CHAPTER V.

INDUSTRIES.

Old time Industries.

In the last *District Gazetteer of Shahabad* published in 1924, the following paragraphs mention the old time industries in the district:—

"As in other districts of Bihar, a large majority of the people are engaged in agricultural pursuits, no less than seventy-five per cent of the population deriving their livelihood from agriculture or pasture. Half of these are classed as actual workers (as distinct from dependent members of the households concerned); and these actual workers include 9,200 rent-receivers, 6,88,900 cultivators and 2,00,000 field labourers. Eleven per cent of the population are supported by industries, a smaller proportion than would have been inferred from the figures of the census of 1901. The difference is to be attributed, not to any recent decline in industrial activity, but to more careful classification. Enumerators were formerly apt to enter members of castes such as Barhi or Teli as following the industry appropriate to their caste, though they might really be cultivators.

"As is only natural in a district where the great majority of the people are engaged in agricultural and pastoral pursuits and where the urban population is small, the bulk of the industrial community are employed in supplying the simple needs of a rural people. Thus industries in connection with dress support 48,900 persons, of whom 13,000 are supported by the manufacture of boots and shoes. Again, working in precious metals supports 13,200 persons; but all these industries merely supply local needs. Manufactures in the more common sense of the word are few in number and of little significance. The Bihia sugar mills have been exported all over the province; and in the lime industry in the south of the district a raw material is prepared for export on a large scale; otherwise scarcely any of the industries produce anything for export, and those few which do are on a small scale.

"The manufacture of *gur* and molasses is carried out on a considerable scale by the cultivators who grow sugarcane, but this can hardly be reckoned as an industry

apart from agriculture. The only large refining factory is the turbine mill at Nasriganj.

"Paper was at one time made in large quantities at Hariharganj, and in 1872 there were twenty-one manufacturers who produced 1,293 reams of ten different qualities. The industry is now almost extinct; it has been unable to compete with the machine-made paper of Serampore, and the paper-makers have mostly betaken themselves to agricultural pursuits. The paper manufactured is called *basaha,* and is exported to Benares, where it is used by bankers who find it of superior durability.

"Weaving was formerly a large and prosperous industry, and Buchanan estimated that there were over seven thousand houses of weavers working in cotton with 7,950 looms. As in other parts of the province, the hand-made article has been driven out of the market by machine-made piece-goods, and the weavers have forsaken their hereditary calling for more profitable occupations. The weaving of coarse cotton cloth is, however, still carried on to a certain extent, as some people prefer it to machine-made stuff, as being more durable and warmer in the cold season. At the last census thirteen thousand cotton weavers were enumerated. Country blankets are woven by the shepherd caste, those made in Bhabhua being of good texture; and carpets of cotton and wool are manufactured in the Sasaram and Bhabhua subdivisions. At Sasaram they command a fair sale, but the industry is languishing owing to the importation of carpets from Mirzapur.

"The manufacture of lacquered pottery is a special industry at Sasaram. This pottery consists of ordinary earthen pots and vases painted over with lac. The designs and colouring display considerable taste, and though the industry is not extensive, the small cost of production and the high prices obtained leave a good margin of profit.

"The mineral resources of the district have hitherto been little exploited, except for the recent development of lime manufacture in the Son valley below the Rohtas plateau. *Kankar* is found in almost all parts of the plains, particularly in the beds of rivers and along the banks of the Son; it is used for metalling roads, and is also burnt in order to obtain lime. The sandstone quarried from the Kaimur hills is extensively used for

building purposes, for which it is admirably adapted. It is very durable, and even now the blocks which compose the great structures built by Sher Shah and his family show little signs of decay, while the inscriptions at Rohtasgarh are still as clear cut as if they had only recently been chiselled. On the construction of the Son Canals, when a demand for building blocks was created, the Irrigation Department succeeded in obtaining all the materials they required from the Dhaudhanr hill on the Sasaram-Tilothu road, and the East Indian Railway Company* used large quantities of stone extracted from the hills at Karaundia for the bridges and station buildings on the Mughalsarai-Gaya section, as well as for metalling the line. Besides this, small slabs are quarried near Sasaram for domestic purposes, being used for hand-mills and curry-stones. A small quantity of alum used to be manufactured about half a century ago in the area north of Rohtasgarh to the west of the Son, from slates belonging to the Kaimur group of the Vindhyan series; copperas or iron sulphate is also obtained in the same region.

"Limestone is found at the bottom of the precipices which surround the tableland and its ridges, in the deep glens behind Shergarh, and in the bed of the Karamnasa; large quantities are extracted and, when burnt, yield a good lime. The lime-burning industry was formerly in the hands of small local men; but towards the end of the nineteenth century, large firms, European and Indian, began to work the quarries in the Son valley on a considerable scale. The development of the industry was encouraged by Government, by the offer of special facilities to several companies to start limestone quarries in the Banskatti Mahal at low rates of royalty; so that, in spite of the handicap imposed by the long road journey to the railway at Dehri, the Son valley lime could compete on practically equal terms with the products of the Katni quarries. The pioneers of the industry on a large scale were Messrs. Octavius Steel and Company with their factory at Banjari; but early in the present century other companies were working in the valley, the Rohtas Lime Company and Messrs. Mukherji and Company of Calcutta. The trains of the Dehri-Rohtas Railway, covered from end to end with lime dust, indicate to the traveller what is the main use of that

* Now Eastern Railway.

line, which has brought about a great development of this industry. In the year ending March the 31st, 1923, the export of lime from Dehri-on-Sone was 35,500 tons, and of limestone 1,19,000 tons.

"There are four factories, officially described as such, in Shahabad district. These are—

(1) The Engineering workshop of the Public Works Department at Dehri.

(2) The works of the Buxar Central Jail.

(3) The Bihar Oil Mill at Dehri.

(4) The turbine oil, sugar and flour mills at Nasriganj.

"The engineering workshop at Dehri, fitted with modern appliances, turns out all the wood and iron work for the anicut, locks and canals, and is prepared to undertake necessary ship building for the canals, from a steam or motor launch to a jolly boat, adapted for sailing, rowing or towing. The Buxar Central Jail is a great manufacturing concern, where the chief industry carried on is the manufacture of tents; besides this, the prisoners are employed in weaving cloth and in making uniforms and clothing for the Police and Jail Departments."*

This picture of the old time industries has now undergone many changes. Although agriculture continues to be the main occupation of the people a number of large-scale industries has come up and there is particular industrialisation in Dalmianagar area. There have been certain shifts and the Bihea Sugar Mills have ceased to function long before. The incidence of weaving has definitely declined and Nasriganj and other places no longer produce that quantity of blankets or carpets of cotton and wool. The lacquered pottery of Sasaram has also had a decline. The mineral resources are being more exploited. The tiny Dehri-Rohtas Light Railway is now a very important link and is bound to play a much more important role in the near future.

With the establishment of the Rohtas Industries in 1933, the wages of the labourers went up. As the industrial township grew, the traditional artisans left their cottage industries for better emoluments in medium and heavy industries. Apart from the direct employment in heavy industries, a few other openings, such as hotels, shops, *biri*-making, ice-cream, transport, building construction, road construction, etc., gained importance. A number of rice mills came up in Nokha, Sasaram and Buxar areas which affected adversely the hand-pounding rice industries.

* *District Gazetteer of Shahabad* by J. F. W. James (1924), pages 108—111.

Gur used to be manufactured by crushing the cane just like oil-seeds, in a stone made *ghani* which was replaced by bullock-operated steel crushers. There were two sugar mills at Buxar and Bikramganj, but with the starting of a big sugar mill at Dehri by Rohtas industries in 1933 in Shahabad district and in Bihta in Patna district most of the sugarcane is now drawn by them. The sugar mills at Buxar and Bikramganj could not stand the competition with the bigger units and were closed.

With the development in communication, some new industries like making of stone-chips for road and quarrying of lime for building construction developed fast particularly in Dehri and Rohtas areas. Limestone quarrying for the Cement Factory at Dalmianagar received a great fillip.

It may be mentioned that the main agricultural produces of the district are rice, wheat, pulses, maize, *bajra*, gram, oil-seeds and sugarcane. Sugarcane is extensively grown and the district has now got a flourishing sugar industry since the last three decades. There is a large number of oil, flour and pulse mills in the district and two of them, one at Mohania and the other at Kudra in Bhabua subdivision are first class mills where pulse, rice and oil-seeds are pressed. According to 1951 census report 20,627 persons or 2.46 per cent of the total number of economically active persons in the district were employed on the various manufactures and industries.* There were in all 189 registered factories employing 7,900 persons. These registered factories consisted of rice, flour, oil and *dal* mills, sugar mills, paper and paper-pulp manufacture, cement manufacture, general engineering, manufacture of chemical, etc. Thus the majority of the persons earning their livelihood through manufactures and industries were employed on small and cottage industries. Due to industrialisation and development in communication there has been an increase in the number of the factories and according to the figures supplied by the District Industries Office, Shahabad, there are in all 530 registered factories employing 24,421 persons in the district.

