while the higher plateau surface of Hazaribagh extends over different types of rocks with varying resistance and the rivers are shallow and flat-bottomed, the lower plateau is deeply dissected with rugged surface and the rivers pass through narrow gorges and defiles in many places. The lower plateau and hilly country is heading towards maturity in its present cycle of erosion. Here the rivers have steep gradients and many waterfalls. The Mohana, draining the northern slope of Hazaribagh plateau, flows through a long and narrow gorge from below its confluence with Garhi about three miles north-west from Itkhori. It is nearly six miles long with a fall of 100 feet at some distance within the gorge. The falls of the Mohana are just beyond the border of the district, but can easily be reached from Kahudag. The first fall at Tamasin is situated at the head of a deep valley, where the river plunges abruptly down a high steep face of black rock into a shady pool below and then dashes down a gloomy gorge of strangely contorted rock; the lower falls at Hariakhal present a scene of more placid beauty, as here the river, issuing through a picturesque glen glides down a sloping slide of red rock into a still large spur surrounded by high wooded banks. At Kakolat a hill torrent, from the Mahabar Hill (1,832 feet) tumbles down a long series of cascades, buried in thick woods and extending far up the side of the hill till it makes a final leap over a precipice some 90 feet high near the foot of the crag, and then hurries down over a rock-strewn bed to the plains below.

River System.

Since the high lands lie in the southern and low lands in the northern parts of the district, the rivers take their rise in the highland of the Chotanagpur plateau and flow from south to north in almost parallel courses. On account of the seasonal character of rainfall the streams suffer from a lack of perennial supply of water in them, and hence they are turbulent and devastating during the rains but are reduced to tiny rivulets winding in tortuous course over wide sandy beds soon after the rainy season is over. The rivers of the district are the Son, Poonpoon, Adri, Madar, Dhawa, Morhar, Jamuna, Phalgu, Paimar, Dhadkar, Tilaiya, Dhanarji and Sakri. All these rivers flow from south to north towards the Ganges but it is the Son and Poonpoon alone that are able to reach the Ganges or Ganga; others are used up before joining the Ganges or Ganga in the network of *pain* or artificial water channels used for purposes of irrigation or their water is collected in a huge lake in the Barh subdivision of the Patna district. These rivers are very useful from the agricultural point of view during times of scarcity of rainfall. Some of the rivers like Poonpoon, Dhawa, Jamuna and Paimar rise below the hills and have, therefore, deep clayey beds though in hilly portion of their courses their beds are rocky and their banks steep. During the rains these rivers are so swollen and turbulent that they carry down with them enormous quantity of fine sand and gravel which are deposited lower down. Their beds are thus raised and a large area of land used to be inundated with flood water on either side but much of the flood water is now diverted into small *pains* or *ahars* which are used for irrigation purposes. The sudden rise and fall of water level in these rivers is remarkable. After heavy rain in the hills they become swollen torrents but they fall as rapidly as they rise and become fordable again within a few hours. Their beds are so sandy and the current is so rapid that within a few months, sometimes within a few weeks after the rains stop, they are almost dry and for the rest of the year they are reduced to tiny streams.

The Son.

The most important and principal river of the district is the Son which rises near the sources of Narbada and Mahanadi in the elevated plateau of Central India near Maikal Hills. It traverses a course of nearly 325 miles through a hilly tract until it enters the Gangetic valley opposite Akbarpur in Shahabad district. It then runs almost straight to the north for about 100 miles through the plains of South Bihar until it finally joins the Ganges or Ganga a few miles north-west of Maner which is about 20 miles west of Patna.

The Son forms the western boundary of the district and nowhere enters the district although there is evidence to show that its previous course was a little to the east of its present course and that it joined the Ganges as far east as Futwa in Patna district. The river first

touches the district opposite Akbarpur about 400 feet above sea level, and then passes Barun, Daudnagar and Arwal and then leaves the district.

After entering its valley stage the river attains a great width and all through its journey along the western boundary of the district the river is nowhere less than two miles wide and in places the width extends to three miles. Another peculiarity of the river is that on its eastern bank there is heaped up an enormous quantity of sand due to the prevailing westerly winds during the hot weather season with the result that the eastern bank becomes a sort of natural embankment for many miles. Another characteristic noticeable in the river is its meagre stream of water at ordinary times as compared with the enormous breadth of its bed, its vast size and its paroxysmal violence during floods. In April or May the river presents a wide stretch of drifting sand with an insignificant stream of water meandering from bank to bank. But in the rainy season, and specially after a storm has burst on the plateau of Central India, the river presents a great contrast. It drains a hill area of 2,300 square miles and the entire rainfall of this enormous catchment basin requires to find an outlet by this channel and after heavy rain the river rises with incredible rapidity. The river frequently proves unable to carry off the total flood discharge and the flood waters rush down so violently as to spill over its broad bed and occasionally cause disastrous inundations in the low-lying plains on either side. These floods are, however, of short duration, hardly lasting for more than three to four days and the river quickly sinks to its usual level.

