On the basis of available data, an industry-wise account of diversification moves as adopted by the 100 sample companies is given in the following pages. The description of companies in each industry is so arranged that the companies which are less diversified are studied earlier and those which are more diversified are discussed later on.

A. CONSUMER GOODS INDUSTRY

1. Food Products and Beverages

In this group of industries 16 of the largest companies have been selected, of which 12 were originally sugar companies, two edible oil companies, one flour mill, and one in the field of beverages.

1) Sugar Industry - Of the 12 companies from this industry, THE BELAPUR SUGAR COMPANY (1919) is the least diversified, as this company along with its subsidiary, namely Gangapur Sugar Mills which was acquired in 1957, has not taken up any other line of activity except that it is having a backward integrated or successive function of sugarcane cultivation to ensure some supply of sugarcane during the crushing season. Stability, that is, maintaining
an assured source of supply of basic raw material, has been the major motivating force for this vertical integration.

Three companies, THE HINDUSTAN SUGAR MILLS, THE GANGA SUGAR CORPORATION and THE UPPER DOAB SUGAR MILLS incorporated in 1931, 1932 and 1933 respectively, are mildly diversified in the sense that these companies, besides cultivating sugarcane and manufacturing sugar, have also taken up a divergent move by installing distillery plants to manufacture spirits so that sugar molasses, a waste and by-product of sugar manufacture, is productively utilised. In 1964 the Hindustan Sugar Mills was the third largest producer of sugar and the second largest producer of rectified spirits with 2.9% and 4.6% shares respectively of the total production in the country.¹

Similarly, these companies had another divergent move into the manufacture of confectionery and this move was taken in 1943-44 (the war period) to meet a sudden spurt in the increased demand for “packed food” from armed forces including several contingents operating overseas. But as this opportunity was transitory, The Ganga Sugar Corporation and The Upper Doab Sugar Mills abandoned this new line of

¹This and all similar subsequent references have been taken from statement 2 (Absolute Levels and Percentage Shares of Top Five Enterprises in Annual Production in 1964, page 260 to 371) of the Report of the Monopolies Inquiry Commission, 1965.
activity in 1949 in the face of market competition whose severity with the passage of time had increased due to shrinkage in demand. At the same time these companies had an opportunity of expanding their refinery capacities in view of the unsaturated demand for alcohol and spirits in the textile, plastic and other synthetic industries.

Another set of companies, THE KOLHAPUR SUGAR MILLS and THE OUDH SUGAR MILLS, incorporated in 1932, are slightly more diversified than the units considered earlier because these companies, besides having the successive function of sugar cultivation and the divergent function of manufacturing distillery products, had adopted a convergent function by entering into the edible oil industry. In 1964 The Oudh Sugar Mills was the largest producer of sugar and fourth largest producer of rectified spirits with 4.4% and 4.6% share respectively of the total production in the country.

Later on, The Kolhapur Sugar Mill took up a successive function by further processing one of its secondary products viz., spirits into acetic acid; whereas The Oudh Sugar Mills adopted the successive function of further refinement and hydrogenation of its edible oil produce. Thus, though both the companies adopted successive forward functions on their secondary products, these differed in the direction of diversification. Again, The Oudh Sugar Mills, in order to ward off the seasonal character of its trades and also to make use of some of its existing technical skill,
entered into another seasonal industry of ice manufacturing. This lateral move was to offset the seasonal fluctuations; whereas the successive diversification moves were prompted by high margins on the new products and competition with the products of rival concerns in the vegetable oil market.

One more company THE UPPER INDIA SUGAR MILLS (1933) also is not highly diversified as this company produces sugar but its subsidiary, namely Rewari Electric Supply and General Industries (acquired in 1953 and till recently engaged in the distribution of hydroelectricity after having stopped its own power generation in 1957), diversified in 1964 into the production of household aluminium wares. The annual report of the company for that year states that:

"Efforts are continuing to further increase the scope of this work (Metal Works) with an added urgency in view of the proposed nationalisation of the Electric Undertaking in April, 1965."

Thus, of the seven companies considered above none has moved outside the food and beverage group except that these companies have integrated sugar cultivation to their principal activity and a few have undertaken the production of industrial chemicals by the further processing of their distillery products.

There is another set of three companies which besides having their original interest in sugar manufacture have substantially moved into the casting and fabrication
of heavy mill machineries. These companies are The Saraswati Industrial Syndicate, K.C.P., and Walchandnagar Industries.

THE SARASWATI INDUSTRIAL SYNDICATE (established in 1933 and formerly known as Saraswati Sugar Syndicate till 1962 when its subsidiary, namely Indian Sugar and General Engineering Corporation which was floated in 1946 was merged with it) was initially engaged in the manufacture of sugar and cultivation of sugarcane. With the establishment of its subsidiary it began to have an interest in the manufacture of sugar machinery, a vertical integration move to sugar manufacture. This move was prompted by a number of diverse factors such as growing demand for and import restrictions on sugar machinery, the availability of technological research and know-how about sugar machinery within the company because of its many years' experience in sugar manufacturing, the availability of foreign collaboration, and the realization on the part of the company management that due to the high capital intensity of the venture there would not be an effective competition particularly in the north western part of the country where no other concern by

---

2 In 1957, the company secured foreign collaborations with some British firms for the manufacture of sugar machinery and again in 1959 it concluded collaboration with John Thompson Ltd., of U.K., for the manufacture of boilers. In 1963 it further entered into collaboration with Farrel Birmingham Co., of U.K., and Kewashki Dockyard Co., of Japan for the production of sugar machinery and cement machinery respectively.

3 The works of the Company are located in the State of Haryana.
that time had stepped into the production of heavy mill machinery. With a base in such machinery the company had a series of divergent diversification moves into the manufacture of cement mill machinery, boilers, and pressure vessels so that it could have an optimal utilization of its excessive workshop capacities. In this connection, the 1963 annual report of the company records that:

"Diversity in the lines of manufacture for which there is a demand plays a great part in the success of an engineering concern because it ensures maximum and continuous utilisation of installed equipment."

In order to maintain a balance in vertical integration for achieving self-reliance and continuous utilization of the fabrication capacity, the company further diversified in 1964 by installing its own casting (alloys) capacity. In 1965, the company with one of its foreign collaborators set up a subsidiary namely ISGEC John Thompson Ltd., for undertaking the sale and erection of boilers and pressure vessels.

Similarly, The K.C.P. Ltd., which took over in 1943, a co-operative sugar factory (which was set up in 1941 under the name Vuyuru Cooperative Agricultural, Industrial and Credit Society Ltd.) made in 1946 a divergent move into distillery products like alcohol and another divergent move in 1951 into confectionary manufacture. In 1952, the company set up its engineering workshops to manufacture sugar machinery to begin with. For maintaining an assured source of supplies
for its fabrication work, The company installed its iron and steel casting capacities and recently for judiciously utilising its enlarged fabrication and casting capacities, it has further embarked upon a series of divergent moves and has started manufacturing cement plants, paper and pulp machinery, water tube boilers, plate working machinery and machinery for chemical industries such as sulphuric acid and superphosphate. In 1958 the company had a lateral move into the manufacture of portland cement and from this base. In 1964 it applied to secure industrial licenses to manufacture asbestos cement products. The future programmes for further diversification are noticeable from the annual report for 1964 of the company which records that:

"... further proposals are under consideration for the utilisation of alcohol, bagasse and other by-products of sugar industry."

At present, the company is on its way to manufacturing electronic equipment such as analogue computers. In 1964 the company was the second largest producer of cement.

---

4 In its diversification program, the company has largely been helped by foreign enterprises as in 1960 the company secured foreign collaboration with Eimco Corporation of U.S.A., Fives Lille-Call of France and Societe Fives Lille of France for the manufacture of sugarcane filters, boilers, and cement plants respectively. In 1963, the company further entered into foreign collaboration with Fives Lille-Call of France and Wilhelmsburger Maschinenfabrik Hinricks and Sohn of West Germany respectively for heavy castings and forging, and for plate working machinery.
mill machinery, and the third largest producer of centrifugal mill machinery and boiling mill machinery while contributing 35.6 %, 27.7 % and 8.9 % shares respectively of the total national produce.

The story of WAICHANDNAGAR INDUSTRIES, which was founded in 1908 as Marsland Privy and Co., and adopted its present name in 1944, is similar to that of K.C.P. This enterprise after integrating sugar cultivation with sugar manufacture had a divergent move into distillery products besides having a convergent move into the manufacture of edible oils which were further processed for the production of vanaspati (hydrogenated vegetable oil). With a base in agriculture and edible oils, the company made another convergent move into dairy products by rearing its own livestock and a divergent move into soap manufacture. Later on, the company made an entry into tin smithy for the manufacture of tin containers, a packing material for its oil and dairy products. From its production of alcohol, the company further diversified divergently into the production of plastic goods like plastic mouldings required for machinery and electric motors, plastic buttons, lamp shades. The company had also taken a substantial move into the fabrication of heavy mill machinery, but to begin with it commenced production of sugar mill machinery, a successive function to sugar manufacture. The range of engineering goods was widened when the fabrication of cement machinery boilers, pressure vessels, storage tanks, solvent extraction plant and mechanical presses,
The basic reason for diversification of the engineering activities was disclosed by the company chairman at 1961 annual general meeting in the following words:

"Due to excess sugar production, there is likely to be short-fall in orders of sugar machinery. Hence to supplement the production of sugar machinery, your Directors have under consideration the proposal to undertake the manufacture of cement plants, paper plants and mechanical presses."

As the range of activities widened some old and traditional items like oils and other related goods were abandoned because of "uneconomical working of oil mills, hydrogenated plant, tin plate and soap plant .... Government proposal of taking over agricultural land of the company because of Ceiling and Holding Act, 1961."

In 1964, the company was the largest producer of sugar mill machinery (miscellaneous) and its contribution exceeded sixty per cent of the total produce in the country. Similarly, in the manufacture of centrifugal sugar mill machinery and boiling mill machinery it held the second

---

5In 1960, the company had a foreign collaboration with Stainmuller-Export Company of West Germany for the production of hammer tips. In 1963, collaboration with Escher Wyss Zurich of Switzerland was also secured for the manufacture of cement machinery, and chemical and paper equipments. Further, in 1964 the company concluded an agreement with G & J Weir of U.K., for the production of steam turbines. In the same year for the manufacture of gears and steel castings, collaborations with one Swiss and another Japanese enterprises respectively were concluded. The company, has recently again entered into collaboration with a czechoslovakia firm for the manufacture of machinery and a swiss firm for the production of boilers.
position while producing 28.0% and 12.7% shares respectively of the total produce in the country. In the line of boilers and water tubes manufacture it was the third largest producer with 4.2% as a share of the total national produce.

The remaining two companies, namely Rohtas Industries and Modi Industries are comparatively more diversified than the companies studied above. But with regard to the direction of diversification, both companies differ markedly from each other, because of the different amount of resources administered by them.

ROHTAS INDUSTRIES formerly known as Rohtas Sugar Company, was established in 1933 by setting up its sugar mill and refinery plant. In 1936, the company contemplated diversifying its activities, and so it changed its name to the present one. As contemplated in 1937, the company made a lateral move into the production of caustic soda and liquid chlorine. In 1939, the manufacture of sulphuric acid and alums was also added to the existing lines of chemical manufacture. Also, in 1938, the company with a base in sugar bagasse and inorganic industrial chemicals such as soda caustic and chlorine made an entry into paper and board manufacture. These moves are divergent in nature, but in 1938 again a lateral move into the manufacture of cement was also undertaken. Subsequently, in 1943, like some other sugar companies it also made a convergent move into the manufacture of edible oils and had a further successive
function of hydrogenating the oils to produce vanaspati.
The most probable reason for this move was to tie customers and maintain the market share by meeting new products of the competitors. With a base in oils and chemicals like soda caustic, the company also made, in the same year, a divergent move into the manufacture of soap. Similarly, with a base in portland cement, a divergent move into the production of cement products such RCC (reinforced cement concrete) spun pipes and poles was undertaken. In 1948 another divergent move related to sugar was adopted when the company stepped into the manufacture of confectionary, but soon in 1954 this line of activity was abandoned. Again, in 1950 the company expanded the range of its paper products by manufacturing valcunised fibre for the manufacture of seamless cans, tubes, and rods. From its sound experience of pulp and paper industry, the company has recently moved into the fabrication of pulp and paper mill machinery,\(^6\) a vertical integration move, and from this move it has adopted a divergent move to manufacture cement mill machinery which also is a successive function of its cement interests. In 1964 the company was the biggest producer of wrapping paper in the country, with its share of production as, brown (23.7% share), duplex

\(^6\)In 1961, the company secured a foreign collaboration with Okamoto Jekko of Japan for manufacture of pulp and paper machinery and in 1962 it concluded collaboration with Presspan Fabric Chr Authenriath Stuttgart of West Germany for the production of presspan paper.
and triplex board (52.3 % share) and other miscellaneous boards (34.5 % share). Similarly, it was the second largest producer of board pulp (10.7 % share) and A.C. roofing accessories (30.2 % share). In the fields of A.C. pipes and fittings (3.9 % share) and cement mill machinery (1.9 % share), the company was the third largest producer. In certain chemicals like alumina ferric it held the fifth top position (7.1 % share).

MODI INDUSTRIES, formerly known as Modi Sugar Industries and incorporated in 1932, changed to its present name in 1964 in view of its highly diversified activities. After commencing the manufacture of sugar and while making a successive function in sugar cultivation in 1938, it made a convergent move into edible oils and subsequently into hydrogenation. With a base in oils, the company had a series of divergent moves into soap, paints, enamels, varnishes, glycerine, and stearic acids in the years 1940, 1946, 1947 and 1950 respectively.

In order to have self reliance in the supplies of tin containers for its oil products, the company took up in 1942 a successive function of manufacturing tin containers and later on in 1950 and 1960 to have the best possible use of wastes of its tin smithy workshop, it adopted another series of divergent moves into the manufacture of lanterns and flash light cases respectively. In 1950 the company, initially to meet its requirements for hydrogenation of
vegetable oils, stepped into the manufacture of oxygen and acetylene gases, a successive function, and subsequently in 1959 the range of gases was further widened when it installed a distillery to manufacture spirits and alcohol from the sugar molasses of its sugar division.

Having a complex business of chemicals, gases, lanterns and torches, the company in 1962 took up the manufacture of another complement product of gases namely electrodes and in order to ensure stability in the principal raw material for this venture, the company adopted a successive function to manufacture a wide variety of alloy steel rods and wires.

Because of pressures on funds from the opportunities which promised high margins of return, the company abandoned some of its traditional and highly competitive products like toilet soap and toilet hair oil. In 1964 in the country, the company was the biggest producer of oil-fatty acids (67.6% share), the third largest producer of welding electrodes (15.6% share), hurricane lanterns (13.9% share), stearic acid (14.3% share), the fourth largest producer of vanaspati (5.3% share) and flash light cases (3.5% share). In the production of oxygen gas it held the fifth rank (2.4% share).

In 1960, the company secured foreign collaboration with VeB Electrodenwerk, A German Democratic Republic Firm for the manufacture of electrodes and currently a fertiliser complex of the company in collaboration with a Japan firm is also coming up.
ii) Edible Oil Industry - Two companies, namely Hindustan Lever and The Tata Oil Mills Company have been selected from this industry.

HINDUSTAN LEVER⁸ (formerly Lever Brothers (India) Private Ltd.) was set up in 1932 and was converted into a public limited company in 1956 when it got its new name. In 1932, the company commenced production and marketing of edible oils, vanaspati (hydrogenated edible oils), margarine and other edible fats and with this base, in 1934, it embarked upon a divergent function by commencing the production of washing and toilet soaps. Later on in 1943, some more divergent-cum-convergent activities⁹ like toilet hair oil, talcum powder, shaving cream, and tooth pastes, were added to the existing manufacturing activities. After 1956, when it became a public limited company, its range of activities further widened when it took the manufacture of non-soapy detergents (Surf) in 1958, dehydrated vegetables in 1959, animal feeding stuff in 1961, and dairy products such as

---

⁸The company has four subsidiaries namely Indexport Ltd., Levers Associated Trust Ltd., Hind Lever Trust Ltd., and Levindra Trust Ltd., and is also a member of Unilever Group as more than 85 per cent of the nominal value of its share capital is held by Uni-Lever Ltd.

