CHAPTER V

INDUSTRIES

71. Old Time Industries

Agriculture has been the principal industry of the district from remote past, as it is today. Other main industries in the past were weaving of cotton and tusser cloth and manufacture of bell-metal utensils. The industries of the district were small establishments run by manual labour of village artisans and met the simple needs of the villagers. With the exception of silk and fancy cotton fabrics, few of the manufactured articles were exported. Brief accounts of the principal industries which then existed, are given below.

(*i*) Silk Weaving

Tusser silk weaving was for many years a principal industry of the district. Dr. Shortt who visited Sambalpur in 1855 found that tusser silk was manufactured to a great extent, the fabrics being used locally and also exported. In 1864 the Deputy Commissioner, Major Cumberleage reported that five large villages or towns were occupied in weaving tusser, and in each, at the very lowest computation, 1,000 thans or pieces were produced annually. The culture of the tusser silkworm was carried on in almost every jungle village and at least 7½ million cocoons were produced. Only one-third of the cloth remained in the district the rest being exported to Cuttack and Berhampur, and also to Raipur and Bilaspur; and it is clear that the industry was then in a flourishing condition. Again in 1876 it was reported that Sambalpur was more advanced than other districts of the Central Province (now Madhya Pradesh) both in the quality of the cocoons exported and in the workmanship of the cloth produced by its weavers. The export of manufactured tusser had apparently fallen off, but half of the cocoons produced were sent out to Ganjam, Cuttack, Raipur, and Bilaspur.

Since that time the industry declined still further, the local supply of tusser cocoons having decreased in quantity, degenerated in quality, and risen in price. The closer conservation of Government forest, the clearing of village forests which were most convenient to the rearers, unfavourable seasons, and lack of care and capital on the part of the breeders are all said to have contributed to this result. For the rearing of tusser worms differs widely from the rearing of the ordinary silk worm, in that the latter is a domesticated insect, whereas the tusser worm thrives best when in the jungle. Not being able to have access to forests, the rearers have not renewed their stock of cocoons from wild seed. Consequently, deterioration

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has set in, diseases such as grasserie have become common and the cocoons do not contain as much silk as formerly. Even as long ago as 1892, the rearing of the tusser worm in Government and *malguzari* forests had practically ceased. It was then reported that the cocoon rearers had migrated to the Feudatory States, where, although taxed, they were at least given strips of forest, and that the weavers drew their supplies of cocoons only from those States and from the Zamindaris. This was exactly the condition of affairs which then existed, except that the weavers had to go further afield for their supply, and obtain most of the cocoons from Singhbhum and Baudh State.

The rearing of the tusser worm (locally called *Kosa*) was carried on by Gandas, chiefly on the *Sahaj* tree (*Terminalia tomentosa*). Spinning and weaving were a monopoly of the Koshtas, the centres of the industry being Sambalpur, Remenda and Barpali. The industry was carried on almost entirely with cocoons imported from outside the district. The rearing of tusser cocoons is almost extinct as an industry in Sambalpur. The Koshtas were extremely conservative in their methods and the silk industry of the district suffered set backs owing to the necessity of importing cocoons and the failure of the weavers, to adopt more up-to-date methods.

(*ii*) Iron Work

Iron-ore was found in the hilly country on the borders of the district, particularly in the Borasambar, Kolabira, Laira, Paharsirgira and Rampur ex-Zamindaris, and in the Barapahar hills. Some of them were of good quality, the one east of the Mahanadi especially in Laira, being said to be superior to those of the Bargarh subdivision. King's Gazetteer of 1932 says "the following description given by Dr. Shortt still holds good, no change of any kind having been effected". "In the process for obtaining iron from the stone, no flux is used; it is smelted by means of charcoal. The furnance stands about 4 feet in height and the width inside is 1 foot. Three men are employed at each furnace, two to work the bellows and one as feeder. The furnace is closed at the botton, the fire being maintained by an artificial blast introduced through a fireclay pipe, which is closed with clay after the introduction of the bellows, whose tubes are made of bamboos, which play into the fire-pipe. The materials consist of charcoal and ironstone; and the latter is broken in to pieces, and put together with the charcoal, into the furnace, which is constantly being supplied from the top. On another side a hole is made in the ground connected with an opening at the bottom of the furnace, through which the slag escapes and is from time to time removed, leaving the metal below".

These furnaces are now nowhere to be seen. But dumps of slag in different villages weathered through decades prove one time smelting of iron-ore.

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Iron smelting and the manufacture of iron articles were a monopoly of the Lohars (from *Loha* which means iron), who numbered 6,697 at the 1931 census. They were found chiefly in the ex-Zamindari villages, more especially in Borasambar, Laira, Paharsirgira, and Rampur, near forests which they could cut freely for charcoal. There were about 29 furnaces at work, and the iron produced was used for the manufacture of agricultural implements, such as plough shares cart-wheel tyres, however, were imported; and when old, were cut up into lengths of about 2 feet each, which were converted in to plough-shares. A few smiths were still able to manufacture, in fairly tempered metal, the finely curved hachet which was once the battle-axe of this country. But owing to the faultiness of the surface-ore extracted and to the primitive methods of smelting, the implements usually made were apt to be soft and brittle. During about 1911, iron boiling pans for sugar-cane were manufactured, but they were found to flake readily on the fire, and their manufacture had been discontinued. The articles most commonly made were the *Kuri* or hoe and the spoons and strainers used in cooking rice, while in villages where the Lohar was still a public servant he made axle-pins and the coulters of ploughs.

The special study carried out during 1961 by the Census Organisation on iron-smelting in Penthabahal village (Rairakhol subdivision), states—"The Konds were the first to discover the occurrence of iron-ore in the locality and started extracting iron for some years till they migrated from the village for better living conditions elsewhere. The village lay uninhabited for some time, but ultimately when the new settlers came, there were some skilful and enterprising Lohars (black-smiths) among them. They revived the industry of iron-smelting and of manufacture of iron and steel implements necessary for agriculture, hunting and domestic purposes. The village then served as a centre for production and sale of iron and steel implements. According to another version as given by an old Kamar of the village, the process of smelting iron is locally called 'penthoi'. The village therefore acquires the name Penthabahal, signifying a land of processing iron..... It appears that the naming of the village is closely associated with the indigenous industry of production of iron"[1].

(*iii*) Brass and Bell-metal

A large bell-metal industry existed in Sambalpur town during the first decade of the present century, where a number of Kansaris (from *Kansa* which means bell-metal) worked only in bell-metal and at Tukra (or Kultatukra), a village near Kadobahal in Bargarh subdivision. A number of artisans were also found in Remenda, Barpali and Bijepur, and a few at Rampela and Katapali. The artisans were Kharuras and

[1] Census of India, 1961—A Monograph on village Penthabahal.

