SOME ASPECTS OF THE DEVELOPMENT AND UTILIZATION OF RESOURCES IN A COLONIAL SETTING - A CASE STUDY OF THE MINERAL BELT OF BIHAR, BENGAL, CENTRAL PROVINCES AND ORISSA (1857-1947)

A Dissertation submitted in patial fulfilment of the Degree of

MASTER OF PHILOSOPHY

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Certified that the dissertation entitled "Some Aspects of the Development and Utilisation of Resources in a Colonial Setting - A Case Study of the Mineral Belt of Bihar, Bengal, Central Provinces and Orissa (1857 - 1947)" submitted by Shubhra Dwivedy in partial fulfilment of the degree of Master of Philosophy is a bonafide work to the best of my knowledge and may be placed before the examiners for their consideration.

Dated : 30 August 1979

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C O N T E N T S

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List of Tables

List of Figures

Chapter 1

INTRODUCTION

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1.1 THE PROBLEM STATED

The mineral resource regions had emerged in India during the latter half of the nineteenth and the early twentieth century, i.e., during the final phase of the colonial rule in India. The pattern and characteristics of the development and utilisation of mineral resources in the country hence cannot be understood outside the context of the British capitalist expansion, that changed the economy in ways that were absolutely incompatible with the natural development of the country. The needs of capitalist Britain determined the nature of these changes. The process of resource development and utilisation in India was in direct response to the demands of the metropolitan economy. It, therefore, followed a pattern which was very different from the pattern observed in developed countries where in the initial stage, natural resources contributed directly towards meeting requirements for food, fuel and crude metals. As population increased and markets widened, natural resources provided a base for a more complex economic organisation with increasing specialisation of labour and larger accumulations of capital. These in turn made possible the establishment of manufacturing industries, first on a small (more or less handicraft scale), later on a light machine basis and finally on a heavy machine and large

scale capital basis. Ultimately, the industrial pattern becomes highly diversified. In each of these various stages, the availability of natural resources and derived raw materials exerted decisive influence.[1]

However, in the Mineral Belt of India, i.e., the region under investigation, these successive stages failed to appear and the whole process of the development of mineral resources seems to have frozen at the very first stage where natural resources contribute directly only towards meeting local requirements of a rudimentary nature. A change in the situation, however, did come about during the late nineteenth century when Britain's proliferating industries needed raw materials and its domestic natural resources proved to be insufficient. The imperial power looked towards its colonies[2] for the supplies, its main focus being on the vast resources of India. As a consequence the Mineral Belt acquired the essential characteristics of a mining enclave, i.e., closed system having no interaction with its surroundings.

It is in this context of an enclave that the mineral region is proposed to be studied and analysed in this study.

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1. J.L. Fisher, "The Role of Natural Resources" in H.F. Williamson and J.A. Buttrick (ed.), Economic Development : Principals and Patterns, 1964, pp. 29-30.

2. Originally, the term colony was used to designate a territory occupied by emigrants from a mother country. By the 19th century, a recurrent characteristic of colonies attracted attention : the dominance exercised by immigrants over native populations. By the middle of 19th century colony was understood to mean, the possession of a territory in which European emigrants dominated indigenous peoples.

The mining areas provided a link in the economic relationship between the metropolis and the hinterland. The mining areas opened up by the foreign entrepreneur were superimposed on the regional structure which consisted primarily of vast areas of subsistence agriculture. This non-traditional sector of primary production was one of the most profitable avenues for investment by the British. The exploitation of mineral resources in the region was geared to the development of an alien economy, the effects of which were seen in various related fields. This study is an attempt to analyse some of these salient changes that were brought in the economy and the regional structure of the Mineral Belt. It also aims at finding out those specific factors which were responsible for bringing about these changes.

1.2 RECEIVED THEORIES OF RESOURCE DEVELOPMENT IN A COLONIAL SITUATION

Though a large number of studies have been made on mineral resource regions in India, they are limited in outlook and focus on the occurence, production, methods of mining and labour characteristics in specific mining areas. There is a dearth of studies which try to establish the relationship of the development of natural resources and its influence on the economy of the resource region. Such studies are almost non-existent for colonial India. However, a large literature has accumulated which deals with the exploitation and development of resource regions in the other developing countries, especially Latin America.

These studies subscribe to two schools of thought. Most of the studies reviewed here are based on the theory of dependent capitalism, i.e., they deal with the changes that were brought about in the economic structure of a region as a result of their relationship with the world capitalist system. The generally accepted definition of dependency given by T. Dos Santos runs as follows : "By dependence we mean a situation in which the economy of certain countries is conditioned by the development and expansion of another economy to which the former is subjected. The relation of interdependence between two or more economies, and between these and world trade, assumes the form of dependence when some countries (the dominant ones) can expand and can be self-sustaining, while other countries (the dependent ones) can do this only as a reflection of that expansion, which can have either a positive or a negative effect on their immediate development."[3] In summary, it means that dependence is the direct outcome of foreign rule.

The second school of thought which has forwarded the diffusion model is just the contrary of the dependency model. The diffusion model views underdevelopment as a condition through which all nations have passed at some time or the other. Due to their specific circumstances some countries

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3. R.H. Chilcote and J.C. Edelstein (ed.), Latin America : The Struggle with Dependency and Beyond, 1974, p. 26.

managed to develop, others did not. It states that change requires the introduction of outside capital because the country is poor. Modern technology can be introduced in the latter by foreign investment. Within the diffusion model, underdevelopment is depicted in political instability, inequality, illiteracy, lack of social mobility and an economy characterised by the dominance of one or two minerals or agricultural products and by a low level of technology and productivity. A state or region which manifests all or most of these characteristics is regarded as underdeveloped areas.[4]

1.3 STUDIES PERTAINING TO LATIN AMERICA AND OTHER UNDERDEVELOPED COUNTRIES

1.3.1 Studies Based on the Dependency Model

Stanley and Stein, probing for those features of Latin America's past which may provide an understanding of the process of change in the area, examine the process of economic change in a colonial area.[5] Among other regions they focus on mining enclaves too. During the first two hundred years of colonial rule, the Spaniards had developed a colonial mining sector to maintain the metropolitan economy and Spain's international position in western Europe. As the leading sector of the colonial economy, mining paid for the adminis-

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4. Ibid., p. 4.

5. J. Stanley and B.H. Stein, The Colonial Heritage of Latin America : Essays on Economic Dependence in Perspective, 1970.

trative costs of the Empire. The export orientation of the Latin American economy was a product of Spanish colonialism from 1500-1700 and of the mining boom on the Mexican plateau. The Spaniards opened up mines and there they created sub-sectors of the mining nuclei, large estates devoted to agriculture and ranching.

However, there was a recession in mining due to a large scale migration at the turn of the sixteenth century. There was a shift from mining to agriculture and ownership of land. This landed estate too was oriented towards export - the second element of the colonial heritage of Latin America. This bloomed only in the eighteenth century in the form of plantations, which was created to produce staples for European consumption. It was the product of European technology, applied by European technicians for European entrepreneurs.[6]

Theotonio Dos Santos offers historical distinctions among colonial dependence which dominated the economic relations of the Europeans and their colonies; financial industrial dependence which consolidated itself in the rise of imperialism at the end of the nineteenth century when central systems expanded their investments abroad in the production of raw materials and agricultural commodities.[7]

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6. Ibid., p. 41.

7. T. Dos Santos, "The Structure of Dependence", in The American Economic Review, LX (May 1970), pp. 231-36.

Dos Santos outlines the fundamental role of sugar production and gold mines in Brazil in financing the industrial revolution. At the end of the nineteenth century Brazil had a monopoly of the world's coffee supply and later for a short period it was rubber. By the middle of the twentieth century Brazil had developed an industrial base with intensive foreign participation (more than any other Latin American country). Yet, inspite of all these opportunities, its enormous resources and size, in five hundred years Brazil has been unable to break the barrier of dependency and underdevelopment.

Another useful analysis is that of Sussane (Bodenheiner) Jonas done on Guatemala.[8] She examines the specific characteristics of the international system (prevailing forms of capitalism, the needs of dominant nations, concentration of capital, and type of international trade) as well as the ties of the dependent nation to the international system. Foreign conquest in Guatemala took new and changing forms of the economic base, land ownership and accumulation of wealth. The seeds of contemporary Guatemalan underdevelopment and dependency was found in the colonial heritage which lasted for three hundred years (1524-1821). The first act which defined the nature of colonial relations was the Spaniards' appropriation of the native's land and of local force to work on it. For some time after the conquest, cacao was used as a unit of exchange (including

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8. S. Jonas, "Guatemala : Land of External Struggle", in Chilcote and Edelstein (ed.), op. cit., pp. 93-219.

Indian tribute to the Crown) and a principal export. Later there were a number of plantations (sugar, indigo, cotton) all controlled by the Spanish colonists.

J.C. Corradi gives an account of Argentina's dependent economy.[9] For decades the Argentines believed they were a chosen people. But British imperialism had its eyes on the pampas - those open spaces they must have seen from London to supply it with foodstuffs. And then followed Argentina's path towards dependency. As the economy - under the impact of capitalism - came to rest on foreign and colonial commerce, raw materials were exported and returned as manufactured goods for domestic consumption and re-export to the colonies, while colonial gold and silver flowed to England to compensate for the deficit in the balance of trade. The export orientation of Latin American economies was shaped during this period.

J.D. Cockcroft gives an account of the processes leading to dependency in Mexico and holds that Mexico's condition of limited development, prolonged underdevelopment, and economic dependence upon a foreign, capitalist metropolis, derives from its contact with Europe.[10] Mexico's ports connected the trade routes of Asia and Europe. Mexican agriculture was integrated into the import-export flow of goods from Europe. Thus, most

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9. J.C. Corradi, "Argentia" in Chilcote and Edelstein, op. cit., 1971, pp. 309-397.

10. J.D. Cockcroft, "Mexico" in Chilcote and Edelstein, 1972 (ed.), op. cit., pp. 225-299.

of Mexico's economy came to revolve around trade with Europe, especially in the mining sector (with the emergence of world famous cities). These areas boomed in the sixteenth century, declined in the seventeenth and rose again in the eighteenth. Today they are representative of Mexico's most underdeveloped regions. These areas became systematically underdeveloped through their colonisation and subjugation, their maximal integration into the world-wide capitalist market economy and their subsequent abandonment once the capitalists had exhausted their natural wealth. In this way, mercantilism and nascent capitalism led to the underdevelopment of Mexico.

Marcello J. Cavarozzi and James F. Petras examine Chilean dependence which was established through foreign penetration of key mining export sectors.[11] Dependence was a late nineteenth century phenomenon linked to the world expansion of British imperialism. With the loss of ownership of the nitrate (and later copper) mines, Chile's dependence on external forces was confirmed. Chile's recent economic and political history provides an example of how a relationship dependent upon foreign economic and political interests can negatively effect and hence deform a country's socio-economic development. From the last third of the nineteenth century to 1930, Chile was an export oriented economy, reproducing the pattern that was predominant in Latin America. A foreign owned economic enclave - mining - constituted the most dynamic sector.

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11. M.J. Cavarozzi and J.F. Petras, "Chile" in Chilcote and Edelstein (ed.), 1973, on. cit., pp. 495-574.

As early as 1881 mining exports amounted to 67 per cent of the total while agriculture accounted for less than 15 per cent. Thus an enclave - both geographically isolated from the most populated regions and owned by foreigners - replaced agriculture as Chile's most dynamic economic structure.

Cavarozzi and Petras further state that mining, which generated foreign exchange capable of providing capital to make Chile a modern industrial society, were owned by capitalists who proceeded to skin off the profits. The equitable distribution of benefits supposed to accrue from this "international division of labour" to both the suppliers of raw materials and the industrial metropolis were not forthcoming. In the Chilean case, the dependant position of providers of raw materials within the world system was thus aggravated by the country's reliance on one single export commodity. This dependence in turn distorted Chile's internal development.

R.R. Brand discusses the impact of the early years of the cocoa trade on the economy of Accra.[12] Brand mentions the development processes which transformed the economy of the Gold Coast, from one based primarily on subsistence agriculture to one dominated by export agriculture and profitable mining. Accra was intended in the colonial scheme of governance to serve as a seat of Gold Coast administration and as

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12. R.R. Brand, "The Role of Cocoa in the Growth and Spatial Organisation of Accra Prior to 1921", African Studies Review, Vol. XV, No. 2, Sept. 1972, pp. 271-282.

a principal entrepot facilitating the exploitation of agricultural products and domestic markets.

According to Brand the articulation of the overall philosophy of colonial administration had far reaching consequences for the emergent commercial economy of Accra in terms of the overall nature of its economic base and the size of its enterprises. Virtually all the large establishments in Accra were owned and managed by Europeans. The growth of the entrepot function to the virtual exclusion of secondary industry produced an economic base quite unlike that of many western cities during similar phases of rapid metropolitan growth in the nineteenth century.

Richard Wolff bases his study on the general hypothesis that "... the basic economic policies of British imperial authorities in Kenya after 1895 constituted a consistent application and extension of the accumulated British experience with new imperialism".[13] New imperialism refers to the British colonialist undertakings after 1870 and do not include the 'older' regions (Canada, Australia, South Africa etc.). The initial aim of Wolff's work is to demonstrate first, that the late nineteenth century British economy derived significant economic advantages from its colonies, second, that it could reasonably expect that these advantages

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13. R.D. Wolff, The Economics of Colonialism, Britain and Kenya - 1870 to 1930, 1974.

would increase absolutely and relatively, and third, that these advantages would most probably not have been available without colonial ties. These points are adequately shown for the period 1870-1974 through the analysis of data pertaining to international product cycles, trade patterns and resulting terms of trade.

A.A. Beveridge examines the new policies designed to indigenize the Zambian economy and their actual impact on private business.[14] Foreign and alien minority interests are still dominant resulting in a few countries having effective control over their economies. The author has laid emphasis on "indigenization", the replacement of aliens with locals, which is certainly a pre-requisite to economic independence, if not independence itself.

Grunwald and Musgrove in a very detailed statistical survey, historically review the major issues relating to natural resources and economic growth in Latin America and suggest a causal relation between stagnation and export of primary products in Brazil from the last quarter of the eighteenth century to the mid-nineteenth century.[15] They also analyse the linkage effects of natural resource exports and the role of foreign capital.

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14. A.A. Beveridge, "Economic Independence, Indigenization and the African Businessman", African Studies Review, vol. XVII, No. 3, December 1974, pp. 477-81.

15. J. Grunwald and P. Musgrove, Natural Resources in Latin American Development, 1970.

Rothermund and Wadhwa along with others have made a useful study on the Dhanbad coalfields.[16] According to them the zamindars and feudal lords who controlled land and labour and the British managing agencies which extended their operations there, determined the history of the Dhanbad coal fields while the former wasted their resources and encumbered their estates, the latter exploit mines and men to their full capacity. Inspite of being unskilled, the peasantry was drawn into this new activity. And the low wages paid to them at the mines was more than what they acquired in their terrace rice agriculture. The result was a stagnation of agriculture and the coal field becoming an enclave in a backward region.