The following table supplied by District Industries Office, Shahabad will indicate the type and number of industries in December 1963:—

Description of Industry.	Number.
(1) Rice, flour and oil mills	371
(2) Cold Storage and Ice factory	12
(3) Saw mills	50
(4) General Engineering	20
(5) Foundry	5

* *District Census Handbook*, 1951, page viii.

Description of Industry.	Number.
(6) Utensils making	6
(7) Wire drawing	1
(8) Powerloom scheme	1
(9) Chemical Industries	3
(10) Re-rolling mills	2
(11) Cement Industry	2
(12) Lantern and Nail Industry	1
(13) Sugar mills	1
(14) Tailoring	4
(15) Asbestos	1
(16) Confectionary	3
(17) Soap making	15
(18) Printing	10
(19) Unclassified Industries	4
(20) Electricity generation	2

Sources of Power.

The district has no provision for the produce of Hydro-Electric Power. There is no Thermal Station. The district is receiving power from the Damodar Valley Corporation. The Bihar State Electricity Board is purchasing power from the Damodar Valley Corporation. The following statement supplied by the State Electricity Board Department, Arrah, will show the units purchased and sold for the period of 1961-62, 1962-63 and 1963-64:—

TABLE I.

Month.	Units purchased.	Units sold.
April, 1961 ..	9,02,283	8,12,912
May, 1961 ..	10,39,050	10,91,173
June, 1961 ..	9,43,808	9,42,413
July, 1961 ..	11,39,390	8,20,353
August, 1961 ..	13,08,760	9,99,732
September, 1961. ..	13,89,804	9,41,705
October, 1961 ..	11,51,005	17,51,247
November, 1961 ..	9,19,454	8,12,246
December, 1961 ..	9,18,696	8,49,625
January, 1962 ..	10,39,321	8,06,202
February, 1962 ..	9,79,057	7,52,271
March, 1962 ..	11,52,857	7,73,234

Month.	Units purchased.	Units sold.
April, 1962 ..	12,02,870	9,89,266
May, 1962 ..	12,77,911	9,15,321
June, 1962 ..	10,85,668	9,47,865
July, 1962 ..	13,13,736	10,29,148
August, 1962 ..	14,93,300	10,42,915
September, 1962 ..	12,64,316	9,99,701
October, 1962 ..	19,16,950	14,76,690
November, 1962 ..	14,48,900	12,47,694
December, 1962 ..	12,97,558	9,51,619
January, 1963 ..	14,70,774	10,47,222
February, 1963 ..	13,58,152	10,62,681
March, 1963 ..	14,13,265	9,45,519
April 1963 ..	14,21,689	10,71,294
May, 1963 ..	17,01,191	11,63,041
June, 1963 ..	15,36,197	10,01,377
July, 1963 ..	16,81,052	10,03,357
August 1963 ..	18,59,758	12,17,250
September, 1963 ..	17,34,172	13,36,881
October, 1963 ..	20,29,763	13,34,782
November, 1963 ..	13,15,058	12,83,344
December, 1963 ..	14,49,501	10,00,075

The supply of electricity may broadly be categorised into four classes, namely, domestic, commercial, industrial and others.

The valuation against the total units sold from April, 1961 to December, 1963 is given below:—

Month.	Amount (in rupees).
April, 1961	1,81,729.63
May, 1961	1,97,105.49
June, 1961	2,08,481.84
July, 1961	1,92,150.64
August, 1961	1,73,132.25
September, 1961	2,06,211.71
October, 1961	1,98,777.65
November, 1961	3,18,772.83
December, 1961	1,86,138.79
January, 1962	1,86,593.66
February, 1962	1,72,804.57

Month.	Amount (in rupees).
March, 1962	1,78,289.83
April, 1962	1,69,725.39
May, 1962	2,20,551.99
June, 1962	1,99,386.67
July, 1962	2,01,251.04
August, 1962	2,14,328.85
September, 1962	2,11,928.10
October, 1962	3,01,043.65
November, 1962	2,88,946.55
December, 1962	2,58,640.28
January, 1963	2,35,225.44
February, 1963	2,18,926.10
March, 1963	2,20,745.58
April, 1963	2,01,188.16
May, 1963	2,19,781.98
June, 1963	2,32,582.50
July, 1963	2,30,102.87
August, 1963	2,23,117.62
September, 1963	2,65,831.36
October, 1963	2,89,770.08
November, 1963	2,73,355.38
December, 1963	2,68,091.07

The table below supplied by the State Electricity Board, Arrah, will give the figures of consumers in December, 1963:—

	Rural.	Urban.
(1) Domestic	6,781	10,866
(2) Commercial	2,643	5,312
(3) Industrial	567	287
(4) Public lighting	417	2,817
(5) Others	267	687

It may be noted that prior to 1957, the private electric supply companies at Arrah and Dehri used to supply power to the consumers in the district. In 1957, these private companies were taken over by State Government and since then the State Electricity Board at Arrah and Dehri are supplying power obtained from the Damodar Valley Corporation. The incidence of urbanisation is found to have gone up and there is no doubt that in another ten years the requirements for electricity both for domestic and industrial purposes will go up much higher.

Efforts have been made to increase the supply of electricity within the State. Progress in Bihar in the spread of electrification has been striking although it falls far short of the requirement for an all-round development of the State.

There are six subdivisions of the Electricity Department at Arrah I and Arrah II, Buxar, Dehri, Bhabua and Sasaram. Regarding the present low incidence of consumption of electricity it may be mentioned that the high rate of electricity is complained to have resulted in less consumption of energy for domestic and industrial purposes.

LARGE-SCALE INDUSTRIES (DALMIA GROUP OF INDUSTRIES).

(1) *Sugar Factory.*—The levy of protective duty on sugar in 1933 served as an incentive to the growth of the sugar industry in India. Many sugar factories were set up in Bihar. A sugar factory was established at Bihta in Patna district. As Shahabad grows a lot of sugarcane it was considered proper to locate a sugar mill in this district.

With this view, on March 18, 1933, a company was registered under the style of Rohtas Sugar, Limited with an authorised capital of Rs. 30 lakhs and issued capital of Rs. 16.12 lakhs. On April 22, 1933, the company commenced its business.

The site near the railway station of Dehri-on-Sone was selected and considered as an ideal one for the location of the sugar factory as it was served not only by the Grand Chord Section of the Eastern Railway, the Grand Trunk Road and the Sone river, but also by the Dehri-Rohtas Light Railway, the Sone Canals and a network of roads connecting the remotest corner of the country.

On May 15, 1933, the foundation-stone of the sugar factory was laid by Sir Sultan Ahmad. The erection work went apace and was completed in about seven months time.

The first sugar plant with a crushing capacity of 1,000 tons of sugarcane per day was supplied from Glassgow. With the addition of new machines the capacity of the sugar factory was quickly raised from 1,000 tons per day to 1,500 tons per day in 1935 and to 1,800 tons per day in 1936-37. Rohtas sugar which is classed as of very good quality both for its colour and crystals, is manufactured by double carbonisation and sulphuration process.

Sugarcane supplies were supplemented to the factory by opening a new 16-mile Nasriganj-Dalmianagar Railway in 1957-58. During the same year the 25-mile Dehri-Rohtas Light Railway was extended 18 miles further south from Rohtas to Pipardih where the company's new limestone quarries were located. The extension brings in more sugarcane to the factory.

The table below supplied by the Rohtas Industries will show the details of annual production of sugar in every ten years to 1962-63:—

Years.	Production (in maunds).
1933-34	1,23,760
1943-44	3,30,750
1953-54	2,82,891
1961-62	3,04,843
1962-63	3,21,312

The total installed capacity during 1962-63 was 4,80,000 maunds.

(2) *Paper Factory.*—In July-August, 1938, foundation was laid of the paper factory with one machine with a capacity of 6,000 tons per year.

On April 4, 1939, Dr. Rajendra Prasad had inaugurated machine no. I of the paper factory.

In 1953 two more machines were added—one with an installed capacity of 15 tons and the other with 3 tons per day. During the First Five-Year Plan period (1951—56) the monthly production capacity of 1,500 tons a day of paper and paper boards was doubled to 3,000 tons. This plant along with the two other paper machines from Japan installed in 1956 have enabled the company to manufacture some fine varieties of light weight papers.

A steady programme of expansion of the paper factory was implemented during the First and the Second Plans. This raised the monthly capacity from 1,500 tons to 3,000 tons at the end of the First Five-Year Plan and to 5,000 tons at the end of the Second Plan.

Machine no. I after modernisation and extensions carried on in it, has a production capacity of 80 tons per day or about 30,000 tons per annum. Duplex boards to meet the country's needs in respect of packing purposes, craft and other light weight papers, and different types of poster papers of light weight and high class bank, bound and ledger papers are now produced.

Three machines with up-to-date plants were installed and commissioned for the manufacture of special varieties of boards. Tag board required for machine accounting was developed and produced for the first time here in 1958. Thus with the completion of the expansion programme, the production capacity has come to 5,000 tons per month. This factory is one of the largest paper producing centres in the country, and has also the distinction of being the

maker of a very large variety of papers and boards from the thinnest to the thickest category. It represents about 20 per cent of the total production of papers and boards in India.