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Kansaris, and the articles most commonly turned out were *lotas*, bowls, basins, plates, saucers, drinking-mugs, water-cans, lamp-stands and pipes, besides the curious boat-shaped anklets worn by many women. Brass cooking and water pots (*Kalsis*) were usually imported, but were being made locally to a small extent, for during the famine of 1900 some brass-workers migrated from the south and settled in Tukra, and the local workmen were trying to acquire the craft. The old brass-work of the district was often curious and much superior to anything then attempted, but it was melted down without regard to its artistic superiority.

(*iv*) Gold and Silver ware

Gold and silver ornaments were made by the local caste of Sonars (from Sona which means gold). The ornament most commonly made, which was to be seen on the necks even of poor women, was the *Khagala*, a band of silver lying flat on the bosom and encircling the neck as a thick round wire. Other common articles of silver were the bangles, armlets, and anklets worn by women, the round ring worn on their wrists by men, and broad flexible silver-ware waist-belts. The usual gold ornaments were amulets, necklets, nose-buttons, ear-rings for the lobe and tip of the ear, and finger-rings. Among other products of the silver-smith's art were fancy articles of silver, such as immitations of the royal canopy or umbrella and figures of beasts, which were said to be not much inferior in finish to the silver work of Cuttack.

(*v*) Stone-carving

Carving on stone was the hereditary function of a caste known as Sansias. The caste has two subdivisions, the Banaria and the Khandait Oriya. The former still parctise carving, but the craft has been given up by the latter. The stone generally used for carving small images was a black stone resembling marble or a green stone like Jade, but a fine red sand stone called *Dalima* was being used for larger figures. The dalima stone was rarely found in the district, but was imported from Kalahandi. The stone mostly used was quarried at Sason and was well adopted for chiselling.

(*vi*) Sisal Hemp

The pioneer of this industry was Mr. Casey of Nildungri who had planted out over 1,000 acres (405 hectares) with Sisal, and extracted the fibre which was very valuable for the manufacture of a specially strong and durable rope. He also had his own ropery by adopting bicycles for twisting the fibre. At present the State Government has taken over the entire plantation and the unit and producing sisal rope (The rope factory is discussed later in this chapter). Sri Brajamohan Panda of Sambalpur had also started a sisal hemp plantation and factory ta Sitlenpali which is producing sisal fibre at present.

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(vii) **Lac Cultivation**

Mr. F. C. Osmaston, Divisional Forest Officer, Sambalpur writes as follows in 1939 "Although lac has been regularly cultivated in some of the adjoining Orissa Feudatory States, until recently little or no interest in lac was taker in the Sambalpur district. In 1925-26 the Forest Department began experiments in lac culture, and these have continued until in 1928 a Lac Farm of 192 acres (77·76 hectares) was laid down at Jhankerbahali in the Sambalpur East Forest Division. This is being developed with the object of seeing whether lac can be successfully cultivated in the district. That it can be successful is by no means certain. The climate during April and May is dry and hot, and devoid of those heavy showers which occur in Chota Nagpur at that time, and which so greatly help in ensuring a successful summer crop. The lac hosts are being grown in company with field crops cultivated by village tenants as this inter-cultivation between the lac hosts is thought to improve growth conditions sufficiently to overcome the severe hot weathers. If successful, the Lac Farm will be used as a demonstration area, so that villagers in the district can learn lac cultivation and obtain some brood locally at reasonable rates. Consistent with these objects, the Lac Farm will be run on as commercial a basis as possible. The hosts being used and being supplemented by planting are *palas* (*Butea frondosa*), one of the commonest trees in cultivated lands in the district, *Kusum* (*Schleichera trijuga*) and *Khair* (*Acacia catechu*) which is common in certain types of waste land. The two years' experience so far suggests that it will be possible to cultivate lac successfully and at a profit, as long as the price of T. N. in Calcutta does not fall below Rs. 60 per maund. But mortality in the hot weather is certainly heavy, and although the winter crops are likely to be more successful, it is certain that results in the Sambalpur district cannnot be expected to be so successful as in Chota Nagpur or Singhbhum. Complete failures and necessity to buy brood from outside the district will be commoner then elsewhere, while good years are unlikely to be so good or so frequent as in other districts. But it has already been proved that lac on a moderate scale is climatically possible". At present there is no trace of lac cultivation in the district

72. Power

Orissa has been a typical example of poverty amidst plenty. There are large deposits of minerals, but they remained unexploited for want of power. This deficiency has been overcome by implementation of Hirakud Dam Project, in this district and the Thermal Power of Talcher in Dhenkanal district. Hirakud has a total installed capacity of 2,72,000 Kilowatts, that is 2,00,000 Kilowatts at the main dam and 72,000 Kilowatts at Chipilima. Before the Hirakud Project was started, the total installed capacity in the State was only 300 Kilowatts. The Aluminium plant, the Cable Factory, Structural Workshop, all at Hirakud, the

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Orient Paper Mills, the Collieries and the Caustic Soda Factory at Brajarajnagar, the Belpahar Refractories, the Cement Factory at Bargarh and several other industries in the district are based on the power generated from Hirakud. Notable industries set up in other districts which get the benefit of Hirakud Power are the Steel Plant at Rourkela, the Cement Factory at Rajgangpur, the Ferro-manganese Factory at Joda and the Ferro-chrome Factory at Jajpur Road in Cuttack district. A list of Industries that consume Hirakud Power is given in Appendix I. Town and rural electrification also consume a sizeable quantity of this power.

Diesel Power House

The first electric power house was established at Deogarh in 1905 It consisted of two generators. During 1916 the power house was switched over to that of hydro-generating sets by utilising the water from the Koradkot waterfall. At present there are two sets of 50 Kw. engines and one 75 Kw. engine in the Deogarh power house. The engines are diesel operated. The diesel power house at Rairakhol consists of two sets of 12 Kw. engine, a 25 Kw. engine and a 50 Kw. engine.

73. Mining

The important minerals found in the district are coal, fireclay, limestone and graphite. Other minerals like iron ore, manganese-ore, china clay, bauxite, mica, galena, corrundum, zircon, mineral pigments, kyanite and quartz also occur in small-scale. Diamond bearing sand near Burla is the latest exciting news.

(*i*) Coal

So far as occurrence of minerals is concerned, coal occupies the first place. The Rampur Coal Field is reported to have a total reserve of 140 million tonnes. The area is now under active mining operations. Extraction started here as early as 1909 by M/s. Hingir-Rampur Coal Company. Subsequently two other collieries, namely, Ib River Colliery and Orient Colliery have started extraction in this field from 1917 and 1955, respectively.

(*a*) Hingir-Rampur Coal Co.

The Hingir-Rampur Coal Company is mining near Brajarajnagar. The coal raised here has no export market. The entire quantity is consumed in India. The annual average output is 145,200 tonnes and Rs. 20,00,000 has been invested as capital. It is a private limited company with its head office in Bombay under the Managing Agency of M/s. Killick Industries Limited. The Industry provides employment to 1,142 persons.