The Son receives no tributary of any importance from the point where it enters the district until it joins the Ganges or Ganga. Several small rivers join the Son in its earlier hilly tract including the river Koel which comes from the south-east and joins the Son in Palamau district. As mentioned before the Son does not enter the district and after passing Barun, Daudnagar and Arwal leaves the district. At Barun there is a massive masonry dam on the river which supplies a head for the Son and from where waters are distributed east to the Gaya and Patna districts and west to Shahabad. The river can be crossed at many points during the dry season but ferry boats generally ply for eight months in the year. Below Akbarpur the slope of the river becomes very gentle but the presence of rocks and rapids above Barun effectually stop river traffic. Navigation is carried on in the lower reaches of the river but it is of little commercial importance because it is rendered dangerous by the violence of the floods during the rainy season and during the rest of the year navigation is not possible for any but small boats owing to the small depth of water. Bamboos and timber are floated down the river bound into rafts specially when there is sufficient water in the river but it becomes a tedious process during the dry weather.

The Son has a historical interest. It is probably identical with the Erannobas described by Megasthenes as the third river of India

after the Indus and the Ganges and that it used to discharge its water into the latter river. The word Erannobas appears to be a corruption of the Sanskrit ' Hiranyabahu ' or golden-armed, a name formerly given to the river and apparently derived, like the name Son (the river of gold), from the golden colour of the sand it brings down in flood when it flowed far to the east and joined the Ganga near Futwa in Patna district, and the ancient town of Pataliputra (modern Patna) was situated at its confluence. The old course of the river may still be traced across the district in a sandy depression forming a number of *jhils* (lakes) in the rainy season. From Daudnagar it flowed north-east as far as Son-bhadra on the river Poonpoon. From this place it followed the present course of the Poonpoon being joined by the Morhar river about four miles to the west of Jahanabad and then flowed to the north, finally joining the Ganga at Futwa. The Son has gradually receded westward and made fresh channels for itself. In some old documents Nadi, a village in the Arwal Thana, is described as Nadi on the bank of the Son. This village is now ten miles from the river on the edge of one of the channels. Traces of old course of the river were noticed by officers engaged in the construction of the Patna-Gaya canal, one of which was used in laying out its line. Old river beds have also been found between Bankipur and Dinapur. It was also mentioned by Mr. Twining, the then Collector of Shahabad in 1801-04 that in his time the river broke through the eastern bank in high flood and flowing along what was recognized as its old channel had inundated the cantonment of Dinapore.

The Poonpoon.

Another river is the Poonpoon which flows to the east of the Son and almost parallel to it towards the Ganga. This is the only river flowing through the district which retains water throughout the year. The Poonpoon rises in the lower reaches of the highlands of Palamau district. Leaving the highlands the Poonpoon flows almost north after entering the Gaya district and passes Nabinagar, a little to the north of which place the river takes a slightly north-easterly course and continues flowing in north-easterly direction until it crosses the boundary of Gaya district and enters the Patna district. The river receives several small feeders on its right bank all coming from the south. They are Ram Rekha, Barki, Batane, Adri, Madar and Bilaro. These streams dry up in the hot weather and even when full the greater part of their water seldom reaches the Poonpoon because several artificial channels disperse their water over the fields. The water of the Poonpoon is extensively used for irrigation by the adjacent villages and it is dammed at several places for this purpose, the principal Bandhor dam being at Kussreh in the Jahanabad subdivision.

The Poonpoon has other tributaries also besides those mentioned above, but they do not join her in Gaya district. One of these is Morhar which rises in the Hazaribagh plateau and flows northward past the villages of Raniganj and Imamganj after which it takes a

north-easterly turn until it reaches the town of Sherghati where the Grand Trunk Road is carried over it on two fine bridges spanning the two arms into which it here divides. A little to the north of Sherghati the two arms join into one for some distance when again it bifurcates. The main stream is known as the Morhar and the other is known by the name of Sorhor river far commonly known as Burhi. A little south of Tekari the two streams again join into one, but after passing Tekari it is again divided into two branches, one the Morhar flowing in a northerly direction to the district of Patna, while the other, the Dardha, flows by Jahanabad, and during the rainy season floods a large tract of country round that place. Some high land to the north forces the excess of water to disperse itself over this part of the district and it only reaches the Poonpoon during high floods. The next stream, the Jamuna, which rises within the district flows from the south almost parallel to the Morhar between Gaya and Tekari; then turns east, passing the Patna-Gaya road at Makhdumpur and flows on beyond Tehta when it twists back and joins the Dardha at Jahanabad.