1.3.2 Studies Based on the Diffusion Model

Sir G. Huggins has stressed the importance of the processing or semi-processing of raw products in the colony.[17] The reason is that the export of ore did not leave behind sufficient money to pay for the infrastructural requirements of the people who produce it. He views the imperialism of Great Britain as a great thing and of benefit to the underdeveloped world. Except for the fact that they took out the raw products and carried out no manufacturing in the country of origin.

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16. D. Rothermund and D.C. Wadhwa (ed.), Zamindars, Mines and Peasants, 1978.

17. Sir G. Huggins, "Southern Rhodesia", African Affairs, Vol. 51, 1952, pp. 140-147.

R.W. Randall seeks to present, in his words "a micro-cosmic view of foreign economic penetration into the Mexican mining industry in the first quarter century after independence.[18] The company he examines was the joint stock British Real Del Monte Company, established in 1824 with the intention of exploiting what London financiers and others considered the underdeveloped and undeveloped Mexican silver resources. However, in 1848 the concern was wound up. In a detailed analysis the causes of the failures are stated. Although the company collapsed, Mexico benefited. Ironically, the British miners handed over to their Mexican successors technical innovations and the basis of a mining venture which within a few years was to be very profitable and remains in existence to this day (This must have been an exception to the rule that the company was handed over to the natives).

The supporters of the dual mandate (i.e., they argued that the interests of Europe and Africa were inextricably linked) tended to emphasize British interests in Africa.[19] It was typical of these writers to emphasize the importance of transport and communication for the development of agriculture and mineral resources. Hetherington writes that emphasis was on the fact that Britain controlled vast untapped resources which were used in the interests of providing wealth

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18. R.W. Randall, "A British Mining Venture in Mexico", Latin American Monographs, No. 26, 1972.

19. P. Hetherington, British Paternalism and Africa, 1978.

for Britain. The consequence of more than fifty years of colonial rule was that Africans were finally left with few resources and few skills to solve the insoluble problems left by the British.

1.3.3 Studies Pertaining to the Mineral Belt of India

As mentioned earlier studies which have been forwarded for the Mineral Belt are very limited in their scope. Studies on resource development in a colonial setting are almost negligible. Most of these studies deal with the physical aspects of the Region (in particular the Chotanagpur plateau).

P.P. Karan has dealt with the various economic regions of the Chotanagpur Plateau.[20] According to him the development of mining has made profound changes upon the use of agricultural land in the surrounding regions. The development of mining and industrial centres have not only modified the physical landscape but also the old pattern of settlement and human occupation. He attributes the declining importance of the old trade centres on road junctions (like Chatra, Gumla) to the development of modern landscapes.

Some of the other studies done on the Region includes those by B.R. Mishra (1959) who has surveyed the socio-economic conditions of the steel city of Jamshedpur.[21] In 1939, J.A.

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20. P.P. Karan, "Economic Regions of Chota Nagpur, Bihar, India, Economic Geography, Vol. 29, July 53, No. 3, pp.216-50

21. B.R. Mishra, Socio-Economic Survey of Jamshedpur, 1959.

Dunn gave an account of the mineral deposits of Eastern Singhbhum and its neighbouring areas.[22] Two years later he contributed a study on the economic geology and the mineral resources in Britain.[23] The mineral wealth of Bihar was also described by Jacob and Mahadevan.[24]

1.4 THEORETICAL FRAMEWORK

A general theoretical framework is essential within which the development and utilisation of resources can be studied. This becomes all the more essential when the study is confined to the colonial period because the development and utilisation of mineral resources in a colonial setting cannot be understood independent of its relationship with the metropolitan economy. The process of resource development in a colonial economy is so complex that it cannot be interpreted with the help of a single theory. However, a general theoretical framework can be put forward within which the the process as it evolved and functioned through time and space can be analysed.

As it has been discussed earlier, two alternative explanations have been advanced regarding the impact of colonial

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22. J.A. Dunn, "The Mineral Deposits of Eastern Singhbhum and Surrounding Areas", Memoirs of the Geological Survey of India, 1939, Vol. LIX, Part X.

23. J.A. Dunn, "The Economic Geology and Mineral Resources of Bihar Province", Memoirs of the G.S.I., 1941, Vol. LXXVIII.

24. K. Jacob and Mahadevan, "Mineral Wealth of Bihar", Indian Mining Journal, 1957, Vol. V, No. 10, pp. 47-57.

rule on the satellites. Studies pertaining to the diffusion model suggest that the development of backward countries will come about through external influence and assistance, whereas the studies conducted within the dependency model view foreign penetration as the cause of underdevelopment.[25] It would be appropriate to discuss these models before we outline the theoretical framework which we propose for the present analysis.

The diffusion model uses two criteria to define development. One is national wealth which is measured by a single aggregate figure, the per capita gross national product. The second is the degree of "modernity", a concept which comprises social and political characteristics such as the rate of social mobility, urbanization, degree of specialization of political and social roles and institutions etc.[26]

The solutions to the problems and conditions of underdevelopment must originate from beyond the borders of satellites. Development is to be diffused from metropolis to periphery (in the case of India from Great Britain) to the national urban centres, to the regional trading cities and finally to their peripheries. The process involves the increased integration of the hinterland with its metropolis at each level. Capital and technology should flow from the

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25. Chilcote and Edelstein, op. cit., pp. 2-5.

26. Ibid.

developed countries. What is required is the creation of economic and political conditions which can attract the greater participation of foreign enterprises.

The dependency model is just the contrary of the diffusion model. Instead of hypothesizing underdevelopment as an original state, the dependency model asserts that contemporary underdevelopment was "created".[27] Ironically, the same process, viz., the expansion of capitalism brought about development in the now developed countries, and underdevelopment in the supressed colonies. The most significant facet of the colonial heritage was not a system of values but economies shaped by the requirements of the expanding central systems. The colonies responded both as the supplier and the buyer depending on the dictates of the centre of the system. The colony remained underdeveloped because of its metropolis.

Viewing the two models it appears that the latter model understands both capitalist development and underdevelopment as the outcome of the same historical process, the expansion of international capitalism. Through this process the political economic and military forces of the systems' centre have penetrated underdeveloped areas, creating development in the metropolis and underdevelopment in the periphery. This perspective incorporates the history of the underdeveloped areas as well as their integration into the expanding system. Whereas the

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27. Ibid., p. 27.

diffusion model assumes that underdevelopment is an aboriginal state and is the inevitable take-off on the road to development - a condition which has characterised every region and every country.

1.5 THE PROCESS OF COLONIZATION AND RESOURCE DEVELOPMENT IN INDIA : THE HYPOTHESES

The process of colonization and resource development in India is more aptly explained by the dependency model. The role played by the metropolitan economy in the development process was characterised by a system of complete dominance over its colony which lasted upto the middle of the twentieth century.

The process of colonization of the Indian economy by British imperialism revolved around two crucial co-ordinates. The first was the mode of production in India, especially the system of extraction of surplus, or in simple terms - exploitation, and the second was the nature of British imperialism which was itself subject to evolution as the British economy was transformed under the impact of the Industrial Revolution. Seen in these terms, the colonial metropolitan anti-thesis went through distinct phases which lasted for almost two centuries (1757 - 1947).[28]

To start with, the merchant capital in the underdeveloped world did not have local roots but originated from the developed

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28. R.K. Sau, Unequal Exchange, Imperialism and Underdevelopment, 1978, p. 37.

countries. The former were the colonized and not the colonizers. It dominated the Indian economy till the middle of the nineteenth century. The East India Company extracted the surplus in the form of levy of land revenue to enable it to buy raw materials without having to pay but at the same time selling it at full price. The entire land revenue was gross profits which was invested to purchase Indian commodities. The Indian 'tribute' was increased manifold before it reached Britain.[29]

The British policy underwent a shift in the first half of the nineteenth century. The objective changed from seizing the Indian commodities to seizing the Indian market. It viewed India as an indispensable source of necessary means of production, particularly raw materials.[30] The colony presented industrial capital with a vast potential market in which it could not only realise the surplus value extracted from the proletariat in the developed world, but could augment it with the surplus product of the non-capitalist satellites appropriated through unequal exchange, i.e., by selling goods in the markets of underdeveloped world at prices that exceeded their values. Its profits were equally enhanced by unequal exchange in the other direction, i.e., by buying raw materials below their values.

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29. For details on India's tribute to Britain, see section 1.7 (Period).

30. G. Kay, Development and Underdevelopment : A Marxist Analysis, 1975, pp. 100-01.

The peak of British imperialism was reached by about the middle of the nineteenth century which marked the flow of British capital into India. However, this partial reversal of the flow of wealth that had so long gone in only one direction, was superficial. The British capital invested in India was in reality first raised in India from the exploitation of resources, and then written down as debt from India to Britain on which the former had to pay interest and dividends.[31]

In the second half of the nineteenth century the British invested in railways - the motive being none other than exploitation. With the railway lines piercing through the country, the heavier products of British industry like metal manufactures (cutlery hardware etc.) and millwork, tools and machinery began to be imported in large quantities. Side by side the railways also aided the export of primary products.

The mineral resources and other raw materials of the colony were plundered by imperialism, without any allowance for the former. This naturally took away the material foundation upon which manufacturing industries could have developed in India.

It has become obvious that the motive of colonial expansion had been economic advantage. It is indeed true that colonization arose out of commerce.[32] This form of domination caused a

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31. R.P. Dutt, India Today, 1940, p. 133.

32. J.S. Furnivall, Colonial Policy and Practice, 1948, pp. 3-4.

spontaneous development of a powerful coalition of interests. It resulted in the continued underdevelopment of the colony due to its lack of access to its products. This in turn, reinforced the processes of development in the increasingly dominant metropolis and underdevelopment in the ever more dependent colony.[33]

The exploitation of natural resources was a function of the demand by the metropolis which seeked to integrate colonies into the empire's economy. This gave rise to a distorted development of colonial sectors and regions, a development which was reflected on a number of planes. From the above mentioned pattern of colonization, has evolved a few hypotheses which we seek to analyse in this study.

1. The development and utilisation of mineral resources in the Region was controlled and directed by the demands of the metropolitan economy. This domination was reflected in the composition of external trade and in the ownership pattern of the mines.
2. The development of infrastructure within the region was not oriented to establishing inter and intra regional linkages but was limited to the linkages between the resource region and the exporting ports.
3. The development of the resource base did not bring about a transformation of the economic structure of

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33. A.G. Frank, Capitalism and Underdevelopment in Latin America, 1971, p. 33.

the Mineral Belt, which was reflected in the absence of vertical shifts in the occupational structure.

4. The opening up of indigenous resources did not give a spurt to urbanization as it had in the case of the developed countries.

5. The exploitation of mineral resource did not enhance the simultaneous development of industries.

1.6 THE REGION

The spatial unit taken up for investigation in this study constitutes the core of India's mineral resources (see Map 1.1). Since the present study is a part of a larger one, the boundaries delineated by a Committee[34] according to the contemporary districts boundaries have been selected. It has been kept in mind that the boundaries fixed by the aforesaid coincides with the boundaries of the pre-independence years (Map 1.2 shows the administrative boundaries of the Mineral Belt according to the 1941 Census). The Region as it stands today, was drawn out for the development of resources by the Planning Commission in association with the State Govt. concerned, the Central Government and the Town and Country Planning Organization of the Government of India. The criteria

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34. A Committee was constituted to study the delineation of the Region. It was composed of the Chief (urban development) of the Planning Commission, the Chief Town Planners of the Governments of Bihar, Orissa, Madhya Pradesh, the Town and Country Planning Commissioner of the Govt. of West Bengal, Director of the National Atlas Organisation and the Technical Secretariat, T & CPO, New Delhi.

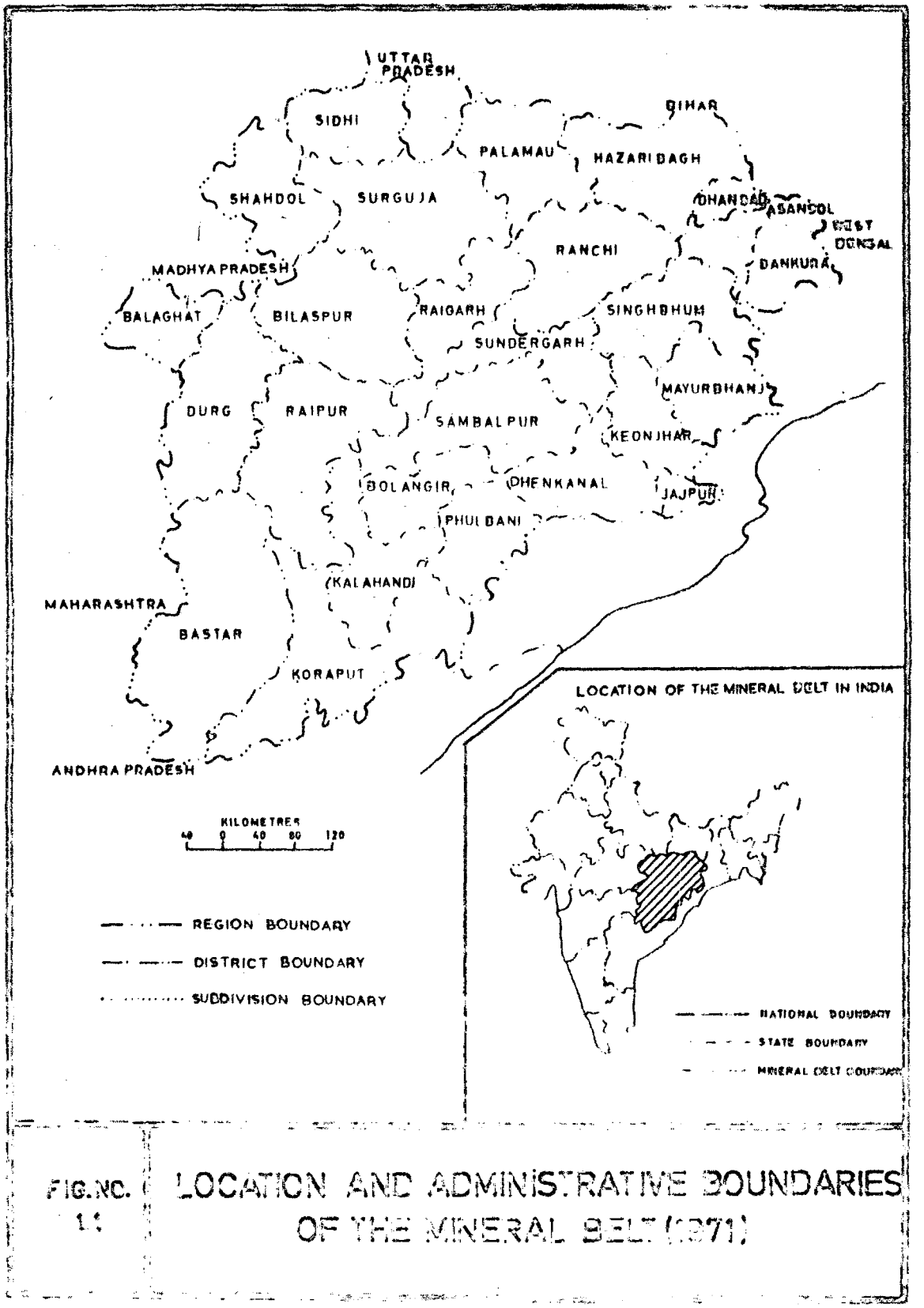

FIG. NO. 1.1

LOCATION AND ADMINISTRATIVE BOUNDARIES OF THE MINERAL BELT (1971)