⁹The company being a member of Unilever Group, has an access to Unilever's international knowledge and experience of manufacture and marketing of detergents, edible fats and toilet preparations.
ghee and baby milk powder in 1963. Some of the products like animal food stuffs were taken up to have a better use of oil cakes, a by-product of vegetable oil industry, and the others like baby milk powder were adopted to make use of the skimmed milk, a by-product of whole milk from which the fat contents (ghee) are extracted. Products like soap and detergents, vanaspati, and ghee are competitively related being substitute products. These have been developed to maintain a strong competitive supply position and a reputation for industrial leadership in the fields of edible oils and soap. Though a few products of the company are divergently related with one another, almost all of them pass through one market channel, and these share one common base of marketing expertise geared to mass consumption. The subsidiaries of the company are largely trust companies managing the provident fund and/or provision funds of the

10 The chairman of the company rightly pointed out in 1961 at the annual general meeting of the company that: "... we are essentially a marketing company. What we produce we have to persuade the consumers to buy — there is no captive market for us. Successful marketing is our life-blood and we can say with some satisfaction that our marketing is lively and effective. Marketing to us is a total operation, more than mere selling. It had a wide brand of activity, from product development to consumer satisfaction. We only go to the market when we have a product that is right for the market and is right in itself. This begins with a process of careful discussion among our men and women in marketing, marketing research, technical research and development. The marketing people know their consumer, marketing research makes sure that this is so; the technical research and development people have to develop the product; the advertising people assist in moulding its personality, they give it name, packaging and appeal. There will be many trials and tests with the product; probes into the market to ascertain the size and shape of the demand; till, finally the product is ready for the market testing."
company's employees. But Indexport Ltd., is engaged in international trading of the company's products. In 1964 the company was the largest producer of vanaspati, washing soap, toilet soap, glycerine, synthetic detergents and talcum powder with its shares as 19.1%, 62.0%, 58.7%, 66.4%, 67.6% and 37.9% respectively of the total produce in the country. In the business of shaving soap it was the second largest producer with 42.4% share and it was third largest producer in the fields of tooth paste and medicated soap having 12.6% and 12.5% share respectively.

THE TATA OIL MILLS, registered in 1917, commenced the crushing of copra in 1920 with a view to producing coconut oil and its by-product — oil cakes. Later on, the company diversely diversified its activities to include the manufacture of oil based consumer goods like refined hair oil (1921), soap (1927), toilet preparations (like Toilet-Eau-de-Colongue) (1935), glycerine (1939), hydrogenated vegetable oils (1940), non-soapy detergents (1960) and edible protein from groundnuts (1967).

In 1952, the company floated a subsidiary namely, Lakme Ltd., which manufactures various toilet goods and industrial perfumes. In 1964 the company was the second largest manufacture of washing soaps, toilets soaps and glycerine refined; whereas it was the third largest producer of soap liquids. The company's respective shares for these
products were 19.3%, 23.4%, 18.4% and 6.2%. Despite diversified activities, the company has more than 63 percent of its labour and other resources in laundry and toilet soaps and because of this specialisation and for many other reasons such as price control policy of the government, import restrictions of raw materials, high excise duty, it is, at present, contemplating the manufacture of high protein foods and other products such as squashes, crushes, and jams in collaboration with Takasage Perfumery Co., of Japan.

iii) Flour Milling Industry - One company, THE GANESH FLOUR MILLS, has been taken from the flour milling industry. This company commenced its flour milling operations in 1964, that: "Soap is throughout the world characteristically a high volume, low profit product. Unfortunately two-third of our operations are still in soap. In the conditions prevailing in India to-day and likely to prevail for many years to come this makes us unduly dependent on a single product highly vulnerable to factors (price control of laundry soap without a control on the prices of oils which go into the manufacture of soap, import of some basic raw materials such as copra and palm oil, soda ash and caustic sodas subject to an export of crude or refined groundnut oil; high excise duty in the organised soap industry than in the non-power operated sector of soap industry etc.) ever which we have little or no control."

"It is clear, therefore, that while pursuing our programme aimed at modernising and increasing the efficiency of our soap making machinery, we should increasingly seek to diversify our activities in the manufacture of products providing high profit margins and seek fresh and less vulnerable source of revenue."
in 1891 and after a period of 66 years of its operation, it abandoned this line of activity in 1957. In 1935, the company convergently diversified into the manufacture of edible oils, and later on it took a successive function of hydrogenation of oils as well as manufacture of tin containers. A year later, another convergent move into the manufacture of sugar was undertaken but in 1948 this activity was completely abandoned. In 1951, the company had a divergent move from its flour milling operations into the manufacture of breakfast foods such as cornflakes, wheat flakes, and rice flakes. In 1962, the company also took a lateral move into the manufacture of electric fans, and subsequently it expanded its electrical engineering interests by manufacturing fractional horse power motors. The company was prompted to take the lateral move because:

"Due to high level of prices of raw materials, cut throat competition in prices of vanaspati, difficulties in import of chemicals and stores, it was rather difficult to maintain production and efficiency of plants ... we have for sometime past been feeling the necessity of expanding the activities of the company into the new lines of business for which there existed a great scope in the country under the present circumstances."\(^\text{12}\)

"Vanaspati which has so far been company's main line of business is threatened with the demand for colourisation ... there are drastic cut in quota of tin plates (and) storage of coal for vanaspati due to dearth of railway wagons."\(^\text{13}\)
"The oil market rose sky high and established a new record during the year with heavy fluctuations. This made the trading in vanaspati rather difficult and highly speculative."14

The company had also a divergent move, in 1964, into toilet oils by producing them through a solvent extraction process.

iv) Beverages Industry - The unit covered under this industry is Dyer Meakin Breweries.15 The pioneers of the company started the manufacture of beer and spirits, i.e., brewing and distillery operations as far back as 1855. Since beer cannot be produced without malt, malting operations were also started in that very year. Though for over a century the company remained in the production of malt, beer and spirits, it was in 1961 that the company took convergent activities like soft drinks (apple juice, mango juice, etc.). Because of fruit juices, the company had, in 1962, a divergent move into canned fruits. Production of yeast, ice, and maintenance of cold storage services were also added to the existing range of activities in the same year. Again in 1963, a new series of convergent-cum-divergent moves

14 Extracted from the annual report, 1961.

15 The company was registered as a joint stock company in 1934, and was formerly known as Dyer Meakin & Company. In 1967, the company has changed its name to Mohan Meakin Breweries.
were adopted when the company stepped into the manufacture of breakfast foods, ghee, and milk powder. A successive move, in order to have an assured supply of glass containers for the products, was also undertaken in 1965. Though the company is the largest producer of beers, liquor, and malt, as in 1964 its output for these products constituted 70.3%, 80.4% and 55.4% respectively of the total produce in the country, yet due to the prohibition policy of the government it was prompted to set up an industrial complex. The chairman of the company rightly observed in 1962, at the annual general meeting of the company that:

"As you are aware, there is a lot of talk in the Press about introduction of prohibition in the country. Let us wait and see how things shape. Your directors are unable to forecast future prospects of the company's alcoholic products."

2. Tobacco Manufacture Industry

Four companies namely the Imperial Tobacco company of India (founded in 1910 and converted into a public company in 1954); Vazir Sultan Tobacco Company (established in 1930); National Tobacco Company of India (incorporated in 1931 but made a public limited company in 1943); and Godfrey Phillips, India (established in 1936 and became a public limited company in 1946) have been selected from this industry.

IMPERIAL TOBACCO COMPANY which produces cigarettes and smoking tobacco adopted a successive function by acquiring,
in 1953, the manufacturing business of Tobacco Manufactures (India) and the complementary lithographic printing business of Printers (India) Ltd., with a view to having self sufficiency in printing cigarette paper and cigarette containers. In 1958, it further acquired one subsidiary, namely Delhi and Orient Tobacco Company which deals in processed tobacco and cigarette manufacture.

THE NATIONAL TOBACCO COMPANY besides manufacturing cigarettes and smoking tobacco has a divergent move into the laminated products. The other two companies namely VAZIR SULTAN and GODFREY PHILLIPS (INDIA) are producers of cigarettes and smoking tobacco. In 1964 the percentage share of cigarette production of these companies in the total production of cigarettes in the country was 46.2 %, 19.9 %, 17.2 % and 4.8 % for Imperial Tobacco, Vazir Sultan, National Tobacco, and Godfrey Phillips (India) respectively.

3. Textile Mill Industry

From this group of manufacturing activity 21 companies have been selected of which 15 are cotton textile, 3 rayon textile and the remaining 3 jute textile units. The nature of diversification moves of these companies is discussed below:

1) Cotton Textile Industry - Of the 15 companies selected from this group, three companies, namely MAOURA
MILLS COMPANY, THE CENTRAL INDIA SPINNING WEAVING AND MANUFACTURING COMPANY and THE INDIA UNITED MILLS set up in 1889, 1874 and 1920 respectively, are least diversified in the sense that these companies are producing only a variety of cotton textiles besides having successively integrated the various processing stages such as ginning, processing, spinning, weaving and finishing. These companies in order to utilise cotton waste are also producing cotton yarn for various purposes and this activity is divergently related with the main product.

Two companies, namely THE BOMBAY DYEING AND MANUFACTURING COMPANY and MODI SPINNING AND WEAVING are mildly diversified as both these companies besides spinning and weaving cotton textile goods are also manufacturing synthetic textiles. Bombay Dyeing which is at the top of the pyramid of the export of cotton textiles continues to concentrate more on the bleached, dyed, printed and finished goods with a view to improving its earning capacity. To achieve this objective the company has introduced special finishing processes such as mercerising, sanforizing, and hecowa. The last process, the hecowas has been introduced by the company

In 1964, Madura Mills entered into foreign collaboration with Stanfast Dyes and Printers Ltd., of U.K., for molton metal dyeing processes.
for the first time in India. These processes enable the company to be in a better position vis-a-vis its competitors. This company also manufactures cotton yarn, cotton blankets and cotton fancy piece goods. It has one subsidiary, namely Nowrosjee Wadia Ginning and Precessing Company which also has been functioning since 1922 in the cotton textile industry particularly in the ginning and precessing field. The other company namely, Modi Spinning and Weaving, besides producing cotton and rayon textiles also produces cotton and rayon yarn. In 1962, in order to ensure a perennial flow of supplies of its basic raw materials for the manufacture of acetate yarn, the company put up a distillery plant in Punjab with an understanding from the Punjab Government that the entire production of molasses in the State of Punjab would be made available to the company. In the same year a knitting factory was also set up to manufacture knitted fabrics. In the succeeding year, a sewing thread plant for the manufacture of sewing thread hosiery and industrial yarn was also set up.

Another set of two companies, namely THE BUCKINGHAM AND CARNATIC COMPANY, and THE STANDARD MILLS COMPANY, which

---

17 In 1960 the company collaborated with Tootal Broadhurst of U.K., for crease resisting and minimum ironing processes and again in 1963 it collaborated with Forthergrill and Harvey of U.K., for the manufacture of 'Tygan Blind Cloth'.

18 Buckingham Mill commenced production in 1877 and the Carnatic Mill in 1883. The two mills were amalgamated in 1923.
were set up in 1877 and 1894 respectively, manufacture cotton textiles and rayon mixed textiles. Both the companies besides having successive functions of ginning, processing, and spinning also have another successive function of manufacturing certain textile organic chemicals. In order to utilise the cotton waste, the companies have also divergently moved into the manufacture of yarn and tapes. In 1964 Buckingham and Carnatic Mills was the second largest producer of biocromates, the fourth largest producer of ferrous sulphate and the fifth largest producer of sodium sulphate with 17.8 %, 1.5 %, and 3.2 % shares respectively in the total produce of the country.

Sayaji Mills (1941) acquired one subsidiary, Shri Shubhlaxmi Mills in 1949 and manufactures along with its subsidiary cotton textile goods and yarn. This company, in order to meet the demand of the textile industry and also to be self-sufficient in the supply of this raw material, took a successive function by producing maize starch. Subsequently from this base, it further took up a series of divergent moves into the manufacture of glucose, dextrose, dextrine, dry and wet bran, and steep water. The main objective of these divergent moves was to make use of the excessive productive capacity of maize starch and to utilize the wastes of by-products of this venture. Later on, it also took up a lateral diversification move into the vegetable oil industry.
SWADESHI COTTON MILLS COMPANY (1911) was converted into a public limited company in 1927 and has four subsidiaries, namely Ganesh Sugar Mills, Shri Anand Sugar Mills, Samla Collieries, and Jaipuria Kojra Collieries. Some time in 1951, the company diversified into the manufacture of vanaspati and having incurred a loss of Rs. 1.7 lakh in 1958, it abandoned this activity in 1961. This company, besides having successive functions of cotton ginning, pressing and spinning, at present, manufactures cotton textiles and mixed rayon textile goods. It also manufactures cotton yarn and staple fibre yarn which are divergently related to the principal activity. Of the four subsidiary companies two produce sugar; whereas the other two are in coal mining operations. In 1964 the company was the second biggest producer of staple fibre yarn with 12.6% share of the total produce in the country.

Similarly, THE BRITISH INDIA CORPORATION (formed in 1920 to continue and amalgamate the business of some companies having manufacturing interests in cotton textiles, woollen textiles, leather goods and engineering goods) has four subsidiaries, namely Elgin Mills, Calico Processors, Cowpore Textiles and Brushwore. Of these the first two were acquired in 1956 and the other two in 1957. By abandoning the production of engineering goods in the depression of 1930, the principal interests of the company, at present, are woollen textiles and leather goods. The subsidiaries
of the company are in cotton textiles (with successive functions of pressing and spinning of cotton and divergent functions of manufacturing cotton yarn) and in the manufacture of brushes. In 1964, the company was the top producer of woollen goods gaberdine, serge, suitings, worsted knitted yarn, and blankets. Similarly, the company occupied the second highest position in the manufacture of carpet yarn and hosiery yarn. Again, in the various activities like myrobalan extract, footwear, soles, vegetable tanning of hides, chrome tanning of hides of the leather industry, the company also enjoyed the second position.

The CENTURY SPINNING AND MANUFACTURING COMPANY was incorporated in 1897 to manufacture cotton textiles and for that it integrated all the stages of production viz., ginning, pressing, spinning, weaving and finishing. Later on, the company had a successive function by producing textile chemicals such as caustic soda, chlorine, and sulphuric acid. In 1956, the company further stepped into the manufacture of viscose rayon, a divergently related product. For this venture, the company also expanded its range of chemicals such as rayon grade caustic soda, carbon-di-sulphide. From viscose rayon yarn it further, in 1963, moved into the weaving of synthetic fabrics and tyre cord. Recently, the

---

19 For the manufacture of tyre-cord the company went into collaboration with Vereinigte Glanstoff-Fabriken of West Germany and Algemene Kunstzijde Unie of Holland.
company made a lateral move into the manufacture of seamless steel pipes. In 1964 the company was the largest producer in the country of viscose tyre cord (64.6 % share) and viscose rayon yarn (26.0 % share). It was also the second largest producer of viscose filament yarn (37.5 % share) and the third largest producer of sodium sulphate (9.5 % share).

THE AHMEDABAD MANUFACTURING AND CALICO PRINTING COMPANY was established in 1880 and at present it has four subsidiaries, namely Rajindra Dyeing & Ptg. Mills, Kalol Mills, Gujrat Nets and Illac. Of these the first was acquired and the second was floated in 1959; whereas the remaining two were established in 1960. Till 1947, when the company had a successive diversification move into the manufacture of textile chemicals (such as caustic soda, liquid chlorine, calcium carbide, hydrochloric acid, and soda bleach), it was a manufacturer of cotton textile goods. With a base in chemicals, the company further diversified in 1951 into the plastic industry$^{20}$ to manufacture PVC resins and compositions, PVC pipes both rigid and flexible, PVC coated wires and cables, and PVC injection moulded goods. The two subsidiaries, Kalol Mills and Rajindra Dyeing and Printing Mills, produce textile goods; whereas the other subsidiaries, namely, Gujrat Nets and Illac manufacture

$^{20}$For the manufacture of vinyl acetate, the basic material for plastic industry, the company secured foreign collaboration with Vinyl Products Ltd., of U.K., in 1961.
mosquito nets and sewing thread, and market the holding company's textiles, chemicals and plastic goods respectively.

In 1964, Calico was the largest manufacturer in the country of PVC compositions (86.1% share) and the second largest producer of PVC resins (39.8% share). It was also the third, fourth and fifth largest producer of liquid chlorine, calcium carbide and caustic soda respectively with the percentage shares of the total produce in the country in these fields being 16.9%, 20.4% and 7.4% respectively.

The remaining three companies from cotton textile industry are highly diversified complexes and their product structure is examined as follows:

**JIYAJEEERAO COTTON MILLS** incorporated in 1921, has acquired two subsidiaries, Central India Machinery Manufacturing Company and Salt and Allied Industries Ltd. The company commenced the manufacture of cotton textiles in 1923 after vertically integrating the ginning, pressing, and spinning processes and having a divergent move into cotton yarn. In 1959, the company had another successive function by commissioning the production of caustic soda and soda ash. Subsequently in 1965, the company had a divergent move into the manufacture of terylene yarn. The company also maintains a power house for the generation of electricity. The subsidiary of the company, Central India Machinery Manufacturing Co., manufactures a wide range of
textile machinery and accessories. The other current manufacturing interests of the subsidiary are: steel castings, railway wagons and wagon carriage and locomotive components, signalling and interlocking equipments, and shuttles and picking sticks. In 1964, this company took on lease the cycle factory of Hind Cycles Ltd., to manufacture cycles and certain defence items. In 1964 the company was the largest manufacturer of plain looms, textile machinery with 75.1% share of the total production in the country. In 1965, this subsidiary company began to manufacture all types of bridges, sand wagons, and mine cars for which there is a rising demand. At the time of beginning these activities the company was experiencing idle capacity in some of its divisions as is evident from the following extracts taken from the company's annual report, 1965:

"But due to continued stringency of finance with the textile mills, the demand fell far short of expectations. In additions to this continued import of foreign looms in spite of idle indigenous capacity has affected the demand for indigenous automatic looms. Therefore, the capacity of the factory at Gwalior could be utilised only to about 40% of its full production. Company's Wagon Division has been able to step up production but here too the entire capacity could not be utilised owing to lack of sufficient orders."