The Poonpoon is believed to be a sacred river for the Hindus and it is the duty of the pilgrim on his way to the holy city of Gaya for performing *sradh* to shave his head on its bank and bathe in its water. Pilgrims offer *pindas* also on its bank near the Poonpoon station on the Gaya-Patna railway line.

The Phalgu.

The Phalgu is another river which flows south to north through the heart of the district. It is formed by the junction of the Nilajan and the Mohana some two miles below Bodh Gaya. They are the two large hill streams which take their rise in the Hazaribagh plateau. Both these rivers are very turbulent on their entering the plains of Gaya as they are subject to high floods. The Mohana enters the district about 20 miles to the south-east from Gaya town. The Nilajan enters it about 11 miles south from Gaya. The two streams which are about 300 yards wide unite near Mankosi village, about 5 miles south of Gaya town, and then the united stream is known by the name of Phalgu which flows on to the north, passes the town of Gaya where it attains a breadth of over 900 yards. The Phalgu here impinges on a high rocky bank on the steep side of which are many *ghats* leading down to the river bed, while above high water is the Vishnupada temple with many minor shrines and the houses of the Gayawals. It then runs in a north-easterly direction for about 17 miles; and opposite the Barabar Hills it again divides into two branches one, the Phalgu, flowing in a northerly direction while the other, the Mohana, in a north-easterly direction. Both these branches enter the Patna district after flowing for a few miles and here again they are divided into numerous branches and their water is taken to several canals and *pains* for irrigation purposes. The river Phalgu is thus hardly able to reach the Poonpoon, although one of its branches falls into the branch of the Poonpoon called Dhorja in Patna district.

The Phalgu like the confluent streams of the Mohana and Nilajan is subject to high floods because of the destruction of forests in its catchment area. During the rains the water level rises very high and almost touches the road and railway bridges at Gaya; but at other seasons of the year it is nearly dry and dwindles to an insignificant stream wandering through a wide expanse of sand dotted here and there with stagnant pools. Steps are being taken however by the State Government of Bihar to minimise the danger from its floods by constructing dams and weirs on the river. A great part of its water is diverted for the purpose of irrigation and is distributed among the fields by a series of irrigation channels, the most important of which is the Jamuawan *pain* opposite the Barabar Hills which has converted the whole area into rich paddy fields.

The river Phalgu is respected by the Hindus for its sanctity and the portion of its course flowing by Gaya is held sacred by the Hindus. It is the first holy site visited by the pilgrim and here he makes his first offerings for the soul of his ancestors. According to the Gaya Mahatmya, the Phalgu is the embodiment of Lord Vishnu himself. One tradition states that it formerly flowed with milk and another states that Sita offered *pinda* on its bank to Dasarath, the father of Rama.

To the east of the Phalgu the district is drained by a number of parallel rivers of which the chief are the Dhadhar, Tilaiya, Dhanraji, Khuri and Sakri. The Dhadhar also rises in the Hazaribagh plateau, enters the plain in Gaya district and flows in a northerly direction until it reaches Majhwe Hill from where it takes a north-easterly direction and is crossed by Gaya-Nawada road and Gaya-Kiul railway line. After flowing for a few miles it is joined by the Tilaiya river from the south which has its source in the southern hills of Gaya district. The united stream is known as the Punchaneh river and this also flows in a north-easterly direction parallel to the Jathian Range and Rajgir Hills. After a few miles of its course the Punchaneh is joined by the combined streams of the Dhanraji and Khuri near Madhuban village on the border of Gaya and Patna districts. The Sakri river enters the Gaya district near Gobindpur in the Nawada subdivision and flows west through a gap between two hills. After crossing the hills it takes a northerly direction and flows on until it leaves the Gaya district and enters the Patna district about two miles east of Giriak and joins Punchaneh lower down. All these rivers have many meanders in their courses through the plains. They have all broad sandy beds and their width varies from 384 feet to 1,050 feet. They are extensively used for irrigation.