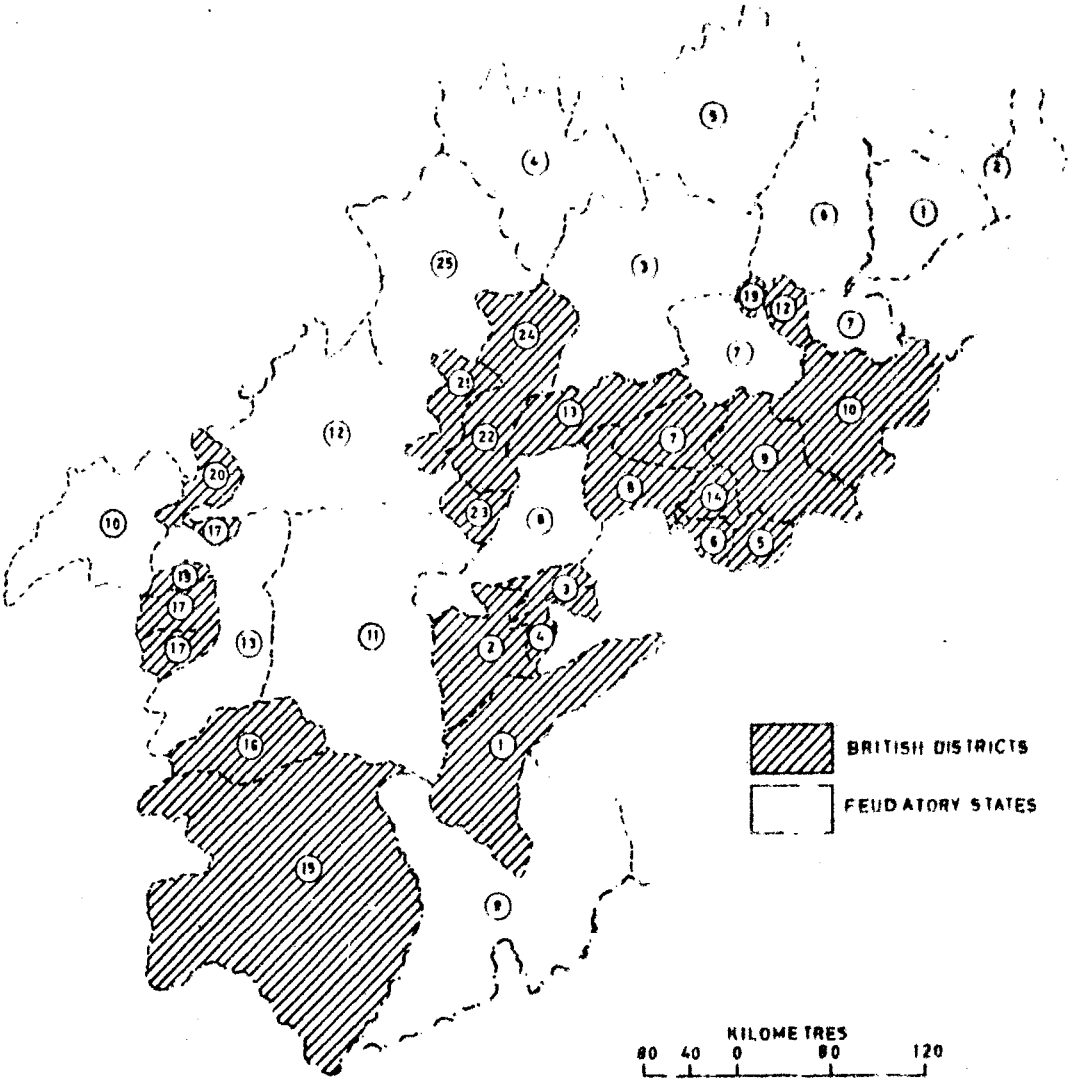

FIG. NO 1.2

ADMINISTRATIVE BOUNDARIES OF THE MINERAL BELT (1941)

fixed for the delineation of this region (which was designated the south-east resource region by the Planning Commission) were physiography, climate, soil, general land use, distribution of mineral resources, population, levels of economic development and intra regional resource linkages.[36]

The Region roughly coincides with the Eastern Plateau Region of India as defined by the National Atlas Organisation. The sub-regions that make up this Mineral Belt includes the Chotanagpur Plateau, the Garahjat Hills[37], Dandakaranya, the Baghelkhand Plateau, the Chhatisgarh Plateau and a part of the Satpura Range. Physiographically the Region is roughly bounded by the Wainganga and the Godawari Rivers in the west, the Sone in the north-west, the alluvial plains of the Ganga in the north and the coastal plains of Orissa in the east.[38]

In all the sub-regions listed above, mineral resources are their most important asset, except perhaps for Chhatisgarh, where a rich agricultural soil also forms an important resource and makes the sub-region the rice bowl of Madhya Pradesh. The Chotanagpur Plateau in Bihar and the Garahjat Hills in Orissa are the store houses of rich deposits of minerals, such as iron ore, coal, mica, bauxite, copper, manganese and chromite.

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36. S.E.R. Regional Plan, op. cit., p. 485.

37. Orissa Highlands according to R.L. Singh, A Regional Geography of India, 1975, p. 76.

38. S.E.R. Regional Plan, op. cit., p. 8.

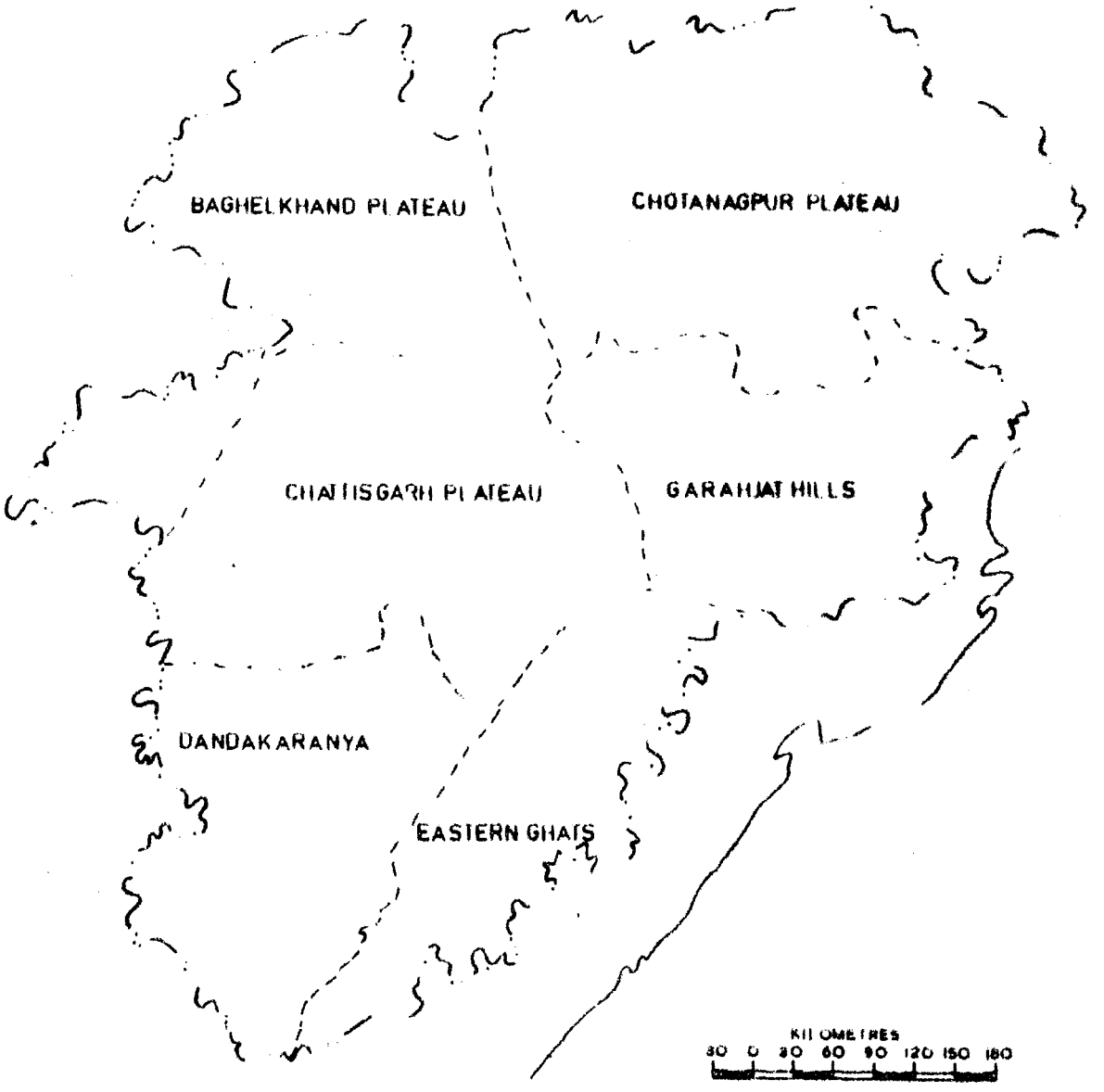

FIG. NO 1.3

SUBREGIONS OF THE MINERAL BELT

The Baghelkhand Plateau, abounds in non-metallic minerals, like coal, limestone, bauxite, building stones. In Dandakaranya large quantities of quartz is found, besides iron ore, bauxite, manganese and limestone. Basically, the entire region is rich in mineral, forest and water resources. Map 1.3 shows the location of these sub-regions.

The Mineral Belt included parts of the British Provinces of Bengal, Bihar, Orissa and the Central Provinces. Within this territory were 13 British districts and 25 Feudatory States.[39] The changes in the area of some of the districts/ states due to transfer of land has not been accounted for.

In 1941 the Region accounted for about 7 per cent of the total area of the country and about 5 per cent of the total population. The average density of population was lower (193 persons per square mile) than that of the country's where the density was reported at 246 persons per square mile. Map 1.4 shows the density of population in the Region according to districts.

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39. The names of these are as follows :
British Districts : 1. Bankura, 2. Burdwan (Bengal), 3. Ranchi 4. Palamau, 5. Hazaribagh, 6. Manbhum, 7. Singhbhum (Bihar), 8. Sambalpur, 9. Koraput (Orissa), 10. Balaghat, 11. Raipur, 12. Bilaspur, 13. Durg (Central Provinces).
Feudatory States : 1. Kalahandi, 2. Patna, 3. Sonepur, 4. Baud, 5. Dhenkanal, 6. Talcher, 7. Bonai, 8. Bamra, 9. Keonjhar, 10. Mayurbhanj, 11. Seraikela, 12. Kharsawan, 13. Gangpur, 14. Pal Lahara (Orissa), 15. Bastar, 16. Kanker, 17. Nandgaon, 18. Khairagarh, 19. Chhuikhadan, 20. Kawardha, 21. Sakti, 22. Raigarh, 23. Sarangarh, 24. Jashpur, and 25. Surguja. (Central Provinces)

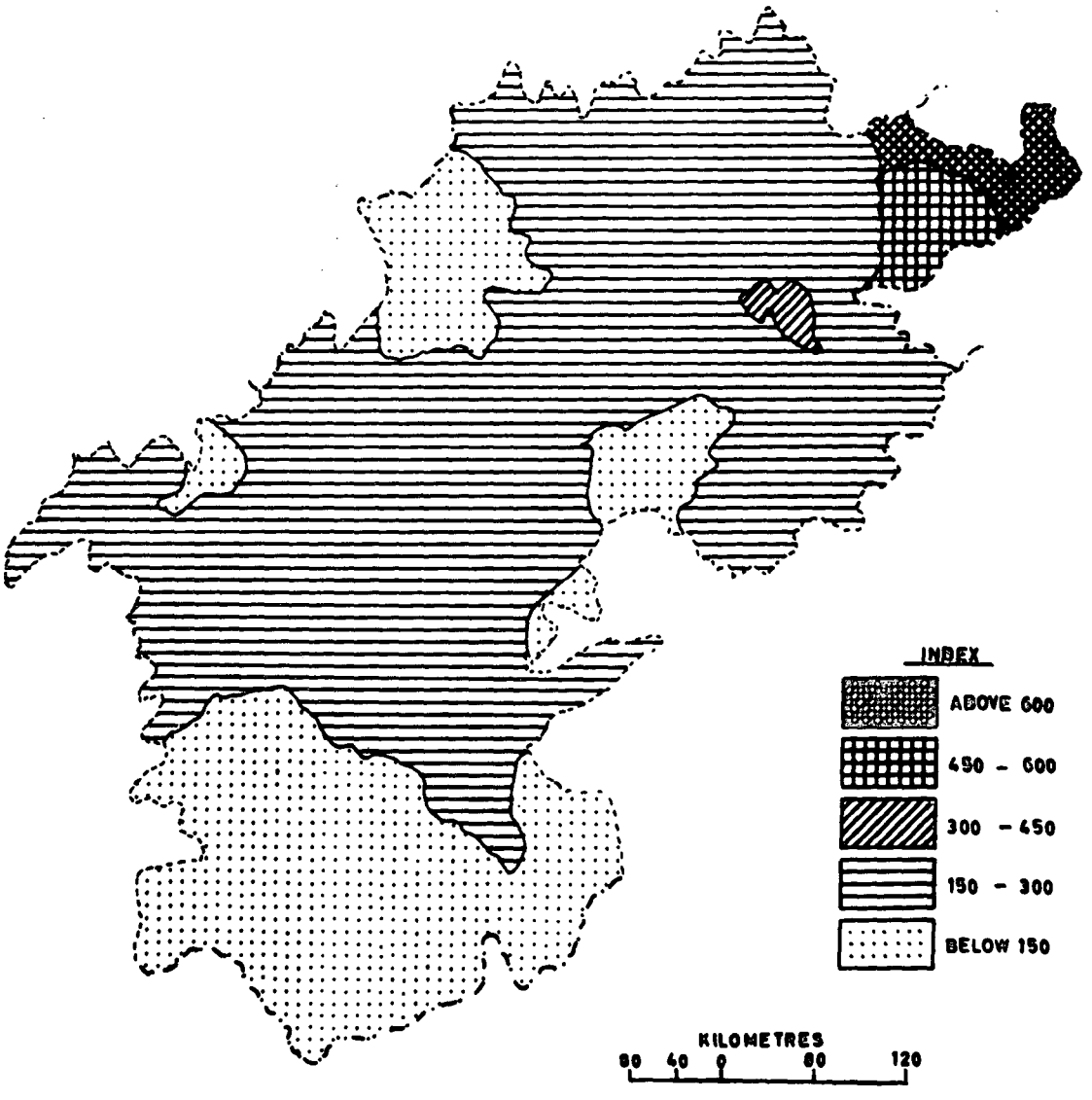

FIG.NO. 1.4

DENSITY OF POPULATION (1941)

The share of urban to the total population in the Mineral Belt was as low as 4.6 per cent whereas for the country it was three times more - 13.9 per cent. In 1941 the Region contained about 3 per cent of the total urban population of India and about 6 per cent of her rural population.