21 In 1960 this subsidiary collaborated with Tokyo Machinery of Japan for the manufacture of textile fishing machines.
The other subsidiary company, Salt and Allied Industries Ltd., which produces salt and gypsum was acquired, in 1960 to ensure adequate supply of raw materials for its chemical plants.

THE DELHI CLOTH AND GENERAL MILLS set up as a cotton spinning unit in 1882, changed its name to Delhi Cloth and General Mills in 1932 when it planned to reach new vistas by expanding its activities into non-textile goods. By this time it had already become a composite textile unit having ginning, pressing, baling, spinning, weaving, and finishing of cotton textiles. In 1932, the company made a lateral move into the manufacture of sugar and from this base it had a divergent move in 1938 into sugar confectionary. In 1939, due to war operations, there was a sudden spurt in the rise of demand for tents and so to make use of this opportunity, the company embarked upon the production of tents, a divergent product of cotton textile industry. Again, due to the war operations there was a blockade in the import of textile chemicals, the prices of which due to a scarcity factor rose at an exorbitant rate. The company, therefore, for the maintenance of an assured source of supply of chemicals for its textile units and also to profit from the seller market in which there were high prices and a ready market for the textile

22"In order to ensure adequate supply of salt for our Saurashtra Chemicals Factory at Porbandar, the Managing Agents decided to acquire shares of M/S Salt and Allied Industries Pvt. Ltd., Jamnagar." Extracted from company's annual report, 1960.
chemicals, took up this successive function of cotton textile by setting up its own chemical plants to produce caustic soda and chlorine. Later on, the range of heavy chemicals was widened. By this time synthetic fabrics were appearing in the market, and the company decided to enter synthetic textiles. Thus, with the dual purpose of utilising the molasses of its sugar plants and of having a dependable source of alcohol, which is the basic raw material for the production of acetate yarn, the company installed a distillery in 1945. In 1946, it further entered into the business of edible oils at a time when most of the big sugar units of the country were entering into this field. With this venture the company further diversified into the manufacture of industrial gases as these were required for hydrogenation of vegetable oils and could be easily developed from a strong base in chemicals and distillery. In 1948, the company entered into another divergent field of ready-made garments because of price control on cotton textile goods. But with the industrialization of the economy in order to attain a self-sustained development, opportunities of expansion in other directions were more attractive and promising, so the company abandoned some of the traditional items like ready made garments and tents in the years 1956 and 1961 because the expectations from these products were not high due to their increased intensity of market competition. Meanwhile the range of products of the chemical unit was widened and the production of rayon tyre-cord was also commissioned. In
1962, an attempt was made to undertake the fabrication and supply of the chemical plant and machinery\textsuperscript{23} for meeting the requirements of its PVC, a fertilizer complex which the company had been contemplating since 1957. In 1964, the production of phosphatic fertilizers and poly-vinyl-chloride (PVC) was undertaken because of the company's heavy base in chemical engineering and growing demand for these two products. In this year, the company established a subsidiary under the name of D.C.M. International Ltd., for handling the company's exports of cloth and yarn. In 1964, the company was rated as the largest producer in the country of PVC resins (60.2\% share) and alums (37.9\% share), and the second largest producer of calcium carbide (28.0\% share), liquid chlorine (18.4\% share), activated bleaching earth (34.5\% share), alumina ferric (23.5\% share), PVC compositions (13.9\% share) and vanaspati (10.1\% share). It held the fourth rank in the production of oleum (25.5\% share) and the fifth rank in the fields of manufacturing hydrochloric acid (5.8\% share) rectified spirits (4.6\% share) and superphosphate (5.7\% share).

\textsuperscript{23} In 1961 the company entered into foreign collaboration with Tootal Broadhurst Lee Co., of U.K., Phosphate Acidulating Corp., of U.S.A., and Shin-Estu Chemicals Industries of Japan for the manufacture of crease resisting textiles, superphosphate plants and machinery and PVC respectively. In 1962 the collaboration was also finalised with Beaunit Mills of U.S.A., for the manufacture of visco\textsuperscript{e} high tenacity rayon tyre-cord and again in 1964 Shin-Etsu Chemicals Industries of Japan was collaborated for the manufacture of caustic soda plants.
KESORAM INDUSTRIES AND COTTON MILLS, (set up in 1919 to manufacture cotton fabrics, cotton yarn and some other by-products of the cotton textile industry), has two subsidiaries, Bharat Kala Bhandar and Hindustan Heavy Chemicals, which were acquired in 1944 and 1965 respectively. In 1956 the company, like many textile units, stepped into the manufacture of divergent products like rayon yarn and synthetic fabrics. Again in 1960 the company diversified into chemical industry to produce various textile chemicals and other heavy chemicals such as sulphuric acid, carbon-dioxide, sodium sulphate. It could then be self-sufficient in the supply of raw materials for its cotton textiles and synthetic fabrics. In order to make use of the excessive available capacity of its chemical plants, the company, in the same year had another move into the manufacture of transparent paper, i.e., high quality moisture proof heat scaling paper. In view of the diversified activities of the company, in 1961, it was renamed as Kesoram Industries and Cotton Mills from its original name as Kesoram Cotton Mills. After stabilising the new ventures again in 1965, a new but successively related dimension to its existing secondary lines of manufacturing activities was added when it took up the fabrication of chemical plants such as storage tanks and later on to have an optimum use of its workshop facilities it further embarked upon divergent moves in the direction
of centrifugal cast iron spun pipes and fittings. Bharat Kala Bhandar, a subsidiary besides being cotton textile producer, also manufactures edible oils (cotton-seed oils), whereas the other subsidiary viz., Hindustan Heavy Chemicals has major interest in the manufacture of caustic soda, hydrochloric acid, sulphuric acid, and alums. In 1964 the company was the second largest manufacturer of cellophane and the third largest producer of viscose rayon yarn in the country with its share in the national production as 67.8% and 13.5% respectively.

ii) Rayon Textiles - Three companies have been selected from this industry and among these three companies: THE SIRSILK LTD, which was incorporated in 1946 commenced the manufacture of acetate yarn and synthetic fabrics in 1951. The company also simultaneously moved into a successive function of producing some essential chemicals like acetate and acetate acid for the principal product. In 1964, the company was the sole producer of acetone and acetate rayon yarn and was the largest producer of acetic anhydride with 96.9% of the total produce in the country. It was also the second largest producer of ethyl acetate and acetic acid with 23.8% and 29.4% share respectively.

24 For the manufacture of this item the company, in 1962, collaborated with G.H.W. Gasellschaft fuer Huttenwerksanlagen and Buderus' Sche Eisenwerke Wetzlar of West Germany.
THE NATIONAL RAYON CORPORATION, incorporated in 1946, commenced the manufacture of rayon yarn in 1951. It also commenced the manufacture of sulphuric acid and carbon-di-sulphide, basic raw materials for rayon yarn, which are successively related to the principal activity. In 1951 certain diagonal functions in the form of water supply and generation of steam, heat and power were also adopted. In 1953 another diagonal function of the generation of electricity was taken up. In 1958 a successive function of the manufacture of caustic soda was added; whereas in 1961 the successive function of rayon yarn, that is, the spinning and weaving of rayon textiles was undertaken. The company once entered into an agreement with International Paper Company of U.S.A., for technical collaboration and engineering services for its rayon grade pulp manufacturing project, but the project was discarded because it lacked economic feasibility as is evident from the following extract taken from the company's annual report, 1960.

"To be self sufficient in the matter of the most important raw material viz., Rayon Grade Pulp, an industrial licence for putting up a 100 ton capacity Pulp Plant in the Mysore area has been obtained .... However, despite the willingness of the Agency for International Development to extend a loan and the undertaking by the Government of Mysore that they would be able to supply the company's requirements of raw materials, the company carried out its own survey, which disclosed that owing to gregarious flowering the raw materials available would not be sufficient to run the plant at an economic level of activity. It has therefore been decided not to proceed at present with the project."
In 1964 the company was the sole producer of carbotetra-chloride and the top largest producer in the country of viscose filament yarn (53.4 % share), hydrochloric acid (34.0 % share), sodium sulphate (27.9 % share). It was the second largest producer of viscose tyre cord (35.4 % share), the third largest producer of viscose rayon yarn (13.5 % share), and hydrogenated gas (26.3 % share) and the fourth largest producer of caustic soda (8.4 % share).

**THE GWALIOR RAYON SILK MANUFACTURING (WEAVING) COMPANY** was incorporated in 1947 and commenced in 1949 the manufacture of rayon and synthetic fabrics. In order to have self sufficiency in certain raw materials, the company in 1954 adopted a successive move into the production of viscose stable fibre and anhydrous sodium sulphate. Subsequently in 1963 it adopted another successive function of the manufacture of rayon grade bamboo pulp and from this base it had a divergent move into paper grade bamboo pulp which subsequently in 1964 enabled the company to make a successive move into paper production. In 1963 the company had also divergently moved into cotton and staple fibre yarn and cotton textiles when it purchased a cotton textile mill at Bhiwani (Haryana). In 1964 the company with foreign collaboration set up an Engineering Division and commenced the casting and fabrication of rayon and ancillary plant machinery and spares, a successive function to its principal activity. In 1964 the company was the sole producer of pulp...
both dissolving grade and paper grade and rayon plant machinery. It was the largest producer of viscose staple fibre with 89.0% share of the total produce in the country. Similarly, it was the second largest producer of sodium sulphate (27.6% share) and the fifth largest producer of sulphuric acid (5.0% share).

iii) **Jute Textiles** - Three companies, New Central Jute Mills, Birla Jute Company and Fort Gloster Industries have been selected from this industry.

**NEW CENTRAL JUTE MILLS COMPANY** was established in 1915 to manufacture all kinds of jute goods such as sacking, hessian and carpet backing, and in 1955 it amalgamated with it two jute mills, Albon Jute Mills and Lothian Jute Mills. In 1959, the company diversified laterally into the manufacture of soda ash and ammonium chloride (fertilisers). In 1964 it was the largest producer of ammonium chloride with 76.5% share, the third largest producer of carpet backing with 13.6% share and the fourth largest producer of anhydrous ammonia with 2.2% share of the total produce in the country.

**BIRLA JUTE MANUFACTURING COMPANY** was found in 1919 to manufacture jute goods such as sacking, hessian and

---

25. For this new project, in 1960, the company concluded a collaboration with Zakee and Co., of West Germany.
and carpet backing. Subsequently, the company took up a diagonal move into the generation of electricity. In 1954, the company had a lateral diversification move into the manufacture of chemicals like calcium carbide and gases such as acetylene and oxygen. Again, in 1957 from its base in chemicals the company made a divergent move into staple fibre and synthetic yarn. In 1959 the company further laterally diversified into the production of portland cement and clinker. The company has acquired two subsidiaries, India Linoleums Ltd., and Assam Jute Supply Company Ltd. The first subsidiary manufactures linoleum and water proof packing materials (laminated products); whereas the other is a jute baler and shipper company. At present, the company is making divergent moves from its base in cement towards the manufacture of refractories, the demand for which is increasing along with the expansion in the basic metal industries of the country. In 1964 the company was the largest producer of calcium carbide with 28.7% share and the second largest producer of jute sacking with 8.1% share in the total produce of the country.

FORT GLOSTER INDUSTRIES, which was formerly known as Fort Gloster Jute Manufacturing Co., Ltd., was established in 1890 and till 1960, when it adopted a lateral diversification move into the manufacture of electric cables, had

26For entering into this new venture, the company had foreign collaboration with British Insulated Calendars Cable Ltd., of U.K.
been manufacturing a wide variety of jute goods. In order to serve many markets, the company adopted a range of divergent moves into the manufacture of VIR cables, trailing cables for machines, inter vehicular railway coupler cables, railway signalling cables, flexible cords, and paper insulated underground cables. In 1964 the company was the third largest manufacturer of VIR cables (13.6 % share), the fourth largest producer of jute sacking (64.0 % share) and the fifth largest manufacture of jute hessian (6.6 % share) in the country.

B. INTERMEDIATE GOODS INDUSTRY

4. Paper and Paper Products Industry

A sample of seven companies has been selected from this industry and the product composition of the companies is discussed below:

STRAW PRODUCTS LIMITED, established in 1938 in Madhya Pradesh and owning a subsidiary, Bhopal Oil & Flour Mills, commenced in 1939, the manufacture of straw board and corrugated board from the surplus of wheat straw, which was of no economic value as it was actually burnt in those days in Madhya Pradesh. In 1957, the company divergently moved into the manufacture of duplex board, mill board, M.G. covers, M.G. wrappers, straw paper. Again in 1961 the production of box board was added to the existing lines. In 1962 the company set up its writing and printing paper mills for the
manufacture of white and coloured printing, cream wove, coloured wove, cream laid, azure laid, bond, maplitho paper. In 1963, it further had a divergent move into the production of bitumen paper. The subsidiary of the company is defunct. In 1964 the company was the second largest producer of miscellaneous board (28.9% share) and the third largest producer of straw board and mill board (8.9% share) in the country; whereas in the manufacture of duplex and triplex boards (0.6% share) and writing and printing paper (5.5% share) it was the fourth and the fifth largest producer respectively.

BALLARPUR PAPER AND STRAW BOARDS, founded in 1945, commenced the manufacture of a variety of writing, printing and superior grade papers, such as bonds, airmail and bible papers in 1953, and also set up in 1956 a mechanised plant to manufacture stationery goods. In order to meet its own requirements, the company, also manufactures pulp (board) and maintains a soda recovery plant to produce necessary bleaching chemicals. In 1966 the company divergently moved into the production of grease proof, glassine paper and laminated boards and now it is contemplating setting up an electrolytic bleach plant for the manufacture of chlorine and caustic soda which are required for the finishing of paper. In 1964 the company was the third largest producer of wrapping paper, brown with 10.6% share of the total produce in the country,
Similarly, THE BENGAL PAPER MILLS COMPANY, and THE SIRPUR PAPER MILLS which were established in 1889 and 1938 respectively produce a variety of writing, printing, wrapping and packing paper besides manufacturing pulp (board) and caustic soda. In 1964 Bengal Paper Mills was the second biggest manufacturer of special quality paper (39.9 % share) and the third largest producer of writing and printing paper (15.4 % share) in the country.

THE TITAGHAR PAPER MILLS COMPANY was set up in 1882 and it maintains two subsidiaries, Commercial Products Ltd., and Paper Agencies Ltd., which were floated in 1941 and 1948 to carry out the marketing operations of the company. The company besides producing pulp, manufactures all types of paper except news print and boards. It also maintains necessary capacities to produce soda caustic for its own requirements. In 1964 the company was the biggest producer of pulp (board), the third largest manufacturer of special variety papers and the fourth largest producer of writing and printing paper. Its shares in these three ventures were 52.3 %, 9.1 % and 12.4 % respectively of the total production in the country.

ORIENT PAPER MILLS which was incorporated in 1936 also manufactures all types of paper, (except news print)

27 In 1962, the company entered into foreign collaboration for the manufacture of paper and pulp with Kimberly Clark Corp; of U.S.A.
and paper board, besides manufacturing necessary chemicals like soda caustic for its own requirements. In 1964 the company was the largest manufacturer of wrapping paper-kraft (41.0 % share); whereas in the production of boards (duplex and triplex), it held the second position with 33.7 % contribution of the total produce. It was also the third largest producer of pulp (board). The company had acquired four subsidiaries, Air Conditioning Corporation, Hindustan Cellulose and Paper Mills, and Orient General Industries and Motolite. The business interests of the Air Conditioning Corporation are trading and manufacturing of air conditioning equipment; whereas those of Orient General Industries are the trading and manufacturing of electric fans, and electrical parts for automobiles. Motolite manufactures car dynamos.

In 1964, the company was the largest manufacturer of wrapping paper-kraft (41.0 % share), the second largest producer of boards, duplex and triplex (33.7 % share) and the third largest producer of pulp-board (10.1 % share) in the country. The Orient General Industries was also the sole producer of horn relays and the second largest producer of electric fans (27.4 % share), starter motors (21.1 % share), electric horns (22.5 % share) and dynamos (20.6 % share) in the country.

---

28 In 1960 the Orient General Industries collaborated with Joseph Lucas Ltd., of U.K., for the manufacture of starter motors and horns for automobiles. Further collaborations by this company were also concluded with Ranco Ltd., and Joseph Lucas of U.K., for the manufacture of rotor starter units for sealed unit compressors for domestic refrigerators and main body and panel harnesses respectively.
The seventh company in the sample viz., SHREEGOPAL PAPER MILLS, incorporated in 1936, is also a diversified concern because besides producing writing, printing, packing and wrapping paper from its own manufactured pulp, it manufactures soda caustic, stationery items like exercise books, writing pads and envelopes. In order to meet the requirements of its stationery division it has its own printing presses. In 1949, the company made a lateral move into the manufacture of hydrogenated vegetable oils (vanaspati) and to have a self-sufficiency in tin containers for its vanaspati division, it made a successive move into tin container manufacturing. In 1964 the company was the biggest manufacturer of writing and printing paper with 18.5% share in the total produce of the country.