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The Railways and the Orient Paper Mills are the two main consumers of this coal. There are few other consumers, such as (*i*) Orissa Cement Limited, (*ii*) Rourkela Steel Plant, (*iii*) Belpahar Refractories, (*iv*) Gujarat Electricity Board, (*v*) Textile Mills in Madhya Pradesh, Gujarat and Maharastra, (*vi*) Jute Mills of West Bengal.

(*b*) Orient Colliery

The Orient Colliery of M/s. Central India Coalfields is also situated at Brajarajnagar. It started mining in 1954. The average output is 2½ lakh tonnes. The colliery provides employment to about 1,000 persons. The principal consumers are the Railways, Paper Mills, Cement Factories and Electric Power houses.

(*i*) Fireclay

Fireclay deposits are confined to the Rampur Coal field areas. Exploitation of this mineral strarted as early as 1928. The first lease was taken by Shri Shankar Prasad Mishra. He sold it for a paltry sum to Tata Iron & Steel Company. The mines are in operation at Jurabaga and Darlipali near Belpahar by M/s. Tata Iron & Steel Company and at Talabira village near Lapanga Railway station by M/s. Orissa Cement Limited and M/s. Sambalpur Mineral Industries. The annual production of fireclay in the district reached 95,715 tonnes in 1961.

The fireclay supply mainly goes to the Refractory Plants at Belpahar, Rajgangpur and Jamshedpur. It also feeds the Rourkela Steel Plant and Ceramic Industry at Jharsuguda. The clay deposit at Khola near Lakhanpur belongs to Cuddapah system and it is used for manufacture of refractory.

(*a*) Talbira Fireclay Mines(Owner : Sambalpur Mineral Industries Limited)

Situated in village Talabira under Katarbaga police-station. The mining operation started in 1958. Mining is done by open cast with the help of manual labour. The quality of fireclay is of semiplastic nature suitable for medium heat duty refractories. This type of fireclay is obtained in an area of over one acre in a layer of 2 feet on the average. The entire area is not yet estimated. Approximately 1,000 tonnes are raised annually. It is only consumed in the local market, the main consumer being the Orissa Ceramic Industries, Jharsuguda. The entire share capital invested in the concern amounts to Rs. 50,000.

(*b*) Talabira Fireclay Mines (Owner : Orissa Cement Limited)

Situated in village Talabira under Jharsuguda police-station. Mining operation started in 1957. It was open cast operation. As estimated, the total reserve of fireclay is about 150,000 tonnes. The qualities are plastic, non-plastic, semi-plastic and calcined clay. The average output per year is 3,080 tonnes. The mineral is not exported. The main consumer is Orissa Cement Limited itself which utilises it for manufacture of refractories. On the average, it employs 60 labourers daily

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(c) Belpahar Fireclay Quarry (Owner : Tata Iron and Steel Company)

Situated in village Jurabaga under Brajarajnagar police-station. The estimated reserves in Darlipali are 2·55 million tonnes, in Jurabaga 3·35 million tonnes, in Block 'A' Jurabaga 0·17 million tonnes and in Block 'B' Darlipali 22·11 million tonnes. The annual average output is 95,000 tonnes. Mining operations started in the main quarry in 1928, in Block 'A' in 1933 and in Darlipali in 1955. The fireclay is consumed by the Tata Iron and Steel Company, Jamshedpur and the Belpahar Refractories for manufacture of fire bricks. Rs. 14,76,100 has been invested as capital. The industry provides employment to about 745 persons.

(iv) Limestone

Large deposits of Limestone and dolomite, suitable for manufacture of cement, flux and lime burning, occur around Sulai, Padampur, Lakhanpur, Dungri, Sauntamul, Badmal, Behera, Banjipali, Kusmuda and Putka. The deposits at Sulai would yield about 8 million tonnes and those around Sauntamul, Badmal and Dungri about 80 million tonnes of which at least 35 million tonnes constitute the cement grade. The mines are being explored by M/s. Industrial Development Corporation a State owned enterprise, to feed the Cement Factory at Bargarh. The Dungri Limestone Quarry was declared open on the 4th April 1966. Up to the end of 1969 nearly 5·3 lakh tonnes of ore has been extracted. The quarry employs about 1,200 labourers at present. The limestone deposits at Lakhanpur have been found to be argillaceous and a reserve of 18 million tonnes have been anticipated by the Geological Survey of India. The deposits which occur in the adjoining area of Nawapara (Kalahandi district) and Pukta hold a prospect of at least 10 million tonnes.

(v) Graphite

Graphite occurs at Baduapali, Baghmunda, Sitapali, Sargipali, Brahmantal and Dahigaon. The deposits at Sargipali are under mining operation since 1944. The area is under geological and geophysical investigation of the State Mining Department.

Sargipali Graphite Mines

It is situated at Sargipali under Padampur police-station. The mining operation was started in 1945. It yields an average output of 300 tonnes. The capital investment is Rs. 1,50,000. About 30 persons work here. The graphite is carried by trucks to Nawapara, the nearest rail-head which is 50 miles (80·5 Km.) off. It feeds the crucible industries, foundries and steel mills.

(vi) Iron-ore

Several deposits of iron-ore are known to occur round Lohakhand, Akhra..and, west of Dingabahal, south-west of Pa apali and Kot aon. The total reserve of iron-ore in these areas has been estimated at 20

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million tonnes. The average ore contains about 60 per cent iron, 0·76 per cent manganese and 0·31 per cent phosphorous. The areas are not mined as yet.

(*vi*) **Manganese ore**

Manganese ore deposits are prevalent in Sagamalia Reserve Forest in Charmal police-station, and Tikilipara and Badibahal areas in Jamunkira police-station. Two leases were worked in Sagamalia Reserve Forest in 1955, but due to low percentage of manganese (about 40 per cent) and long lead, the working was considered uneconomical. The area near Tikilipara has been leased out for mining operation.

(*vii*) **China-clay**

It occurs in small quantity at Ghichamura, Banjipali, Chuhkitikra, Sagunpali and Katapali. The areas are under investigation. There are also a few occurrences of white lithomarge associated with ochre in areas lying to the north of Akharadand and in Nalibasa areas of Bamra ex-State.

Khola China-clay Mines

The Khola China-clay Mines is situated near Lakhanpur in Bargarh Subdivision. Mining operations started there in 1961. The reserve is estimated at 60,000 tonnes. It is held under a lease by a private party. The average annual output is 1,200 tonnes. The consuming industries are Belpahar Refractories, Orissa Industries, Rourkela, and Orissa Cement, Rajgangpur. Difficulties are there in transport. Trucks carry 5 miles up to the bank of Hirakud reservoir, then boats carry across the reservoir (about 13 Kms.) and from the other bank of the reservoir trucks again carry 30 Kms. to reach Belpahar. From Belpahar the clay is carried by railway to the industrial centres.

(*viii*) **Mica**

Mica books of about 3″ size are found near Kenchhodadar, Buromal, Chhamunda and Burhiakata. The deposits near Kenchhodadar were exploited previously. But the workings have been abandoned because of marketing difficulties.