The existing line of manufacture of the paper factory include Duplex, Triplex and Ticket boards, Air Finished Art board, Enamel board and playing card boards, Tissue papers, Match paper, poster paper, etc.

The following chart gives an idea of the raw materials and the places from where they are brought:—

Serial no.	Raw materials.	Places from where brought.
1	Foreign Pulp ..	Imported.
2	Bamboo ..	Bihar.
3	Spruce Wood ..	Kashmir and Uttar Pradesh.
4	Semal Wood ..	Bihar.
5	Limestone Wood ..	Bihar.
6	Sodium Sulphate ..	Rajasthan.
7	Caustic Soda ..	Imported.
8	Felt Wires and other spare parts.	Imported.
9	Waste paper ..	Mostly from outside Bihar.
10	China-clay ..	Bihar.
11	Rosin ..	Uttar Pradesh.
12	Dye ..	Imported.
13	Hessian cloth ..	West Bengal.
14	Base paper ..	Saurastra.
15	Zinc Chloride ..	Saurastra.

The table below gives the details of production:—

Years.	Production (in tons).
1943-44	9,660
1953-54	16,109
1961-62	46,188
1962-63	48,542

The total installed capacity is 58,000 tons during 1962-63.

Cement Factory.

Dalmianagar was also considered an ideal site for the location of cement industries due to the availability of the chief raw material in abundance in its vicinity. For the cement industry very good deposits of limestone are available in abundance in the vicinity and within the district.

To give the new ventures a practical shape, on September 30, 1936, the Rohtas Sugar, Limited, was converted into the Rohtas Industries, Limited and its authorised capital was raised to Rs. 1 crore and issued capital to Rs. 50 lakhs. The authorised capital has since been progressively raised to Rs. 5 crores in 1944 and Rs. 15 crores in 1960 and the issued capital to Rs. 1.70 crores in 1944, Rs. 2.20 crores in 1946, Rs. 3.54 crores in 1955, Rs. 3.56 crores in 1956 and Rs. 6.05 crores in 1960.

The machinery for the cement factory came from Denmark.

Early in 1937, Sir Maurice Hallet, the Governor of Bihar, laid the foundation-stone of the Cement Factory with a plant of 500 tons daily capacity. The erection was completed in 1938.

On March 1938, the plant was inaugurated by Netaji Subhas Chandra Bose. It was at the moment the biggest single unit plant in India. Another plant of the same capacity was installed in 1950. This raised the capacity of the factory to 110 tons per day. This plant was also supplied by the same firm.

A third plant with a capacity of 800 tons per day, was installed in 1956 under the auspices of Ashoke Cement, Limited.

The Ashoke plant has its kiln 330 feet in length, 13′–6″ in diameter and 755 tons in weight as against the two Rohtas kilns of 475′ and 500′ in length, 12′ each in diameter and 20,000 tons each in weight.

The raw materials of limestone, laterite and coal come from Bihar while gypsum comes from Rajasthan. The supply of gunny bags is from West Bengal.

The statement of annual production is as follows:—

Years.	Annual Production (in tons).
1943-44	1,05,573
1953-54	3,55,238
1961-62	2,67,885
1962-63	3,02,142

The total installed capacity during 1962-63 was 6,25,000 tons.

Side line—Coated Boards.

This factory was the first to undertake manufacture of coated boards in this country in 1950. So far the country entirely depended on foreign imports for these boards.

Originally there were only two machines to produce coated boards including Art, Chromo and Playing Card boards for fine printing. These plants have now been modernised and a new plant of the latest design installed with all the modern and up-to-date glazing equipments.

The Rohtas Industries has now the capacity to produce per annum 12 thousand tons of coated boards and papers in all grades required by the Indian market.

Bagasse Pulp.

Of pulp manufacture, special mention is to be made of pulp made from 'bagasse', a waste product of the sugar industry. Pioneer research work was done at this centre in regard to the utilisation of bagasse, the waste of sugarcane as a raw material for the manufacture of paper. A special plant was put up for this purpose.

The plant produces 20 tons of bleached pulp from bagasse per day. There is a plan for its expansion with a view to utilize in larger quantities the sugarcane waste for making paper and board.

Experiments at this centre opened up a new avenue for the use of bagasse as an important raw material for the manufacture of paper and board. The Government of India have since granted licences liberally for the establishment of other plants to produce plup and paper from bagasse.

The Sahu Jains (Managing Agents of R.I., Ltd.) have entered into technical collaboration with Messrs. Crown Zallerbach Corporation, San Francisco, one of the largest paper makers in the U.S.A., for using their patented bagasse pulp process in India for making newsprint. This collaboration extends also to the manufacture of papers and boards in general.

Bamboo Pulp.

Of the raw materials used for pulp manufacture, bamboos are easily most in use. The bamboo pulp plant has up-to-date equipments for bamboo chipping. Its production capacity is 100 tons of pulp per day. A multi-stage bleaching plant has been installed to help manufacture bamboo pulp in a quality that gives the paper a whiteness of lasting character.

Mechanical Pulp.

The Rohtas Industries manufactures pulp from various types of Indian timber by mechanical process. The making of 'mechanical wood pulp' from Indian timbers, was developed in 1944. A modern wood grinding plant with a capacity of 6,000 tons per annum was installed initially for this purpose. Another wood grinding plant was added during the period of expansion to improve the quality and increase the quantity of 'mechanical wood pulp'.

Chemical Factory.

The paper and cement factories were soon followed by the establishment of the chemical factory at Dalmianagar. This started working in 1939.

Chemicals are produced primarily to meet the needs of the paper factory. Production of caustic soda, bleach liquor and bleaching powder started with the inception of the factory and of hydrochloric acid and liquid chlorine in 1945 and 1950 respectively.

The factory in the beginning produced 5.5 tons of caustic soda, 5 tons of liquid chlorine, 3 tons of bleach liquor and 1 ton of hydrochloric acid per day.

With the strengthening of the plan and acquisition of modern equipments particularly the latest type of mercury cells with D.C. rectifier equipment in 1958-59, the production capacity increased to 18 tons of caustic soda and 15 tons of chlorine per day. The caustic soda now produced is suitable for the rayon industry.

The major portion of both caustic soda and chlorine produced are consumed in digesting and bleaching pulp in the paper factory. Part of hydrochloric acid is used to purify brine in the chemical factory and part sold out in the market. Liquid chlorine is sold out entirely to the other paper factories in the country. Hydrogen generated at the cathode in the process of electrolysis of the brine in the cell-house is used to produce hydrochloric acid, being chemically reacted with chlorine released in the chemical process in the cell-house. Hydrogen is further and more profitably used to hydrogenate the oils in the *vanaspati* factory.

Sulphuric Acid Plant.

Production of sulphuric acid started at this centre in 1942. Sulphuric acid is also largely consumed in the paper factory besides the chemical factory and the Central Workshop.

Initially a chamber process sulphuric acid plant was erected in 1941-42 with a rated capacity of 2 tons per day, which in due course was increased to 4 tons per day.

Chamber sulphuric acid and ferric alum solution used to be produced till 1943. Thereafter production began of marketable sulphuric acid and ferric alum. Production of Potash Alum and Ammon started in 1943 and 1945 respectively.

In 1950 the chamber process was changed over to contact process. The rated capacity of the plant was raised to 10 tons of sulphuric acid, 15 tons of ferric alum and 1 ton of ammon alum per day.

It may be noted that sulphur, bauxite and ammonium sulphate are the raw materials used.

After meeting local needs, sulphuric acid is also supplied to outside consumers. Ferric alum, chemically known as aluminium sulphate, is used in the Beater House of the paper factory for 'sizing' paper and boards. Part of this chemical is also supplied to the other paper factories and to waterworks establishments all over the country, to be used as 'water purifier'. Ammon alum is used for medicinal purposes and for dyeing and printing cloths.

Asbestos Cement Factory.

An Asbestos Cement Factory was first established in 1943-44 with a plant fabricated in the local workshop. Production started in September, 1946. But the factory had to be closed down only after a year for want of suitable asbestos fibre. In 1951 the factory was restarted with a new plant imported from the United Kingdom.

The plant has a rated capacity of 50 tons of asbestos sheets including 5 tons of accessories per day or 18 thousand tons of asbestos cement products per annum.

A distinct advantage to the Rohtas Factory is that its chief raw material cement is available locally from the cement factory, although asbestos fibre, another important raw material, is imported from outside, as suitable fibre required for the manufacture of asbestos sheets is not available in the country. But to overcome this permanently, long-term contracts have been signed with asbestos mines abroad for regular supply of requisite quality of asbestos fibre.

Vanaspati Factory.

The *Vanaspati* factory for producing dehydrogenated oil was started in 1944.

The plant was initially designed to produce 40 tons of *vanaspati* cooking medium per day. But the production capacity has since been augmented to 60 tons of *vanaspati* per day.