As all the rivers of the district are hill streams coming as they do from the Palamau and Hazaribagh plateaus, they are liable to high floods during the rains. It is with the intention of checking their floods and utilising their waters for irrigation that the State Government of Bihar have several schemes of constructing bunds or dams on these rivers. Some of these schemes have already materialised while work is in progress in others.

CLIMATE.

Temperature.

The district of Gaya enjoys a continental monsoon type of climate owing to its great distance from the sea. Summers are very hot and winters cool. In summer the maximum temperature for a day has been noticed to rise as high as 118.5° (10th June, 1947) and 117° (12th June, 1931) and in winter the minimum temperature recorded so far has been 38.9° (8th January, 1874) and 40° (18th January, 1913). But such differences of temperature are exceptional and occur very rarely. The average annual temperature rises to 105° in June and comes down to 47° in December; but the following table shows that the lowest mean temperature is 62.5° in December and highest mean is 96° in June in one particular year.

Table showing maximum, minimum and mean monthly temperature.

Months.	Max.	Min.	Mean.	Months.	Max.	Min.	Mean.
January ...	76.3°	55.0°	66.6°	July ...	91.0°	79.0°	85.0°
February ...	81.3°	56.2°	68.5°	August ...	89.0°	74.0°	81.5°
March ...	93.0°	61.0°	77.0°	September ...	89.0°	76.0°	82.5°
April ...	105.0°	76.4°	90.5°	October ...	87.2°	68.0°	72.6°
May ...	108.0°	82.0°	95.0°	November ...	79.3°	62.7°	71.1°
June ...	107.0°	85.0°	96.0°	December ...	75.5°	49.5°	62.5°

From the above table it can also be deduced that the annual mean temperature is 92.3° and the annual range of temperature is 33.5°.

Based on observations from 1881 to 1940 by the Government Meteorological Department of India the mean maximum and mean minimum monthly temperatures are as follows :—

Months.	Max.	Min.	Months.	Max.	Min.
January ...	82.9°	45.1°	July ...	99.6°	74.9°
February ...	90.0°	48.8°	August ...	95.4°	74.8°
March ...	102.0°	57.2°	September ...	95.8°	73.8°
April ...	109.0°	67.6°	October ...	94.4°	63.5°
May ...	112.1°	71.5°	November ...	88.6°	52.5°
June ...	110.8°	74.2°	December ...	81.8°	46.1°

The above table indicates that Gaya has great extremes of temperature. Mean temperature varies from 64° in January to 92.5° in June. The temperature rises generally to 105° in summer but 110° is not unusual.

The year can be divided into well marked seasons—cold weather season lasting from November to the middle of March, hot weather season from mid-March to mid-June and rainy season from mid-June to October. Generally October is not a rainy month but sometimes monsoon continues till this month and the last spell of rain (*hathia*) does come during this month although its failure is not uncommon.

In the cold weather the days are bright and warm and the sun is not too hot. The maximum temperature during the day rarely exceeds 75°. As soon as the sun has set, the temperature falls and a fire is a comfort. The minimum temperature during this season rarely goes below 49°. The district enjoys a long cold weather which commences early in November and ends with the close of March when hot weather sets in with strong west winds which lasts up to the end of May.

In the hot season Gaya is very unpleasant. The intensive heat of Gaya seems to be due partly to the sands of the Phalgu and partly to the arid and bare rocks of the surrounding hills. There is a severe dry heat. Temperature rises to more than 110° as the summer season advances until the middle of June when the monsoon bursts from the Bay of Bengal and the temperature is brought down below 100°. Nights are sometimes very uncomfortable and hot winds, generally known as *loo*, continue blowing from mid-day to a little before midnight. Dust storms are also common. When the *loo* gives place to an east wind by the middle of June the air is moist and enervating and the heat is extreme.

Humidity.

During summer the humidity is much lower than during other months owing to the hot and dry westerly winds prevailing in this period and averages only 41 per cent. With the approach of the monsoon season the air slowly becomes more charged with moisture and humidity remains steady at 80 to 84 per cent throughout July and August. In September when fine weather alternates with the cloud and rain of the monsoon humidity is lower and it gradually falls and reaches a minimum of 70 per cent in November. There is then a slight increase partly because of the unsettled weather caused by the cold season disturbances. The following table gives a picture of the average relative humidity monthwise based on observations from 1881 to 1940 :—

January—66 per cent.	July—78 per cent.
February—63 per cent.	August—80 per cent.
March—36 per cent.	September—78 per cent.
April—25 per cent.	October—71 per cent.
May—39 per cent.	November—67 per cent.
June—56 per cent.	December—70 per cent.