(*ix*) **Mineral pigments**

Red shales associated with Cuddapah sandstone and flagstones occur around Ganjar, Khadupani, Jobhata and Pandupani. Thin beds of soft red shales are also seen in Liakhai and Ulap in the Rampur Coal fields. The area has been leased out, but operation has not yet started.

(*x*) **Bauxite**

There are huge deposits of bauxite in the Gandhamardan Plateu in Borasambar region. The area is under investigation by the Directorate of Mines.

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(*xi*) **Kyanite**

Deposits of kyanite occur at Phatatangar and Mahulmunda near Garposh railway station. It has been leased out for mining. But mining operations have not started. The kyanite is of bladed type and contains much silica.

(*xii*) **Building materials**

Old and black slates associated with Cuddaph formation near Bargarh, coloured flagstones around Ghemjer, Khadupani, Jobhata etc., are worth mentioning.

(*xiii*) **Other minerals**

Quartz occurs at Pandri and Kansar; beryl at Buriakata; galena at Talpatia, Thuntikatarbaga and Gangajal; corrundum at Badmal; zircon at Maulbhanja and in Rairakhol police-station. But they are of meagre economic importance. These areas have not so far been thoroughly prospected.

Mineral production figures from 1964 to 1968 are given in appendix II. Mining revenue from 1964-65 to 1968-69 is given in appendix III.

74. Large-scale Industries

Hirakud–Brajarajnagar region is one of the few places of Orissa where a number of large-scale industries have concentrated. These industries utilise the mineral resources of the neighbouring area. The paper mill at Brajarajnagar is based on forest products. A number of engineering industries have also developed near Hirakud during recent years.

Important industries of the district are discussed below.

(*i*) **Indian Aluminium Company, Ltd., Hirakud**

The Company was incorporated in 1938 under the name of "Aluminium Production Company of India Limited which name was changed in 1944 to "Indian Aluminium Company, Limited." It was started as a private enterprise with a share capital of Rs. 1,30,000 under the sponsorship of Alcan Aluminium Limited, Canada, the largest aluminium producer in the world. At present the Company's paid up share capital is over Rs. 12,30,00,000 of which 37 per cent is held by 7,000 Indian share-holders. The Company's assets exceed Rs. 48,30,00,000.

At the invitation of the Government of India a technical team from Alcan Aluminium Limited (The Company's Principal share holder) had investigated the possible sites for putting up a sizeable aluminium smelter in India and had recommended the establishment of a plant in the close vicinity of the Hirakud hydroelectric station. Besides, some other factories started in other parts of India, the Company began the construction of a new 20,000 tonne smelter in Orissa at Hirakud. The

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smelter was put up in two stages of 10,000 tonnes each. Stage I was commissioned in January 1959. After the completion of Stage I came the Stage II which was completed in November 1961.

The Company manufactures and deals in aluminium and semi-fabricated products—ingots, sheets, circles, extrusions, foil, rod, powder, paste, pyro-technic powder, filter cake, also alumina and carbon paste.

(*ii*) Aluminium Industries Limited, Hirakud

It is a Public Limited Company, having its head office at Kundara (Kerala State). The factory at Hirakud was started by this company in two stages—the Cable Mill was inaugurated in 1959 and the Rod Mill in 1960. The production capacity of both these mills is 3 600 tonnes of aluminium bare conductors and 3·600 tonnes of 3/8" diameter E. C. grade aluminium rods.

The Company has invested a capital of rupees one crore.

(*iii*) Orient Paper Mills Limited, Brajarajnagar

The first paper mill in Orissa was started at Brajarajnagar by Messrs. Orient Paper Mills Limited in 1939. The paper production capacity of the mill was 22 tonnes per day. With subsequent additions of improved machineries the capacity was raised to 50 tonnes. During the period 1948 to 1951 some extentions were done to the plant and the production capacity increased to 100 tonnes per day. The third phase of improvement was taken up in 1956. New machines were installed and the average production of paper and board was raised to 200 tonnes per day.

The Company have invested Rs. 730·07 Lakhs (as on the 31st March 1968) in this paper mill, which produces various kinds of printing and writing paper, packing and wrapping paper, board, crepe, water-proof and polythene coated paper.

The principal raw material consumed by the paper mill is bamboo. It also uses waste paper, pine and other soft woods and subsidiary raw materials for production of paper and board. The nuisence caused by the effluent from the paper mill has been partially solved by a soda Recovery pla t.

(*iv*) Belpahar Refractories Limited, Belpahar

This Refractories Plant, one of India's biggest and most modern, has been put up jointly by the Tata Steel and the Didier Werke of West Germany at a cost Rs. 3·88 crores. Belpahar was chosen as the site for its proximity to a number of raw material bearing areas and to the steel plants at Rourkela, Jamshedpur and Bhilai. Fireclay is available in the quarry two miles away from the factory. But at present the fireclay mine at Belpahar is not in a position to meet the entire requirements of different types of clay. Hence, the Company is drawing part of their requirements from Palamau district of Bihar and Cuttack district of Orissa. High

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Volatile coal is available from the Hingir-Rampur Colliery which is there within a distance of 13 km. Chrome ore comes from Sukinda Mines in Cuttack district and quartzite is received from the mines at Kendudih in Singhbhum district. Magnesite comes from Salem in Tamilnadu where a plant has been erected at a cost of Rs. 45 lakhs for calcining the magnesite ore before despatch to Belpahar.

The factory started production in 1959. Prior to this the basic and silica bricks were being imported from foreign countries. The Plant turns out fire-bricks, silica-bricks and basic-bricks both burnt and chemically-bonded for use in furnaces. The steel plants at Rourkela Jamshedpur, Bhilai, Durgapur, Burnpur, the ordnance factories of Government and various glass factories in the country are the principal consumers. The Company has recently started exporting its product to Uganda, Egypt and Republic of China.

(*v*) Orissa Weavers' Co-operative Spinning Mills Limited, Tora

A spinning mill has been constructed at Tora, near Bargarh at a cost of rupees 88·37 lakhs. It is a co-operative enterprise and has been registered during 1959. There are 327 share-holders, the paid-up share capital being Rs. 33·44 lakhs. The installed capacity of the factory is 12,000 spindles. The unit has not gone into production. When completed it will produce 4.417 kilograms of yarn per annum. The primary object of this unit is to assure supply of yarn to the handloom weavers' co-operative societies.

(*vi*) Hira Cement Works, Bardol (Bargarh)

The Industrial Development Corporation of Orissa Ltd. (A Government of Orissa undertaking) has set up a cement factory at Bardol near Bargarh at a cost of Rs. 7·27 crores. The construction of the factory was taken up towards the early part of 1964 and was finally commissioned in February 1968. The factory utilises the limestone available from the Dungri limestone quarry.