5. Chemicals and Chemical Products

Eight companies have been selected from this industry and four of them have their production activities within the ambit of the chemical industry as classified as the two digit level of SIOC. The other four companies have their manufacturing interests both within and outside the chemical industry. The following paragraphs discuss the product composition of the companies.

THE ATUL PRODUCTS has two subsidiaries, Ameer Trading Corporation and Cibatul Ltd. The former was acquired in 1957 and the latter was floated in 1962 the company was
incorporated in 1947 to produce dyes, both direct and acid. In 1952, when azo dyes and sulfur black plants of the company were commissioned on a commercial scale, the company experienced severe competition from imported dyes as the import of dyes at that time was freely allowed. In order to meet the initial expected losses in the dye market due to the severity of competition, the company had thought of the production of pharmaceuticals as a second string to its bow and hence made a divergent move into this industry by manufacturing a range of sulfa drugs and anti-biotics known as Aurreomycin. The company now possesses a very strong position in the drug market and in the past the profits made on pharmaceuticals were not only used to meet the losses which the company was incurring on dye plants, but these were largely used for adding new dye plants so as to manufacture different groups of dyes to make the range complete for having a strong competitive supply position by meeting the demand and conveniences of the diversified dealers. In order to have a better control over the market and certainty about the optimum utilisation of its heavy

\[29\] In 1960 the company concluded a foreign collaboration with Humphreys and Glassgow Ltd., of U.K., for the manufacture of dyestuff intermediates. Again in 1964, the collaboration was sought from Hodogaya Chemicals Ltd., of Japan for the manufacture of Phosgene. Cibatual Ltd., the subsidiary of the company also had in 1963 collaboration with Humphray and Glassgow of U.K., for the manufacture of urea formaldehyde resins.
plant built up capacity, the company in 1955 adopted a vertical diversification path towards the manufacturing of some basic raw materials such as sulphuric acid, caustic soda and nitric acid. Consequently, the company could carry itself to the highest plateau in the field of dye manufacturing. The Cibatul Ltd., a subsidiary of the company produces urea formaldehyde resins; sulpha drugs and intermediates; textile chemical auxiliaries; whereas the second subsidiary of the company, Ameer Trading Corpn., does the business of an insurance agency and carries out contacts for the holding company for the purchase of materials, clearance of goods through customs, and collection of book debts. In 1964 the company was the sole producer of caustic potash and its contributions to the production of sulphur dyes (others) and sulphur block were 79.1 per cent and 66.2 per cent respectively of the total production of these commodities in the country.

The Alkali and Chemical Corporation of India was set up in 1937 for the manufacture of heavy chemicals like liquid chlorine, caustic soda (liquid), hydrochloric acid. In 1955, the range of activities was widened as it commenced the production of paints and varnishes for meeting its own requirements. Again, in order to use the excess capacity of chlorine, the company made a divergent move into the production of insecticides such as B.H.C. In 1957 the company further added new divergent dimension to its
activities when its plant for the manufacture of 'Alkathene' brand of polythene went on steam. Later on in 1960, the production of alfa powders and rubber chemicals were also taken up. In 1964 the company was the sole monopolist of altrioc powder and rubber chemicals such as accelerators, antioxidants and retarders as it accounted for the entire production of these two products in the country. It held the first position in the production of metal cleaner, polyethylene moulding powder and N.C. lacquers by producing 80.9%, 62.4% and 44.0% respectively of the total market supply; whereas it was the second largest producer of insecticides (B.H.C.) and hydrogen gas with 31.5% and 32.4% shares respectively. In the field of liquid chlorine it was the fourth largest manufacturer and it held 12.7% share of the total produce.

DHARANGADHARA CHEMICALS WORKS, which was incorporated in 1939 developed its interests in heavy chemicals such as soda ash, caustic soda (rayon grade) liquid chlorine, sulphuric acid and ammonia sulphate. The company also manufactures soda bicarb, hydro chloric acid, calcium chloride, bleach liquor and salt. Recently, in order to

---

30 In 1960 the company entered into foreign collaboration with Imperial Chemical Industries of U.K., for the manufacture of alcin and related dyestuffs. Again, in 1961, the company had another collaboration with its old collaborator for the manufacture of polythene.

31 In 1962 for the manufacture of these products and liquid chlorine and calcium carbide, the company entered into a foreign collaboration with Merubeni-Lida of Japan.
utilise its excessive capacity of chlorine, the company has embarked upon the production of polythene and plastic resins. In 1964 the company was the largest producer of caustic soda (22.2 % share) and calcium chloride (39.4 % share). Its ranks in the fields of sodium bicarbonate (16.9 % share) and soda ash (17.1 % share) were second and third respectively.

**TATA CHEMICALS** which was also incorporated in 1939 maintains much wider interests within the chemical industry. Its activities can be classified as heavy chemicals, marine chemicals, pharmaceuticals and agro-chemicals. The important products of these activities are -

i) **Heavy Chemicals**: Soda ash, caustic soda, sodium bicarbonate, liquid chlorine, hydro-chloric acid and zinc chloride.

ii) **Marine Chemicals**: Gypsum, common and pure salt, bromine and magnesium chloride.

iii) **Pharmaceuticals**: Fine chemicals, ammonium bromide, sodium bromide and potassium promite.

iv) **Agro-chemicals (insecticides)**: Benzene, hexachloride, copper oxychloride and copper sulphate.

At present, the company in collaboration with Allied Chemicals of the U.S.A., is engineering the world's biggest ammonia based fertiliser complex project which will be phased over seven to eight years and will ultimately produce 2.3 million tons of fertiliser material containing
1.16 million tons of balanced plant nutrients. In 1964 it held in most of the fields such as ammonium bromide, bromine, potassium bromite, sodium bromite and chlorinated rubber an absolute monopoly of production. In products like soda ash, sodium bicarbonate, zinc chloride and B.H.C. insecticides it is the biggest manufacturer in the country.

**ALEMBIC CHEMICAL WORKS COMPANY** which came into existence in 1907 has also, like other chemical units under study, a wide base in heavy chemicals, fine chemicals, pharmaceuticals, insecticides, and fertilizers. Recently, in order to utilise some wastes of its chemical products it has stepped into the manufacture of animal feeding stuffs. In 1964 it was the second largest producer of penciline (24.4 % share), parathion formulations (36.9 % share) and yeast (5.4 % share) in the country.

**THE METTUR CHEMICAL AND INDUSTRIAL CORPORATION** was established in 1936 and after commencing its production of heavy industrial chemicals such as caustic soda, liquid chlorine bleaching powder, hydrochloric acid, calcium and ferric chloride, sulphate of alumina, common salt potassium chlorate, it took in 1963 a lateral diversification move into the production of refined oils (vanaspati) with a view to reaping heavy profits from the industry as the demand for the product was high due to war operations. In 1944, the company further diversified by taking up quarrying operations.
of lime so as to achieve self sufficiency in the supply of this basic raw material for the manufacture of its chemical products. Later on in 1955, with a base in caustic soda and oils, the company added another new divergent dimension to its activities by manufacturing soap. The lateral diversification move of the company into vegetable oils sometimes stood it in good stead and sometimes proved as an uneconomic venture. This is evident from the following extracts taken from the company's annual reports:

"Owing to production in a number of vanaspati factories in the South far exceeding the demand and a keen competition to get a hold on the market by new manufacturers, the production of vanaspati could not be maintained at an economic level." (1954)

"Due to variety of unforeseen circumstances, production of main chemicals could not be kept to full capacity during the year (1959) .... As against the lower production of the basic chemicals, we have been able to exceed last year's production in vegetable oil products. The profitable working of this department (vegetable oil) has to some extent offset the loss of production in chemicals." (1959)

In 1964 the company was the sole manufacturer of stable bleaching powder, the biggest producer of liquid chlorine (19.8% share), the third biggest producer of caustic soda, calcium chloride, hydro-chloric acid, aluminium sulphate and potassium chlorate, with 8.4%, 23.9%, 10.4%, 18.0% and 7.0% shares of the total production in the country.
founded in 1923 and became a public joint stock company in 1929, commenced in 1924, the manufacture of matches — "fire pocket carriers". In order to meet the requirements of raw materials for its principal activity, the company took successive functions into the production of potassium chlorate in 1942 and of glue in 1943 because during this period the import of these materials became difficult due to war operations. In 1959, the company further vertically diversified into the manufacture of wrapping paper. Again in 1964 the production of salt in order to meet the requirements of the manufacture of potassium chloride was undertaken. These vertically integrated functions of manufacturing wrapping paper and salt were motivated by self-sufficiency in the supplies of basic raw materials; yet, the other most important reason for diversification was the monopoly control policy of the government as is evident from the following:

"In order to reduce the monopoly the company has been having in the supply of matches and to encourage employment in the cottage industry sector, the Government has restricted the company's capacity to make matches. In view of this the company took to manufacture of paper a couple of years ago, but here, too, the Government has made the position difficult by fixing the ex-factory prices at levels considered unremunerative." 32

In 1964 the company was the biggest manufacturer of matches (96.5 % share) and potassium chlorate (83.4 % share)

32 Extracted from company chairman's statement at 1960 annual general meeting of the company.
and was also rated as the second largest producer of glue (19.4% share) and wrapping paper (20.5% share) in the country.

**BENGAL CHEMICAL AND PHARMACEUTICALS WORKS** founded in 1901 is the smallest but the most diversified concern among the selected companies from this industry. The company manufactures a large variety of pharmaceuticals (such as indigenous medicines, snake venom antiserum, tetanus and diphtheria antitoxin, tetanus toxoid, vaccines, and injectules, surgical cotton wools and dressings, synthetic drugs, etc.), heavy and fine chemicals (like sulphuric acid, nitric acid, hydrochloric acid, magnesium sulphate, ferroalum, aluminium sulphate) and the toilet products (such as hair oils, perfumes, snow, cream, powder body and face, tooth powder and paste, soaps-toilet and medicated) and the coal tar distillation products (like naphthalene, phenyl black and white disinfectant fluids, and road tar). Besides these products, the company also manufactures printing inks, fire extinguishers, hospital and laboratory equipment. The functional relations of the company products reveal that most of the products because of having a common production technology, i.e., chemical processing and common use of raw materials, are divergently related. But since some of them also need similar market expertise, these are also convergently related. In 1964 the company was the second largest producer of disinfectants (36.7% share) zinc chloride (37.5%
share) and tooth powder (26.3 % share), the third largest producer of fire extinguishers (5.8 % share) and shaving soap (0.3 % share), the fourth largest producer of alum (9.9 % share) and alumina ferric (10.0 % share) and the fifth largest producer of medicated soap (7.9 % share) and magnesium sulphate (4.2 % share) and coal tar (2.3 % share) in the country.

6. Non-metalllic Mineral Products Industry

Seven companies have been selected from this industry and each of them has cement manufacture as its initial activity. Three companies — SONE VALLEY PORTLAND CEMENT COMPANY, THE INDIA CEMENTS33 and THE JAIPUR UDYOG which were incorporated in 1922, 1946 and 1948 respectively, are manufacturing portland cement with having a vertical diversification move into limestone quarrying. Sone Valley Portland has also another vertical diversification move, adopted in 1944, into coal-mining. In 1964, Jaipur Udyog was the second largest producer (14.8 % share) and India Cements was the fourth largest producer (6.7 % share) of cement in the country.

ORISSA CEMENT incorporated in 1949, commenced manufacture of portland cement in 1951 and in 1953 divergently

33 In 1963 the company collaborated with B.F. Goodrick and Co., of U.S.A., for diversifying its activities into the manufacture of PVC resins.
widened the range of its activities when it took up the manufacture of RCC pipes, stoneware pipes and sanitary wares. In 1958 the company further divergently moved into the production of refractories and chemically bonded and heat resisting bricks. In 1964 the company was the fourth largest manufacturer of refractories (basic, fireclay and silica bricks) with 7.4% share of the total production in the country.

SHREE DIGVIJAY CEMENT COMPANY, which was established in 1944 and commenced the manufacture of portland cement in 1949, diversified in 1962 when it took up the production of asbestos cement pressure pipes, sheets and auxiliary moulds. The company at present has two subsidiaries, West Coast Paper Mills and Asbestos Cement Products Ltd., which were incorporated in 1955 and 1957 respectively. The first subsidiary manufactures pulp and all types of paper, except newsprint, in collaboration with Rayoniers of U.S.A., whereas the second subsidiary is defunct, and recently its Asbestos Cement Products project has been transferred to the holding company. In 1967, the company went into new lines of business such as mechanical engineering and building contacts. In 1964 the company was the second largest producer of A.C. Pipes (26.9% share), the fourth largest producer of A.C. Roofing (3.7% share) and the fifth largest producer of cement (6.1% share);

34For the production of this item, the company, in 1961 had a foreign collaboration with General Refractories Co., of U.S.A.
whereas its subsidiary viz., West Coast Paper Mills was the third largest producer of wrapping paper kraft (13.6 % share) in the country.

**DALMIA CEMENT (BHARAT)** which took over the assets of Dalmia Cement Ltd., in 1951 and also acquired all the shares of Magnesite Corporation of India Ltd., in 1963, commenced the manufacture of portland cement in 1939 and later on in 1949, it diversified into the production of refractories and insulating and acid resistant tiles for all industrial purposes. Two years after this move some new dimensions were added to the existing activities by manufacturing a wide range of stone-ware pipes and R.C.C. pipes for the purposes of irrigation, culverts, water supply and drainage. In 1952, the production of pottery and sanitary wares (abandoned in 1968) such as wash basins, and urinals and closets was also taken up. In 1953 the company laterally moved into the mining of iron ore and in 1959 the manufacture of dead burnt magnesite was also taken up. The company further vertically diversified into the manufacture of cement mill machinery and certain heat resisting, wear resisting machinery parts for the cement and other industries. In 1964 the company was the third largest producer of cement (9.2 % share) and the fourth biggest manufacturer of cement mill machinery (0.9 % share) in the country. Most of the activities of the company fall within the jurisdiction of the cement industry and the products are divergently related because of a common
material base in cement. Some of the activities are also convergently connected because they cater to the needs of a single market, say, construction and buildings. Wherever the company has diversified outside the boundaries of its primary industry, the diversification moves are of the nature of backward vertical integration.

The Associated Cement Companies came into existence in 1936 after the amalgamation of some cement companies with interests in the manufacture of portland cement and stone-quarrying for meeting the requirements of its primary activity. After a year's time of its existence it suspended the manufacture of cement at one of its works, Katni, so that it could use the works for the manufacture of refractories and certain other cement products such as fire brick talcum, french chalk, stoneware pipes, and fittings. In 1942, when due to war operations, the import of cement mill machinery was blocked, the company launched its expansionary programme by stepping into the engineering industry to fabricate cement mill machinery. Later on in 1944, it again vertically moved into coal mining operations to meet the increasing requirements of its cement, refractory, and engineering works. Subsequently, the mining of bauxite and quarrying of gypsum and limestone were also added. In 1964 the company collaborated with Hitachi Ltd., of Japan for the manufacture of electric overhead travelling cranes and with this collaboration the existing range of engineering products was further diversified when in 1967, the manufacture of conveyors and
cranes for handling jobs in various fields like power plants, assembly shops, iron foundries, warehouses, material store yards and steel mills, was commissioned. The company at present is contemplating setting up new engineering works for the manufacture of pulp, paper and chemical plants and mill machinery. In 1930 the company set up a subsidiary, the Cement Marketing Co., of India, for carrying on the sale and distribution of its cement and refractories. In 1964, the company was the biggest producer of cement (39.8 % share) and cement mill machinery (61.6 % share). In the production of conveyors it was the fourth largest manufacturer (4.4 % share) in the country. As the company is largely concentrated in the cement industry and its allied products, most of the diversification moves are of divergent nature. Manufacturing of cement mill machinery, raising of coal, mining of bauxite and quarrying of lime stone are successively related to the main activity. The manufacture of cranes and conveyors and its current plant to manufacture pulp, paper and chemical mill machinery are divergently related to the manufacture of cement mill machinery.

C. CAPITAL GOODS INDUSTRY

7. Basic Metal Industries

Eight companies have been selected for the study from this manufacturing activity. But if the industry is divided into two groups, ferrous metals and non-ferrous metals,
five companies belong to the first group; whereas the remaining three companies are from the second group. The product structure and the functional relations of the companies are discussed below.

i) **Ferrous Metals** - Of five companies, **TINPLATE COMPANY OF INDIA**, which was incorporated in 1920, is least diversified as it deals in and manufactures only one product, namely tinplate. In 1964 the company contributed over seventy-five per cent of the tinplate production in the country and has always experienced a very satisfactory demand for its products.