Hanuman Vanaspati of this factory is packed in 36 lbs. and 10 lbs. containers.

Vulcanised Fibre Plant.

The location here of the Vulcanised Fibre Plant in 1954 opened up altogether a new line of manufacture.

Experiments had been carried on in the paper factory since 1950 and heavy expenditure incurred in preliminary research and experiments to master the manufacturing process and put the plant into successful operation. Manufacture of products on commercial basis commenced in 1954.

The plant has a rated capacity of 125 tons of vulcanised fibre products per month. But the monthly production has so far varied from 30 to 50 tons. Lack of the chief raw material called Base Paper which is imported, has been the greatest handicap in stepping up production. This handicap may be overcome when the paper factory executes its plan to produce Base Paper on one of its new machines.

Vulcanised fibre sheets in different ranges of thickness are claimed to have been produced for the first time in India in this factory, without any foreign technical know-how or collaboration.

The factory has now embarked upon manufacture of a wide variety of standard and special grades in colour in the form of sheets, strips and tubes under a special process, in collaboration with a Japanese firm.

Rohtas vulcanised fibre has innumerable uses. Among its applications may be included such diversified products as athletic safety guards of ears, textile bobbin heads, card and silver cans, electrical components, rail joint insulations and packing. Thick sheets are used for making suit-cases.

Central or Mechanical Workshop.

The Central Workshop which has all the modern equipments, generally caters to the needs of the various factories at this centre. During the war years it manufactured various equipments, machinery and spares, requiring a high degree of precision.

The workshop has a Grey Cast Iron Foundry, Cast Steel Foundry, Mechanical shop and a Fabricating shop.

During the past few years the worshop fabricated the *Vanaspati* Plant, 10 per cent of the Ashoke Cement Plant and several important components for the paper mill. Material parts for additional wide-looms for Sahu Jain Jute Mills were also made here.

Among the important items made in the workshop for the pulp and paper mills are Bamboo chippers, Disintegrators, Blow Tanks, Coarse Screens, Vortraps, Pulp thickners, Rotary Flow screens, Pulp Diffusers, Bleaching Hollanders, Evaporator Body, Lime Kiln and Gas Producer and Caustricising Plant (except moving parts), and a Heat Recovery Plant.

Besides, most of the material handling equipment were also fabricated, such as, conveyors, elevators, open type impeller pumps for handling 100 tons of pulp per day, storage tanks for black, green and white liquor, centrifugal fans of 1,500 cbm capacity and cyclones for bamboo chips.

The Electric Arc Steel Furnace with 3 tons|hr. capacity has been installed under Ashoke Cement, Limited. This caters to the needs of special steel castings, required for the cement and other factories.

The table below supplied by Rohtas Industries Office, Dalmia nagar will give the details of production in various industries:—

Serial no.	Name of the product.	1943-44.	1953-54.	1961-62.	1962-63.	Installed capacity in 1962-63.
1	2	3	4	5	6	7
1	Vanaspati	60 tons	688 tons	9,795 tons	10,004 tons	14,500 tons
2	Soap	Nil	Nil	351 "	575 "	1,800 "
3	Bamboo pulp..	4,765 tons	6,790 tons	26,608 "	27,114 "	36,000 "
4	Wood pulp	Nil	2,778 "	3,541 "	3,695 "	6,000 "
5	Bagasse pulp	..	2,847 "	4,291 "	4,418 "	6,000 "
6	Coating Plant	..	1,005 "	5,320 "	6,419 "	12,000 "
7	Vulcanised fibre	..	43 "	343 "	492 "	1,500 "
8	Sulphuric Acid	1,331 "	2,705 "	2,992 "	3,104 "	3,600 "
9	Asbestos cement	..	4,334 "	17,770 "	17,802 "	18,000 "
10	Power	32 million units.	83 million units.	49 million units.	59 million units.	100 million units.
11	Steel castings..	..	..	..	2,200 tons	5,000 tons.

KALYANPUR LIME AND CEMENT WORKS LIMITED, BANJARI.

Banjari has been the site of Lime Production since 1906. The quarries of limestone at Banjari and Lebura were worked by John White Abdul Sattar and later by John White Abdul Sattar and M|s. Planters Stores Agency during the period 1906 to 1918. The works were then known as Kalyanpur Lime Works. In 1918 Messrs. Martin and Co. (now M|s. Martin Burn, Ltd.) bought out the said two firms and in 1920 they formed a Company known as Kalyanpur Lime Works, Limited which worked the quarries and produced Hydraulic Lime till 1930 when M|s. Martin and Company put the Company into voluntary liquidation and sold it to Messrs. M. N. Banerjee and Company. In 1939 M|s. M. N. Banerjee and Company promoted the Company named Kalyanpur Lime and Cement Works, Limited at 2|3, Clive Row, Calcutta, who have been producing a Portland Cement Manufacturing Plant of 120 tons per day in 1937 but the outbreak of hostilities in September, 1939 prevented some parts of the machinery reaching India.

The control of this Company passed to Shri C. P. Sinha in 1946 and the Cement Plant order in 1937 from Germany went into operation in the year 1946.

The Company has been granted a licence under the Industries Development and Regulations Act, 1947, and had put in a further extension in 1962.

The factory has not been able to achieve optimum production due to transport problems which are caused by the fact that Banjari is served by a small Light Railway which has limited carrying capacity. Furthermore this Light Railway is heavily strained for the carriage of goods for Dalmianagar factory and as such finds it difficult to cope with the increasing demands of the Banjari factory. Lack of metalled roads for a portion of three miles from the factory to Amjhore junction made it difficult for the Company to transport its goods by road.

The main raw materials for this factory is available in the Kaimur hills—

Raw materials used.	Source of raw materials.
1. Lime ..	Bihar
2. Laterite ..	Bihar
3. Gypsum ..	Rajasthan.
4. Coal ..	Bihar
5. Gunny Bags ..	West Bengal.

Annual Production.

Years.	Production in tons.
1955-56	46,603
1956-57	48,109
1957-58	49,301
1958-59	50,108
1959-60	51,302
1960-61	52,001
1961-62	53,109
1962-63	54,302*

SMALL-SCALE AND COTTAGE INDUSTRIES.

There are different types of Small-Scale and Cottage Industries in the district, the details of which have been given below:—

(1) *Soap Industry.*—In 1964 there are about fifteen soap manufacturing units concentrated in Arrah, Buxar, Sasaram and Dalmianagar. None of them is a large concern and on the average about 7 or 8 persons are engaged in each of the units. The average output varies per year. One factory in Arrah is reported to be producing 90 tons of soap per year while another at Sasaram has an output of only one ton per year. These units produce only washing soaps. All the ingredients, namely, oil, caustic soda, sodium silicate, chemicals, etc., have to be imported. There is no difficulty in marketing the soap within the district.

(2) *Timber and Furniture Works.*—The large-scale industries require a good quantity of wood. In 1964 there are about 23 small-scale timber works in the district located at Arrah, Buxar, Bihia, Dalmianagar, Dumraon and Sasaram. On the average about 6 to 12 persons are engaged in each of these units. Timber of various categories and size are supplied in factories and outside also from saw mills.

(3) *Leather Industry.*—There are individual leather workers distributed all over the district. There is a concentration of them at certain places like Dehri, Khilafatpur and Rampur, etc. At Khilafatpur village in Buxar subdivision there is a centre where about 20 pairs of shoes are turned out everyday. The centre has been receiving help from the Industries Department.

(4) Tasar *Industry.*—The State Government has started a *tasar* sub-station at village Sarodag in Adhaura Block. The main function is to train the *tasar*-rearers in rearing and spinning. The Industries Department of State Government have taken some initiative to distribute eri-silk worms.

* These figures were supplied by the Administrative Officer of the said factory.

(5) *Lime Industry.*—In Shahabad district lime industry has been started in good number and according to the figures supplied by the District Industries Officer, Shahabad, there are about 20 lime industry units in the district and all of them are located in Dalmianagar areas. Because of availability of limestone from Kaimur Hills, many industries have been started.

The statement below supplied by the District Industries Officer, Shahabad will give the details of the lime factories in the district:—

Serial no.	Name of the industry.	No. of persons employed.	Capital investment (in rupees).
1	Hind Lime Works, Dalmianagar	10	10,000
2	Khedan Lime Works, Dalmianagar	22	16,000
3	Diadih Lime Works, Dalmianagar	20	23,000
4	Kalyanpur Lime Works, Banjari	100	35,000
5	Kalyanpur Lime Works, Dehri-on-Sone ..	110	50,000
6	Rohtas Lime Works, Dalmianagar	20	14,000
7	Anant Lime Works, Tilothu	7	13,000
8	Sasaram Lime Works, Dalmianagar	16	11,000
9	Dehri Lime Works, Dehri-on-Sone	10	17,000
10	Sinha Lime Works, Sasaram	30	22,000
11	Hindustan Lime Centre, Dalmianagar ..	8	8,000
12	Nathuni Singh and Brothers Lime Works, Dalmianagar.	9	11,000
13	Shahabad Lime Works, Dalmianagar ..	10	31,000
14	Bihar Lime Works, Dehri-on-Sone	10	12,000
15	Bharat Lime Works, Dehri-on-Sone ..	30	25,000
16	Janta Lime Works, Dalmianagar	10	11,000
17	Janta Lime Works, Takia	7	4,800
18	South Shahabad Lime Works, Nokha ..	6	6,000
19	Rohtas Lime and Stone Centre, Dalmianagar ..	6	4,000
20	Kasiawan Lime Works, Dehri-on-Sone ..	15	22,000
21	Kurwaha Lime Works, Dehri	10	12,000

The average daily production ranges from 40 to 80 mds.