If, however, humidity chart for one particular year is examined it gives a slightly different picture as is evident from the following table of humidity of Gaya for 1948 :—

Mean Humidity.

January—76 per cent.	July—78 per cent.
February—59.5 per cent.	August—87.5 per cent.
March—55 per cent.	September—84 per cent.
April—38.5 per cent.	October—61.5 per cent.
May—54 per cent.	November—65 per cent.
June—62.5 per cent.	December—41 per cent.

Winds.

By far the most prevalent winds are from the east and west. From the beginning of January to the end of March the west winds usually prevail; from thence to the middle of June the east and west winds are nearly balanced. From that period to the end of July the east winds prevail. From the end of July to the end of August the west winds prevail. From thence to the end of October the east winds return and finally from that period to the beginning of January the east and west winds are nearly balanced. But to be more precise and brief it can be said that the winds are westerly from October until May and a marked change takes place with the commencement of the monsoon which enters from the Bay of Bengal. The flow of the moist winds from the Bay of Bengal is northwards over the plains of Bengal but afterwards they turn to the west owing to the barrier interposed by the Himalayan range. After the passage of the cyclonic storms easterly and south-easterly winds set in and continue with but little interruption until the middle of September when westerly winds again become common. The west winds are injurious to vegetation and if strong early in the season injure the crops of wheat and barley. They dry up the juice of palms. Easterly wind is more helpful for juice to the palms.

Rainfall.

The district receives more than 90 per cent of its total annual rainfall from the monsoon during the rainy season which lasts from the middle of June to October. During the months from November to May, fine dry weather prevails, with an almost entire absence of clouds and rainfall and only a fraction of an inch of rain falls monthly. The commencement of the rainy season is marked by the bursting of the monsoon, the time and date of which is rather uncertain. In normal years the monsoon breaks in June and the heaviest rainfall occurs in July and August varying from 12.1 inches in the former to 11.8 inches in the latter month. From the middle of September the monsoon current begins to fall off in strength; and if the westerly winds are stronger than usual, the storms coming inland from the Bay of Bengal recede eastwards and rainfall is consequently deficient. The rainy season

comes to an end with the fall of ' *hathia* ' rain, generally in October which is very beneficial for the rice crop and preparation of land for *rabi* sowing and the failure of this rain results in a poor harvest of rice and also *rabi*.

The following table gives an idea of distribution of rainfall normals monthwise for a number of places in the district of Gaya. The figures indicate rainfall normals in inches extending over a period varying from 25 to 70 years :—

Station.	Jan.	Feb.	Mar.	Ap.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Annl.
Aurangabad	0.71	0.76	0.49	0.27	0.84	5.82	13.28	14.48	7.57	2.21	0.43	0.22	47.08
Gaya ..	0·72	0.85	0.49	0.24	0.93	6.45	13.21	13.75	7.50	1.92	0.49	0.18	46.73
Nawada ..	0.66	0.84	0.44	0.30	1.28	5.82	11.07	11.90	6.75	2.03	0.35	0.17	41.61
Jahanabad	0.64	0.78	0.39	0.22	1.08	5.55	11.49	12.84	7.38	1.95	0.44	0.17	42.93
Arwal ..	0.63	0.85	0.37	0.18	0.87	5.26	12.60	11.83	7.48	1.88	0.37	0.31	42.63
Daudnagar	0.75	0.86	0.39	0.18	0.78	5.42	13.23	14.26	7.48	1.94	0.53	0.22	46.04
Sherghati	0.74	0.88	0.54	0.19	0.79	5.64	10.97	12.52	7.82	2.11	0.49	0.19	42.88
Nabinagar	0.81	1.07	0.66	0.35	0.50	5.21	11.43	13.27	6.39	1.61	0.56	0.16	42.02
Rafiganj ..	0.71	0.79	0.41	0.30	0.63	5.01	13.21	16.00	7.75	1.93	0.43	0.19	47.36

From the above data it can be safely inferred that the district receives an average annual rainfall of 44.96 inches. The stations selected in the above table are such that they represent almost every corner of the district and they all go to show that the rainfall is almost evenly distributed in every part of the district. There is, however, slightly greater rainfall noticeable in the southern and south-western sector of the district which is probably due to the hilly and forested nature of the region. From the above table it is also clear that out of the 44 inches annual rainfall of the district nearly 40 inches fall during the rainy season, i.e., from June to October. Other months of the year have hardly an inch of rainfall. January and February are cold weather months and they have nearly two inches of rainfall from the western cyclones which originate in the Mediterranean Sea during this period. This rain is beneficial for *rabi* crops provided it is sudden and is immediately succeeded by sunshine but two or three days of cloudy weather with drizzling rain entirely cause withering of the crop of wheat.