**MUKAND IRON AND STEEL WORKS**, incorporated in 1937, has one subsidiary, Batala Engineering Company which was acquired in 1952. The company has major manufacturing interests in gray iron and steel castings for locomotives, rolling stock, the cement industry, mining industries, the automobile industry. Besides casting of steel, the company also manufactures certain rolling mill products such as iron and steel bars, rods, and structurals. Recently in 1965, the company has diversified into machine building activity by manufacturing cranes and furnaces which are largely in

35"The performance in the Steel Foundary suffered owing to shortage of orders. This situation was largely the result of heavy reduction in the coupler requirements of the Indian Railways, our largest buyer of steel castings, and the tapering off of production for another major customer owing to prolonged labour strike in their plant .... We have received orders for the fabrication of structures of seven furnaces, two of which have been manufactured and supplied. During the year we built six cranes of varying capacities and type and three more are under production at present." Extracted from company’s annual report, 1964-65.
demand due to industrial expansion in the country. The company's subsidiary, which collaborated in 1962 with machinefabrik Wienneustadt of Austria for the manufacture of wood working machinery, has manufacturing interests in iron and steel casting and machine tools. In 1964 the company was the largest manufacturer of steel castings with an 18.5 per cent share and the fifth largest producer of electric ingots with a 7.9% share in the total produce of the country.

BURN & CO., established in 1895 is a diversified complex, but most of its operations are vertically integrated. The company operates foundaries for iron and brass castings and also maintains capacity to manufacture structurals. With interests in castings and structurals, the company is one of the largest and a pioneer manufacturer of railway wagons and railway rolling stocks, ships, boats, bridges, chain pulley blocks and tools (twist drills) etc. Recently the company has entered into the manufacture of cranes. The chairman of the company once observed that:

"It is one of the largest wagon building and heavy general engineering unit. The Howrah works of the company remain fully booked. The Directors continued to seek new lines of business to diversify the activities, as they anticipate a falling off in demand for wagons for the Government of India over the next few years. During the year under review, an agreement between the company & Vanghan Crane Co., Ltd., of U.K., was concluded for the manufacture of cranes at the Howrah works."

36 Extracted from company chairman's statement at the 1960 annual general meeting of the company.
In order to meet its own demand for refractories the company set up its works which later on were developed into a complex of ceramics, potteries, bricks and tiles and other stone wares by integrating stone and clay quarrying with these operations. Besides these manufacturing activities, the company undertakes the contracts of various structural engineering services. In 1964 the company was the biggest producer of refractories (19.8 % share), the second largest producer of railway wagons (21.6 % share), mining of magnesite (28.5 % share) and fire clay (11.1 % share); whereas in the manufacture of steel structurals (4.0 % share) and stoneware pipes (12.7 % share) the company was rated as the third largest producer. It also held the fourth highest rank in the field of steel castings (10.7 % share) and manufacturing of certain tools like twist drills (3.4 % share) in the country.

THE INDIAN IRON AND STEEL COMPANY, with which the steel Corporation of Bengal was merged in 1953, was set up in 1918. It has at present its major interests in the manufacture of iron and steel products for which it has its own very large scale capacities of smelting, casting and forging. With such facilities, the company produces a vast variety of rolling mills and foundary products such as blooms, billets, slabs, bars, rails, sleepers, wheels, tyres, axles, soun iron pipes and iron and steel structurals. In order to have self sufficiency in the matter of supply of
basic raw materials for its various mills, the company integrated vertically the mining operations of iron ore and coal. Again, in order to use the metal scrap and wastes of coke, the company further entered into the field of coke oven products such as coal tar, toluene, benzene, benzol, solvent nepatha and carbonised coal. The company also manufactures as a by-product of its main activity certain acids such as ammonium sulphate and sulphuric acid. Most of the functions of the company are vertically integrated but there are also a good number of them which are divergently related because of a common use of raw material such as pig iron or productive utilisation of by-products of the main operations. In 1964 the company was the top producer of galvanised sheets, wheels, tyres and axles, pig iron (foundry grade), light rails, heavy structural steels, cast iron pressure pipes (including spun pipes); whereas it held the second largest position in the fields of hoe bars, pig iron (basic), carbonised coal, solvent nepatha and crude coal tar. Similarly, it was adjudged as the third largest producer of billets (saleable), heavy rails, black sheets (plain), light and medium structural steels etc.

THE TATA IRON AND STEEL COMPANY, established in 1907, is the biggest company in the industry and is also at the top of the pyramid of the Indian private corporate sector. The major interests of the company lie in the manufacture of iron and steel products for which it has huge capacities of
smelting, casting, forging, and rolling. The company operates a large number of supporting activities such as mining of iron-ore, coal, managnese and chromite; quarrying of limestone, dolomite and clay; a wide range of refractories, furnace and lining bricks. The company also manufactures, as a by-product of its steel making operations, some chemicals and coke oven products such as ammonium sulphate, tobrene, benzene, benzoil, carbonised coal, coal tar and nepatha.

Again, besides producing ingots, blooms, billets, slabs, bars, rails, plates, sheets, tyres and wheels, axles and structural, the company makes some tools and implements like hoes, picks, beaters, hammers, crow bars and shovels. In 1960, the company set up its oxygen plant to meet its own requirements under very compelling circumstances. It is currently contemplating manufacturing material handling and processing equipments. The company has four subsidiaries,

37"I regret to have to report that the Government of India have refused to sanction a very satisfactory arrangement we had concluded that the Indian Oxygen Company whereby that company was to set up at its own cost, a tonnage plant at Jamshedpur for which the steel Company was to purchase on favourable terms its greatly enlarged requirements of oxygen. On the ground that Indian Oxygen Company already has too large a share of business, Government have decided that the plant should either be put up by another company in collaboration with a different foreign firm or that the Steel Company should put up the plant itself. As the first alternative would have resulted in delay and unnecessary complications through the presence of two oxygen suppliers at Jamshedpur, and in the lost certain financial benefits which would have accrued from the proposal initiated with the Indian Oxygen Company, we had no alternative but to decide to put up a tonnage plant of own and to shoulder the additional expenditure which will amount to over a crore (ten million) of rupees." Extracted from company chairman's statement at 1960-61 annual general meeting of the company.

38In 1962, the company concluded foreign collaboration
West Bokaro, Mysore Chromite, Eagle Rolling Mills and Belapahar Refractories. The first was promoted in 1945, the second and third ones were acquired in 1951; whereas the fourth one was floated in 1958. These are currently engaged in the manufacture of refractories, coal mining, re-rolling manufacturing, and mining of magnesite respectively. The range of the products manufactured and the activities pursued by the company suggests that most of the activities are either vertically integrated or divergently related with one another. The production of basic raw materials and the manufacture of diverse products either with the same basic raw materials or with the use of by-products of the main operations, are the chief characteristics of the company. In 1964 the company was at the largest producer of bars (hoe bars, shelp bars, tin bars), billets (saleable), blooms, ingots and clay; whereas in the fields of pig iron, plates, galvanised sheets, wheels, tyres and axles, rails, structurals, iron ore, managenese ore, toluene, benzol, solvent nepath, it was the second largest producer. It also held the third rank in the production of heavy structurals, dolomite, coal tar and carbonised coal.

ii) Non-ferrous Metals and Alloys - Three companies, Indian Aluminium Company, the Aluminium Corporation of India, with Fraser and Chalmers of U.K., and Hewit Robins of U.S.A., for the manufacture of material handling and processing equipments.
and the Binani Metal Works have been selected from this industry. The product composition of these companies is examined below:-

**INDIAN ALUMINIUM COMPANY**, which was incorporated in 1938 under the name Aluminium Products of India and later in 1945 changed its name to the present one commissioned its Rolling Mill in 1941 to manufacture plates, coils, sheets, circles, and strips. In 1943, the company installed its Aluminium Reduction Plants and also integrated the mining operations of bauxite, the only raw material required for the manufacture of aluminium metal. Subsequently, again the company widened its field by setting up alumina plant, aluminium paste plant, aluminium extrusion plant and another aluminium reduction plant in 1948, 1951, 1955 and 1959 respectively to produce virgin aluminium ingots, alloy ingots, aluminium billets and bars, aluminium chemicals, aluminium pipes, tubes and structural. In 1951 the company also had a diagonal move into the generation of electricity for meeting its own power requirements. Thus the company's main interests in bauxite mining, manufacture of aluminium metal and semifabricated products and chemicals indicate that much of the activities are vertically integrated. In 1964 the company was the largest producer of bauxite (28.8% share), aluminium virgin metal (48.2% share), aluminium sheets (7.90% share), aluminium circles (46.2% share), aluminium extruded products like rods, sections, pipes and tubes (91.4% share) and was
also the sole manufacturer of aluminium paste and pyrotechnic aluminium powder in the country.

**ALUMINIUM CORPORATION OF INDIA**, pioneer in producing aluminium metal from Indian bauxite, was incorporated in 1937 and commenced the production of alumina, aluminium metal and aluminium rolled products in 1944. In order to be self-sufficient for its power and energy requirements, the company diversified into coal mining and power generation. In 1963 the company installed its extrusion plant to manufacture extruded products such as aluminium rods, bars, pipes, irrigation tubings, structural angles and channels, beams, architectural sections. In 1964 the company, from its base in aluminium, further divergently diversified into the manufacture of ACSR and AAC conductors with a view to catching the increasing demand for electric cables. In 1965 the company further divergently diversified by commissioning its foil plant to manufacture aluminium foils and container sheets of a wide variety such as toffee and chocolate wrapper, tea chest lining, foil for jewellery, cigarette foil, pharmaceutical foil, milk bottle cap foil, and soap wrappers. As a by-product of the main activity, the company also produces a range of chemicals such as alumina hydrate, alumina calcined and carbon electrode paste. The activities of the company starting from bauxite mining to the manufacture of aluminium foils reveal that the company is a self contained and integrated unit. In order
to meet the growing demand of certain industries, it also has divergently diversified from its base in aluminium. In 1964 the company was the second largest producer of aluminium extruded products such as rode, sections, pipes and tubes (8.6 % share) and aluminium sheet (19.4 % share), the third largest producer of aluminium virgin metal (13.3 % share) and the fourth largest producer of aluminium circles (5.3 % share) in the country.

BINANI METAL WORKS, which was incorporated as a private company in 1941 and converted into a public company in 1961, is primarily in the manufacturing field of non-ferrous alloys, soft and hard, and castings. Besides these operations the company also manufactures some engineering and fabricated metal product items like melting equipment such as oil fired and coke fired furnaces, boring tools, door closures. Most of the products of the company are divergently related because of common casting facilities. In 1964 the company was the sole producer of cupro nickle alloys, managanese bronze and tin bronze; whereas it was the top biggest manufacturer of lead alloys (89.8 % share), aluminium bronze (88.4 % share), zinc alloys (59.9 % share),

\[39\text{In 1962, the company collaborated with Peterson Ltd., of Denmark for the manufacture of milling machines and again in 1963, it secured foreign collaboration with Multicore Solders of U.K., for the manufacture of solid and flux cored solders.}\]
aluminium alloys (43.2 % share), type metal, including printing metal (55.6 % share), white metal, including antrification bearing metal (32.4 % share) and was the second largest producer of phosphor tin (12.5 % share), resin cored solder wires and billets (37.4 % share), antimonial lead (32.4 % share) and phosphor copper (21.3 % share), and the third largest producer of tin solder (13.5 % share) in the country.

8. Metal Products Industry

Four companies have been selected from this industry and among them INDIAN STEEL AND WIRE PRODUCTS is comparatively less diversified as a company. Since its inception in 1935 it has been manufacturing rods, mild bars, and a wide range of wires, such as barbed wires, galvanised wires, telephone and telegraph wires. The company also manufactures various types of fixtures and fasteners, such as nails, bolts, nuts, rivets. In 1951, the company commissioned its sulphuric acid plant to utilise the waste of its main activity. In 1964 the company was the largest manufacturer of wire nails and barbed wire with its share as 87.2 per cent and 71.2 per cent respectively of the total produce in the country. The product structure of the other three companies is discussed below:

THE METAL BOX COMPANY OF INDIA, incorporated in 1933 as a private limited company and converted into a
public limited company in 1949, has major manufacturing interests in the packing industry. In 1933, the company commenced the manufacture of metal containers, closures, and screw caps. With the passage of time, the company diversified its activities by taking up the manufacture of engineering goods such as can closing, bottle sealing and metal stamping equipment which are complementary in demand to the package products. The range of the existing activities was further expanded when hardware items like ordinance supplies, insecticide sprayers, trays, calendars, advertising show cards, toys and novelties were also taken up. After 1947 with the launching of a massive programme of economic emancipation through industrialization, there has been a brisk increase in the demand for containers and package products. This has stimulated the increase in demand for tin-plate, the main raw material for packing industry. As the indigenous capacity to produce tinplate is limited and there also is no possibility of its increased imports due to slender foreign exchange position, the Research Division of the company has developed some substitutes which are to be made of non-tinplate materials. In 1953 the company embarked upon the manufacturing of plain and printed flexible packages, bags and tubes which are made from diothene and heat sealing films. Later on, in 1963, the company further diversified by taking up the manufacture of paper packages and containers made from treated and laminated paper, paper board and cardboard. Since then in order to maintain its
market leadership in the packing industry, the company has constantly been developing new products which effectively compete with the existing products and also meet the requirements of diversified dealers. The diversification moves of the company therefore, can be classified as convergent. The development of various engineering items such as deep stamping, can closing, bottling, bottle sealing equipment and insecticide sprayers are also convergently related in demand to the main products of the company. A few sets of divergent moves in order to make use of the waste of the metal container division and the excess capacity of the lithographic and printing division of the company, have also been undertaken by the company. In 1964 the company was the biggest producer of miscellaneous metal forming machines, pilfer proof closures, crown corks, tin containers and collapsible tubes, with its contribution in these fields as 75 %, 60.9 %, 53.9 %, 38.6 % and 53.7 % respectively of the total produce in the country.

GUEST, KEEN AND WILLIAMS, which was incorporated in 1931 as a private limited company under the name of Henery Williams India 1931 Ltd., changed its name to the present one in 1934 and became in 1956 a public limited company. The company advertises that "forging is its business" but

40 With an object of acquiring and carrying on the business of Henery Williams (India) Ltd., which was established in 1922.
it maintains five divisions, Engineering, Forge, Steel, Bolts and Nuts and Screw. Each of these divisions produces different specialised products and therefore have elevated the company into a diversified complex. The products of these divisions are normally used by wagon builders and railways, automobiles, building, mining, structural electrical and many other engineering industries at home and abroad. The traditional lines of the company are the manufacture of fittings, fixtures, and fasteners such as bolts, nuts, screws, industrial buckle pins, safety pins, cotter pins, and hypodermic pins. The company has stepped into new lines of activity because of many reasons. First, that due to intermittent shortages of basic raw materials for the manufacture of traditional products; second, an increased competition in the market of bolts and nuts; third, the growth of new opportunities for expansion in the fields where the demand is much more than the available production capacity; and fourth, availability of foreign technical and financial collaboration. The Steel Division of the company

41 In 1960, the company collaborated with Mills Scaffold of U.K., for the manufacture of clips and fittings of tubular scaffoldings whereas its wholly owned subsidiary namely Sankya Electrical Stamping (P) Ltd., which was amalgamated in 1963, collaborated in 1958 with Joseph Sankey and Sons Ltd., of U.K., for the fabrication of electrical stamping and laminations from high silicon steel. Further collaboration in 1961 for the manufacture of automobile wheels was also finalised with this foreign concern. Again in 1963 and 1964, further collaborations were concluded with Williams Crossbond Ltd., and Talcon Magnetic Gons Ltd., of U.K., for the manufacture of press tools and silicon iron cores respectively. At present the subsidiary has been merged with the holding company.
produces special steel bars, bright sections, and steel springs used by railways and the automobile industry. The Forgee Division undertakes the forging work from wagon builders, railways and the automobile industry; whereas the Engineering Division produces products like metal stamping equipment, grinding media and a vast variety of railway wagon parts, railway permanent way materials like railway points and crossings, sleepers and signal components. The product structure of the company reveals that though the company has still its main interests in fittings, fixtures, and fasteners, most of its new products are convergently related as these cater to the demand for certain specialised products and services of railways and the automobile industry. But most of them are also divergently related as these are produced to make use of its excessive machine tooling capacity.

In 1964 the company was the biggest producer of safety pins (98.3 % share), machine screws (55.8 % share), wood screws (61.2 % share), the second largest manufacture of steel forgings (13.5 % share), automobile wheels (30.1 % share), auto pressings (29.9 % share) and electric ingots (19.4 % share), the fourth largest producer of tungstun carbide — sintered (10.8 % share) and the fifth largest producer of grinding media (7.5 % share) in the country.