In this district there is a large number of families whose traditional profession is utensils manufacturing industry of brass, bell-metal and German silver, etc. There are 70 families at Jagdishpur, about 20 families at Buxar, and 20 families at Sarenja who have been brought in co-operative fold.

Food Processing Industries.

Rice Mills.—The district is a large rice-growing area in Bihar. There are altogether 275 pure rice mills and 71 rice, oil and *dal* mills in the district. A list of important rice mills with number of workers employed and average daily crushing capacity in December, 1963 is given below:—

Serial no.	Name of mills and place.	No. of persons employed average per day.	Average daily crushing capacity.
			Mds.
1	Shree Laxmi Rice Mill, Sasaram	15	150
2	Shahabad Industry Private Ltd., Gajrajganj, Buxar	29	290
3	Ambika Rice Mill, Mohania	35	350
4	Shankar Rice Mill, Nokha	82	650
5	Bishwanathji Rice Mill, Buxar ..	91	800
6	Shri Manohar Rice Mill, Charitraban, Buxar ..	31	300
7	Shri Mahabirji Rice Mill, Paijela, Sasaram ..	60	500
8	Shri Krishnaji Rice Mill, Nokha	38	350
9	Shri Annapurna Rice Mill, Nokha	74	650
10	Shri Laxmi Narain Rice Mill, Ghusiakalan, Shahabad	47	425
11	Shri Thakurji Rice Mill, Nokha	63	550
12	Shri Laxmi Rice Mill, Nokha	87	800
13	Shri Durga Rice Mill, Chausa, Shahabad ..	70	650
14	Shri Janki Rice Mill, Nokha	150	1,500
15	Shri Mahadeoji Rice Mill, Nokha	70	700

Oil Mills.—There are about 25 oil mills in the district which are quite separate. Besides, the oil mills are attached with either rice mills or flour mills. The average number of persons employed per day is about five. The market is local. It may be noted that the labour force required for the industry is mostly unskilled and they are recruited from the local population. The industry is of seasonal nature.

Repairing Workshops.—There are a number of repairing workshops. Some of them are the Central Workshop at Dalmianagar, Vijoy Gopal Engineering Works, Dehri-on-Sone, Oriental Lathe Works, Dehri, Jai Hind Motor Works, Arrah, Vishwakarma Engineering Works, Bihia, Shahabad Engineering Works, Arrah, Sharma Engineering Works, Raja Bazar, Bihea, Mahesh Engineering Works, Arrah, Arrah Engineering Works, Arrah, etc.

Women Industrial School, Arrah.

The scheme was started in 1961 to impart training to the females in knitting, embroidery (hand and machine), tailoring and cutting, cane and bamboo wares, leather goods, toys and dolls making. The total number of the trainees in the centre is sixty and the course of training is for one year. This is the only institution in the district for imparting training to the females in different crafts.

Training-*cum*-Production Centres.

There are twenty-seven training-*cum*-production centres including eight for ladies in different trades, e.g., tailoring and cutting, knitting and embroidery, blacksmithy and tinsmithy, carpentry, leather goods-making, tanning, cane and bamboowares, cotton-weaving, *durrie* and carpet-weaving, wool-weaving and toys-making, etc., in the different blocks of the district. These centres impart training to the artisan class of the rural areas. The trainees are given financial and technical help in order to implement the follow up programme.

Institutional Type Cluster Centre, Dumraon.

The centre was started in 1961-62. Three crafts, viz., leather, carpentry and blacksmithy have been clustered in the centre. The total number of the trainees (1964) is 36, i.e., 12 in each craft. During 1963-64 the production was worth Rs. 10,384 in the said centre and the sale of the products was worth Rs. 10,313 only.

Weavers' Training Centre, Tilothu.

The centre was started in 1961-62 to impart training to the professional weavers on improved type of looms and designs in cotton weaving, *durrie* weaving and dyeing. The number of trainees in the centre is 36.

Model Blacksmithy Workshop.

It was started in 1962 as Training-*cum*-Production Centre at Arrah. In 1963, eight trainees had passed from this centre. The centre will impart training to the blacksmiths on improved type of power-driven machine. The building for the centre has been constructed and the installation of the machine and power connection is in process.

Dumraon Industries, Dumraon.

This is managed by the Dumraon Maharaja, the ex-landlord of Dumraon. There is a lantern factory under this management and is called Dumraon Lantern Factory. It started production in 1941. At present (1963) its capital is Rs. 5,96,000. It is equipped with all the necessary machineries and other implements required for the manufacture of lanterns. Its present (1963) production capacity is on the average 400 per day. The lanterns are consumed within the State and outside.

Tinsheet, the main raw material, is brought from Jamshedpur. There are a number of plants for turning in the different components. Three brands of lanterns are produced and the capacity is 400 pieces daily on the average. It is gathered that there was no difficulty in disposing of the produce before. Recently, however, a few such factories have been set up in other States and now there is keen competition. The peak period of the sale is from June to September every year.

There is a side line of manufacturing nails which are used for making shoes. It is understood that there is no difficulty in disposing of the produce.

The following figures supplied by the District Industries Office will indicate the production of five years from 1959-60 to 1962-63:—

Years.	Number of pieces.
1959-60	1,44,802
1960-61	1,46,301
1961-62	1,48,291
1962-63	1,54,802
1963-64 (December, 1963).	1,60,207

The total number of labourers employed in the factory was 107 during 1963-64.

INDUSTRIES IN CENTRAL JAIL (BUXAR).

The Buxar Central Jail since 1880 has been engaged in various types of industries manned by the convicts. The following are the main items at present (1964):—

(1) *Tailoring.*—This is a very busy section turning out liveries of various types for different classes of Government servants of both Central and State Governments.

(2) *Tent.*—Manufacture of tents with the subsidiary industries like the making of *Durry, Newar* rope and dyeing has been a prominent feature of the jail. Previously beautiful carpets were also made.

(3) *Weaving.*—Bedsheets, towels, *Dhotis, Jharans* and cotton cloth for prisoners clothing are made.

(4) *Spinning.*—There are 50 powerlooms which are fully engaged and cotton yarn for feeding the heavy weaving industry is made. Yarn is also supplied from this jail to the other jails.

There are some minor sections like oil and flour mills, carpentry and smithy, etc.

The table below supplied by the Superintendent of Central Jail, Buxar, will give the output in industries from 1959 to 1963:—

Sections.	1959.	1960.	1961.	1962.	1963. (December).
1	2	3	4	5	6
1. Weaving (in meters).	1,31,415.10	1,43,562.87	1,63,931.21	1,26,453.84	1,51,912.41
2. Garments (in number).	1,27,419	1,34,136	1,39,035	1,34,348	1,51,241
3. Tent (in number).	584	610	504	836	942
4. Rope (in Kg.)	7,542.19	8,063.88	8,282.32	9,540.80	10,319
5. Oil "	12,130.35	14,312.39	15,219	14,312	13,212
6. Spinning "	1,05,677	1,13,397	1,08,108	1,13,124	1,24,314

Kg.—Kilogram.

A chart of the number of prisoners employed in the factory is given below:—

Years.	Average daily labouring prisoners.	Sales in (rupees).	Net profit (in rupees.)
1940	888	5,44,905	87,789
1941	905	5,50,172	60,018
1942	916	5,97,935	77,438
1943	865	9,39,582	2,44,298
1944	978	13,04,026	2,50,038
1945	908	7,67,505	1,18,051
1946	753	7,79,991	1,29,140
1947	563	6,15,174	80,905
1948	479	7,28,427	91,332
1949	536	10,26,715	3,53,095
1950	572	12,43,822	1,86,189
1951	820	10,76,430	1,63,763
1952	642	13,08,078	1,13,333
1953	621	13,91,107	76,133
1954	646	13,31,258	56,126
1955	649	12,07,512	55,756
1956	698	14,29,279	73,960
1957	646	17,30,278	1,40,898
1958	690	14,89,478	1,24,499
1959	756	19,77,060	2,29,828
1960	812	17,11,556	1,77,894
1961	804	20,19,153	1,81,786
1962	827	23,50,726	2,12,949
1963	851	25,31,216	2,89,312

As will be evident from the above figures, the sale figures of Rs. 5,44,905 in 1940 has gone up to Rs. 25,31,216 in 1963 and the State Government have already got back in full the investment made to this jail industry up to 1963 plus the labour cost for the prisoners working in the factory, the present rate being 8 annas per prisoner per day and about 4 per cent interest charges all these years.