The economy of the Mineral Belt was basically agrarian. The complete figures for the district-wise occupational structure in 1941 has not been available because of some unavoidable reasons faced by the census authorities.[40] Therefore, the percentage share occupied by the different economic sectors will be provided according to the 1931 census. About 80 per cent of the workers were engaged in the primary sector, about 12 per cent in the secondary sector and 8 per cent in the tertiary sector. The proportion of workers engaged in the tertiary and secondary sector was very small.

1.7 PERIOD

Since the characteristics of the contemporary regional structure of the Mineral Belt have their roots in the period of colonial rule in India, it becomes necessary to analyse the various aspects of resource development in the region during this period. Keeping this in view the present study is confined to the crucial phase of colonial rule in India, i.e.,

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40. The reason for incomplete compilation of data in 1941 census has been mentioned later in the section on Data Base (1.8).

from 1858 to 1947. The dominant interests of the commercial policy of Britain brought about the abolition of the rule of East India Company over India in 1858 and in its place the direct government of the Crown was established. The imperial government held its sway till 1947, when India attained liberation. This was an eventful period, and the changes that it heralded were to be immense.

One of the significant changes of this period which affected the process of regionalisation and resource development was the expansion of the railway network in the country. In the first half of the nineteenth century, the state of internal communications in India was extremely inadequate. The Ganga and the Indus with their tributaries were the only river systems that were navigable to a large extent. In most parts of the country, roads did not exist, and where they did, their conditions were very unsatisfactory.

The railway policy in India was mainly affected by two factors, i.e., the lines on which the construction of these rail-roads was sketched, and the question of railway management. Through the construction of port-oriented trunk lines, the internal markets were linked to the major ports which were linked to Britain directly, in their turn.[41] This left

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41. The railways were laid down to meet the demands of Britain more than that of India. Within the Mineral Belt the first railway line (of the East India Railway) was built in 1854, connecting the Raniganj coalfield to Calcutta. Of the total British capital invested in the country, till the beginning of this century, about one-

cont'd.

a mark on the nature of the freights charged, which to a great extent hampered the development of Indian industries during the late nineteenth and early twentieth century. Since favourable rates were charged for raw produce moving to the ports[42], industrial centres in the interior of the country could not develop which resulted in a concentration of industries at the ports. The railways were designed to open up India more completely for commercial penetration. Moreover, with the introduction of the railways the heavier products of British manufacture (like cutlery, hardware etc.) and machinery and tools began to be imported in large quantities. The machine made goods reached every port of the country, thus displacing the local manufactures and resulting in the process of de-industrialisation of India which had been more or less completed by the end of the nineteenth century.[43]

Footnote 41 cont'd.

thirds (£ 136.5m) was devoted to the railways (see R.P.Dutt, op. cit., p. 137). In the Mineral Belt there was a tremendous increase in the railway mileage. In the period 1855-65, just 46 miles of rail lines were laid, this mileage increased to 717 during the period 1885-95. By 1945 about 2588 miles of railways were constructed within the Region, connecting about thirty mines in all (Based on data available in the "History of Indian Railways Upto 1947", Govt. of India, 1949). The land revenues increased four-fold from £ 3.9 m (in 1792-93) to £ 12.67m (in 1837-38). For details refer to R.C. Dutt, Economic History of India, Vol. I, 1901, pp. 278-81.

42. Report of the Indian Industrial Commission 1916-18, Chapter XIX.

43. R. Sau, op. cit., p. 39.

Besides the development of the railways, attention was also directed towards other infrastructural requirements, such as the introduction of the electric telegraph and the establishment of a regular postal system; the introduction of the European banking system and the beginnings of an Anglicised education to provide a supply of clerks and subordinate agents.

From 1858 onwards, the emphasis moved away from the levy of tribute through land revenue[44] to the exploitation of India as a market and as a source of raw materials. The realization of tribute from India had taken the form of export of Indian manufactures. The tribute continued and grew rapidly throughout the nineteenth century alongwith the growth of trade . In the twentieth century it grew even more rapidly though there was a relative decline in trade, as shown in the following table.

Growth of Tribute from India to England[45]
(in £ Million)

	1851	1901	1913-14	1933-34
Home Charges	2.5	17.3	19.4	27.5
Excess of Indian Exports	3.3	11.0	14.2	69.7

44. The tribute included "home charges" which included payments, including the interest in the management of debt (of all types), and amenities on account of railways and irrigation works; payments due in connection with civil departments in India, India office expenses (including pensions); Army and Marine charges, effective and non-effective (i.e., pensions and gratuities); payments for stores purchased in India.

45. R.P. Dutt, op. cit., p. 131.

Besides a quantitative increase in tribute there was also a change in the quality and methods of exploitation. The enormous and rapid increase in the tribute from India during the second half of the nineteenth century and its further acceleration in the twentieth century, however, conceal the emergence of new forms of exploitation. This developed out of the conditions of the period of free trade capitalism of the nineteenth century which developed into the stage of the finance - capitalism during the twentieth century.[46]

After the first half of the nineteenth century India made big strides in its foreign trade which virtually ushered in a commercial revolution in the country. Imports and exports increased considerably in both volume and value; they also underwent dramatic changes in their scope and character.[47]

The growth of India's foreign trade (1834-35 to 1898-99) may be seen in Appendix 1. The average annual loss to India on the above was £ 75,29,798. It may be noted that the aggregate trade increased in the later years as compared with the earlier years. The percentage of increase of exports in 1898-99 over the exports of 1833-34 was 1,000 per cent! The profit on this enormous business was made mainly by the British

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46. Ibid., p. 132.

47. B. Chandra, The Rise and Growth of Economic Nationalism in India, 1966, p. 142.

subjects trading in India.[48]

The composition of India's exports and imports also underwent radical transformation during the nineteenth century. Earlier, India had primarily been an exporter of manufactured goods and importer of precious metals and luxury products. Gradually and particularly after 1858, India became an exporter of largely raw materials and an importer of manufactured products. In 1860, all export duties on Indian raw products were abolished, and import duties on manufactures were considerably reduced. While the British merchants welcomed this step by the government, India suffered a loss of revenue at the time of her sorest need.[49] The principal export and import duties, fixed by Act XIII of 1871 of the government may be seen in Appendix 2.

To give a few illustrations, the import duties (during the 1840s) on British cotton and silk goods were three and a half per cent, while Indian cotton goods imported into England paid 10 per cent, silk goods 20 per cent, woolen goods 30 per cent. In 1848 the import duty on raw produce was three and a half per cent and on manufactured goods three and a half or 5 per cent, but these rates were doubled in the case of goods imported from countries other than England.[50] These rates

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48. W. Digby, Prosperous British India, 1901, pp. 222-23.

49. R.C. Dutt, The Economic History of India, Vol. II, 1976, p. 243.

50. S.K. Sen, Studies in Economic Policy and Development of India (1848-1939), 1972, p. 115.

were maintained until 1859 when import duties had to be increased to meet an increased expenditure, mainly due to the Mutiny of 1857. The general rate of import duties was raised by double - 5 per cent to 10 per cent; and on yarn from three and a half to five per cent. In 1862 there was a budgetary surplus hence the import duty on iron was reduced from 10 to 1 per cent. Machinery was on the free list. This measure was designed to facilitate the flow of British iron and machinery in India.[51]

It was only after 1857 that British capital began to pour into India in significant amounts. During the period 1854-59, when this flow was at its height, nearly £ 150 million were invested.[52] After 1870 the annual inflow of fresh capital was superseded by the volume of annual interest remitted abroad on account of the existing foreign investments. This implied that throughout the last quarter of the nineteenth century, Britain was a net importer of capital from India. To state this otherwise, not only was investment of new foreign capital in India made wholly from the profits of the past investment of foreign capital in India but a part of these profits were also utilised by British financiers to develop other countries.[53]

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51. Ibid., p. 116.

52. L.H. Jenks, The Migration of British Capital to 1875, 1927, p. 208.

53. Ibid., p. 230.

Since it was foreign enterprise that was largely developing Indian resources, it was the foreign capitalists who reaped the advantages resulting from this development and appropriated the additional wealth thus produced.[54] Foreign exploitation of the mineral resources of the country was most serious as it meant the permanent loss of natural resources which once exhausted could never be renewed.[55] Though the mineral wealth of the Region was opened up during the period under study but these minerals were mostly exported in their ore form or semi-processed form.

1.8 THE DATA BASE

Since the study contains various aspects of resource development and utilisation, varied types of data was required. It was attempted to trace the data to its primary source, as far as it was possible. However, in a number of places this was not possible and hence secondary sources had to be used.[56] A brief description of the contents of each of the source material used in this study has been given here which is followed by a detailed note on the parts of the source material used.

The gazetteers provided invaluable information on which large sections of the study are based. They give an account

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54. D. Naoroji, Speeches and Writings, p. 398.

55. B. Chandra, op. cit., p. 106.

56. Almost the entire data has been obtained from the National Archives, the Central Secretariat Library, Nehru Memorial Museum and Library - in New Delhi.

of the location, physiography, history, population, agriculture, commerce, communication system and administration of districts. Regarding minerals, information is given about their place of occurence, indigenous production and their use in indigenous industries.

1. Thornton's Gazetteer - Edward Thornton published his gazetteer in two volumes in 1844. The second edition in four volumes was published in 1854 and was claimed to be the first printed work which assumed the character of completeness as a gazetteer.[57] It contained the location of places, physiography, history, population, communication lines etc. The names of places are arranged alphabetically. However, all the towns do not find a place in this gazetteer. It includes the territories under the Government of East India Company and of the Native States of the continent of India.

2. Hunter Series - The most famous gazetteer series of Bengal is Hunter's Statistical Account which was published in 1875-77 in twenty volumes. This series provides information about the location, population, agriculture, communication and commerce, administration, climate and medical aspects of the district.

Out of the twenty volumes, three have been used : i.e., (a) of Burdwan, Bankura and Birbhum (Vol. 4, published in 1876);

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57. S.B. Chaudhuri, History of the Gazetteers of India, Govt. of India, 1964, p. 55.

(b) Hazaribagh and Lohardaga (Vol. 16, 1866); (c) Singhbhum, Chotanagpur and Manbhum (Vol. 17, 1877). The information provided on population, communication and commercial aspects of the districts have been used at various points in the present study.

3. Imperial Gazetteer of India - The first edition was published in nine volumes in 1881. The second edition was issued in the years 1885-87 in fourteen volumes. A revised form, greatly enlarged and with statistics brought up to date, appeared as an independent volume in 1893 under the title, 'The Indian Empire : Its Peoples, History and Products'. All of these were edited by Sir W.W. Hunter. The single volume of 'The Indian Empire' was expanded into four volumes entitled respectively, 'Descriptive', 'Historical', 'Economic', and 'Administrative' in 1893.[58] The Imperial Gazetteer of India was last revised in 1885-87.

The Imperial Gazetteer proved to be an important source of information (besides the District Gazetteers which appeared later) for the tracing the factors for the origin of towns, the industries which were functioning in various towns, etc. In this study volume three (Economic) has been used. The contents of the volume include agriculture, forests, mines and minerals, arts and manufactures, commerce and trade, irrigation and navigation, railways and roads, post and telegraph,

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58. The Indian Empire, Vol. I, Descriptive, 1895, p. 5.

rents, prices and wages and famines. Of these topics, those on mines and minerals, arts and manufacture and commerce and trade were used for the present study.

4. O'Malley Series - The district gazetteers of Bengal compiled mostly by L.S.S. O'Malley include thirty-eight volumes written between 1906 and 1925.[59] This series was written on more or less the same lines as the Hunter series.

For our study six volumes covering six districts (Palamau, Vol. 9, published in 1907; Bankura, Vol. 14, 1908; Sambalpur, Vol. 16, 1909; Singhbhum, Saraikela and Kharsawan, Vol. 20, 1910; Burdwan, Vol. 23, 1910 and Manbhum, Vol. 28, 1911) were referred to. The information regarding origin of towns, industries within a district, means of communication and trade of local commodities is given in detail. The information in the district gazetteers are more in detail than the Imperial Gazetteers.

The Census

The Census operation in India was launched formally in 1872, and is a regular decadal feature uptil now. As part of

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59. Bihar and Orissa were once two of the four sub-provinces within Bengal Province. In 1912 Bihar, Orissa and Chotanagpur were formed into one separate province called Bihar and Orissa. This remained in effect until 1936 when Bihar and Orissa became two separate provinces. So Bihar has been dealt partly in the Bengal District Gazetteer Series (1905-12) and partly in the Bihar and Orissa Gazetteer Series (1912-1936).

an integrated programme of data collection, the Census is the primary source of basic national population data required for administrative purposes and for many aspects of economic and social research and planning.[60]

5. Census of India - Provinces of Bengal and the Central Provinces : 1872 to 1931 Tables -

The Imperial Tables give immense information regarding population, religion, age, sex, education, language, caste, tribe, occupation etc. The data used from the Census was Part A - General Tables of Occupation or Means of Livelihood from 1872 to 1931. This data was the sole basis of the chapter written on occupational structure and its relation with the resource base (on the district level). The Part B statistics for Industries and Particulars of Ownership of Mines has also been utilised in the present study. However, the latter was available only for 1911 and 1921.

6. Census of India - Provinces of Bengal and Central Provinces - 1872 to 1931 Report -

The census reports give brief explanations of the tables which are presented in a separate volume as enlisted above. The Reports have been consulted wherever it deemed necessary to do so.

The Census of 1941 does not provide the complete data similar to the earlier Census. The Census enumeration was

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60. S.C. Srivastava, Indian Census in Perspective, Census Centenary Monograph No. 1, 1977, pp. 33-35.

carried out in full according to plan but the Government of India decided to restrict the tabulation for British India. Consequently the tables covered less than half the contemplated range.[61]

7. Report of the Chief Inspector of Mines in India - 1902-47

The Report is divided into five sections : (i) Persons Employed, (ii) Output of Minerals, (iii) Accidents, (iv) Prosecutions and Additions to the Indian Mines Act, (v) General Remarks (which include health and sanitation, mining education etc.).