Port-land cement conforming to Indian Standard Specification No. 269 of 58 is manufactured under wet process by means of 2 rotary klins where the slurry prepared out of crushed limestone and morrum is burnt by a process of firing pulvarised coal for the production of clinker and then ground into fine cement. The products are marketed in the zone fixed by the Cement Corporation of India, comprising of Orissa, portion of Bihar, West Bengal, Assam, NEFA, Manipur,

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Tripura and Nagaland. The factory authorities have appointed their stockists and distributors at different places for the marketing of cement.

(*vi*) Bargarh Co-operative Sugar Factory Limited

It has been decided to establish a Sugar Factory at Bargarh under co-operative ownership and management. The co-operative society was registered in 1959. The cost of the project is estimated to be rupees 220 lakhs. The daily average crushing capacity of the plant will be 1,250 tonnes with provision for further expansion. The construction of the factory has been started and is scheduled to be completed during 1971.

At present sugar-cane is being cultivated on 6,768 acres (2,741 hectares) of land situated within a radius of 25 miles (40 Kms.) from the factory which will be insufficient to feed the mill which will require 187,500 tonnes of sugar-cane every year during crushing season. So, further extension of sugar-cane cultivation is necessary.

(*vii*) Bhaskar Textile Mills Ltd., Jharsuguda

It is a private enterprise established since 1964 at Jharsuguda. The Company has invested Rs. 1·75 crores in the factory which produces cotton yarn from raw cotton procured from Maharastra. It provides employment to 1,700 persons.

75. Small-Scale Industries

A number of small-scale industries have developed in the district during recent years specially after the construction of the Hirakud Dam Project. Also the State Government have been giving various aids for development of these industries. Under the State-aid to Industries Act, these industries are being given increased financial assistance on liberal terms, supply of machinery on hire purchase basis, provision of ready-made factory buildings in Industrial Estates, supply of controlled raw materials and assistance to obtain raw materials from abroad, and free technical advice.

Concentration of forest based industries are pronounced in the district. There are about 38 saw mills, 30 bidi factories, 20 wooden furniture factories, 2 rope works, and 1 match factory. All the industries deriving their raw materials from forests employ nearly 1,500 persons. Bidi industries alone provide employment to about 1,100 persons.

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There are about 35 rice mills and 40 rice hullers, 2 oil mills, 12 flour mills, 10 soap factories, 3 ice factories, 3 ceramic factories, 16 printing presses, 8 dyeing units, 14 chemical and pharmaceutical units, 2 fountainpen units, 10 Gudakhu (chewing tobacco) factories, 5 weaving factories, 150 tailoring works, 7 brass and bell-metal works, 15 automobile engineering works, 2 foundry works, 3 stainless steel units 15 iron and steel fabricating works, 4 cold storages, 2 paints and varnishes units, 15 bakery units, 5 confectionary units, 2 polythene industries and one industry each for manufacture of aluminium utensils, electric equipments, sodawater, leather goods, Ayurvedic medicines and allied hospital equipments and products. Besides, a tile factory, a sugar factory, 3 iron works, and 2 carpentry units which were started as Panchayat industries have been transferred to Orissa Agro and Small-Scale Industries Corporation from 1st October 1964.

Many among these units are so small that they can be taken under cottage industries.

Some of the important small-scale industries of the district are discussed below.

(*i*) Orissa Ceramic Industries Limited, Jharsuguda

The factory was started in 1961 at a cost of rupees three lakhs It produces salt glazed stone ware pipes for use in sewerage lines. The Government is the main consumer of its products. The factory utilises fire clay available from the Khinda mines and ordinary clay from the factory site. About 60 workers are working at present.

(*ii*) Hirakud Industrial Works

The Industrial Works put up at Hirakud by the Industrial Development Corporation of Orissa in 1962 at a cost of Rs. 50 lakhs manufactures transmission line towers, pug mills, tile presses, sheep foot rollers and rice hullers, etc. It is a Government of Orissa undertaking which employees about 430 persons.

(*iii*) Dhankauda Tile-making Co-operative Society

This factory is situated at Dhankauda—2 kilometres from Sambalpur town. The State Government has contributed Rs. 70,000 as share capital for construction of buildings. The unit has started production from the 1st October 1963. The annual production capacity is 5 lakhs of tiles.

(*iv*) Attabira Sugar-cane Factory

It is a co-operative undertaking located at Rengalipali near Attabira. The State Government has contributed Rs. 2,20,000 as share capital. At present the unit has stopped its production due to shortage of sugar-cane.

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(v) Rice Mills

Production of paddy has gone up to a great extent due to irrigation facilities and introduction of intensive cultivation in this area. A large number of rice mills and rice-hullers have been set up in different parts of the district. At present there are 35 rice mills and 40 rice-hullers mostly located at Sambalpur, Bargarh, Hirakud and Jharsuguda.

A modern rice mill, the only one of its kind in Orissa is under construction at Hirakud by the Food Corporation of India with Japanese collaboration at a cost of about Rs. 12 lakhs. The entire machinery is imported with indigenous accessories. The mill is expected to produce better quality rice with higher outturn. The milling capacity of the plant is 20,000 tonnes of paddy per annum.

(vi) Power-loom, Tora

A power-loom factory has been established at Tora in Bargarh subdivision at a cost of Rs. 9·61 lakhs. It is a co-operative enterprise which employees about 94 persons and produces Dhotis, bed-sheets, napkins and long cloth, etc. The factory started production from September 1964. Average production per year is 8·50 lakh metres of cloth.

(vii) Fibre Factory

There is a fibre factory at Nildungri with a corona decoticator fitted with one 38 h. p. diesel engine. The annual production of sisal fibre is now about 80 tonnes, the value of which is nearly Rs. 2 lakhs. The extraction is seasonal in nature. It continues for six months (from November to May). The operation includes fibre extraction, removal of sisal waste, washing, drying, brushing, and bailing the fibre. The factory employ 36 workers during these six months.

Sisal ropes are being manufactured by a hand operated machine at Nildungri. The quantity produced is very small. It is sold in local markets. The bulk of the fibre is exported.

76. Cottage Industries

Among cottage industries of the district mention may be made of cotton weaving, bidi making, carpentry, pottery, blacksmithy, hand pounding, match making, soap making, metal works, etc.

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Besides handloom there were 96 industrial co-operative societies in the district during 1969. The list of these industries is given below:

Name of Industry		No. of Co-operative Societies
1. Hand pounding	—	27
2. Oil pressing	—	15
3. Bee-keeping	—	2
4. Fibre	—	2
5. Carpentry	—	3
6. Blacksmithy	—	2
7. Spinning	—	3
8. Soap making	—	1
9. Cottage match	—	1
10. Sugarcane growers	—	6
11. Non-ferrous metal	—	5
12. Leather	—	15
13. Pottery	—	7
14. Handicraft	—	3
15. Miscellaneous	—	4
Total	—	96

Some important village industries are discussed below :

(*i*) Cotton weaving—

The district is famous throughout India and even abroad for handloom fabrics. It is an indigenous industry manned mostly by Kostha and Bhulia weavers. Besides their adroit workmanship, the speciality of their products is reckoned more for the choice of colour and the design. This has earned them world-wide fame. This industry was in a flourishing condition in the past. Some fine exhibits of handloom fabrics at the British Exhibition in Wembley in 1924 and 1925 were much appreciated and orders were obtained though the department of Industries and Labour for a supply of the said type of cloth. The weavers exhibited considerable taste in colour and variety of pattern. Even the coarsest cloth was woven with a dainty border. The Bhulias had nothing to fear from competition with mill cloth as they made good use of their monopoly of inherited skill. The Gandas who weave a cheaper and coarser cloth went down against the onslaught of the glamour of mill cloth.