**HYDERABAD ALLWYN METAL WORKS**, which was incorporated in 1942 to take over a liquidating concern, Allwyn Steel
Equipment Co., (P) Ltd., had to begin with manufacturing interests in steel furniture, safes, vaults, lockers, cash boxes, shelvings, and almaraha. But later on in 1946, with a base in steel metal technology, the company divergently diversified into the manufacture of bus bodies. In 1955-56, the company expanded its bus body making capacities and also undertook the manufacture of ballot boxes. But as in 1957, the company experienced keen competition in its major line of manufacture viz., bus body building. Due to this the company planned to diversify its activities to manufacture products which could be well received by the market and particularly by the old customers such as households, offices, factories and hospitals of the company. In 1958 the company initiated a convergent move into the manufacture of household refrigerators and as this item was very much appreciated by the market, the production capacity to manufacture refrigerators of bigger capacity, i.e., 6.25 cu. ft., was enlarged in the next year. In 1959 the manufacture of electrically operated washing machines, in 1961, the production of metal cutting band saws and in 1962, supply of some defence requirements were also commenced. Subsequently in 1964, with setting up the fabrication facilities for bus

42 The margin of profit on Bus Body orders which is one of the major items of manufacturing programme was low as compared to previous years. Extracted from company's annual report, 1957-58.
bodies, the company also divergently moved into the fabrication of chemical plants. Again in 1965 the company further diversified by manufacturing industrial ventilation equipment for factories and hospitals as it had experienced that due to non-availability of some vital components such as sealed compressors, it was becoming difficult for it to effectively utilise the increased capacity for the manufacture of refrigerators. In 1966 it further added new dimensions to its activities when it commenced the manufacture of tipping gears, trailers and hydraulic hoists. The product structure of the company reveals that though most of the products are based upon a common material, say metal sheet, yet some of the engineering items such as fabrication of chemical plants and proposed activities of manufacturing cranes and hoists are lateral in character. The other activities viz., refrigerators, washing machines, steel furniture, ventilators,

43 In 1960 the company collaborated with Pressed Steel Co., of U.K., for the manufacture of domestic refrigerators and in 1962 the collaboration with Swartout Fabrication of U.S.A., for the manufacture of industrial ventilators was also concluded. In 1964 further foreign collaboration with Western Corporation of U.S.A., for the manufacture of leading gears and vertical front support was finalised.

44 "The Government of India has been pleased to issued a Development Licence to the company for the manufacture of Hydraulic Hoists, Tipping Gears, Heavy Duty Trailers, and Semi-trailers. Collaboration arrangements with M/S Anthony and Co., of U.S.A., and M/S Carrimore Six Wheelers Ltd., of United Kingdom and Consultancy arrangement with M/S Western Corporation of U.S.A., have been completed and the details of manufacturing processes are being worked out." Extracted from company's annual report, 1963-64.
safes and vaults, are convergently related as they meet the growing requirements of households, offices, factories and hospitals and pass through like marketing channels. The manufacture of heavy duty trailers and semi trailers in also convergently related with the fabrication of bus bodies. In 1964 the company was the largest manufacturer of domestic refrigerators (57.3 % share) and the second largest manufacturer of steel furniture (10.9 % share) in the total produce of the country.

9. General Engineering Industries

Seven companies have been selected from this industry and two of them, NATIONAL ENGINEERING INDUSTRIES and NATIONAL MACHINERY MANUFACTURERS which were incorporated in 1946 and 1947 respectively are comparatively less diversified in the group than the former manufacturers of ball and roller bearings and axle boxes; whereas the latter is exclusively devoted to the manufacture of cotton textile machinery such as ring spinning and doubling frames, carding engines, and automatic looms. Both the companies in order to fabricate their products have vertically integrated the steel casting capacities by setting up foundries. The products of the National Machinery Manufacturers are largely convergently

For the manufacture of automatic looms the company collaborated with Ruti Machinery Works Ltd., of Switzerland.
cum divergently related as these are complementary to one another and also share a common technological base. In 1964 the National Engineering Industries made a lateral move by purchasing a factory which specialises in the manufacture of rubber goods including rubber components for the automobile industry. This company also possesses a subsidiary, the National Bearing Company of Jaipur which is exclusively engaged in trading the products of its holding company. The other company, the National Machinery Manufacturers, is actively searching for its product proliferation as is evident from its chairman's report:

"The company has suffered a serious decline in its programme of manufacture of carding engines owing to continue: depression in the textile industry. Active search is underway for utilising a programme of diversified production at this excellently equipped factory."

In 1964 the National Engineering Industries was the sole manufacturer of axle boxes, the biggest producer of ball bearings (70.3 % share), the second largest producer of steel balls (29.7 % share) and cylindrical rolling bearing (0.8 % share) in the country, was the largest manufacture of automatic looms (54.9 % share), ring frames (42.9 % share), the second largest producer of carding engines (16.0 % share) and the third largest producer of other textile machinery miscellaneous items (19.2 % share) in the country.

The other remaining five companies selected from this industry are relatively more diversified and their
product structure is studied below:

JESSOP & COMPANY, which was established in 1788 and registered as a private limited company in 1932 and converted into a public limited company in 1941, is a diversified wagon building and structural fabricating unit as it currently manufactures a range of heavy and sophisticated engineering goods like cranes and hoists, diesel road rollers, railway wagons and coaches including electric multiple unit coaches, heavy structurals like sluice and crest gates. Besides maintaining heavy workshops for the manufacture of these engineering items, the company also maintains its foundries for casting purposes. In order to find an easy outlet for its products and to have an economic utilization of its specialised technical staff, the company has vertically integrated to undertake the contracts for engineering services. The activities of the company are largely divergently related as these emanate from a common use of basic materials and engineering technology. But instances of backward integration (casting capacities) and of forward integration (mechanical engineering services) are also observable in the product structure of the company. In 1964 the company was the largest manufacturer of cranes and road rollers (with a share of 45.5 per cent and 33.1 per

46 In 1962 the company secured collaboration with Aveling Barford of U.K., for the manufacture of road rollers.
cent respectively of the total produce) in the country. Similarly, in the field of railway wagon manufacture it was rated as the third largest producer (with 13.0% share of the national output).

**JAY ENGINEERING WORKS**, which was set up in 1935, commenced the manufacture of sewing machines in 1938 and later on in 1944, it laterally diversified into the manufacture of electric fans. Again with the passage of time it further diversified when it took up the manufacture of paints and varnishes as these products are largely demanded by the company for its own use. Again in 1956, the company added a new dimension to the existing lines when from its electrical engineering base it stepped into the production of fractional horse power motors. Subsequently, the manufacture of precision iron casting was also taken up.

In 1967 the company chairman expressed the need for further diversification. Though the two products of the company,

---

47 In 1961 the company collaborated with Westing House Elec. International Corporation of U.S.A., for the manufacture of sealed units for refrigerators and air conditioners. In 1964 another foreign collaboration was concluded with Arneldo Vigorelli S.P.A. of Switzerland for the manufacture of zig-siz sewing machines.

48 "Profitability of the company's investment is the prime and ultimate corporate goal for the management of any enterprise. We are caught in India in a situation in which costs continue to rise, while prices cannot be correspondingly adjusted. In this situation of cost price squeeze, profit are the first casualty. We are now working intensively towards the twin objectives of effecting economies in costs of production and marketing and diversification of our products. Production and sales of needles
sewing machines and electric fans are laterally related, yet these are also remotely convergently related because of a common market base. Precision costing is vertically integrated; whereas the manufacture of electric motors is divergently related to the company's electrical engineering base. In 1964 the company was the largest producer of sewing machines (66.6% share), electric fans (27.7% share) and the second largest producer of sewing machine needles (28.3% share) in the country.

LARSON & TOUBRO, incorporated in 1946 as a private limited company and converted in 1950 into a public limited company, have five subsidiaries, Engineering Construction Corporation Ltd., India Crown Cork Company Ltd., Alu Capsule Ltd., Christensen Longyear (India) Ltd., and Willcox Buckwell India Ltd., which were floated in 1944, 1947, 1947, 1960 and 1965 respectively. The company along with its subsidiaries is a highly diversified engineering complex as it manufacturers a vast range of industrial machines. The major manufacturing dimensions of the company are food

was re-organised during the year; our needle plant is now having for the first time more orders, than it can cope with it. It has also been possible for us to secure continuing orders for the products of our grey iron foundary, to enable the foundary to run at a higher capacity. Our tools department which until now was catering largely to meet the requirements of our plants, is now being geared for meeting external demands exceedingly. Extracted from company chairman's statement at 1967 annual general meeting.

In 1957 the company collaborated with certain individual firms of U.K., for the manufacture of capsules whereas in 1950 the collaboration was concluded with Silkeberg
processing machinery, dairy machinery; distilleries and brewery plants, cooling towers, grinding media for the cement industry, paper and pulp machinery, chemical dyestuffs and pharmaceutical machinery, petroleum machinery, mining equipment, construction machinery, road rollers, electricals switchgears and motor starters, control instruments, metering pumps, etc. Besides these manufacturing activities, the company also undertakes mechanical and electrical engineering jobbings. The activities of the subsidiaries are given below:

<table>
<thead>
<tr>
<th>Subsidiary</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Engineering Construction Corporation</td>
<td>Engineering and contracting businesses such as civil engineering works, fabrication, supply and erection of mechanical equipments, piping and air conditioning instrumentation and manufacture of electrical installation.</td>
</tr>
<tr>
<td>ii) India Crown Cork</td>
<td>Manufacture of crown corks.</td>
</tr>
<tr>
<td>iii) Alu Capsuls</td>
<td>Manufacture of foil bottle, capsule bottle closures and capsuling machinery.</td>
</tr>
<tr>
<td>iv) Christensen Longyear (India)</td>
<td>Manufacture of drilling equipment and diamond drill bits for mineral operation and foundation testing.</td>
</tr>
</tbody>
</table>

Mashinfabrik of Denmark for the manufacture of plate pasturisers and can washers. Again in 1960, Wright Hargreaves Engg., of U.K., and Weiger Maschinanhan of West Germany were collaborated for the manufacture of plate pasturisers and can washers, and portable belt conveyers and hand scrapers. In 1961, the company also concluded collaboration with Niro Alomier of Denmark and Chemiban Dr. A. Zirren and Superphosphate of West Germany for the manufacture of spray drying plants complete for dairy industry, and sulphuric acid plants. Collaboration with F.L. Smith and Co., Denmark was also concluded in 1964 for the manufacture of cement making machinery.
In most of the manufacturing fields, the company has a stable demand and sellers' market as was once stated by company chairman:

"The general machine and fabrication workshops worked to full capacity throughout the year (1962), manufacturing plant and equipment for chemical, pharmaceutical, dyestuffs and dairy industries, distilleries and breweries and variety of other items of factory plant and equipment. There continues to be a heavy demand in India for equipment which can be manufactured in our workshops; their capacity is being fully utilised, and a satisfactory backlog of orders on our books."50

"The company represents a large number of overseas manufactures, notably of tractors, agricultural and earth moving machinery, food producing and processing and dairy and refrigeration machinery, plant and machinery for chemical and pharmaceutical industries equipment for drilling and mining industries and general industrial and engineering plants."51

About the future plans of the company, the chairman of the company stated:

Alu Capsule Ltd., a subsidiary of the company also secured in 1964, a foreign collaboration with Corona Capsule Denmark for the manufacture of capsule making machinery. Similarly, another subsidiary namely Christensen Longyear (India) Ltd., was incorporated for the manufacture of drilling equipments in collaboration with E.J. Longyear Company and Christensen Diamond Products Company of U.S.A.

50Extracted from company chairman's statement at 1961-62 annual general meeting of the company.

51Extracted from company chairman's statement at the annual general meeting of the company.
"Looking ahead, I believe the policy of the company should be continued to develop activities, complementary and allied to one existing lines of business, and at pace commensurate with the growth of our financial resources and trained manpower."  

Almost all the activities of the company are divergently related because of common technology, i.e., a common mechanical and electrical engineering base. In 1964 the company was the largest producer of sulphuric acid and sulphuric phosphate plants (80% share) food processing machinery (58.9% share), dairy machinery (50.0% share), sheep foot rollers (71.1% share), petrol dispensing pumps (45.8% share), switch-gear starters (46.6% share), the second largest manufacturer of chemical and pharmaceutical machinery (10.3% share) and the third largest manufacturer of road rollers (25.2% share) in the country. Alu Capsuls had also a virtual monopoly in the manufacture of metal caps when it accounted for 99.8 per cent of the total national produce.

THE BRITANIA ENGINEERING COMPANY established in 1917 commenced, the manufacture of a considerable range of jute mill machinery. Later on in 1930, it diversified into the manufacture of tea processing machinery. Again in 1935,

---

52 Extracted from company chairman's statement at the annual (1962-63) general meeting of the company.

53 In order to diversify its production base the company concluded a series of foreign collaboration. In 1960, collaboration with B.S.A., Tools of U.K., Leesana
the range of production activities was widened when the manufacture of railway carriages and wagon components was undertaken. During the second World War period the manufacture of textile machinery, level flames and interlocking materials was also commissioned. After 1959, the company further widened the tempo of its diversification when it embarked upon the production of diesel road rollers and railway rolling stocks in 1959, printing machines in 1961, wood working machines in 1964 ferrous and non-ferrous castings in 1964 and milling machines in 1965. Most of the activities except casting, are divergently related and are in the direction where there is a rising demand and paucity of production facilities. The casting of steel and alloys, which meets company's own requirements and also feeds the industrial demand, is a successive function being vertically integrated. In 1964 in most of its activities the company was one of the largest producer and the percentage of its contribution in some of the selected products in the country was as under:

Halt Ltd., of U.K., and Gidding and Lewis of U.K., for the manufacture of single spindle automatic lathes, pre-beamer and dressing machines, and jute cone winders respectively were secured. In 1961, collaboration with Densfield Holdings of U.K., for the manufacture of cop loaders and in 1963 with Levage Monutention Valindo of France and Marute Hasagowa Kosakayo of Japan for the manufacture of electric hoists and rubber machinery respectively were also finalised.
TEXTILE MACHINERY CORPORATION incorporated in 1939 commenced in 1942 the manufacture of spinning frames and automatic looms. In 1946, when the textile industry after having been operated at its peak to meet the war requirements was completely shattered and worn out, it clamoured for rehabilitation and modernisation. The company, in order to catch up the brisk in demand for various textile machinery items, took up the manufacture of various types of frames, such as doubling, draw, speed and fly, carding engines, warping winding machines and some jute textile machinery items. In 1951 with a view aimed at seeking growth and providing a cushion against the recessionary winds which were then blowing in the jute and cotton textile industries, the company diversified into the production of boilers, railway wagons, sugar mill machinery, and structurals. Again in 1956, it installed its steel foundries to meet its own and outside requirements for casting. The three divisions of the company, textile, heavy engineering and steel foundary have elevated it into a bustling diversified complex. At present the company manufactures a wide range
of textile machinery, carding engines, drawing frames, simplex fly frames, doubling frames and various other components, castings for railways and industrial concerns, heavy structurals like spillway sluice and pen stock gates, steel liners and pen stock pipes, pressure vessels, kilns, chimneys and ductings, machine tools, thermic syphons, fire boxes, forging items, sugar mill machinery, steam generators such as water tubes, fire tubes and loco boilers. As most of the activities emanate from a common manufacturing skill, technical know-how and engineering experience, their interse relations are divergent in character. The company is proud of being a pioneer in India in the manufacture of various products such as Ring Spinning Frame (1946), Lancashire Boiler (1952), Vertical Boiler (1954), Large Radial Crest Gate (1958), Loco Syphon (1958), Vulcanising Chamber (1960), Penstock Gate (1961), and Water Tube Boiler Drum (1961). In 1964, it was the sole producer of boilers (Cornish and Lankashire), the largest manufacturer of boilers - Vertical (92.4 % share) and railway wagons (24.2 % share), the second largest producer of ring frames (23.6 % share), the third largest producer of carding engines (14.2 % share), the fourth largest producer of boilers-water tubes (14.2 % share) and the fifth largest producer of power driven pumps (14.2 % share) and sugar mill machinery-miscellaneous items (4.1 % share) in the country.

---

54 In 1963 the company collaborated with Zinser Textile-manschinan of West Germany for the manufacture of ring frames.
10. Electrical Machinery and Appliance Industry

Nine companies have been selected from this industry of which six companies are from heavy electrical industry; whereas the remaining three companies are from light electrical industry.

The product structure of the sample companies is discussed below:

i) Heavy Electrical Industry - THE INDIAN CABLE COMPANY was established in 1920 and commenced the production of copper conductors and rubber insulated cables in 1924. Later on with the commissioning of non-ferrous rod rolling mills in 1953, a synthetic enameled winding wire plant in 1956, and a paper insulated power cables plant in 1958, the company has begun to produce for a large number of markets and uses a wide range of electric cables and wires such as rubber and thermo-plastic insulated cables and flexibles, paper insulated cables, varnish cambric insulated cables, radio aerials and or aided aerial cables, bell wires, trolley wires, winding wires and strips, and cords of various types. Later, the company has vertically integrated the jobbing activities by setting up a contract department which undertakes cable installation of various projects and erection of radiators. With the working of this department the company feels that "while keeping the probable effect of increased competition, it is hoped that the company shall not experience undue difficulty in disposing of their output"
at a fair margin of profit.\(^5\) The products of the company are uniformly and divergently related and in 1964 the company was the largest producer of electrolytic copper wire rods (53.4 \% share), paper insulated cables (37.2 \% share), VIR cables (27.6 \% share), winding wires, paper and cotton covered (25.9 \% share), the second largest producer of aluminium rods for ACSR (26.1 \% share), P.V.C. cables (14.1 \% share) and the fifth largest producer of winding wires enamelled covered (8.3 \% share) in the country.