The entire section on output of minerals has been made use of. The tables besides giving the output of minerals according to mines or/and district also provide figures for daily employment (average), the total number of mines opened or closed and the number of existing mines. The production per miner has been calculated from this data.

8. Report Exhibiting the Moral and Material Progress and Condition in India - 1859 to 1934

The report gives information about the administrative and economic aspects of the Government. Since the report was on all-India level it could not provide details for districts or regions. However, the section on mineral resources proved

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61. R.A. Dutch, Census of India - Bengal, 1941, Part IV, Tables.

quite useful because it dealt with mineral resources of the Region under our study.

9. Report of the Indian Industrial Commission 1916-18

The twenty four chapters of the Report deal with various aspects of industries and industrial development in India. The first few chapters of the Report deal with India as an industrial country, her position and her potentialities. The Report advocates the introduction of modern methods of agriculture and in particular of labour, saving machinery. The subsequent chapters deal with 'The Indian in Industries'. These discuss measures designed to improve the efficiency of the Indian artisan and to encourage the educated Indian to take part in industrial enterprise. The remaining chapters of the Report deal more specially with Government intervention in industries. There is a concluding note covering the industrial condition of India given by M.M. Malviya who was one of the ten members of the Commission.

The Report has been referred to in various parts of our study. The section on Bengal coalfields; minerals for industries; imports of machinery and parts of the concluding note.

10. Annual Statement of Sea-Borne Trade in India, Vol. II, 1888 to 1945

The statement contains Abstract Tables; Detailed Statement of the Trade at the Chief Ports of India; Detailed Statement of Trade with each Country; Custom Duty; Trade and Navi-

gation of Aden, Trade of the French Possessions in India; Shipping Tables.

The entire section written on foreign trade in our study has been based on the data available in the Detailed Statement of the Trade at the Chief Ports of India. Keeping in view the extent of the Mineral Belt under study the trade at the Chief Port of Calcutta has been dealt with. The statement provides figures for the import and export of all the items. But for our purpose only the import and export of metals, ores, mill-work and machinery has been taken into consideration.

1.9 ORGANISATION OF THE STUDY

As mentioned earlier, the object of the study is to analyse some of the aspects of the development and utilisation of resources in the Mineral Belt. Seven chapters have been written for the purpose. The outline of each chapter is as follows :

The introductory chapter, i.e., the present one, begins with the statement of the problem which has to be studied. This is followed by a survey of literature available on the studies pertaining to the development of mineral resources in a colonial setting in any part of the world. After this the theoretical framework has been outlined within which the present study has been written. This is followed by a brief description of the region selected for the analysis, the period within which the study has been confined and the data base on which the analysis has been based.

In Chapter II, the British Government's policy towards the mining industry in India is given briefly. After a preliminary account of the first attempts by the Government to examine the industrial resources of the country, the rules and regulations laid down by the Government of India for the grant of exploiting and prospecting licences and mining leases is given. These rules are a reflection of the Government's attitude towards mineral exploitation. The pattern of ownership of mines has been given which reflects the external dominance in that field. Since coal and iron are the two important minerals of the region from the commercial and industrial point of view, the Government's policy towards their exploitation and development have been discussed in detail. A brief mention has been made of the Government's attitude towards the development of a few other mining industries. The latter part of this Chapter is essentially a description of the Region's resource base. In order to provide a background for the study of the most important resource region of the country, an introduction to its resource base is of utmost significance. The description includes the history of mineral exploitation, whereby the occurence, development and production of important minerals are dealt with.

Chapter III deals with the exploitative character of the British policy in terms of the pattern of foreign trade. The aspect which has been analysed in this Chapter is the volume and trend of foreign trade in metals, ores, millwork and

machinery, carried out at the Chief Port of Calcutta. This will show whether the minerals were utilised within the country or were exported and also the form in which the minerals were imported.

Chapter IV is an attempt to study the broad occupational structure of the various districts of the Region to find out whether the development and utilisation of resources was in any way related to the occupational structure of the people. The break-up of occupational structure within the industrial class has been studied in detail. A similar study has been done of the trading class to find out whether the growth in trade of industrial products was linked to the growth of manufacturing of the same industrial products. The second part of Chapter IV seeks to find out whether the development of railways established any inter and intra regional linkages within the Region.

Chapter V studies the pattern of industrial development of the Region in relation to the resources available therein. First of all the development of coal mines in an otherwise isolated and backward region has been described. Next, an attempt has been made to study briefly the traditional industrial base and the emergence of the 'modern' industrial sector. A substantial part of the chapter has been devoted to the development of technology and its impact on the industries of the Region. In some places, comparisons have been made between India, Britain and other countries.

In Chapter VI the characteristics of urbanisation during the colonial period has been analysed to find out whether the process of urbanisation in the resource region responded to the process of resource exploitation and utilisation. In the first section of the Chapter a statistical analysis has been done through some selected measures, of the level, speed and concentration of urbanization, the growth of towns and the movement of towns in their size class. In the second section the factors responsible for the origin of all the towns has been traced. A brief mention has been made of the case of towns which were on the decline during the period under our investigation.

Chapter VII contains the conclusions and the summary of the findings of the present study.

Chapter 2

COMMERCIAL POLICY OF THE BRITISH GOVERNMENT AND EXPLOITATION OF MINERALS

Introduction

2.1 Rules for the Grant of Mining Lease and Licences

2.2 Ownership Pattern of Mines

2.3 Government Policy Towards Important Mineral Resources

- 2.3.1 Coal
- 2.3.2 Iron
- 2.3.3 Minerals and Metals of Secondary Importance

2.4 Distribution and Exploitation of Mineral Resources

- 2.4.1 Coal
- 2.4.2 Phases of Development of Coal Mining
- 2.4.3 Iron
- 2.4.4 Mica
- 2.4.5 Manganese
- 2.4.6 Limestone
- 2.4.7 Dolomite
- 2.4.8 Copper
- 2.4.9 Kyanite
- 2.4.10 Bauxite

2.5 Trends in Mining 1859 - 1947

Conclusions

Chapter 2

COMMERCIAL POLICY OF THE BRITISH GOVERNMENT AND EXPLOITATION OF MINERALS

The basic objectives of the early commercial policy of the British Government in India were, firstly, the exploitation of indigenous raw materials for Britain's industrial use, and secondly the expansion of the Indian market for the goods manufactured in Britain.[1] This chapter deals with the British Government policy towards mineral exploitation in India and the development of the mining industry in the country.[2]

The initial attempts at industrial development in the country took two forms - firstly, a very imperfect provision of technical and industrial education and secondly the collection and dissemination of commercial and industrial information. One expression of the latter policy was the Calcutta Exhibition of 1884-85, which led to the institution of the Calcutta Commercial Museum and to the examination of Indian industrial resources. A number of experts were employed to investigate matters of industrial importance and to awaken commercial interest in them. The Geological Survey of India was established and its work was systematised after 1904.[3]

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1. R. Dutt, op. cit., p. VI.
2. A specified policy on this subject has not been available. However, whatever information has been collected is compiled up.
3. Indian Industrial Commission Report, op. cit., p. 75.

The Geological Survey was organised and equipped to deal with all problems related to the development of mineral resources. Its various branches were required to complete the general geological mapping of the country and to collect information regarding mineral occurences, mineral statistics and the conditions under which prospecting licences and mining leases could be granted.[4] Since the Geological Survey of India had its origin in the desire of the Government to have the coalfields of the country systematically investigated, the work of the survey was for some time wholly devoted to this work. It was only after the principal coalfields had been mapped and described, that the general examination of the geology of India was taken up.[5]

2.1 RULES FOR THE GRANT OF MINING LEASE AND LICENCES

Before discussing the policy of the Government regarding the exploitation of some of the basic mineral resources found in the region, it would be appropriate to outline the rules laid down by the resolution of the Government of India for the grant of licences for the exploitation and prospecting of mineral resources and for the mining leases, as approved by Her Majesty's Secretary of State for India.[6] The rules

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4. Ibid., p. 88.

5. V. Ball, A Manual of Geology, Part III, p. V.

6. M. Finucane, No. 147, Circular No. 19-17.3, 1899, Circular to the Department of Revenue and Agriculture/ Geology and Minerals.

were framed in a manner which encouraged British subjects to carry on mining operations while deterring the Indians to do the same. A look at the rules will clarify this stand by the Government.

The rules were based on the principal that the Government, while desiring to facilitate the development of India's resources for the public benefit, did not undertake the duty of protecting the private interests of those who embarked their money in Indian private enterprises. With regard to prospecting licences, it was laid down that such licences could be granted to Syndicates and Companies as well as to single persons. Also, that the area with respect to which a prospecting licence could be granted was not limited by the rules to blocks of specified dimensions, but was to be determined in each case by the Collector subject to the control of the Local Government. In granting a certificate of approval the Local Government had to satisfy itself that the person intended to carry out bona fide prospecting work and had the sufficient means at his disposal.

A prospecting licence was given to such area as was reasonably required for bona fide prospecting purposes. Under the earlier rules a prospecting licence was limited to one or more blocks, each of a prescribed area and separated from each other by prescribed spaces. These prescriptions were abandoned, as they hampered the work of prospecting by preventing the prospector from following up promising indi-

cations, and enabled others to reap the fruits of his enterprise. But as a prospecting licence confered exclusive rights for a term which may be extended to three years, the area over which such a licence should be granted was a matter of some consequence. The Collector's powers in this respect were made subject to the control of the local Government, and the local Government was suitably directed that, in cases in which a prospecting licence was applied for over a large area, previous reference to higher authority were to be made by the Collector.[7]

In 1913, the rules of 1899, were revised. The aim of the Government of India was to give more powers to the local Governments and to their subordinate officers, for the disposal of application for prospecting licences and mining leases, while retaining sufficient power of control over the grant of important concessions. According to the new rules a prospecting licence conferred on the licencee the sole right to work all minerals instead of those specified in the licence. However, permission to prospect for manganese, chromite, nickle, vanadium, molybdenum, all ores of tungsten and petroleum was granted only to British subjects. If a foreigner was already in possession of a prospecting licence for a reserved mineral, he could be given a renewal of the licence or a mining lease, to which he would have been entitled under the old rules, but no fresh concession could be

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7. These rules applied only to British India.

given to him in respect of such minerals.[8]

A glance at the regulations laid down by the Government, in respect to mining, shows that these were far from being favourable to the Indian entrepreneur. In the words of F.R. Harriss the mining and prospecting regulations "seemed carefully devised to obstruct and prevent development".[9] The provisions of the regulation established the truth of this remark.

One of the rules spelled out that permission to prospect for important minerals (like manganese, chromite, petroleum) could be granted only to British subjects. This, in a great way made impossible the undertaking of mining by native investors. The Government imposed further control by restricting the receipt of a prospecting licence and the area over which such a licence could be granted.[10] The permission to embark on any sort of mining venture, was subject to scrutiny by the local Government. In the initial years the number of private investors were very few because the Government's policy did not protect the interests of such investors. A licencee or lessee could not transfer or assign his mining

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8. Instead of a surface rent, an acreage fee was substituted for the land covered by the licence. The Government of India hoped that this rule would reduce the number of applicants who had no serious intention of carrying out prospecting operations. Govt. of India, Foreign Dept., Internal A, Proceedings, Nos. 8-10, 1913, p. 16.

9. F.R. Harriss, Life of J.N. Tata, 1950, p. 162.

10. Provincial Governments could refuse to grant prospecting licences even after an area had been surveyed and existence of mineral reserves were ascertained there.

lease or prospecting licence to another person except with prior sanction of the Governor-General-in-Council.

However, with the issue of the Revised Rules by the Government of India in 1913, some of the existing rules were made more flexible.

2.2 OWNERSHIP PATTERN OF MINES

Since the ownership pattern of all the mines in the Mineral Belt was not easily available, the discussion in this section has been confined to the coal mines for which systematic data was collected from time to time. It can be observed that the largest and the best mines, producing the bulk of the coal were owned and operated by European Companies. The coal industry which was a beneficiary of Government spending was dominated by foreign capital in the earlier years. In 1904, a chief inspector estimated that European owned companies produced 82 per cent of the total production and that four of these companies mined 31 per cent of the total.[11] The dominance of the European capital can be gauged by the fact that the Indian Mining Association formed in 1892, was made up largely of European concerns. It was only in 1913, that the Indian Mining Federation was founded which represented Indian capital in the coal mining industry of Bihar and Bengal.

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11. Buchanan, op. cit., p. 267.

However, one cannot fail to note that between the early 1890s and the depression of 1925-26, the coal industry attracted Indian (especially the trading community) capital, particularly Bengal capital. But it is important to note that most of the Indian enterprises consisted of small pits. The prospects of quick profits was provided by a large and growing market demand, cheap labour and abundance of coal. The Bengalis found the coal industry to be the most profitable venture.[12]

The Report of the Inspection of Mines in India (1899) showed that in the Bengal coalfields several Bengalis owned and managed coal mines. In 1897, there were fourty mines in the Burdwan Division which were owned by Indians, out of those only two were non-Bengalis. Most of the mines (36) were owned and managed by private individuals.[13] This dynamic growth was apparently self-financed. For some reason joint stock companies did not make much progress among the Bengalis who preferred to work small pits as individual owners.

The first twenty-five years of this century witnessed the growth of Bengali entrepreneurial involvement in the coal mining industry. Beyond that the balance of influence within the indigenous community began to move away from the

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12. S.K. Sen, Studies in Economic Policy and Development of India (1848-1939), 1972, p. 70.

13. Ibid., p. 70.

Bengalis.[14] They received a jolt initially by the 1925-28 slump and thereafter by the Great Depression, which spelt bankruptcy to most of the indigenous entrepreneurs. A few dominant ones, however, managed to survive.

It was this ripe moment which the non-Bengali trading communities seized. They were immigrants who came from Gujarat (especially Kutch), Rajasthan, Sind and the Punjab, to establish a foothold in the industry. Before the depression their stake in the coal trade was marginal.[15] The Marwaris (from Rajasthan) began to take an active interest in acquiring coalmines for themselves. It was found that as early as 1902 two Marwari colliery owners were entered in the returns for the Jharia coalfields.[16] The 1911 Census revealed that in Jharia, nine Aggarwalas appeared as colliery proprietors and in Raniganj one.[17] By 1923, atleast thirty Marwari coal mines owners were figures in the two fields and their combined output came up to about 4,000,000 tons.[18]

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14. First Annual Report of the Indian Mining Federation (1913), pp. 3-16.

15. C.P. Simmons, "Indigenous Enterprise in the Indian Coal Mining Industry, 1835-1939", in the Indian Economic and Social History Review, Vol. XIII, 1976, p. 196.

16. Note on the Production and Consumption of Coal (1907), Table 2, pp. 12-24.

17. L.S.S. O'Malley, Census of India, 1911, Vol. V, Bengal, Bihar and Orissa, Part 2, Table XVE, p. 350, Table XVE, p. 230.