Sambalpur sarees found a brisk market not merely in Sambalpur district but also in all the neighbouring districts. Their colour and design and the method of wearing made the women look some of

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t' e prettiest women in the world. Even it has been found that women of this district rarely wear mill-made sarees or handloom sarees produced in other parts of the State.

Scarcity of raw materials, want of capital and lack of marketing facilities are the greatest impediments in their progress. They manufacture generally Saree, Dhoti, Gamucha, bed-sheets, etc. Gradually many co-operative societies are being formed of the weavers of the district. Technical aid is also being given. During 1966-67 there were 96 weavers' co-operative societies in the district consisting of 14,426 members. The total working capital was Rs. 30,14,000. There were 12,433 looms for weaving cotton fabrics and 1,365 looms for silk weaving in the district out of which 6,447 looms and 180 looms, respectively were working during 1966-67.

(*ii*) Bidi making

Bidi is made by wrapping dry raw tobacco in Kendu leaf. It takes the shape of a cone, the thick end being about half the size of a cigarette The leaf is folded in to stop the tobacco falling out. The whole Bidi is tied with a very thin thread to prevent the leaf unwrapping.

Several small units sprang up in the district for manufacture of Bidis. This industry has been fostered by the development of the trade in Kendu leaf, Sambalpur being one of the chief sources of supply of this leaf, which was extensively used in making Bidi. Only a very small portion of the leaf was used in the district, the bulk of it being exported to Bombay, Calcutta and other parts of India.

(*iii*) Carpentry

This district is well known for forest wealth and for trading in timber. Logs and sawn wood are mostly exported. There are many skilled artisans, who manufacture articles like chairs, cots, almirahs and box s and agricultural implements which find easy market in local towns and villages.

(*iv*) Toy-making

T e following lines from *Yojana* (July 5,1964) give an account of toy-making industry in the district.

"Sambalpur in Orissa is one of the many places in our country well known for its wooden toys and dolls. The Simul tree grows in abundance in the district and the near-by Kalahandi forest. The village carpenters collect the wood and carve out from it a wide range of attractive toys.

"Toy-making is a traditional craft of the carpenters who follow it in their spare time. The main centres are the small villages—Kodabahal, Sonapur (in Bolangir) and Bargarh.

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"Being soft, the Simul wood yields easily to the stroke of the carpenter's chisel. With great skill he carves out from a single piece of wood a variety of figures, particularly of the familiar wild and domestic animals like the cat, the horse, the tiger and the elephant. The size and the use of two or more bright indigenous colours distinguish the Sambalpur toys from those of other parts in the country. They are not like the light and linear traditional folk-toys of Kalighat; they do not also resemble the tiny models produced at places in Uttar Pradesh. Four square in structure, and heavier, the colourful Sambalpur toys are excellent specimens of the village carpenter's craftsmanship."

(v) Other minor industries

Among minor industries, mention may be made of bamboo work and basket-making, which was in the hands of Turis, Mahars, Kandias, Birjias and Betras, Large number of baskets were exported from Sason and Rengali stations. Drums were made by Ghasias, which the Kols used largely for their dances. The District Council had endeavoured to develop a tanning industry in the district, and had a Chamar of Barpali trained at Utkal Tannery at Cuttack with this end in view, but the industry made little progress. Glass bangles were made in several villages, but the industry was on a very small scale and it could not flourish.

77. Industrial arts

Sambalpur textiles with traditional designs have earned wide renown and have been highly commended in markets all over the world. This artistic get up and brilliant colour schemes have made them a rare, creation in textiles.

Orissa with her long sea-board was in the past a prosperous kingdom. Her enterprising merchants were carrying on trade with many countries in the East. They were regularly calling at the ports of the islands of the East Indies such as Java, Sumatra and Bali with merchandise. Today the cloth designs in those places bear close resemblance, both in figure work and in processing, to the textiles of Sambalpur.

The traditional designs have undergone vast changes at the hands of the master craftsmen and they have been enriched by varied motifs from the temple sculpture and nature to suit the tastes of the people down the ages. These fabrics are excellent pieces of art which are being adopted to changing tastes and fashions. But the processing and methods of producing these designs remain practically the same.

Traditional designs

The traditional cloth designs are mainly produced by (1) the Tie and Dye-processes, and (2) extra yarn stitching.

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The Tie and Dye process is applied to a variety of fabrics. It imparts elegance and beauty to a very wide range of fabrics from the coarse quiltings and furnishing fabrics to dress materials of complicated designs and tapestry fabrics. Apart from the richness of motifs, the harmonious blending of colours and their rainbow brilliance have made the Tie and Dye process unique in textile designing. It is equally, striking to note that without employing any extra shedding mechanism like the Jacquards and Dobbies, elaborate and rich figure effects are obtained on the cloth by the use of this process. Both the ground and figure weave plain and no extra ends are required for figures. The fabric is of compact texture and has comparatively stronger wearing properties.

The process and methods employed therein are equally interesting. Both the warp and weft are dyed by this process according to the need of the design. Thus, for borders, the warp alone is processed; for Palavs or Anchals the weft is processed; and for the over-all body designs both the warp and weft are processed. Before carrying on the actual process, the yarn to be employed as warp or weft has to be wound round a wooden frame. The length of one turn in case of weft yarn wound depends on the reed width to be woven. The craft weaver mostly learns from his experience the total allownace he has to give in the length of the yarn, taking into consideration the counts of warp and weft and the reed and pick used in the cloth. The yarn, thus having been prearranged the man sits with his paper design before the frame and carefully binds the outline of the figure on the yarn itself. Thus, the weaver actually transfers the designs from paper to the yarn on the frame. This process s known as tying. While tying the weaver also takes into consideration the likely waste in the subsequent processes of winding, warping and looming and gives due allowance for it in the initial stage of preparing the yarn for tying. In one tying, yarn for several pieces of cloth of the same design is ready for dyeing.

The yarn which is now ready for dyeing is taken out from the frame. The dyeing is mostly done in the napthol colours. Parts of the tied yarn is dyed in different colours according to the colour scheme of the original design. The yarn is first dyed in the lighter shade and gradually developed in the deeper ones. To develop a second colour in the design, the first coloured portions are tied and the portion of the yarn on which the second colour has to be developed is processed. In one complete process of dyeing, dyed yarn for several pieces of cloth of the same design is ready for weaving.