THE NATIONAL INSULATED CABLE COMPANY OF INDIA was set up in 1942 and manufactures a wide range of electrical cables, wires\(^5\) and conductors such as PVC insulated cables, VIR insulated cables, aerial and signalling cables, are welding cables, bell and telephone cables, winding wires sheathed with rayon, silk, cotton, paper and enamals, aluminium and copper conductors. Most of the products of the company are either uniformly or divergently related and the reasons for the product proliferation are traceable in the following extracts

"The demand for ACSR continued to be slack ... the present trend of slackness of demands coupled with additional plants established will bring about idle capacity in the country ... the company has in hand a further expansion programme

\(^5\) Extracted from company directors' report for 1961.

\(^5\) In 1958 the company collaborated with certain firms of U.K., for the manufacture of wires and cables.
for increasing the manufacture of existing types of products and for a new line — making of Armourd cables for Railway Signalling and other purposes. 

In 1964 it was the second largest producer of electrolytic copper wire rods (26.9 % share), winding wires paper and cotton covered (16.9 % share), VIR cables (15.5 % share), the third largest producer of aluminium wire rods for ACSR (14.5 % share) and bare copper conductors (13.3 % share) in the country.

THE ALUMINIUM INDUSTRIES established in 1946 with technical collaboration with Aluminium Industries Ltd., of Canada, manufactures a wide range of aluminium cables for electrical transmission, insulated and non-insulated aluminium and conductors, high tensile steel wire core for ACSR. In 1955 the company set up its casting and rolling capacities whereas in 1957, Wire Plant for the manufacture of high galvanised steel core wire was commissioned.

In addition to these activities, the company has recently made a vertical diversification move towards the manufacture of cable making machinery and is also contemplating the manufacture of high voltage switchgears. In 1964

---

57 Extracted from company directors' report for 1960.

58 In 1958 the company collaborated with certain concerns of U.K., for the manufacture of aluminium cables and again in 1962 and 1964, foreign collaborations with C.G. Gartoh of U.K., and Miyazaki Iron Works Ltd., of Japan for the manufacture of solidal underground cables, and wire drawing standing and allied machinery respectively were concluded.
the company was the sole manufacturer of extrusion dies, the largest producer of aluminium wire rods for ACSR (39.9% share), aluminium conductors - ACSR (28.4% share), ACSR and AA conductors (36.0% share) in the country.

HINDUSTAN ELECTRIC COMPANY, incorporated in 1942 and possessing a defunct subsidiary company namely Central Mines, is comparatively more diversified than the three companies studied earlier as it maintains manufacturing interests in the production of aluminium and copper conductors with their accessories, transformers and generators, wire of all capacities, switchgears, electric motors, air-blast circuit breakers, electrical welding sets, ARC melting, and induction melting furnaces. Besides these divergent-cum-convergent moves, as most of the products are based upon a common electrical engineering technology and are complementary in demand to one another, the company has also moved vertically to find an outlet for its products and an optimum utilisation of its technical personnel by undertaking contracts of electrical jobbings of various project sites, such as power stations, roads, canals, dams, communication and transport equipment workshops. In 1964 the company

59 In 1962 the company collaborated with U.S. Electrical Motors of U.S.A., for the manufacture of variable special motors and geared motors. Foreign collaboration for financial aid technical assistance was also concluded with Brown Boverie and Co., of Switzerland.
was the fifth largest producer of aluminium wire rods for ACSR with 8.3 per cent share of the total produce in the country.

KIRLOSKAR ELECTRIC COMPANY established in 1946 commenced the manufacture of electric motors in 1940. Soon the range of electric motors was so widened that the company felt proud of advertising "Kirloskar Electric Motors for Every Purpose".

In 1951 a new line of manufacturing was effected when the company started producing transformers, and further in 1963, the production of diesel and motor generator welding sets, control equipments, D.C. machines, automatic generating sets was commissioned.

To provide cast iron shells and other castings for the manufacture of its electrical equipment, the company also has taken up a successive function of installing its own foundries. Similarly, the processing of various raw materials such as electrolytic copper insulated with synthetic enamel, electrical steel, insulating material and ball bearings which go into the manufacture of electric motors.

60 In 1958 the company entered into technical collaboration with Lincoln Electric Company of U.K., for the manufacture of welding generators and equipments and later on in 1962, collaboration for the manufacture of electric motors, transformers and alternators was also secured with Bush Electric Engineering of U.K.
and other electrical equipment have also been taken up by the company. The products of the company are largely divergently-cum-convergently related and a few set of activities are also vertically integrated with the principal products. In 1964 the company was the largest manufacturer of electric motors (34.1 % share) and the fifth largest producer of transformers (9.8 % share) in the country.

ELECTRIC CONSTRUCTION AND EQUIPMENT COMPANY was incorporated in 1945 and in 1947 it commenced the manufacture of elevators such as passenger and goods lifts, hoists, and mechanical platforms. In 1954 and afterwards, the company embarked upon a vigorous expansion and diversification programme when it took up a wide range of activities such as power distribution transformers in 1954, gang operated switches, switchgears and switch boards in 1955 electric motors and iron clad switches in 1958, paper covered and

61 In order to have a diversified complex base, the company secured a large number of foreign collaborations and it collaborated in 1950, with Tokyo Shibaura Electric Company of Japan for the manufacture of electric motors and electric motor starters; in 1962 with Foreign Trade Company of German Democratic Republic for the manufacture of singlephase, polyphase electric meters; in 1963 with Atobiers De Construction of France and Tokyo Shibaura Electric Company of Japan for the manufacture of switchgears, and transformers and electric hoists respectively; in 1964 with Kralovopolska Strojirne of Czechoslovakia, Schindler and Co, of Switzerland Linex GmbH of German Democratic Republic, Establishments J. Villars of Switzerland, and VEB Electric Apparate Werke of German Democratic Republic for the manufacture of electric overhead travelling cranes; lift parts and components; L.T. circuit breakers, H.T. oil circuit breakers and transformers with aluminium winding; industrial lifting platform, and house service meters respectively.
cotton covered copper wires and copper strips in 1962, motor starters in 1963, house service meters in 1963, poly-phase meters and pump sets in 1964. In 1964, the company also set up its four contract divisions (a) Power and Distribution Station Equipment Supply and Erection; b) Railway O.H.E. Equipment Supply and Erection; c) Transmission Line Equipment Supply and Erection, and d) Industrial Plant Supply and Erection) to undertake electrification and structural jobbings such as erection of switching and booster stations. Most of the products of the company are divergently-cum-convergently related because of their common technological base and their complementary demand relations. In 1964 the company was the second largest producer of lifts (21.0% share) and the fourth largest manufacturer of winding wires, paper and cotton covered, (12.9% share) in the country.

ii) Light Electrical Industry - UNION CARBIDE INDIA, which got its present name in 1959 after having been converted in 1955 into a public limited company was incorporated as a private company in 1934 under the name of Ever-Ready Company India Ltd., which was further changed in 1941, to the National Carbon Company, India Ltd. It commenced in 1940 the production of a wide range of batteries and dry cells, such as flash light batteries, military communication batteries, railway signalling batteries, electronic equipment batteries, hearing aid batteries. In 1956, the company
latterly diversified into the manufacture of non-ferrous metals and alloys when it commissioned its zinc rolling mill. 62 Again in 1958, to have a full line supply, the company made a convergent move from its zinc strips plates and began to manufacture flashlight cases. In 1960 the company reached another milestone of diversification when it stepped into chemical industry for the manufacture of industrial organic chemicals such as acetic acid, butyl alcohol, butyl acetate and ethyl acetate which command specific preference from paints, lacquers, antibiotics, textiles, petroleum processing industries, plastic and plastic processing industries.

In 1964 the company which is characterised by a steady increase in product volume and progressing diversification of product range, touched new vistas of diversification when it charged its carbon products plant to steam for the manufacture of arc carbons (man made miracle of light) and midget electrodes, the former for the use of cinema industry and the latter for use in dry battery operations. 63

62 Which manufactures highly polished zinc for lithographic plates, zinc strips for addressograph plates, zinc coils and strips for battery manufacture, zinc photograver plates etc.

63 In 1961 and 1962, collaborations with the Union Carbide Corporation of U.S.A., for the manufacture of cinema are carbon, and polyethylene and other organic chemicals respectively were concluded.
With a base in chemicals, the company further expanded the diversity of its products when it commenced production of polythene resins and polythene film, a transparent and glossy product for packing purposes. Again in the same year, divergent moves from polythene into the manufacture of flexible and rigid pipes and tubes for water supply, drainage and sewage system were also taken up. In 1966 the naphtha based petro-chemical complex of the company was inaugurated with the objective of opening a stream of indispensible chemicals for serving a wide spectrum of vital industries and trebling the production of polythene. Most of the initial diversification moves of the company are convergently related but in order to have self-sufficiency in the matters of supply of basic raw materials, a set of successive moves have been adopted and these secondary moves have served as a spring board for series of divergent moves. In 1964 the company was the sole manufacturer of zinc strip plates, butyl acetate and butyl alcohol, the biggest producer of ethyl acetate (66.2% share) and dry cell batteries.

In addition to their use in building trade, irrigation projects, electrical industry and chemical plants, these pipes have been found to be excellent substitutes and in some applications, even superior materials, for the conventional GI and CI pipes. Some of the properties which made plastic pipes preferable to age old ones are their flexibility, lightness in weight, availability in longer lengths and corrosive resistance. Plastic pipes have offered longer service performance and their maintenance costs are almost negligible.
(82.0 % share), the second largest manufacturer of polythene film (25.2 % share), polythene moulding powder (37.6 % share) and flashlight cases (25.9 % share) and the fourth largest manufacturer of acetic acid (12.3 % share) in the country.

**PHILLIPS INDIA**, whose 69 % of the equity capital is held by NV Phillips Gloeilampfabrieken of Holland, was incorporated in 1930 as a private limited company under the name of Phillips Electrical Company (India) Ltd., in 1956 it adopted its present name, and a year later it became a public limited company. Though the company was formed primarily to sell a great variety of articles such as electric lamps, radio sets and other electrical products manufactured by NV Phillips Gloeilampenfabrieken and their associated companies in the Netherlands, in 1938 it commenced the manufacture of electric lamps. In 1947 the company set up a plant to assemble radio sets, and in 1957, another integrated plant for the manufacture of radio sets and their components was installed. Later on, in order to maintain a regular flow of production, particularly when the company experienced frequent cuts in its import quotas and inordinate delays in the issue of import licences, the range of radio components was expanded. In 1958, the company went into the fabrication of tools required for the manufacture of radio components and in 1960, a liquidating lamp manufacturing company, Oslar Electric Lamp Mfg. Co. Ltd., was purchased.
With the acquisition of the works of this company, the production of finished lamps was intensified and various components thereof, such as tungsten and molybdenum wire, tungsten coils, glass shells, glass tubings for fluorescent lamps and fluorescent powder began to be produced. In addition the company also embarked upon further vigorous plans of diversification by installing plants to manufacture a variety of electronic instruments, X-ray, sterilisers, electro-medical, surgical and dental equipment, scientific and quality control equipment, cinema projection and sound equipment, public address equipment like amplifiers and tape recorders, hearing aids, closed circuit television and telecommunication, i.e., wireless communication, apparatus, water heaters, light fittings and accessories, and certain intermediate products and raw materials thereof. The product structure of the company reveals that most of the diversification moves are divergent in character as these emanate from a common electrical precision engineering technology. But since some of the products are either marketed jointly to organised consumers like offices, 

---

65 In 1957 foreign collaboration with NV Gloeilampfenfabrieken of Netherlands were secured to obtain the benefit of their research facilities and vast technical know how in the field of production of radio apparatus, radio components, light fittings and accessories, public address equipments and glow switches for starters and fluorescent lamps. In 1961 further collaborations with this company were concluded for the manufacture of 35 mm, cinema projection and auxiliary equipments, burners and gaseous discharge lamps, and X-ray Equipments. Again in 1962 collaboration was finalised for the manufacture of photoflash lamps, electronic measuring instruments, tungsten wire and molybdenum coils and transreceivers (wireless communication apparatus).
laboratories, educational institutions, hospitals and factories to meet their needs for 'light and music', the products are also convergently related. In order to attain self sufficiency in the supply of raw materials and semi-fabricated goods, vertical integrated diversification moves have also been undertaken by the company. In 1964 the company held the top position in the manufacture of radio-receivers (32.4% share), shadowless lamps (95.0% share) and electrical instruments (56.3% share), whereas it was the second largest producer of sterilizers (21.2% share) and the fifth largest producer of surgical instruments (0.3% share) in the country.

BAJAJ ELECTRICALS, which prior to 1960 was known as Radio Lamp Works Ltd., was founded in 1938. In 1940 it commenced the manufacture of electric lamps. After the attainment of independence in 1947, when the country presaged a tremendous upsurge in industrialization and increasing demand for electrification, the company, after relegating the manufacture of electric lamps to its subsidiary Hind Lamps Ltd., expanded and diversified its activities in 1952 by taking up the production of transformers, precision instruments both industrial and scientific.66

66 A collaboration arrangement with Westinghouse Electric International Company of U.S.A., for the manufacture of electrical measuring instruments was concluded in 1964 and in the same year negotiations for the manufacture of special types of transformers were also concluded with two British companies.
Again, in 1954 and afterwards, a series of diversification moves were adopted when the manufacture of hardware electrical fittings and fluorescent tubes, lamp shades, fans, heating appliances, electrical accessories, Alan fittings, and cables was begun in 1954, 1956, 1957, 1958, 1960, 1961 and 1963 respectively. In 1963 the company acquired a subsidiary, Matchwal Electrical (India) Ltd., which has manufacturing interests in electric fans and fractional horse power motors. The product composition of the company reveals that most of the products are convergently related because of common marketing channels, yet these are also divergently related being based upon a common production technology. In 1964 the company was the second largest producer of electrical measuring instrument (18.4 % share) in the country; whereas its subsidiary, Hind Lamps Ltd., was the largest manufacturer of miniature lamps (37.5 % share) and the second largest producer of electric lamps G.L.S. (24.1 % share), fluorescent lamps (31.4 % share) and glass shells (37.0 % share). The second subsidiary, Matchwell Electricals (India) Ltd., was the fourth largest producer of electric fans with 8.2 per cent share in the total produce of the country.

11. Transport Equipment Industry

Nine companies have been selected from this industry of which six companies are in the automobile industry, one in railway rolling stock manufacturing, and the remaining
two are in the bicycle industry. The activity composition of the companies is discussed below:

1) Automobile Industry - Of the six companies from this industry, ASHOK LEYLAND which was incorporated in 1948 is comparatively less diversified as it manufactures 'Comet' and 'Leyland' chassis for buses, lorries and trucks. After having commenced the manufacture of chassis in 1955, the company has also begun to manufacture various components for its vehicles so as to have complete 'indienization' of the vehicles by replacing all the imported components with indigenous parts. In 1959 the company had a divergent diversification move into the manufacture of industrial diesel engines and later on in 1961, the range of this activity was also widened. Since there is a big road haulage need in India (20 million tons of goods and 2000 million passengers every year), the company, in the course of time, has increased its workshop capacities and at present is contemplating the manufacture of heavy duty chassis for rugged surface — the Beaver and Hippo range, and the double-decker passenger chassis. In 1964 the company was the fourth manufacturer of commercial vehicles with 11.1% share in the total production of the country.

67 In 1957 the company collaborated with Leyland Motors Ltd., of U.K., for the assembly and progressive manufacture of Leyland vehicles.
MAHINDRA & MAHINDRA, established in 1945, owns five subsidiary companies, Mahindra Engineering, India and Eastern Engineer, Turner, Hoare & Co., Mahindra Owen, and Mahindra Sintered Products, the first four having been floated in 1958 and the last one in 1963. After having set up its casting and fabrication capacities it commenced under a licence agreement with Willys Motors of U.S.A. the manufacture and assembly of jeep vehicles in 1948. In order to meet the diversified demand for transportation, the company has widened the range of its jeep vehicles by manufacturing utility vans, pick-up trucks, station wagons, personnel and carriers. Further, to achieve self-sufficiency in the supply of various parts and components of its vehicles, the company, since its inception, has been moving vertically to manufacture various components, and at present it produces over

eighty per cent of the contents of its vehiculars. The activities of the subsidiaries are sale, service and manufacture of industrial process control instruments (Mahindra Engineering Company), publication of engineering and technical journals (India and Eastern Engineering Company), sale and manufacture of automobile clutches (Turner, Hoare and Company), sale and manufacture of trailers, axles, slotted angles and other vehicular components, sale and manufacture of oil retaining sintered bronze bearings, thrust washers and self lubricatings (Mahindra Sinstered Products). In 1964 the company was the sole manufacturer of jeeps and its subsidiary namely Mahindra Owen was the largest producer of trailers with 86.6% share in the total production of the country.