18. Report on the Production and Consumption of Coal (1923) Table 2, pp. 21-53.

The second group of immigrants to displace the native Bengalis were the Gujaratis. At the end of the First World War several medium-sized collieries were owned by them. Similarly involvement by the Punjabis and Sindhis in the pre-1914 period began. There was also a small element of Parsi entrepreneurship in the first two decades of this century which came to an end with the depression.[19]

Though it was true that there were a large number of Indian enterpreneurs owning coal mines but the great majority of them occupied only a subordinate place in the coal industry as a whole. In the period prior to 1939, indigenous enterpreneurship was typically confined to small scale family or individual proprietorships, mining second class (i.e., high ash, low volatile) coal from very shallow depths.[20]

Table 2.1 shows the pattern of ownership of collieries in 1911 and 1921 in the two principal coal mining provinces of India. This statistics was provided by the Census of India but was limited to only two census years.

It follows from the table that all but 13 of the 155 privately owned coal mines in the Bengal Presidency were in Indian hands, and a decade later, though the total number of such collieries had more than doubled (to 325), only 15

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19. Production and Consumption of Coal (1937), Table 2, pp. 21-53.

20. Simmons, op. cit., p. 200.

Table 2.1 Pattern of Ownership of Collieries 1911-21

Province	No.	No. owned by Govt.	Collieries of which Directors are			Private persons who are	
			European or Anglo Indian	Indians	of both Races	European or Anglo Indian	Indians
Bengal							
1911*	129	-	53	6	21	7	43
1921**	202	-	65	19	18	8	65
Bihar and Orissa							
1911	199	-	80	11	5	6	99
1921	380	11	92	29	20	7	245

* Census of India, 1911, Tables V, Part II, p. 350

** Census of India, 1921, I, Part II, p. 302.

were owned by non-Indians. In contrast, the indigenous enterpreneurial presence in the company was of a small order. Only 17 of the 176 public and private coal companies recorded in the 1911 census had a board of wholly Indian directors. Though 26 companies had atleast one Indian director on their board, this does not necessarily imply that Indians controlled the activities of these companies. By 1921 only 48 of the 243 listed public and private joint stock companies were entirely Indian. An additional 38 companies had directors of both Indian and European races.

The foregoing account on the ownership of coal mines in the coal belt of Bihar and Bengal reveal that :

1. Large scale coal mining in the region was initially stimulated by the Europeans.
2. Most of the larger coal companies were in the hands of the Europeans.
3. The Indians owned the bulk of the small and indigenous collieries which had no stable standing.

2.3 GOVERNMENT POLICY TOWARDS IMPORTANT MINERAL RESOURCES

The two most important minerals from the commercial point of view were coal and iron. The policy of the British Government towards their exploitation will be outlined briefly.

2.3.1 Coal

Coal mining commenced in Bengal as early as in 1820. During the earlier decades the East India Company had found it cheaper to transport coal by ship from England around the Cape rather than to mine and use Indian coal. However, in 1808 it was pointed out by the Court of Directors that the import of coal from England for the Company's use in India incurred enormous expenses.[21] As a consequence the Bengal Government was directed to ascertain whether good quality coal was available in India or not.

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21. H.R. Ghosal, Economic Transition in the Bengal Presidency (1793-1833), 1966, p. 160.

The coal mining industry received an impetus in 1854 - the year in which the East Indian Railway reached the Raniganj coal field. The railways themselves required huge quantities of coal. The growth of the coal mining industry depended on the extension of railways in India and on the freights. The question of freights was one of the greatest handicaps for the proper extension of the Indian coal industry. The Government had fixed high railway charges which proved a deterrent to the demand of coal in regions located far from the Bengal coal fields. Places in western and southern India found it impossible to import coal from Bengal. Instead, they preferred to import welsh coal by sea which was cheaper than the domestic coal. About 70 per cent of the coal imports into India were taken up by the Bombay Presidency.[22]

However, the entire eastern India used coal produced from the Bengal coalfields. The causes helping the coal industry to expand was the growth of the factory industry and the growth of the transport network. Another factor for its growth was the change made in the conditions of the grant of mining licences and leases.

During the war period the Government requisitioned a very large supply of superior coal so that the general public had to be content with inferior supply of coal - consequently the coal prices soared high. Exports ceased but were revived

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22. D.R. Gadgil, The Industrial Evolution of India, 1971, p. 59.

later due to a very high output in the post-war period. Government embargo on coal export (except under licence) continued till January 1923. As a result demand and prices in the local market fell considerably.

Due to improper organization of coal mines, it was seen that as soon as demand for coal increased the number of small coal mines increased and vice versa. This had a deleterious effect on the proper exploitation of the country's resources. These collieries were generally ill-equipped and their object was to secure the easiest coal. In 1937 the problems of improved methods of extraction and conservation were discussed in detail by the Coal-mining Committee. The Committee found that wasteful methods of mining were followed and that the policies and attitudes of managing agents were responsible for their adoption and continuance. A major contributory cause was that the certificates issued by the Coal Grading Board referred to sections of seams which encouraged wasteful exploitation through encouraging the working of only parts of seams.[23]

The main recommendations of the Coal-mining Committee were that compulsory stowing for safety and conservation be introduced. For financing the stowing operations, the Committee recommended that a tax should be levied on all coal and coke despatched by rail and that a statutory autho-

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23. Ibid., p. 280.

rity be set-up for the administration of the cess and for control over all voluntary and compulsory stowing operations and also to exercise other measures of control over the working of mines. The Government accepted the recommendations of the Committee in relation to stowing and a Stowing Board was created in 1938. With the exception of this measure, no attention was paid by the Government during the inter-war years to the problem of conserving the coal resources.[24] Government controls imposed on the collieries during the two world wars were designed for the benefit not so much of the coal industry itself as of the railways and other essential industries that consumed coal. The chronicler of the Indian Mining Federation had complained : "Actually, the industry has throughout its long history been made to play a subservient role in the economic mechanism of the country. The Railways, the conserving industries and the Government had each their reasons to find their interest staked in the coal industry. ... Historically speaking, it is correct to say that the policy regarding coal in India has been purely instrumental, i.e., the industry has never been conceded the right to live and thrive for itself but only to eke out a career as an instrument for furtherance of interests other than its own".[25]

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24. Ibid., p. 181.

25. Indian Mining Federation, Golden Jubilee Souvenir 1913-1963 : Fifty Years of the Indian Coal Industry and the Story of the Indian Mining Federation, 1963, p. 15 (refer as Fifty years of Coal).

2.3.2 Iron

Very little attention was given to iron ore mining by Europeans until the demands of the 'age of steel' began to outrun the supplies in Europe.[26] The establishment of iron industry would have enabled the state to keep vast sums of money in circulation besides employing a large number of people who had agriculture as their only resource. Even after many years of British rule in India the iron resources of the country remained undeveloped and until the beginning of the twentieth century India had to pay about Rs. 10 crores per annum for its iron imports. Simultaneously the old race of smelters were also stripped of their traditional occupation.

At the same time the Government of India was not totally inactive in its efforts in this context. It had ordered some surveys to be carried on. In 1872 the Government of India availed of the service of Bauerman, a specialist, and deputed him to visit India. His report was received a year later in 1873, and the Government of India adopted a resolution pointing out the importance of establishing an iron industry in view of the proposed extension of the railways.

2.3.3 Minerals and Metals of Secondary Importance

Besides coal and iron, the two other minerals which were

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26. M.G. Ranade, Essays on Indian Economics, 1898, p. 160.

mined considerably in Bengal included mica and copper. India was the chief producer of mica in the world but it was exported raw. The main reason for the complete absence of mining of metalliferous minerals in the late nineteenth and early twentieth century was attributed to the absence of the modern chemical and metallurgical industries in India. Until such types of industries were established, India continued to import metals as also their related manufactures. However, in the same period striking progress was made in opening out deposits from which products were obtained which were suitable for export, or for consumption in the country by what may be called direct processes.[27] There was a significant growth in India's mineral production on the whole, but it could not cope up with the enormous needs of the country. This is further established on seeing that the total value of minerals produced locally ran far short of the total value of minerals and mineral products imported into India.

It was after the first world war that conditions favourable to the development of mineral resources of India were created. As a consequence of the demand for munition, the metallurgical and chemical industries also attained importance.[28] In Singhbhum, Bihar, the production of chromite received a sudden impetus.

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27. Material and Moral Progress and Condition in India, 1911-12, p. 265.

28. D.R. Gadgil, Op. cit., p. 274.

As mentioned earlier, mica was still exported in the form of blocks and splittings while no attempt was made to manufacture micanite. Copper, too continued to be exported in its raw form. India possessed the mineral resources, yet she could not utilize it independent of Britain. The raw ores had to be exported at low values and again imported back in manufactured form at very high values. The essential characteristic of the colonial type of economy in India was the exploitation of India's mineral and other resources solely for the use of Britain's industry. While the country was drained of valuable mineral wealth it did not get an equal return, i.e., in the form of development of mining industries in India itself.

2.4 DISTRIBUTION AND EXPLOITATION OF MINERAL RESOURCES

An attempt has been made here to trace the sequential development of the significant minerals found in the mineral belt. Though the region under consideration accounts for as many as 33 different minerals, the following description will confine itself to only those minerals which are of economic importance. These essentially include minerals, such as, coal, iron ore, manganese, bauxite, chromite, copper, limestone, mica, dolomite, kyanite, nickel etc.[29]

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29. South East Resource Region Plan, Vol. I, T & CPO, Government of India, p. 88.

The following table indicates the sequence in which the mineral resources of the region were opened up for commercial exploitation.

Table 2.2 Sequential Exploitation of Mineral Resources

S.No.	Mineral Resource	Year of Opening	Year since commercial exploitation started
1.	Coal	1774 (Raniganj)	1860's (Raniganj and Jharia)
2.	Iron	1778 (Birbhum)	1870's (Kulti)
3.	Mica	1826 (Kodarma)	1800's (Kodarma, Tisri etc.)
4.	Manganese	1901 (Balaghat)	1901 (Balaghat)
5.	Limestone	1898 (Bisra)	1900's (Bisra)
6.	Dolomite	1898 (Sambalpur)	1900's (Rourkela, Bisra)
7.	Copper	1829 (Singhbhum)	1906-08 (Singhbhum)
8.	Kyanite	1924 (Lapsa, Baru)	1934 (Ghatsila)
9.	Bauxite	1903 (Ranchi, Palamau)	1937 (Ranchi)

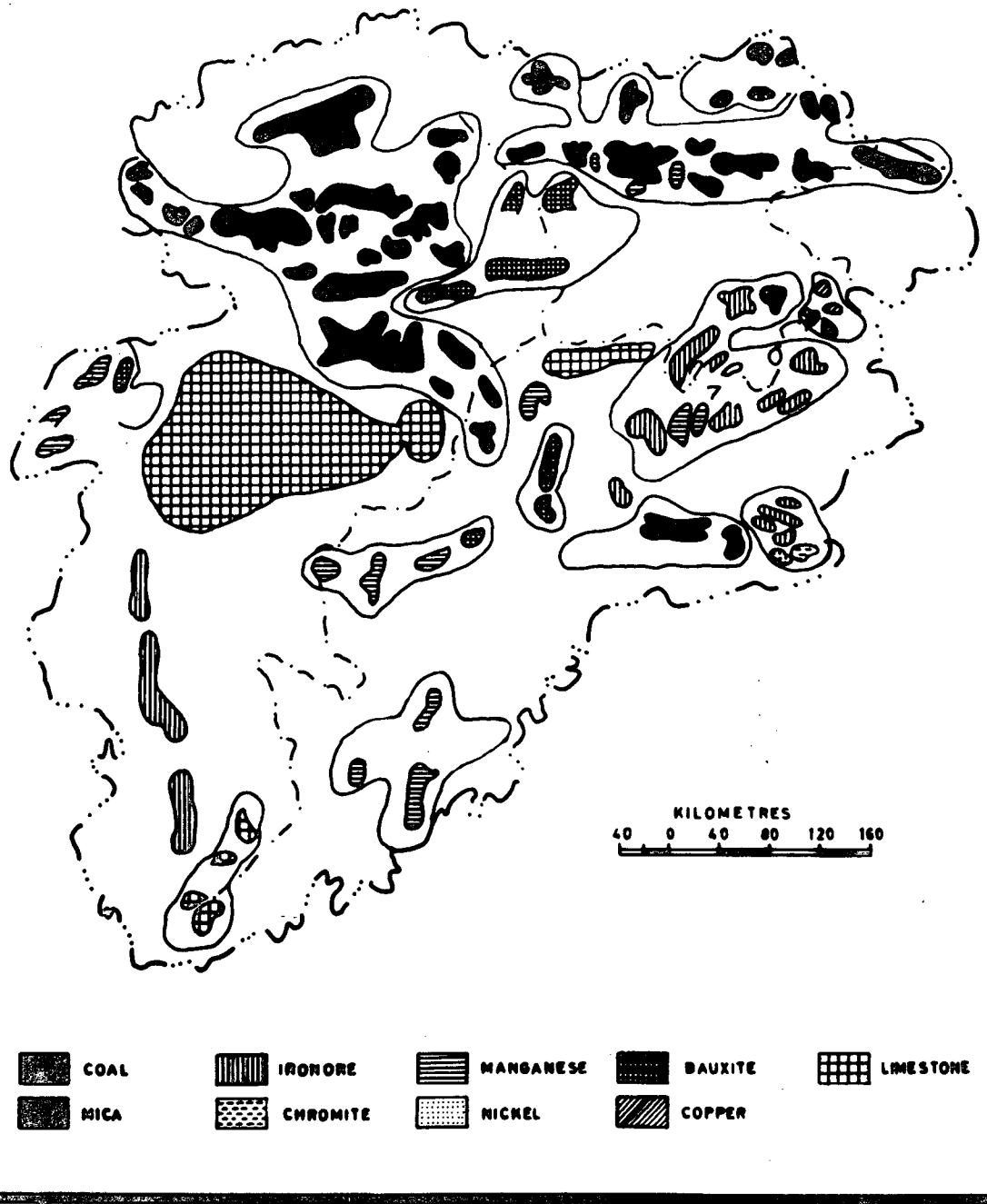

FIG.NO 2.1

CONCENTRATION OF MINERALS

2.4.1 Coal

The first recorded reference to coal-mining in India dates back to 1774[30], when the first mines were started in the Raniganj coalfields near Sitarampur. Owing to a number of reasons, one being the poor quality of coal extracted, this had ended in failures. An attempt for exploitation of coal was made fourty years later in 1814 near Egara.[31] By 1858-60 when detailed examination of the Raniganj coalfield was made by W.T. Blanford, nearly 50 collieries were working producing annually about 286,500 tonnes of coal. The coal was transported to Calcutta by boats down the Damodar river.