Skilled Workmanship

Woven designs produced by this process differ from printed and jacquard designs. The figures produced by printing and jacquard can be developed only on one side of the cloth whereas equally prominent

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bright coloured designs are produced on both sides of the cloth by the Tye and Dye process. This process, however, requires highly skilled workmanship and great precision. Thus, an expert remains fully engaged for about 20 days to prepare the yarn of a new design for weaving.

The process is at present widely practised in Cuttack, Sambalpur, Bolangir and Baudh-Khondmals districts of Orissa and in fact some of the traditional designs owe their origin to the master craftsmen of the Sambalpur, Bolangir and Cuttack districts. Mention may be made of the following designs :

Patola

This type of design has mostly animal and floral motifs. Among the animal motifs, elephants, deer and horses are common. Rose and jasmine are the popular floral motifs. The fabrics excel both in the richness and variety of colour and once used to be a necessary bridal wear.

Nakshatra Bhushan

These designs comprise of differently coloured and spotted star motifs and are used in a wide range of fabrics, both coarse and fine. They impart elegance to ladies' dress materials, skirts fabrics for light summer fashions and have universal appeal.

Saptapadi

This design has for its motif the dice board in keeping with its special use. It is a post wedding custom among the newly married couple to play the game of dice and these fabrics were designed for the occasion. Furnishing fabrics, quiltings, table mats, table covers in coarser testures and skirts and Palav in finer textures have also adopted these designs.

Ornamental Fabric

BICHITRAPURI

This is a design in check pattern with elaborate figuring in a wide range of colours of flowers, creepers and animal motifs in between the squares. This makes a richly ornamental fabric and can be employed to grace any occasion or any customary celebration. In fact most of the modern designs in 'Tie and Dye' are derived from the Bichitrapuri patterns. The designs are full of lifee and movement with a strong aesthetic appeal.

MUKTAJHARI

These designs comprise of an unique combination of the floral and animal motifs in rich colour combinations and contrasts. They are mostly applied on Sarees and dress materials.

KUMBHA

This is a Bandha design with the motif of a temple tower. The prominence and boldness of these designs are very difficult to achieve by other process of weaving except the Tie and Dye

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Weaving where both the warp and wept are pre-dyed in the same colour. This design is generally applied in borders and narrow fabrics and in a variety of textures.

The above are only a few traditional designs from the vast gallery of Tie and Dye fabrics and are in no way exhaustive.

It affords unlimited scope for designing and improvement in processes. For example, the dyeing process which previously used to be done in few colours of vegetable origin had only a small range of colours namely, red, white, yellow and black. With the use of chemical dyes a vast range of colours in different shades and with different toning effects can now be introduced. Similarly, emphasis may now be shifted from the natural motifs to more commercial motifs with traditional background.

Government have started a research station for experimenting on the Tie and Dye designs. This centre has been able to evolve some new designs with new motifs and colour schemes.

Extra Yarn Stitching

In contrast with the Tie and Dye, designs produced by the extra yarn stitching have derived their motifs from the temple sculptures of Orissa. Though they cannot claim to be as old as the Tie and Dye designs, yet they have been practised for centuries. The important centres of this type of work are in the Cuttack and Puri districts. In addition to employing different colours, different classes of yarn are also used to impart special charm to the fabrics.

Regular extra weft designs in the Palav and borders and even in the whole body could be woven by the use of staves. Seven staves were in common use for the borders whereas up to 40 staves could be employed for the whole body figuring in a pit loom engaging two weavers to work simultaneously. Dobbies and jacquards through the use of which similar weave effects can be had, are now slowly replacing this laborious process. In this process in which warps are controlled by staves hung from the top frame of the loom and supported by dead weights at the other end, the desired figuring effect is obtained by lifting staves with hand as required in the design and controlling the individual warp ends.

Screen Designs

Screen designs are, however, of a different type of texture and show a prominent embossed design on the face of the colth. This is done by stitching extra yarn on the plain ground. The extra yarn thus employed may be of different colours and materials.

Following are a few traditional designs of this class;

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(*a*) BIMAN DESIGN

This design signifies the throne of Lord Jagannath during the famous car festival and lower panels are motifs from temples. The extra weft is stitched on a plain ground with the traditional Tie and Dye 'Kumba' border.

(*b*) TEMPLE DESIGN

These designs comprise of bold motifs of the renowned temples of Bhubaneswar Konark and Puri. These are fabrics of comeparatively coarser texture and rare artistic creation reminiscent of the skill and workmanship of the great sculptures of Orissa. The harmonious blending and interlacement of the various classes of dyed yarn of different materials make these fabrics attractive.

(*c*) MODERN DESIGN

There has been a noticeable change and departure from tradition in the modern designs of this class of fabrics. The vast number of motifs carved out of stone in the temple sculptures, the folk paintings, the filigree designs and the Alpana designs of the countryside have opened up a vast treasure for the textile designer. With the working of the pattern making factories a new outlook in designing has been ushered in, the old patterns have been reoriented and a number of new designs introduced.

78 Industrial potential and plans for future development

The industrial potentiality of the district has changed to a very great extent after the construction of the Hirakud Multipurpose Dam Project. A vast area is irrigated by the Hirakud irrigation system. Hydroelectric power is available from Hirakud. These factors have influenced both agriculture and industries based on agricultural produce. The other important resources in this area are forests and clays. These factors will largely determine the nature of industrial growth in this area.

The availability of graphite in some parts of the district points to the prospect of starting a pencil making industry with plenty of wood of different varieties being ready at hand. Low grade coal is available in the Rampur coal mine. Prospect for producing coaltar in that area may be investigated. From the saw mills of Sambalpur and to a lesser degree from Bamra, huge quantity of saw dusts are available, the utilisation of which are not properly done. The ply-wood making is another industry which has a good prospect because of availability of the class of wood required for this purpose in Sambalpur. There is also prospect for strarting ancillary industries at Hirakud and Bargarh to feed the requirements of the large and medium scale industries already established in those areas.

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79. Labour and Employers' Organisation

All the industrial labourers are not members of Labour Unions. Mostly workers of large industries have formed unions to safeguard their interests. A list of registered factories and mines with the number of workers employed by each of them and a list of Trade Unions of the districts are given as Appendices IV and V, respectively.

There is no employers' organisation existing in this district.

80. Welfare of Industrial Labour

The minimum wage level varies from one industry to another. A daily mazdoor (labourer) earns Rs. 1·50 to Rs. 1·25 per day as the minimum wage. But in certain industries like Indian Aluminium Company and Indian Aluminium Industry the minimum wage earned by a mazdoor is Rs. 230 per month excluding annual profit bonus.

The general condition of the workers engaged in small industries like rice and saw mills are deteriorating partly because of availability of cheap labour from Bilaspur area of Madhya Pradesh and partly because of rising cost of living which has not yet been duly compensated by the revised rate of minimum wages for different scheduled industries under the Minimum Wages Act, 1948.