THE PREMIER AUTOMOBILES was incorporated in 1944 and began in 1947 the manufacture and assembly of 'Fiat' cars and 'Dodge' trucks (both diesel and petrol units) with varying capacities of trucks from one ton to five tons. Later on while installing huge capacities for casting, forging and fabrication, the company began the manufacture of vehicular components. The company has divergently diversified into the production of locomotive springs for railways and again

69 For the manufacture of Meadows diesel engines (vehicular) and S.G. Iron Casting the company collaborated in 1962 and 1965 with Henry Meadows Ltd., of U.K., and International Nickel Company of U.S.A., respectively.
in 1963 it opened a new chapter in its history by manufacturing room air conditioners for export purposes. The company owns three subsidiaries, Premier Auto Electric, India Stearing Gears Ltd., and Pal Hire Purchase Ltd., which were floated in 1950, 1959 and 1962 respectively. Pal Hire Purchase is engaged in financing the purchase of the company products; whereas the other two companies have trading as their main activity. Most of the products of the company are vertically integrated; whereas a few are divergently related. The manufacture of room air conditioners is a lateral diversification move. In 1964 the company was the second largest producer of commercial vehicles (26.1% share) and diesel engines, vehicular (11.5% share); the third largest manufacturer of cars (16.7% share) and locomotives springs (18.9% share) and the fourth largest producer of auto leaf springs (12.9% share) in the country.

HINDUSTAN MOTORS, which was founded in 1942, is comparatively more diversified than the three companies studied earlier. This company by setting up its foundries and fabrication workshops commenced, to begin with, the assembly and manufacture of motor cars (Ambassador and Hindustan) and trucks (Bedford). Later on with a purpose of achieving self-sufficiency in the supply of components and parts, the company integrated the manufacture of internal combustion engines and engine valves. In the course of time, the company established a heavy engineering base so as to
diversify its interests towards the manufacture of earth moving machinery such as excavators, scrapers, bulldozers and dampers. Again in 1963, new dimensions of manufacturing activities were added when the production of overhead travelling cranes, wharf cranes, steel plant cranes and Goliath cranes was taken up. The company set up a subsidiary, Hindustan Motor Corporation Ltd., for financing the purchase of its products on a hire purchase basis. The initial activities of the company were successive in relations; whereas the subsequent activities are divergently related. In 1964 the company was the largest manufacturer of cars (66.1% share) and scrapers (76.5% share), the second largest producer of excavators (17.4% share), the third largest producer of commercial vehicles (14.8% share) and pistons (6.8% share), the fourth largest producer of engine valves (4.9% share) and the fifth largest manufacturer of cranes (4.4% share) in the country.

TATA ENGINEERING AND LOCOMOTIVE COMPANY, incorporated in 1945 and changed its named in 1961 from Tata Locomotive and Engineering Company to the present one is more a heavy

70 In 1960, the company entered into collaboration with Athey Products of U.S.A., for the manufacture of Athey dumpers and in 1961, the collaboration also was finalised with Caterwiller Tractor of U.S.A., for the production of bulldozer and tractor spare parts. Again in 1964, the company secured foreign collaboration with Parket Hanninf Corporation of U.S.A., for manufacturing air powered and hydraulic presses, and hydraulic power units.
general engineering and automobile company than a locomotive manufacturer. The company, while vertically integrating the manufacture of complicated castings of steel, iron and alloys by installing large versatile foundaries and also setting up heavy forging capacities commenced the manufacture of commercial motor vehicles in 1955 such as 'Tata Mercedes Benz' and bus chassis in collaboration with Daimler Benz A.G., Stuttgart. Since the demand for trucks continued unabated, the company further expanded its workshop capacities to increase the output of commercial vehicles to catch up with the demand and also intensified the program of manufacturing various components and parts of its vehicles.

In 1952 the manufacture of steam locomotives was also undertaken and by 1963 it had 98% indigenous contents of the locomotives. In 1961, the company divergently diversified

71 Besides collaborating with Daimler Benz, the company also collaborated in 1960 with Haraischfger Corporation of U.S.A., and Fichtal and Sachs of West Germany for the manufacture of P & H excavators and hydraulic shock absorbers respectively. Again in 1962, 1964 and 1965 further collaborations with Garrington Ltd., of U.K., for the manufacture of automobile forgins, with Raymond E. Thompson of U.K., for the manufacture of fogs, fixtures, dies, gauges, press tools and inspection equipments, and with Full Mold Process of U.S.A., for the manufacture of metal casting respectively were secured.

72 By 1963, 'the indigenous content of Tata Mercedes Benz Vehicles was as high as 84% and the company was 'confident of attaining target of 90% indigenous content from December, 1964 without in any way sacrificing the very high quality it had already achieved.'
into the manufacture of paper and pulp making machinery, and in 1962 the magnitude of diversification was further increased when the production of power and hand excavators and industrial diesel shunters was taken up because:

"The manufacture of these products will help ... to utilise fully available capacity in the General Division and ... to yield a fair margin of profit." 73

"The prices paid for locomotives, however, continue to be unremunerative. As order for steam locomotives are on reducing scale, a part of the capacity that is released is being effectively utilised for the production of other important products such as excavators and industrial shunters." 74

"The company has agreed to supply a further 200 locomotives to meet the requirements of Railway Board during the Fourth Plan Period. The acceptance of this order was based on the clear understanding that on completion of these supplies the company would cease to produce steam locomotive and direct its manufacturing capacity to other engineering products which could make a greater contribution to profits of the company as well as to the economy of the nation." 75

Though the chairman of the company observed at the general meeting of the company held on 5th July, 1963 that "the execution of the projects undertaken recently and implementation of our expansion programmes have fully

73 Extracted from company chairman's statement at the general annual meetings of the company for 1960.
74 Ibid., 1962.
75 Ibid., 1963.
extended our financial and managerial resources, therefore, consider as inadvisable at this stage any new venture which might detract from the major task to which we are fully committed;"; yet the exception was made to commence the manufacture of press tools and complex dies because these are in intense demand with mass production engineering industries in the country and are imported at a very heavy expenditure of scarce foreign exchange. The foundries of the company besides meeting their own requirements of high grade alloy iron and steel castings also meet the requirements of the companies and workshops engaged in the manufacture of cement mill machinery, locomotives and passenger coaches. A large number of activities of the company are divergently related because of common use of casting, forging and fabrication facilities, but a few are also of successive functions in nature. In 1964 the company was the sole manufacturer of locomotives, the largest producer of heavy earth moving equipment like excavators (82.6 % share), commercial vehicles (42.9 % share), chemical and pharmaceutical machinery (26.6 % share), paper mill machinery (25.4 % share) and auto leaf springs (20.1 % share) and the third largest producer of steel castings (11.2 % share) in the country.

SIMPSON & COMPANY, which was established in 1840 and was registered a limited liability company in 1925, has been in the business of body building industry (chassis)
since its inception. In 1940 on the one hand the war requirements for engineering products were at their highest pitch, and on the other, the country experienced a complete blockade in imports and low indigenous production capacity in the country. The company in order to avail itself of the opportunity of rapid growth and higher profits, vigorously diversified by manufacturing a very wide range of light engineering products such as trailers, storage tanks, mechanical jacks, cranes, wheelbarrows, water tanks, hand carts, platform trolleys, sack trucks, luggage barrows, air blowers, forges, industrial stools, adjustable vehicle steel props, creepers, battery trollys, engine assembly and repair stands, hygienic dust bins and bitumen drum mixers. In 1953, the company chartered itself on another wave of production diversification when it stepped into the manufacture of trailers and diesel engines such as P.6 vehicles type engines, P.4, P.3 and P.6 industrial engines, and P.3 T.A. tractor type engines. Though the company itself is a subsidiary of Amalgmations Private Ltd., it owns 13 subsidiaries and their business interests are enumerated below:

<table>
<thead>
<tr>
<th>Name of subsidiary</th>
<th>Nature of business activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Addison &amp; Co. Ltd.</td>
<td>Manufacture of engineering goods particularly tools.</td>
</tr>
<tr>
<td>2. Addison Paints and</td>
<td>Manufacture of paints and varnishes.</td>
</tr>
<tr>
<td>Chemicals Ltd.</td>
<td></td>
</tr>
<tr>
<td>3. Amco Batteries Ltd.</td>
<td>Manufacture of storage batteries.</td>
</tr>
</tbody>
</table>

continued....
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>India Pistons Ltd.</td>
<td>Manufacture of pistons, piston rings, cylinder liners etc.</td>
</tr>
<tr>
<td>6.</td>
<td>Reichhold Chemicals India Ltd.</td>
<td>Manufacture of synthetic resins.</td>
</tr>
<tr>
<td>7.</td>
<td>Shardlow India Ltd.</td>
<td>Steel forgings and stampings for automobiles and ancillary industries.</td>
</tr>
<tr>
<td>9.</td>
<td>Shree Ram Vilas Service Ltd.</td>
<td>Clearing, forwarding and warehousing services.</td>
</tr>
<tr>
<td>10.</td>
<td>Tractors and Farm Equipments Ltd.</td>
<td>Manufacture of tractors.</td>
</tr>
<tr>
<td>11.</td>
<td>Wheel and Rim Co. of India Ltd.</td>
<td>Manufacture of bicycle rims.</td>
</tr>
</tbody>
</table>

One of these subsidiaries T. Stanes and Co., has two subsidiaries, Stanes Motors Ltd., and United Coffee Supply Ltd., which are in the trading and manufacturing of coffee and tea business respectively. Stanes Motors Ltd., has again two subsidiaries, Courtesy Transport Ltd., and the Stanes Tyres and Rubber Products Ltd., which are operating transport services and manufacturing rubber tyres respectively. The United Coffee Supply Company has also one subsidiary,
The Indian Cashewnuts and Plantations Ltd., which has coffee plantations and cashewnut fields to look after. Though the products of the company are divergently-cum-convergently related because of common workshop capacities and marketing expertise; yet when the products of the subsidiaries and sub-subsidiaries are viewed, the company becomes a highly diversified complex with a spectrum of lateral, convergent, divergent and successive functions extending over a large number of industrial fields. In 1964 the company was the largest manufacturer of diesel engines — vehiculars (88.5% share) in the country, the second largest manufacturer of trailers (5.2% share) and the fourth largest producer of diesel engines — stationery (5.4% share). Similarly, some of the subsidiaries of the company were also the largest producers of certain products in the country. The details of these products are given below:

76 In 1960 the company collaborated with Laystal Engg., Co., Ltd., of U.K., for the manufacture of liners for automobiles and again in 1961, it collaborated with Reicholds Chemicals of U.S.A., for the manufacture of synthetic resins. Similarly, India Pistons Ltd. — a subsidiary concluded in 1962 and 1963, foreign collaborations with Repco Ltd., of Australia for the manufacture of fly wheel ring gears and with Associated Engineering Ltd., of U.K., for the manufacture of pistons, piston rings and cylinder liners. The Amalgamations (P) Ltd., — the holding company, also had collaborations in 1960, 1961 and 1962 with Ambrose Shardlow of U.K., for the manufacture of steel forgings, tractors and diamond tools respectively.
<table>
<thead>
<tr>
<th>Name of the Subsidiary</th>
<th>Products</th>
<th>Percentage</th>
<th>Highest position held</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Addison &amp; Co. Ltd.</td>
<td>i) Gear Holes</td>
<td>100.0</td>
<td>First</td>
</tr>
<tr>
<td></td>
<td>ii) Butt welded tools</td>
<td>9.5</td>
<td>Second</td>
</tr>
<tr>
<td></td>
<td>iii) Twist tools</td>
<td>36.8</td>
<td>do</td>
</tr>
<tr>
<td></td>
<td>iv) Reamers</td>
<td>39.9</td>
<td>do</td>
</tr>
<tr>
<td></td>
<td>v) Lathe Tools</td>
<td>6.6</td>
<td>Fourth</td>
</tr>
<tr>
<td></td>
<td>vi) Tungsten Carbide</td>
<td>6.4</td>
<td>do</td>
</tr>
<tr>
<td></td>
<td>vii) Threading tools</td>
<td>6.9</td>
<td>Fifth</td>
</tr>
<tr>
<td>2. Addison Paints &amp; Chemicals Ltd.</td>
<td>i) N.C. Lacquers (ancillaries)</td>
<td>30.5</td>
<td>First</td>
</tr>
<tr>
<td></td>
<td>ii) N.C.Lacquers (Pigment)</td>
<td>37.0</td>
<td>Second</td>
</tr>
<tr>
<td></td>
<td>iii) Metal cleaner</td>
<td>6.0</td>
<td>do</td>
</tr>
<tr>
<td></td>
<td>iv) Alkyd Resins</td>
<td>12.3</td>
<td>Third</td>
</tr>
<tr>
<td></td>
<td>v) N.C. Lacquers(clear)</td>
<td>6.0</td>
<td>do</td>
</tr>
<tr>
<td></td>
<td>vi) Brake fluid</td>
<td>7.6</td>
<td>Fifth</td>
</tr>
<tr>
<td>3. India Pistons Ltd.</td>
<td>i) Piston pins</td>
<td>100.0</td>
<td>First</td>
</tr>
<tr>
<td></td>
<td>ii) Piston rings</td>
<td>56.6</td>
<td>do</td>
</tr>
<tr>
<td></td>
<td>iii) Cylinder liners</td>
<td>94.3</td>
<td>do</td>
</tr>
<tr>
<td>4. Tractors &amp; Farm Equipment Ltd.</td>
<td>i) Tractors</td>
<td>54.1</td>
<td>First</td>
</tr>
<tr>
<td></td>
<td>ii) Harrows</td>
<td>16.8</td>
<td>Second</td>
</tr>
<tr>
<td>5. Wheel and Rim Ltd.</td>
<td>i) Bicycle rims</td>
<td>24.7</td>
<td>Second</td>
</tr>
<tr>
<td>6. T.Stanes &amp; Co.</td>
<td>i) Mixed fertilizers</td>
<td>15.0</td>
<td>Third</td>
</tr>
</tbody>
</table>
ii) Railway Rolling Stock Manufacture Industry -

Indian Standard Wagon Company which was incorporated in 1918, has manufacturing interests in railway carriages and wagons. Later, the company also commenced the manufacture of coil springs and components of locomotives, but subsequently it diversified its activities by stepping into the automobile industry by manufacturing chassis of commercial vehicles. Recently, the company has widened the range of its existing activities by taking up the manufacture of a variety of industrial diesel engines. In order to maintain the span of its diversified activities, the company has its own casting capacity. Most of the activities of the company are divergently related emanating from a common technological base; yet a few are also successive in nature. In 1964 the company was the largest manufacture of railway coil springs (61.2 % share) and the locomotive springs (59.5 % share).

iii) Bicycle Industry - Of the two companies selected from this industry, Sen-Raleigh Industries, which was incorporated in 1949 and prior to 1960 was known as Sen-Raleigh Ltd, is a comparatively less diversified unit than the other company, Tube Investment of India. The major interests of Sen-Raleigh Industries are in the manufacture of bicycles and cycle accessories and parts including saddles. In 1960 the company felt the urge for diversification.77

---

77"The bicycle industry is now a developed area and industrial licenses for expansion in this industry are
because by that time the bicycle industry no longer had an easy seller market. The era of closer competition in the industry called for either massive improvement in business methods and a genuine effort at raising the level of productivity or a diversification into some promising fields. So in 1962, the company adopted a convergent diversification move into the manufacture of dynamo lamps and a lateral move into the production of house service meters. For this lateral move the company collaborated in 1961 with the Associated Electrical Industries of U.K. In 1964 the company was the largest manufacturer of spokes (13.3% share), the second largest producer of complete bicycles (21.4% share), chains (20.7% share), hubs (32.6% share) and bicycle saddles (34.0% share), and the third largest producer of free wheels (13.5% share) in the country.

TUBE INVESTMENTS OF INDIA, formerly known as T.I. Cycles of India and incorporated in 1949, changed with the merger of Tube Products of India with it in 1959 to its present name, had initial interests in the manufacture of cycles, cycle components and accessories including saddles for cycles. With the merger of Tube Products of India, getting restricted. Your Directors are sincerely considering embarking on manufacturing of other light engineering products where industrial licences are more readily available and where the company's technical knowledge, plant, capacities and experience could be used more effectively."

Extracted from company's annual report, 1960.
the company began to develop manufacturing interests in tabular products, conduit pipes, cold-rolled steel stripes and steel tubes of various diameters, thickness, qualities and shares suitable not only for cycle manufacture but also for various other industrial uses. In 1960 and 1961 the company established two subsidiaries, T.I, Diamond Chah Ltd., and T.I. Miller Ltd., which manufacture chains (cycle and industrial) and dynamo lighting sets (for autocycles, scooters, cars and bicycles) respectively. Most of the activities of the company are successive in nature, yet a few are also convergently and divergently related. In 1964 the company along with its subsidiaries was the largest producer of bicycle hubs (34.0 % share), B.B. axles (33.6 % share), cycle chains (28.5 % share) and bicycle dynamos (55.2 % share), the second largest producer of bicycle free wheels (26.6 % share), the third largest producer of complete bicycles (21.4 % share), and spokes (10.9 % share) and the fourth largest manufacturer of saddles (8.1 % share) in the country.

---

78 Collaborations with Diamond Chain Company of U.S.A., H. Miller and Co., of U.K., and Tube Investments Ltd., of U.K., were secured by the company for chains, cycle accessories and steel tubings respectively.