The railway line between Calcutta and Raniganj was completed by 1855 by the East India Railway and was extended north-westwards to Sitarampur and westwards to Barakar by 1865. This gave an impetus to coal production which reached 500,600 tonnes by 1870.[32] The Raniganj coalfield remained the most important producer of coal in the country until the Jharia coalfield finally surpassed the Raniganj coal-field in importance.

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30. Coal Resources of India, Memoirs of the Geological Survey of India, Vol. 88, Government of India, 1971, p. 28.

31. T.L. Seccombe, Statement Exhibiting the Moral and Material Progress and Condition of India - 1859-60, George Edward Eyre & Co., London, 1861, pp. 74-77.

32. E.R. Gee, Memoirs, Geological Survey of India, LXI, G.O.I, 1932, p. 278.

Though coal was known to occur in the Jharia coalfield before 1858, mining was not undertaken seriously until 1894, when the field became linked to the railway system. During 1893-94 the growth of the coal-mining industry was most remarkable. It marked the beginning of the rapid progress in mining activity which took place during the next twenty years.

Initially, the growth of the coal mining industry was determined to a large extent by consumers like the railways and others requiring coal for steam raising only. It was only in 1911, when the Tata Iron and Steel Company was established in Jamshedpur half-way between the coal fields and the iron ore, that the first step was taken towards the utilisation of the Jharia coking coals.

Another important coalfield viz., Bokaro coalfield, located 2-3 miles west of Jharia had 3 collieries under development by 1910. Its output soared up from 10,000 tons to nearly 200,000 tons per annum with the development of an approach line in 1916, through communication being finally established in 1919. In 1922 over a million tons were raised accounting for 5.46 per cent of the Indian total for that year. In 1946 it recorded its highest output (2,775,286 tons) or 9.34 per cent of the country's total.[33]

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33. J.C. Brown and A.K. Dey, Mineral Wealth of India, Oxford University Press, 1955, pp. 19-21.

2.4.2 Phases of Development of Coal Mining

The coal mining industry of the Mineral Belt experienced a series of booms and depressions. These may be roughly grouped in a few phases as follows :

The period of the most rapid expansion of the coal-mining industry is said to synchronize with that period in which the industrialisation of British India began, i.e., from the 1890s until shortly after the turn of the century.[34] The period between 1895 to about 1908 was marked by the growing excess of the exports of Indian coal over the imports and the diminishing share taken by the railways of the total produce. This showed that the coal production was increasing at a slightly more rapid rate than the consumption by the railways and the coal-consuming industries.

These features were absent in the years after 1908. The exports of coal diminished slightly. This was attributed partly to the large quantities of inferior coal sent out of India during the boom of 1908. During 1908-14 the consumption by the railways as well as the coal consuming enterprises grew at a faster speed than the production of coal.[35]

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34. H. Papendieck, "Managing Agencies", in Rothermund and D.C. Wadhwa (ed.), Zamindars, Mines and Peasant, 1978 p. 175.

35. The Quinquennial Review of the Mineral Production of India (1909-13), p. 17.

The immediate effect of the war on the coal industry was to produce a shortage in demand because of the adverse effects on industries. However, this was short-lived and the demand recovered soon. The war put a virtual stop to imports of coal and all parts of the country depended on Bengal coal.

There was a fairly rapid increase in the production of coal in India during the war and immediately after, so that by 1924 production exceeded 20 million tons. After a couple of years of stagnation production again resumed and reached about 24 million tons in 1930. There was a sharp decrease in production during the years of depression. It fell below 20 million tons in 1933 and kept below the 1930 level for all years till 1937. The period 1937-39 was marked both by a high level of exports and by greatly increased industrial activity within the country.[36] The introduction of the second world war saved the industry from the state of over-production. However, wagon shortage and labour difficulties in 1942-43 brought production down from 29.3 million tons in 1940 to 25.8 million tons in 1944. In that year government stepped in to fix prices. The conditions in the coal industry were fundamentally altered and from now on there was never a break in the continuous expansion of output.

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36. D.R. Gadgil, op. cit., p. 277.

Table 2.3 List of Coal Mines in the Mineral Belt Uptil 1948

S.No.	Name of coalfield	District	No. of Mines
1.	Bihar-Jharia	Manbhum	479
2.	Bihar-Jharia	Hazaribagh	4
3.	Bihar-Raniganj	Manbhum	107
4.	West Bengal-Raniganj	Bankura	7
5.	Bihar-Giridih	Hazaribagh	8
6.	Bihar-Bokaro	Hazaribagh	12
7.	Bihar-Karanpura	Hazaribagh	24
8.	Bihar-Ramgarh	Hazaribagh	12
9.	West Bengal	Birbhum	5
10.	West Bengal-Raniganj	Burdwan	251
11.	Bihar-Karanpura	Ranchi	17
12.	Bihar-Daltonganj	Palamau	5
13.	Bihar-Hutar	Palamau	1
14.	Orissa Hingir-Rampur	Sambalpur	2
		total	934

Source : List of Coal Mines in Indian Dominion uptil December 31, 1948, Government of India, 1950.

According to the Indian Mines Act the number of coal mines worked in Bihar, Bengal and Orissa upto 1948, numbers

934[37]. Table 2.3 shows the names of the main coalfields, the district in which they were located and the number of mines operated by each. It is obvious that more than half of the total coal mines (479) were in the Bihar-Jharia coalfield in Manbhum. Trailing far behind with 251 mines was the West Bengal-Raniganj coalfield in the Burdwan district. Third in order was the Bihar-Raniganj coalfield (Manbhum) with 107 mines.

Table 2.4 shows the production of coal in the country and the factors governing output in a summarised form.

Table 2.4 Coal Production and Factors Governing Output 1905 - 1944

Year	Tons (Million)	Factors governing output from year to year
1905	8.4	Stock exchange boom in coal shares
1908	12.4	High coal prices
1912	14.7	Market expansion due to TISCO; wagon shortage
1914	16.4	Wartime demand
1917	18.2	Wartime demand
1918	20.7	Wartime demand
1919	22.6	Increasing demand
1920	17.9	Wagon shortage; high prices

37. Based on the list of Coal Mines in Indian Dominion Uptil December 31, 1948, G.O.I, 1950, pp. 1-90.

1921	19.0	New demand due to IISCO; high prices
1922	19.0	Market expansion; high prices
1924	21.1	Increase of wagon supply
1925	20.9	Fall in prices
1930	23.8	Cost reduction by output increase
1932	20.1	Slump
1933	19.7	Slump
1936	22.6	Cost reduction by output increase
1937	25.0	Cost reduction by output increase, recovery of prices; wagon shortage
1938	28.2	Market expansion; cost reduction by output increase
1940	29.3	War demand
1942	29.4	War demand
1943	25.3	Acute shortage of wagon; labour difficulties
1944	25.8	Continuing labour shortage, wagon crisis, fixation of coal prices

Source : Fifty Years of Coal, 1963, p. 15.

2.4.3 Iron

The exact time of the commencement of iron manufacturing in India is not known. However, in Bengal its mining began with the grant by the East India Company to Messers Farquhar and Motte, in 1778, of an exclusive right to manufacture iron within the company's territories (in the Birbhum district). But in 1795 they relinquished their grant. In

1839 Messers Jessop & Co. experimented unsuccessfully with Burdwan ore. Similarly in 1875 efforts were again abandoned which had started in 1855 by Messers Mackay & Co.[38] It was estimated that during the 1860s or so iron worth Rs. 150 crores was imported into India and atleast 50 crores were paid for freight and landing charges.[39]

Table 2.5 Production of Iron Ore in the Mineral Belt 1900 - 48

Period	Bihar and Orissa	Bengal	Madhya Pradesh	Total Tonnage
1900 - 03	-	252,111	-	266,511
1904 - 08	-	383,431**	10,949	407,514
1909 - 13	1,282,392	95,274	13,058	1,455,286
1914 - 18	2,001,643	3,447*	37,379	2,149,748
1919 - 23	3,257,233		35,793	3,510,466
1924 - 28	8,025,628		72,222	8,551,913
1929 - 33	8,619,115		3,983	8,893,766
1934 - 38	12,199,389		3,212	12,492,445
1939 - 43	15,096,356		2,287	15,338,480
1944 - 48	11,629,963		2,963	11,818,552

** 286,347 tons from Bengal and 97,084 tons from districts which later became part of Bihar and Orissa.
* ceased in 1915

Source : C. Brown and A.K. Dey, Mineral Wealth of India, p. 192

38. H. Sanyal, The Indigenous Iron Industry of Birbhum, 1968, p. 104.

39. M.G. Ranade, op. cit., p. 160.

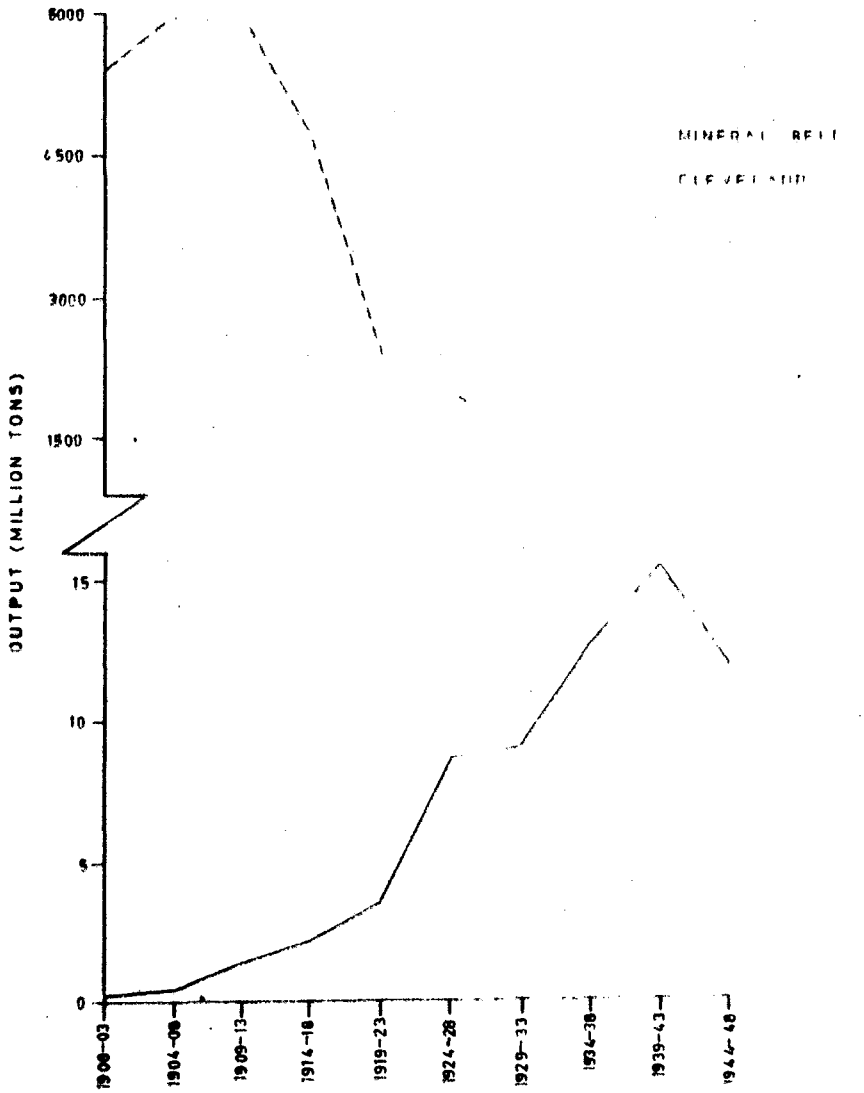

FIG. NO. 2.2	OUTPUT OF IRON ORE IN THE MINERAL BELT AND CLEVELAND DISTRICT (1900 TO 1948)

At the beginning of this century, the yearly production of iron ore in the country was about 65,000 tons on an average. During 1939-43 this average rose to more than 3,000,000 tons per annum.[40] About 98 per cent of the ore supply came from the two states of Bihar and Orissa. Table 2.5 shows their distribution over the past 48 years (1900-48) in 5 yearly periods. As far as the output in these two states is concerned, Singhbhum (Bihar), where mining started in 1904, contributed 47 per cent to the total; Mayurbhanj (Orissa), which began to produce in 1911, 42 per cent and Keonjhar in the same state, the latest comer into the list, approximately 11 per cent in 1927.

P.N. Bose (1855-1934), one of the pioneer geologists of Bengal, discovered the haematite deposits of Gurumahishani and other places in Mayurbhanj in 1904. While in 1907, R. Sambalia of Martin & Co., Calcutta found the deposits of Pansira Buru and Buda Buru in Singhbhum. Later work carried by different geologists revealed that within parts of Singhbhum, Bonai, Keonjhar and Mayurbhanj there existed one of the major iron ore fields of the world in which enormous tonnages of rich ore were readily available.[41]

In 1934, H.C. Jones estimated the minimum quantity of ore (above 60 per cent iron), then known at 2,701 million

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40. Brown and Dey, op. cit., p. 191.

41. Brown and Dey, op. cit., pp. 176-77.

tons[42], distributed as given below in the various areas - Singhbhum - 1,047 metric tons, Mayurbhanj - 18 metric tons, Keonjhar - 988 metric tons and Bonai - 648 metric tons.

A number of surveys carried out by Government and private prospectors brought to light the occurence of rich iron ore deposits in a number of places. The important sites being the Hirapur hills (Koraput district), with an estimated quantity of atleast 10 metric tons haematite, the Nalibasea hill (15 metric tons) and widely scattered deposits in Sambalpur containing 50 metric tons of ore with 55-60 per cent of iron content.

The I.I.S.C.O. Ltd. began exploiting the ores of Pansira Buru and Buda Buru (Singhbhum) since 1938. These were connected by a light line (Eastern Railway) in 1911. The Gua mines of the same concern were located near the termination of a branch line of the Eastern Railway. Ore despatches began in 1923 with the completion of this line.

The ores of Bagia Buru Range, which ran parallel to the Bara Jamda-Barbil branch of the Eastern Railway, were quarried by the United Steel Corporation of Asia Ltd. during the 1920s.

The Noamundi mine of the T.I.S.C.O. was also in Singhbhum, though its ore bodies actually extended into Keonjhar.

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42. Ibid., pp. 176-77.

It was connected to the Amda-Gua extension of the Eastern Railway, to which two aerial ropeways delivered ore to the lines at Noamundi station. The ore was discovered in 1917 independently by R. Sambolla and C.R.N. Aiyengar. Till 1910, iron ore was worked in six small mines with 641 workers and a total production of 17,646 tons in Singhbhum.[43] Singhbhum and Keonjhar together supplied about 57 per cent of all the iron ore smelted in India up to the end of 1946.

Over 12 deposits of high-grade iron ore occurred in the more accessible parts of Mayurbhanj, and three of them - Gorumahisani, Sulaipat and Badampahar were developed by the Tata Company. The Eastern Railway branch line (56 miles long) connected all of them with Jamshedpur.