Building Industry.

The incidence of urbanisation in Shahabad district has increased and Arrah, Dehri, Sasaram, Buxar and Dumraon have expanded enormously and other townships are also developing. The more availability of cement has led to a change in the pattern of the houses. Instead of mud and brick houses more of reinforced brick and reinforced concrete houses are being built. There has been a great expansion of Government offices at the district headquarters and a number of institutions are now located in Arrah. All this has led to a sizeable population being engaged in what may be loosely described as the building industry.

This building industry has spread to many of the rural areas as well. The location of the block headquarters at important villages has led to the construction of a number of *pucca* houses for Block Development Office and residential houses. The well-to-do villagers have also come to appreciate better houses to live in and houses with modern comforts are coming up in many villages.

There are no brick-kilns in Arrah town but they are at Dumraon, Dehri, Bhabua, Buxar, Sasaram, Bikramganj, Jagdishpur and other places. On a rough estimate about 1,300 persons are engaged at the brick-kilns in Shahabad district.

Labour and Employers' Organisation.

Shahabad district is not yet very well industrialised. Industry is localised in one zone. The employers have not got a very effective organisation in the district. The industries of the district require both skilled and unskilled labour. Most of the unskilled labourers employed in different factories come from within the district itself. The supply of the skilled personnel comes from not only within the district but from outside the district also. There are labour unions in different industries. It may be mentioned that generally it is taken that the labourers are more conscious of their rights than their obligations. Some of these labour organisations make themselves occasionally felt by threatening complete or partial strikes.

Following is the list of the registered labour unions as supplied by the Labour Office, Shahabad in the district till 31st December, 1963:—

Serial no.	Name of the union.	Registration number.	Date of Registration.	Affiliation with Central Organisation.
1	Bihar Light Railway Men's Union, Light Railway Colony, Arrah.	58	5th September 1944.	*A.I.T.U.C.
2	The Rohtas Industries *Mazdoor Sangh*, Dalmianagar.	93	4th September 1946.	†H.M.S.

* A. I. T. U. C.—All-India Trade Union Congress.

† H. M. S.—Hind Mazdoor Sabha.

Serial no.	Name of the union.	Registration number	Date of Registration.	Affiliation with Central Organisation.
3	The Rohtas Industries Staff Union, Dehri-on-Sone.	110	24th January 1947.	Not affiliated.
4	The Baulia Quarries *Mazdoor Sangh*, Baulia.	128	8th March 1947.	H.M.S.
5	The Arrah Scavengers' Union, Arrah	155	27th June 1947	H.M.S.
6	The Rohtas Quarries *Mazdoor Sangh*, Murli, Rohtas.	135	29th March 1947.	*I.N.T.U.C.
7	The Kamayarange Quarries Labour Union, Banjari.	199	15th November 1947.	I.N.T.U.C.
8	Kalyanpur Lime and Cement Workers' Union, Kalyanpur.	200	15th November 1947.	I.N.T.U.C.
9	Electrification and Lift Irrigation Employees' Union, Dehri.	227	10th January 1948.	I.N.T.U.C.
10	Arrah Electric Supply Co. Workers' Union, Arrah.	248	4th March 1948.	H.M.S.
11	Dalmianagar *Mazdoor Sewa Sangh*, Dalmianagar.	297	24th September 1948.	I.N.T.U.C.
12	Dehri Rohtas Light Railway Employees' Union, Dalmianagar.	301	28th October 1948.	H.M.S.
13	Baulia Quarries *Rastriya Mazdoor Sewa Sangh*, Baulia.	356	5th May 1949	I.N.T.U.C.
14	Shahabad Zila *Dukan Karamchari* Union, Arrah.	418	11th February 1950.	Not affiliated.
15	Buxar Municipal *Karamchari* Union, Buxar.	503	7th April 1951	Ditto.
16	Rickshaw *Mazdoor* Union, Buxar ..	504	9th April 1951	Ditto.
17	Dehri-on-Sone Dalmianagar Notified Area Workers' Union, Dehri.	534	30th November 1951.	Ditto.
18	The P.W.D. Workers' Union, Dehri	536	18th January 1952.	A.I.T.U.C.
19	Dalmianagar Staff Employees' Union, Dalmianagar.	579	9th January 1952.	Not affiliated.
20	Shahabad *Sona Chandi Karigar* Union, Dumraon.	634	14th September 1953.	A.I.T.U.C.
21	Dumraon Industries *Mazdoor* Union, Durmaon.	687	23rd October 1954.	Not affiliated.
22	Shahabad Stone Quarries *Mazdoor* Congress, Karwandia, Shahabad.	746	7th October 1955.	Ditto.
23	Arrah *Aspatal Karamchari Sangh*, Arrah.	757	26th November 1955.	Ditto.

*I. N. T. U. C.—Indian National Trade Union Congress.

Serial no.	Name of the union.	Registration number.	Date of Registration.	Affiliation with Central Organisation.
24	Cinema *Karamchari Sangh*, Arrah ..	792	11th August 1956.	H.M.S.
25	*Biri Mazdoor* Union, Arrah ..	793	11th August 1956.	A.I.T.U.C.
26	Martin Light Railway Employees' Union, Arrah. ..	839	23rd October 1957.	H.M.S.
27	Cinema *Karamchari Sangh*, Buxar ..	853	7th May 1958	H.M.S.
28	Eastern Railway Vending and Catering Workers' Union, Dehri-on-Sone.	856	7th May 1958	Not affiliated.
29	Eastern Railway Licensed Porters' Union, Dehri.	865	27th September 1958.	Ditto
30	*Vyapar Mazdoor* Union, Dehri ..	882	30th December 1958.	Ditto.
31	Bihar Martin Light Railway *Mazdoor* Union Congress, Arrah.	888	27th February 1959.	Ditto.
32	*Biri Mazdoor* Union, Jagdishpur ..	917	4th October 1959.	H.M.S.
33	Shahabad *Khelohar Mazdoor Sangh*, Maravna, P.O. Karma, Shahabad.	927	21st November 1959.	Not affiliated.
34	Nokha Mills *Mazdoor Sewa Sangh*, Nokha.	931	11th January 1960.	Ditto.
35	*Karamchari Sangh*, Nawratan Bazar, Sasaram.	949	31st March 1960.	Ditto.
36	Dehri-Dalmianagar *Biri Mazdoor* Union, Dehri-on-Sone.	985	26th October 1960.	Ditto.
37	Universal Bank Employees' Union, Dalmianagar.	986	26th October 1960.	Ditto.
38	Kachuar Quarries *Mazdoor* Union, Banjari.	987	26th October 1960.	Ditto.
39	Dehri Workshop *Mazdoor* Union, Dehri-on-Sone.	992	6th December 1960.	Ditto.
40	*Chawal Mill Mazdoor Panchayat*, Nokha	1011	6th July 1961	Ditto.
41	Rickshaw *Chalak Panchayat*, Sasaram	1018	12th August 1961.	Ditto.
42	Press *Karamchari Sangh*, Sasaram ..	1019	14th August 1961.	Ditto,
43	*Rastriya Paramit Mazdoor Sangh*, Amjhore, Shahabad	1026	9th November 1961.	Ditto.
44	Rickshaw *Mazdoor* Union, Dumraon, Shahabad.	1050	6th July 1962	Ditto.
45	Sone Barrage *Karamchari Sangh*, Dalmianagar.	1052	10th July 1962.	Ditto.
46	Patel Baruhi Lime Stone Quarries *Mazdoor Sangh*, Rohtas.	1060	20th December 1962.	Ditto.

There are no employers' organisations in the district.

Welfare of Industrial Labour.

There are altogether 510 factories running with power and 20 factories running without power. About 24,421 labourers are working in this district in the registered factories. This number, however, does not include the workers employed in construction work relating to the factories.

Labour Welfare.—For the successful implementation of the different objectives to be realised through various labour laws regarding general condition of work, health, remuneration, safety and security, it had been contemplated in the two Five-Year Plans to augment the strength of the Factory Inspectorate so that the frequency of inspection may be increased. To achieve the end one Inspector of Factories with staff has been posted at Dehri-on-Sone.

Secondly, one Labour Superintendent and two Labour Officers are posted at Arrah under the programme of expansion of the Labour Department. The officers look after labour welfare work of the industrial establishments in the district. Their duty covers housing conditions, recreational, educational and sanitary facilities for the workmen. The employees have to be provided with canteens, dispensaries, hospitals and other requirements under the Factories Act.

WELFARE AMENITIES SUPPLIED BY THE FACTORIES IN THE DISTRICT UNDER FACTORIES ACT.

As regards provision for the welfare facilities to industrial workers it may be noted that under the Bihar Factories Act, 1948, there has been provision for welfare facilities mentioned below:—

Washing facilities.—In every factory adequate and suitable facilities for washing shall be provided and maintained for the use of the workers therein. Separate and adequately screened facilities shall be provided for the use of male and female workers. In every factory suitable sitting arrangements be provided and maintained for all workers obliged to work in a standing position, in order that they may take advantage of any opportunities for rest, which may occur in the course of their work.