The above table gives an idea of average rainfall spread over a number of years which indicates constancy but from a study of the following rainfall statistics of Gaya town it will appear that the rainfall is uncertain and variable even in one season from year to year.

Rainfall in inches of Gaya recorded at Gaya Hospital.

Months.	1945.	1946.	1947.	1948.
November to February ..	2.92	0.76	2.86	1.65
March to May	0.86	2.92	0.58	0.53
June to October	45.80	49.66	26.69	52.11

There is great variation between the monthly rainfall and normal rainfall of Gaya district as is apparent from the following statistics :—

	Monthly rainfall (inches).	Normal rainfall (inches).
March, 1951	0.42	0.47
April, 1951	0.27	0.26
May, 1951	0.05	0.87
June, 1951	6.40	5.46
July, 1951	10.61	12.48
August, 1951	8.32	13.50
September, 1951	4.77	7.58
October, 1951	1.09	1.94
November, 1951	0.01	0.50
December, 1951	Nil	0.20
January, 1952	0.02	0.74
February, 1952	0.36	0.96

Botany.

The alluvial country which forms the greater portion of the district presents in its botanical features a great contrast to the hilly tracts to the south. In the former sugarcane, poppy, rice and a great variety of other food-crops are extensively grown; the area under cultivation is bare or dotted over with clumps of bamboos and mango orchards; while the villages are frequently surrounded by groves of palmyra (*Borassus flabelliformis*) and date palm (*Phoenix sylvestris*). Numerous more isolated examples of *Tamarindus*, *Odina*, *Sapindus* and *Moringa* also occur, associated with which one frequently finds in village shrubberies *Glycosmis*, *Clerodendron*, *Solanum*, *Jatropha*, *Trema*, *Streblus* and similar semi-spontaneous and more or less useful species. In the rice-fields which cover the low-lying lands, the usual weeds of such localities are found, such as *Ammannia*, *Utricularia*, *Hygrophila* and *Sesbania*. Elsewhere a dry scrub jungle is sometimes met with, of which the principal species are euphorbiaceous shrubs, *Butea* and other leguminous trees, and various examples of *Ficus*, *Schleichera*, *Wendlandia* and *Gmelina*. The grasses clothing the drier parts are generally of a coarse character, such as *Andropogon contortus*, *aciculatus*, *annulatus*, *foveolatus* and *pertusus*, *Aristida adscenscionis*, *Tragus racemosus*, *Iseilema laxum*, various *Anthistrioe*, and *sabai* grass

(*Ischoemum angustifolium*) . Throughout this tract the mango (*Mangifera indica*), Pepal (*Ficus religiosa*) and banyan (*Ficus indica*) are common, the other principal trees being the *bel* (*Aegle marmelos*), *nim* (*Melia azadirachta*), *siris* (*Mimosa sirissa*), *sisu* (*Dalbergia sissoo*), jack-fruit tree (*Artocarpus integrifolia*) and red-cotton tree (*Bombax malabaricum*).

In the hills a different class of vegetation is met with. The solitary peaks and ranges, which break the surface of the level plain in the heart of the district, have been almost entirely denuded, but they are still clothed to some extent with low thorny scrub-wood and masses of cactus, which make the ascent by any but frequented paths a tedious process. On some of the hills such as the Barabar Hills, there are a number of flowering shrubs and creepers, and after the rains the rocks are covered with graceful festoons of spiraea. Further south the cultivation is less extensive, the groves of palms near the villages are larger, and the bush jungle is more plentiful; it becomes a long belt of brushwood under the hills, stretching from east to west, and studded in places with a number of stately trees, sole survivors of a former forest, which give it a park-like appearance. It rapidly passes into a submontane forest, extending up the slopes that lead to the edge of the tableland of Chotanagpur, and resembling in many of its features the forest clothing the foot-hills of the Himalayas. This forest consists of stunted trees of no great height or girth, and it yields no timber of any size. But it is the main source from which the fuel-supply of the district is derived, and it is also rich in jungle products, from where the denizens of the jungle obtain a livelihood. The *kend* (*Diospyros melanoxylon*) yields the ebony of commerce; lac is obtained from the *palas Butea frondosa*); *tasar* silk-worms feed on the *asan* (*Terminalia tomentosa*) tree; and the long coarse *sabai* grass is made into a strong twine. Perhaps, however, the most useful of all the trees which clothe the hills and the undulating slopes at their base is the *mahua* (*Bassia latifolia*) which yields food, wine, oil and timber, and affords the lower classes a ready means of subsistence in times of dearth.