The Orient Paper Mills, Brajarajnagar and the Bhaskar Textile Mills, Jharsuguda are covered under Employees' State Insurance Scheme which provides sickness and maternity benefits to the employees. The rest of the industries are covered under Workmen's Compensation Act, 1923 and Maternity Benefit Act which provides accident benefits, benefits for occupational diseases and maternity benefits, respectively. Regarding old age benefits, almost all big industries have got their own gratuity schemes and the statutory provisions also provide provident fund facilities to the employees where more than twenty workers are employed.

Messrs. Indian Aluminium Company, Hirakud and Messrs. Orient Paper Mills, Brajarajnagar conduct sports activities among the workers and arrange cultural programmes for amusement of their employees. Besides, the major industries have provided houses for their workers, recreation clubs, hospitals, schools and subsidised canteens, etc.

The Indian Aluminium Company has got a "suggestion and method improvement scheme" which provides an incentive to the workers to suggest and to improve the method and standard of production in an economical way for which they receive monetary rewards and lucrative prizes. This also gives a belongingness to the workers in their industries.

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APPENDIX I

List of Industries and other concerns that consume Hirakud Power

Name of Industry		Quantity of Power consumption (in Maximum Demand Megawatt)
Sambalpur and Sundargarh districts		
1. Indian Aluminium Company, Hirakud	..	50·00
2. Orient Paper Mills, Brajarajnagar	..	55·00
3. Refractories at Belpahar	..	1·20
4. Hingir-Rampur Colliery	..	0·80
5. Orient Colliery	..	0·70
6. Ib river Colliery	..	0·35
7. Steel Plant at Rourkela	..	110·00
8. Bird & Company, Biramitrapur	..	1·75
9. Orissa Cement Limited, Rajgangpur	...	6·60
10. Aluminium Industries Limited	..	2·50
11. TISCO Quarry, Panposh	..	0·35
12. Hatibari	..	1·50
13. Orissa Manganese and Minerals, Koira	..	0·35
14. Kiriburu Mining	..	5·00
15. Railway Electrification	...	25·00
16. Bandhamunda Marshalling Yard	..	2·00
17. Small-Scale Industries	...	2·60
18. Town and Rural Electrification	...	4·00

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Name of Industry		Quantity of Power consumption (in Maximum Demand Megawatt)
Cuttack, Dhenkanal and Puri districts		
1. Titaghur Paper Mills, Choudwar	..	1·50
2. Kalinga Tubes, Choudwar	..	2·80
3. Orissa Cotton Mills	..	0·10
4. Orissa Textile Mills, Choudwar	..	2·00
5. Refrigerator Factory	..	2·00
6. National Foundary and Rolling Mills	..	0·25
7. Orient Weaving Mills	..	0·17
8. Orissa Industries, Barang	..	0·80
9. Cuttack Electric Supply Company	..	2·00
10. Puri Electric Supply Company	..	0·40
11. Railway Workshop, Khurda Road	..	0·50
12. Colliery, Talcher	..	2·00
13. Small-Scale Industries	..	Not available
14. Town and Rural Electrification	..	2·50
15. Ferro–Chrome Factory	..	6·00
16. Barsua Mines	..	3·50
Mayurbhanj, Keonjhar and Balasore districts		
1. Ferro–Manganese Plant, Joda	..	16·00
2. Tata Mines, East Joda	..	0·48
3. West Joda	..	0·30
4. Mines of Bird & Company, Barbil	..	1·90
5. Iron-Ore Mines of Lal & Company, Barbil	..	1·75
6. Ferro-Manganese Plant of Kalinga Industries, Barbil.		1·50
7. Mines of Serajuddin & Company, Barbil	..	0·25
8. Town and Rural Electrification	..	2·50
9. Small-Scale Industries	..	1·92
10. Power Supply to the State of Bihar	..	5·00

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APPENDIX II

Mineral Production figures for the years from 1964 to 1968

(in Metric tons)

	1964	1965	1966	1967	1968
Coal ..	450,756	472,641	531,606	498,520	382,250
Fireclay ..	73,198	56,490	47,998	76,399	71,995
China-clay ..	12,302	2,209	1,612	3,124	3,977
Graphite ..	410	464	351	437	417
Limestone ..	..	..	21,873	74,382	167,364

APPENDIX III

Mining Revenue

		Rupees
1964-65	..	4,74,417
1965-66	...	8,55,268
1966-67	...	7,43,087
1967-68	...	8,64,415
1968-69	...	9,41,727

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APPENDIX IV

Name of registered factory/Mines		Approximate number of workers employed
1. Orient Paper Mills Ltd., Brajrajnagar	..	3,000
2. Belpahar Refractories Ltd., Belpahar	..	1,500
3. Indian Aluminium Co. Ltd., Hirakud	..	700
4. Aluminium Industries Ltd., Hirakud	..	300
5. Bhaskar Textile Mills Ltd., Jharsuguda	..	1,600
6. Hira Cement Project, Bardol, Bargarh	..	800
7. Hira Cable Factories Ltd., Hirakud	..	200
8. Tora Weaving Centre, Tora	..	300
9. Orient Paper Mills Forest Centre	..	180
10. Hingir Rampur Colliery, Brajrajnagar	..	1,500
11. Orient Colliery, Brajrajnagar	..	1,600
12. S. K. Khansons (Stone Lime) Co. Private Limited, Brajrajnagar.		200
13. Ib Colliery, Brajrajnagar	..	250
14. Belpahar Fire Clay Mines, Belpahar	..	250

There are about 22 Rice and Flour Mills, 18 Saw Mills, fifteen Registered Bidi Factories and 80 other industries existing in the district.

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APPENDIX V

Name of the Trade Union	Approximate number of members
1. Jharsuguda Industrial Mazdoor Union, Jharsuguda.	409
2. Hirakud Cable Factories Shramik Congress, Hirakud.	81
3. Industrial Development Corporation Employees' Union, Hirakud.	150
4. Orissa Ceramic Workers' Union, Jharsuguda ...	140
5. O. P. Mills Shramik Congress, Brajrajnagar ..	1,700
6. Orient Colliery Workers' Union, Brajrajnagar ..	647
7. Bargarh Cinema Staff Association, Bargarh ..	19
8. Aluminium Industries Employees Union, Hirakud	200
9. Bhaskar Textile Shramik Union, Jharsuguda ..	1,047
10. Hira Cement Shramik Sangh, Bardol ...	326
11. Orissa Pipe and Water Workers' Union, Sambalpur Branch, Sambalpur.	300
12. Indal Co. Works Employees' Union, Hirakud ..	500
13. All Orissa Transport Employees' Union, Sambalpur Branch, Sambalpur.	250
14. Alumunium Industries Workers Employees' Union, Hirakud.	330
15. Hirakud Mazdoor Union, Hirakud ...	70
16. Hirakud Workmen Association, Hirakud ...	2,274
17. Belpahar Refractories Employees' Union, Belpahar	1,000

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