First-aid boxes have to be maintained and in the factory with more than five hundred workers, an ambulance with medical and nursing staff has to be maintained.

Canteens.—In the factory where more than two hundred and fifty workers are employed, a canteen or canteens shall be provided and maintained by the occupier for the use of the workers.

Shelter, rest rooms and lunch rooms.—In the factory where more than one hundred and fifty workers are employed, shelters or rest rooms with provision for drinking water shall be provided and maintained for the use of the workers.

Creches.—In the factory where more than fifty women workers are employed a room or rooms for the use of the children under the age of six years of such women

shall be provided. Such rooms shall provide sufficient accommodation and lighting and shall be maintained in a clean and sanitary condition under the charge of women trained in the care of children and infants.

Welfare Officers.—In the factory where five hundred or more workers are employed, the employer shall employ welfare officers as may be prescribed.

WELFARE FACILITIES PROVIDED BY THE FACTORIES.

(1) *Kalyanpur Lime and Cement Works Limited, Banjari.*—This factory employs about 1,892 workers. Since 1958 there is one middle school with 200 students and five teachers. During 1961-62 one high school has also been started with 179 students and seven teachers. A well-equipped club has been provided for the recreation of the workers. The factory provides free housing accommodation for about 700 workers. A canteen and a creche have been provided by the factory. A Welfare Officer has been appointed to look after the welfare and interests of the workers.

There is a labour welfare centre sponsored by the State Government and also a voluntary welfare centre started by the company where the workers of all the industrial units of Banjari have an access. A hospital with about 18 indoor beds has been started by the company. Besides, the Employees State Insurance dispensary has been started by the Government where only the registered employees of the factory are treated. Ten beds in the company's hospital are reserved for hospital cases from Employees' State Insurance dispensary.

(2) *Pulp Factory, Dalmianagar.*—The factory employs about 1,439 workers. It has started one middle school with 150 students and four teachers, a well-equipped club, a library, free housing accommodation for about 800 workers, a canteen, a creche, and a ten-bedded hospital. The factory has appointed a Welfare Officer to look after the interests of the workers.

(3) *Paper Factory, Dalmianagar.*—The factory employs about 1,970 workers. A Welfare Officer has been appointed by the factory. A recreation club, a voluntary welfare centre, a middle school with 179 students and four teachers, a canteen, a creche and a library have been provided by the factory. About 1,000 workers have been given houses.

(4) *Cement Factory, Dalmianagar.*—The factory employs about 780 workers. A well-equipped club has been provided for the workers with games and library. A canteen and creche have been started. The factory provides free housing accommodation to about one-third of the employees. A Welfare Officer has been appointed by the company to look after the interest of the workers.

(5) *Asbestos, Vanaspati and Sugar Factory, Dalmianagar.*—These factories employ about 1,046 workers. A Welfare Officer has been appointed by the factory. A recreation club, a middle school with 315 students and seven teachers, a canteen, a creche and a library have been provided by the factories. About 579 workers have been given houses.

Besides, one Employees' State Insurance Dispensary with two doctors, two compounders, two dressers has been provided by the State Government. One high school has been started with 675 students and 20 teachers. A well-equipped club has been provided for the recreation of the workers. Under the Industrial Housing Scheme, 500 quarters have been allotted by the State Government to all workers of the factories located at Dalmianagar.

There is a Labour Welfare Centre sponsored by the State Government and also a voluntary welfare centre started by the Company where the workers of all the industrial units of Dalmianagar have an access. A hospital with about 47 indoor beds has been started by the Company. A rest shelter has been provided where drinking water is also supplied.

It may be noted that the welfare centres located at Kalyanpur and Dalmianagar have got a film projector and a propaganda-*cum*-health van. There are facilities for indoor and outdoor games.

The organisation at Dalmianagar maintains a dairy for supply of cow and buffalo milk at subsidised rate to the employees. Firewood and soft coke are also supplied to the workers at concessional rate. To workers working in conditions that entail dust and gas, mustard oil and *gur* are supplied free of cost. Soap and soda are also supplied free of cost.

Workers' Earnings.—A worker getting a basic wage of Rs. 21.00 per week gets Rs. 90.00 for working 23 days. If the cost of his work, holidays and weekly rests are taken into, he earns Rs. 112.35 per month as under in 1963-64:—

	Rs.
(1) Weekly wage	21.00
(2) Dearness allowance	39.00
(3) Bonus	12.12
(4) Company's contribution to Provident Fund.	1.12
(5) Gratuity	2.50
(6) Minimum cost of accommodation ..	9.61
(7) Proportionate cost of leave, holidays and weekly rests.	27.00
TOTAL	112.35

The production bonus scheme enables the employees to earn between 10 per cent to 15 per cent of their gross wages. Maximum bonus earned in different factories in 1963-64 is as under:—

(1) Pulp 12.25 per cent of gross wages.
(2) Paper 13.72 per cent of gross wages.
(3) Cement 26.72 per cent of gross wages.
(4) Asbestos 10.25 per cent of gross wages.
(5) Vanaspati 12.50 per cent of gross wages.
(6) Chemical 14.18 per cent of gross wages.
(7) Acid 17.58 per cent of gross wages.
(8) Power House 13.68 per cent of gross wages.
(9) Electric Workshop 15.15 per cent of gross wages.
(10) Vulcanised fibre 17.10 per cent of gross wages.

INDUSTRIAL POTENTIAL AND PLANS FOR FUTURE DEVELOPMENT.

Shahabad district has a good industrial potential based on agriculture, mineral and forest resources. The southern belt has a good deposit of high quality limestone. Recently (1960) a huge reserve of pyrites has been found in Amjhore to the south-west of Banjari about 21 miles from Dehri-on-Sone. It is proposed to recover the sulphur in elemental forms. Apart from above, this will help in preparing the acid plant in Sindri in Dhanbad district from the waste gas. Sulphuric acid is one of the important chemical products based on which a number of other chemical industries may be started. After the full exploitation of this project, India is expected to meet the sulphur requirements. The Government of India will shortly enter into an agreement with a Finnish firm for the installation of the said plant to produce sulphuric acid from pyrites. Dr. Kane, Adviser to the Union Petroleum Ministry, New Delhi, had proceeded to Finland for finalising the negotiations. Pyrite reserves at Amjhore has been estimated at about 200 million tons.

There are already two cement factories at Dehri-on-Sone and Banjari, which are fed by the limestones available in plenty in Kaimur areas. There are a number of lime producing units in the district. Full exploitation of the deposits can only be possible, if communications are better developed. The narrow gauge Dehri-Rohtas Light Railway runs only up to Pipardih and further extension is required. The capacity of this railway is very limited and cannot cope with the growing demand. Transport through trucks is also difficult and expensive because of bad road communications. Better roads and better railways can only fully utilise the rich industrial potential of the area. Apart from these cement factories, the cement factory of Japla in Palamau district is also fed through ropeways from Baulia in the Rohtas lime hills. Now with the

prospect of the establishment of the new Steel Plant at Bokaro either in Dhanbad or in Hazaribagh district, the demand of lime will increase tremendously. As a matter of fact the blue print regarding the resources to be tapped for the Bokaro Steel Project mentions utilising the limestone deposits of this area. At present (1964) the lime deposits of Rohtas hills are connected by the narrow gauge Dehri-Rohtas Light Railways, owned by the Rohtas Industries which will not be able to cope with the increased load of goods traffic in the near future. With the growing importance of this area for pyrites and supply of lime to the Steel Plants, it is felt necessary that the above railway line should have broad gauge and double lines. Electrification of the railway section when made into broad gauge with double lines will follow automatically. It is understood that the railway section from Gaya to Mugalsarai will soon have electrification.

Rohtas Industries have created an industrial nucleus for development of a number of new industries. A number of industrial units as discussed before are running. It may be repeated that there is a great concentration of large-scale industries in Dalmianagar a part of Dehri situated in the southern part of the district. The possibilities of starting new industries either to feed the large-scale units or to utilise their products for further processing on small-scale basis, viz. (1) Cement Factory, (2) Asbestos Cement Factory, (3) Vulcanised Fibre Plant, (4) Paper mills, (5) Sugar Factory, and (6) *Vanaspati* Factory were examined by the office of the Development Commissioner (Small-Scale Industries), Ministry of Commerce and Industry, New Delhi, during 1959-60 in Shahabad district. They had submitted a Small-Scale Industry Area Survey Report in 1960 for Shahabad district.

According to this report the new small industries from large-scale industrial units at Dalmianagar are as follows:—

(1) *Cement.*—There is a good scope for manufacturing spun pipes and cement tiles. These two industries have good prospects in Bihar, as the existing units cannot meet the growing demand of the State. Dalmianagar could be a central location for such types of units.

(2) *Asbestos.*—A unit for manufacturing soil pipes and drainage pipes from asbestos cement could be set up along with this unit, as the proposed unit would be required to mould the wet asbestos cement into soil pipes and drainage pipes.