The work of afforestation has been taken up in the district of Gaya by the Forest Department as there had been a ruthless destruction of the forest in the past few decades. The Forest Department have also taken up the question of giving a forest belt and afforest the bare hills round the town of Gaya.

Fauna.

The carnivora of the district comprise tiger, leopard, bear, hyaena, wild dog, wolf and other smaller species. The ungulata are represented by *sambar* (*Cervus unicolor*), spotted dear (*Cervus axis*), barking deer, *nilgai* (*Boselaphus tragocamelus*), antelope, gazelle, four-horned antelope and wild pig.

Tigers (*Felis tigris*) inhabit the jungles of the southern ranges bordering on Hazaribagh and Palamau. They are not very numerous,

but wander a great deal; one or two, however, used to be always met with in certain favoured localities, such as Nawadih near Kauwakol, Dubaur, Singar, Dhanwa, Dhangain, Pinra near Sherghati and Delho-Kachanpur near Deo. But they have now become scarce owing to the thinning of the jungles. Leopards have also become almost extinct and have gone over to the thicker jungles of Palamau and Hazaribagh.

Hyaenas (*Hyoena striata*) are very common, almost every trap-rock hill holding one or more. They do not as a rule do much damage, living chiefly on carrion, but they occasionally carry off goats and dogs. Bears (*Ursus melursus*) are also common in all the jungly tracts along the hills and jungles; and many instances are known of their attacking wood-cutters and mauling them terribly. Wild pigs (*Sus cristatus*) swarm in some of the hills, such as Maher and the range running from Giriak to Mora Tal near Bodh Gaya, and are the cause of heavy damage to the *raiyats'* crops. They come down nightly in great numbers, and no efforts to scare them away have any effect. The thick thorn-hedges which the *raiyats* put round their crops afford no protection against their ravages, as the pigs go through these without hesitation and even firing off of guns only moves them from one patch to another. They are literally a scourge to the villages lying under these hill ranges, and during the time the rice crop is ripening each plot has to be guarded by night watchers. In these two ranges they multiply exceedingly owing to the fact that there are none of the larger carnivora, except a few leopards, to keep their number down. The larger hills to the south have camparatively few wild pigs, owing to the number of wild dogs and tiger.

Sambars (*Cervus unicolor*) are not very plentiful, and are only found on the higher ranges along the southern boundary. Their horns run to a very fair size, an ordinary head being over 30 inches. Spotted or *chital* deer (*Cervus axis*) are only found in certain localities, and are not very numerous. They are steadily on the decrease, as they are largely shot by local *shikaris* over water in the hot season. Barking deer (*Cervulus muntjac*) are rare, but are occasionally met with in the jungles of the southern hills. Four-horned antelopes (*Tetracerus quadricornis*) are also rare. They frequent the same localities as barking deer, and are generally met with when beating for or stalking *sambar*. *Nilgais* (*Boselaphus tragocamelus*) are only common in a few localities, such as the big grass *chars* of the Son river, but two or three are found here and there along the foot-hills of the southern range. Antelopes or black *bucks* (*Antelope cervicapra*) were formerly very numerous, all the high cultivated *tanr* lands holding big herds, but they are now fast disappearing. Gazelles or ravine deer (*Gazella bennetti*) were once fairly numerous along the broken ground at the foot of the southern hills.

Game Birds.

The game birds of the district consist of jungle spur and pea-fowl, grey and black partridge, common rain, button, bustard and bush quail, and sand grouse (*Pteroclurus exustus* and *Ptericles fasciatus*). Lesser

floricans are occasionally seen, and one great bustard has been shot. Two varieties of geese are found, the grey-lag and bar-headed, and among ducks the red-headed and white-eyed pochard, pintail and gadwall are most numerous. Widgeons are rare, but the spotted-bills breed in the *chars* of the Son river. Besides these, the following are found: the shoveller, ruddy sheldrake, common blue-winged teal, whistling teal, cotton teal, and the comb duck, the last three breeding here. Snipes of four varieties and golden plovers are met along the Son, and kulans (*Grus communis*) and demoiselle cranes (*Anthropoides virgo*) frequent the same locality. One Siberian crane (*Grus leucogeranus*) was shot some years ago. Most of the usual waders are met with.

The following are the birds recorded in the district of Gaya :—

Jungle Crow (*Corvus macrorhynchos*), House Crow (*Corvus splendens*), Treepie (*Crypsirina vagabunda*), Grey Tit (*Parus major*), Jungle Babbler (*Turdoides somervillei*), Common Babbler (*Turdoidesa caudata*), Red-vented Bulbul (*Pycnonotus cafer*), Red-Whiskered Bulbul (*Pycnonotus jocosus*), Collard Bushchat (*Saxicola torquata*), Redstart (*Phoenicurus ochrurus*), Brown-backed Robin (*Saxicoloides fulicava*), Dhayal (*Copsychus saularis*), Grey Shrike (*Lanius excubitor*), Wood Shrike (*Tephrodornis pondiceriana*), Small Minivet (*Pericrocotus peregrinus*), White-bellied Minivet (*Pericrocotus erythropygius*), Large Cuckoo Shrike (*Coracina Novae-hollandiae macei*), Black Drongo (*Dicrurus macrocercus*), Tailor Bird (*Orthotomus sutorius*), Ashy Wren-Warbler (*Prinia socialis*), Golden Oriole (*Oriolus oriolus*), Black-headed Oriole (*Oriolus xanthornus*), Grey-headed Myna (*Sturnus malabaricus*), Black-headed Myna (*Sturnus pagodarum afghanorum*), Common Myna (*Sturnus tristis*), Bank Myna (*Acridotheres ginginianus*), Pied Myna (*Sturnus contra*), Baya (*Ploceus philippinus*), Red Munia (*Estrilda amandava*), House Sparrow (*Passer domesticus*), Swallow (*Hirundo rustica*), Wire-tailed Swallow (*Hirundo smithii*), White Wagtail (*Motacilla alba dukhunensis*), Large Pied Wagtail (*Motacilla madraspatensis*), Grey Wagtail (*Motacilla cinerea*), Tree Pipit (*Anthus hodgsoni*), Paddyfield Pipit (*Anthus novae-seelandiae rufulus*), Golden-backed Woodpecker (*Dinopium benghalense*), Crimson-breasted Barbet (*Megalaima haemecephala*), Papiha (*Cuculus varius*), Koel (*Eudynamis scolopaceus*), Crow-Pheasant (*Centropus sinensis*), Lesser Crow-Pheasant (*Centropus benghalensis*), Rose-ringed Parakeet (*Psittacula krameri*), *Nilkanth* (*Coracias benghalensis*), Patringa (*Merops orientalis*), Pied Kingfisher (*Ceryle rudis*), Common Kingfisher (*Alcedo atthis*), Grey Hornbill (*Tockus birostris*), Hoopoe (*Upupa epops*), Batassia (*Cypsiurius parvus batassiensis*), Barn Owl (*Tyto alba*), Scops Owl (*Otus scops sunia*), Spotted Owlet (*Athene brama*), Pondichery Vulture (*Torgos calvus*), White-backed Vulture (*Pseudogyps benghalensis*), Scavenger Vulture (*Nephron percnopterus*), Red-headed Merlin (*Falco chiquera*), Brahminy Kite (*Haliastur indus*), Pariah Kite (*Milvus migrans*), Shikra (*Accipiter badius*), Sparrow-Hawk (*Accipiter nisus*), Blue Rock Pigeon (*Columba livia*), Spotted

Dove (*Streptopelia chinensis*), Ring Dove (*Streptopelia decaocto*), Red Turtle Dove (*Streptopelia tranquebarica*), Painted Sandgrouse (*Peterocles indicus*), Spotted-billed Pelican (*Pelecanus philippensis*), Little Cormorant (*Phalacocorax pygmaeus*), White-necked Stork (*Dissoura episcopus*), Openbill (*Anastomus oscitans*), Little Egret (*Egretta garzetta*), Cattle Egret (*Ardeola ibis*), Pond Heron (*Ardeola grayii*), Night Heron (*Nycticorax nycticorax*), Nukta or Comb Duck (*Sarki diornis melanotus*) and Brahminy Duck (*Tadorna ferruginea*).

Fish.

The Son contains *buali, tengra, bachua, rohu* and other small fish, and *mahseer* and *hilsa* are said to pass up when the river is in flood. The large tanks are stocked with *rohu, naini, katla*, etc. The fish-eating alligator or *garial* is common in the Son, as well as the *mugger* or snub-nosed crocodile, which also haunts large deep reservoirs in one or two localities.