(3) *Vulcanised fibre.*—(*a*) Due to easy availability of vulcanised fibre, a unit for the manufacture of suit-cases, winding spools for silk mills and enamelled electric wires may be set up near Dalmianagar.

The Vulcanised Fibre may also be used for making fibre coding for use in telephones and other electrical installations.

(*b*) The Vulcanised Fibre plant at Dalmianagar is consuming about 3,000 pieces of black sheet pans of the value of Rs. 10,000 monthly in the manufacture of vulcanised fibre cans. The demand for these bottom is likely to rise to 6,000 (numbers) monthly in the near future. At present (1964) these are purchased from Calcutta. These black sheet bottoms could be manufactured by a small-scale unit, located nearby Dalmianagar.

(*c*) The Vulcanised Fibre Plant in Dalmianagar is selling about 4 tons of waste vulcanised fibre sheets every month. These sheets have a maximum width of 12" and a maximum length of about 3'-6". These are being purchased by suitcase manufacturers of Kanpur and Agra for making suitcase corners. These pieces can be used for making waste-paper basket, washers and corks. Dalmianagar could be the best place to start this unit.

(4) *Paper.*—The present unit is consuming felts and wires worth of Rs. 12 lakhs annually which are imported from other countries. According to the management of this factory, felt worth Rs. 2 crores are consumed by the paper mills all over the country, whole of which are imported from outside. A unit may be started in Dalmianagar.

(5) *Sugar.*—(*a*) This unit is consuming chains and spare-parts, etc. The unit also consumes bolts and nuts of $\frac{1}{2}$" to $\frac{3}{4}$" length and valves from $\frac{1}{2}$" to 6" sizes. All these spares may be profitably manufactured by small-scale units. A factory could probably be set up for manufacturing valves in Dalmianagar or near about.

(*b*) There is a good scope for setting up a unit for manufacturing sugar cubes at Dalmianagar. There is a growing demand for sugar cubes in the country. There are three sugar mills also located within a radius of 100 miles. They are at Bihta, Warsaliganj and Gururu which will also supply sugar besides the sugar mill at Dalmianagar.

(*c*) The sugar mill at Dalmianagar releases 9,600 gallons of molasses per day. A distillery unit may be set up in Dalmianagar. It may be noted that there are other three sugar mills within a radius of 100 miles and the distillery unit can be fully supplied with molasses.

The units are at Bihta in Patna district and Warsaliganj and Guraru in Gaya district. It has been estimated by the Survey Committee that about 22,000 gallons of molasses would be available daily which is sufficient to feed a distillery.

(6) *Vanaspati.*—The *vanaspati* factory at Dalmianagar is using nickel as catalyst which becomes waste after being used twice. About two tons of nickel waste (containing 5.7 per cent nickel) is available annually from this factory. This waste may be used in the manufacture of nickel salts used mostly for electroplating purposes. The possibility is to procure the nickel waste and setting up a unit for manufacturing its salts at Dalmianagar*.

It may be mentioned here that in spite of the recommendations of the Survey Committee's Report in 1960, no such industrial units on small-scale basis have been started in the district as yet.

Straw boards which find market for use as flat files, for book binding trade, for card board boxes and for making registers have got a ready market. Hence straw board may be manufactured out of paddy straw. At Dumraon, a straw board manufacturing unit has been sponsored and is expected to go into action very soon. About 4,26,524 maunds of paddy straw are available annually in the district. In board making bleaching which requires very costly plants is not essential and the board is made mainly by manual process after the pulp has been prepared. The feasibility of a possible site for a unit at Rajpur in Buxar subdivision may be examined.

Two rolling mills one at Nokha and the other at Buxar have been started in 1961. With the increased demand of mild steel rod for building purpose, the prospect of rolling mills appears to be quite bright near Dalmianagar area.

The rate of cattle mortality especially in the northern part of the district in *diara* area is reported to be very high during the flood seasons. Bhojpur, Koilwar, Chenari and Bhabua are the main centres for collection of semi-dried salted hides, which are exported to Calcutta market. The State Government has taken a decision to locate a small tannery at Bhabua. Recently (1963) Rampur village about a mile from Bhabua has been selected for starting a model tannery unit. Further, the Khadi and Village Industries Board, Bihar, has decided to start a model tannery at Chenari and the work is in progress.

* Extract taken from the book Small-Scale Industry Area Survey Report by the office of the Development Commissioner (Small-Scale Industries), Ministry of Commerce and Industry, Government of India, New Delhi (pages 62—68) (Year 1959-60).

The local exploitation of the bones which are sent out of the district may also be investigated.

These tanneries will be benefited by the abundance of tanning materials especially Myrobalan in Adhaura range and an unit for manufacture of tanning materials especially Myrobalan powder may be set up successfully in Rohtas range.

Buxar and Nokha are at the centre of rich rice-growing areas. Rice grain is made up of husk, the seed coat, embryo at the end and the starchy portion inside. During the process of milling, when only the husk is removed, the product obtained is brown rice. Further polishing of the brown rice in order to get white rice results in removal of the red coating from the outer layer of the grain and embryo from the corners which constitute bran. The bran is roughly between 5 per cent to 8 per cent of unpolished rice. It contains oil to the extent of 15 per cent to 22 per cent. This rice oil may be extracted from the bran with the help of a suitable solvent. The oil so obtained is edible and may also be used in the manufacture of *vanaspati* or for making soap. The prospects of two units, one at Nokha and another at Buxar may be looked into for extraction of oil from rice bran.

Further development of communications will help industrialisation. If there is a straight railway line or a first class metalled road from Arrah to Bhabua running through Udwantnagar, Jagdishpur, Piro, Dawath, Dinara, Karghar and Kudra, this will open up further the rich rice bowl of this district. It will create a better market and it may be visualised that there could be a better utilisation of paddy straw for starting a straw board factory.

Further development of communications covering Chainpur, Bhagwanpur, portions of Chenari, Adhaura and Rohtas area will also lead to more industrialisation and probably timber utilisation plants could be located somewhere near Chenari.

There is abundance of lightwood like *Gambhar* in the forests of Kaimur hills which is exported at present (1964) to Varanasi for the manufacture of toys. A few units for seasoning of this wood and manufacture of wooden toys may probably be set up in the Rohtas range.

Manufacture of blankets is an old indigenous cottage industry in Nasriganj. There is no difficulty in the availability of wool. Development of this industry is definitely indicated.

Nasriganj has also been a great centre for turnover of timber and bamboos. Nasriganj can have some saw mills or even a timber seasoning unit.

It is understood that country boats used to be once made at Nasriganj. There is no reason as to why this industry cannot be encouraged.

There is a scheme to settle the weavers to work on power-looms at village Maharajganj near Tilothu Bazar and at Nasriganj. Fifty power-looms have been sanctioned for Nasriganj.

Industrial Estate.

The establishment of Industrial Estate has already come to be recognised as a positive means to achieve decentralisation and dispersal of industry. The four Industrial Estates set up in Patna, Biharsharif, Darbhanga and Ranchi during the Second Five-Year Plan have been helpful in building up an industrial outlook and for stimulating investment in consumer goods industries.

Accordingly, in the light of the recommendation of the working ground set up by the Government of India for small-scale industries, the following schemes of the Industrial Estates have been proposed in the Third Five-Year Plan in Bihar:—

(*a*) Two units of Large Industrial Estates at an estimated cost of Rs. 15 lakhs each for towns having population ranging between 50,000 and 1,00,000.

(*b*) Two units of Small Industrial Estates at an estimated cost of Rs. 10 lakhs for towns having population between 20,000 and 50,000.

(*c*) Ten units of Small Industrial Estates at an estimated cost of Rs. 5 lakhs each for towns having population between 5,000 and 20,000.

(*d*) Fifty units of Workshop Sheds for village artisans at an estimated cost of Rs. 10,000 each in rural towns having less than 5,000 population.

The total outlay on these schemes, therefore, is kept at Rs. 20,000 lakhs for the entire Third Plan period.

The State Government has taken a decision in 1963 to set up an Industrial Estate at Bikramganj. Some more places, namely, Arrah, Dehri-on-Sone and Buxar for Industrial Estates may be taken up.

Lastly it may be noted that as many of the blocks of this district are under Intensive Agricultural Development Programme, there is a huge demand of agricultural implements for the implementation of this programme. Some of the units at Buxar, Bihea and Dehri-on-Sone are manufacturing one or two items but the bulk of such implements are being purchased from Uttar Pradesh and as such there is a good prospect for developing such units which can manufacture the various implements like ploughs, ridgers and thrashers,

etc. Any plan for exploiting the industrial potential of a district should also mention as to the availability of man-power. There is a surplus population within the district that is not usefully employed. The people of the district are sturdy and intelligent and there are certain sections where indigenous technical skill is readily available. There will be no dearth of local man-power to run the industries whether cottage, small-scale or large-scale. It is a complaint that the children of the soil and particularly the men of Shahabad district have got a very small percentage of employment in the industries within the district. It is also a notorious fact that the labourers in the lime quarries are mostly outsiders. This, however, is mostly due to the allergy of the local people to take to such hard manual work.