In 1914-15, it was estimated by E. Curnow that the Gorumahisani hill contained 9,800,000 tons of ore, and the Sulaipat and Okarped peaks - 2,270,000 tons. According to Jones the reserves of the Badampahar range were 7 metric tons in 1928.[44] Later discoveries till 1944 showed these reserves at 44 metric tons.

The smaller mines were completely overshadowed by the above mentioned enormous deposits, and could not be mined in competition with them. Small deposits occurred on Gora

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43. P. Pandey, Impact of Industrialisation on Urban Growth, 1970, p. 63.

44. H.C. Jones, 'The Iron Ore Deposits of Bihar and Orissa', Mem Geol Surv Ind., LXII, Pt. II, 1934, pp. 183-207.

Pahar (Palamau), Sua (Daltonganj) and Sankhamur in Pallahara (Orissa).

In 1887, in the Central Provinces, P.N. Bose noted that the most extensive iron ore deposits occurred in the Dhalli-Lohara zamindari. In 1914 the region was investigated by C.M. Weld for the Tata Company. It was again Bose who noted two extensive deposits of iron ore in the Bastar district (Antagarh tehsil) at the beginning of this century. In 1938 Crookshank described the occurrences of individual deposits of the Bailadilla Range (Bastar district). It was capable of yielding atleast 610 metric tons of first class ore with over 68 per cent iron ore. The development of this ore was intended for export.[45]

2.4.4 Mica

The entire mica belt of Bihar extends for some 90 miles (within and outside the Mineral Belt) with a width of 12-16 miles. But its most productive portion in and around the Kodarma Reserved Forest (Hazaribagh district) lay within the Region. In India the exact date of commencement of mica mining is lost in the midst of antiquity. Yet it is known that the aboriginal tribes such as the Bandathis, Labanas and Mahajins had burrowed into the soft mica schists of the Kodarma field of Bihar, in search of the mineral, for centuries. Such workings were described in 1826 by Breton,

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45. A. Chatterjee, Geology, Mineralogy and Genesis of Iron Ores of Bailadilla Range, Bastar, The Quarterly Journal of Geol., Min. and Metl. Soc. of India, Vol. XXXVI, June 64, No. 2, p. 57.

in 1838 by Buchanan-Hamilton in 1851 by Sherwill and F.R. Mallet in 1874. Earlier efforts by Europeans to work the mines were unsuccessful. Indeed the first European venture in 1888 of F.F. Chrestian, the pioneer of modern mica mining in India, at Bairia, near Tisri proved a failure. But by 1894 mining was well established under his direction at Tisri, Bairia, Bhandari, Musnodi and Kodarma. By 1899 the total number of mines operating reached 169.[46] Of these 100 mines were operated by J.J. Chrestian & Co.

About 1910, modernization of mining began to take place and the Chrestian concern prospered continuously. There were a number of other companies too, in the field. In 1911, Chotanagpur accounted for 55 per cent of the country's total mica production, the former's production being 1,860.[47] After the first world war (1914-18) most of the firms, barring only two European companies (Messers Chrestian's and J. Podgers) left the mica business. The industry gradually passed into Indian hands, a process completed by world war II. There are about 600 separate mines by this period.

Earlier the mica mining industry suffered from the illicit trader but the enactment of the Bihar and Orissa Mica Act in 1932, the Mica Control Order of 1940, and the appointment of a Mica Controller with wide powers, in 1945,

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46. Ibid., p. 541.

47. P. Pandey, op. cit., p. 68.

was a step taken by authorities to curb such evils.

2.4.5 Manganese

The Indian manganese industry dates back to 1891. But in the Mineral Belt the first manganese was worked in 1901 on the great Balaghat ore body.[48] In 1904 development commenced to the south of Chaibasa, Singhbhum which was then in Bengal but is now in Bihar. All the deposits in southern Singhbhum were small, rarely containing 10,000 tons.

In Madhya Pradesh, only the Balaghat manganese ore can be included in this study. Balaghat lies on the northern-eastern extreme of the belt of the Madhya Pradesh ores. The entire belt consisted of 200 individual deposits, but only 20 proved to be most consistent and the largest producers. Out of these, 10 were located in Balaghat district.

The important deposits of Orissa lay in Gangpur (Sundergarh district), Kalahandi, Koraput, Ganjam, Bonai and Keonjhar districts. In Sundergarh the chief deposit was at Ghoriajor which yielded 309,986 tons of ore during the years 1908-23.[49]

2.4.6 Limestone

Orissa supplied most of the country's requirement of limestone. From 1898 till about 1922, Bisra on the Bengal-

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48. J.A. Dunn, Manganese Ores, Economic Geology, No. 20, Govt. of India, p. 32.

49. Dunn, op. cit., p. 41.

Nagpur Railway was the most important lime making centre in the country. The reserves of limestone were very large, and in the Birmitrapur area itself, Dr. H.S. Krishnan, in 1937, estimated that twenty-seven and a half million tons of first grade rock, fit for metallurgical purposes, and 68.75 million tons of second quality, suitable for lime-making were available.[50] The leading producers were the Bisra Stone Lime Co. Ltd. at Birmitrapur, whose quarries were equipped to handle 2,500 tons daily. The great bulk of the output was railed to Jamshedpur and other iron and steel industries, to be used as flux. The long belt of limestone at Lanjiberna near Rajgangpur was quarried for Portland Cement manufacture. Outside the Gangpur area limestone of Cuddapah age were known at numerous places in the Sambalpur district, though not of the best quality. However, in Koraput district there were deposits of better grade material of the same geological age, near the Sabarai river, about three miles west of Kottamatta.

In the section of the Mineral Belt which falls in Bihar discontinuous bands of crystalline limestone of Archean age were to be found from west of Panchet Hill in Manbhum to south-west of Daltonganj in Palamau. The bands to the west of Ramgarh, in Hazaribagh often contained abundant stone suitable for cement manufacture. These were quarried for lime burning in the Bandu-Basaria area of Hazaribagh and

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50. C. Brown and A.K. Dey, op. cit., p. 327.

about Dundu Bay in Ranchi, and for cement manufacture at Khalari, in Palamau. In Singhbhum quarrying began in the limestone zone near Chaibasa in 1947, by the Associated Cement Co. Ltd. and was traceable for about 30 miles from Chaibasa to Jagannathpur. The limestone of Gondwana age occurring near Baghmara in Manbhum, though used long ago as flux at the Kulti iron works were of little economic importance by the 1940's.

Limestones of Cuddapah age were of significance in the eastern districts of Madhya Pradesh. They had been traced as discontinuous outcrops for a distance of 80 miles, between Barondha and Sukhri in the Raipur-Durg region. The stone also occurred in Bilaspur between Darrabhata, on the western bank of the Hasdo river, and Akalatara, where they were extensively quarried. Very large quantities were available, the Mohtara locality alone having some 10 million tons of good flux-stone. The quarries of the T.I.S.C.O. which supplied limestone for the Jamshedpur works since 1919 were at Baraduar.

2.4.7 Dolomite

The best known Indian occurrence of dolomite were found in the Birmitrapur stage, in the Gangpur anticlirorium of Orissa, where they extended from about Sukra in the east for a distance of over 60 miles, across the Ib river into Sambalpur. Both dolomite and limestone had been extracted from this stage since 1898, when exploitation started around

Rourkela and Bisra. The T.I.S.C.O. had been acquiring its requirements from the quarries at Amghat, but since 1918 utilised the Panposh flux. At Birmitrapur the Bisra Stone Lime Company Limited supplied dolomite and limestone to all the Indian iron and steel centres since 1922. At this site alone, Dr. M.S. Krishnan had calculated that 252 million tons of dolomite were available of which 84 million tons were of high grade. Between 1912 (when statistics commenced) and 1933 over two and a half million tons of dolomite were mined - the peak year being 1925. From 1929, however, production decreased due to the replacement of dolomite by limestone as a flux in iron ore smelting by the Tata Works.

A number of occurrences were in Gangpur. One near Kukurbhuka, Khatkurbahal, Amghat, Beldih and Lanjiberna (associated with limestones). Other quarries occurred near Patrapali, Purnapani, Lifripara, Surgura. Dolomite was known to exist in the Sambalpur district and Koraput district too.

The known dolomite resources of Bihar were meagre. Dolomite limestones occurred at Putada near Chaibasa in Singhbhum and in various places in the Palamau district. In Madhya Pradesh extensive beds of flux were known to occur to the north and east of Kodwa, in the Durg district where it had been inferred by P.R. Chatterjee that 25,000 metric tons existed.[51] At Baraduar and other locations near

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51. Ibid., p. 339.

Akaltara and Jairamnagar, in the Bilaspur district dolomite were quarried for use in the iron and steel industries.

2.4.8 Copper

There are evidences of copper being smelted in India in pre-historic times which might have supplied the needs of the country for many later centuries. In the Singhbhum district of Bihar, copper bearing belt is delineated by many ancient workings. It stretches for some 80 miles in length, commencing at Duarparam, on the Bamini river, in the Kora Estate and strikes in an easterly direction through Kharsawan and Seraikela in Dhalbhum, thereafter it reverses to south-east through Rakha Mines and Mosabani culminating to the south east at Baharagora.

The first allusion to the copper ores of Singhbhum appeared in a paper by W. Jones dated 1829, but it was not until 1854, when J.C. Haughton described the old workings at Kharsawan in the Journal of the Asiatic Society of Bengal that their existence was definitely confirmed.[52] In 1857 the first Singhbhum copper company was formed. There were repeated closures of this and of several other copper companies which came up later. It was only in 1903 that Sir Thomas Holland visited the copper belt and, impressed by its potentialities, arranged for a comprehensive survey.

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52. J.A. Dunn, "Mineral Deposits of Eastern Singhbhum and Surrounding Areas", Memoirs of the G.S.I., Vol. LXIX, Part I, 1937, G.O.I., p. 60.

During 1906-08 the Geological Survey of India made systematic investigations in the copper belt and established a base for its modern industrial development.

The Cape Copper Company bought the Rakha mines in 1908 and began production in 1914.[53] Smelting started in 1918 but five years later work stopped owing to financial problems. In 1924 the Indian Copper Corporation (I.C.C) of today came into existence. The ore was conveyed by an aerial ropeway for a distance of about 6 miles to Maubhandar, near Ghatsila, where the concentration plant smelter, refinery and rolling mills of the Corporation were situated.

The extensive old workings at Baragunda, Hazaribagh district were explored in the nineteenth century. In 1888, the Bengal Baragunda Copper Company produced 218 tons of refined metal there, but in 1942, J.A. Dunn considered the reserve to be too small and of a very low quality to be reopened.

The Singhbhum copper belt has been the major source of copper in the country since historic times. It is placed strategically between the coalfields and iron ore deposits and is the most important mineralized belt in India.[54]

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53. Brown and Dey, op. cit., p. 148.

54. P.R. Sengupta, "Studies on Mineralization in the South-Eastern Part of the Singhbhum Copper Belt", Memoirs of the G.S.I., Vol. 101, G.O.I., 1972.

2.4.9 Kyanite

The kyanite deposit of Lapsa Buru was the largest of its kind in the world and had been responsible for much the greater part of India's total production. Operations commenced in Lapsa Buru in 1924. It is situated in Kharsawan in Bihar where the Indian Copper Corporation Limited had several quarries.

Kyanite was known to stretch for about 80 miles in length following the northern side of the Singhbhum copper belt. In Singhbhum the mineral was extracted near Ghatsila by Eastern Minerals Ltd. whose operations started in 1934, and at Kanya-luka by E.O. Murray since 1934. Quarries existed at Bekra, Badia, Uperbanda, Mohanpur, Uparsoli and other sites. In Manbhum, small deposits were known, extending for seven miles in a narrow zone from Ichadih to Salbani. Some small occurr-ences were also known to exist in Dhenkanal, Borai and else-where in Orissa.

2.4.10 Bauxite

In the Mineral Belt bauxites were found in Bihar laterites in 1903 by H and T.J. Warth. The deposits of bauxites in the Ranchi-Palamau region occurred in numerous highly dissected hillocks forming conspicuous scarps. The Indian Aluminium Company was established in 1937 but actual production commen-ced from 1943. The company carried out geological prospecting in the western part of Ranchi district.[55] But in Balaghat

55. Pandey, op. cit., p. 74.

bauxite mining had commenced earlier in 1901. It was however closed down in 1932. Later mining began in Singhbhum, Keonjhar and Bonai where the average annual production between the period 1929-33 was on the increase by some 2.8 per cent as compared with the 1923-28 period.

However, large scale and continuous quarrying for bauxite started much later in 1946 in Bihar. During 1934-43, Madhya Pradesh contributed about 94 per cent of the nation's output. Between 1944-48 the percentage from Madhya Pradesh had dropped to 65.5 and Bihar entered the list of producers with 21 per cent.

2.5 TRENDS IN MINING - 1859-1947

Having seen briefly the history of mining in the Mineral Belt it becomes necessary to review the general trend during the British rule in India, i.e., about the period 1857 to 1947.

The first mine in India was worked in 1830, but in the beginning the development of the industry was rather slow. It was only after the 1850s that the coal mining industry was firmly established. However, inspection by the Government of a truly formal type began only in 1894. And this too was the result of the deliberations of the international conference held at Berlin in 1890.[56] In 1901, for the

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56. P.S. Lokanathan, Industrial Welfare in India, University of Madras, 1929, p. 67.

first time a Mines Act was passed, though it was not very comprehensive. This Act was replaced by another Act in 1923. Another notable thing for the Indian coal industry was the formation of the Indian Mining Association in 1892.

An important feature about the process of exploitation of the mineral resources in India before 1910 was that remarkable progress was made in the few preceeding years in opening out deposits from which products were obtained suitable for export, or for consumption in the country by what may be called direct processes. On the other hand, very little was done to develop those minerals that are associated with the more complicated chemical and metallurgical industries. A country like India had to be satisfied in paying the tax of imports until industries came up which would demand a sufficient number of chemical products to complete an economic cycle. The country therefore imported large quantities of metals and mineral products though she did have many of the mineral resources required to supply the demands in question.

The following conclusions emerge from the foregoing analysis :

1. Since the basic objectives of the British Government was to exploit indigenous raw materials for Britain's industrial use and to expand the Indian market for goods manufactured in Britain, their commercial policy was framed to achieve the aforesaid objectives. The commercial exploitation of

minerals in the Region began as late as in the latter half of the nineteenth century when Britain's industries needed India's minerals. The regulations laid down by the Government for the grant of licences for exploitation and prospecting of mineral resources were designed in a manner which encouraged British subjects to carry on mining while deterring the Indians to do the same.

2. The ownership of coal mines in the Mineral Belt shows that the Europeans not only stimulated large scale coal mining intitially, but also owned and controlled the larger coal companies. Whereas the bulk of the small and indigenous collieries (which were temporary in nature) were owned by the Indians.

3. Coal was the first of the minerals to be exploited and eventually it became the most important mining industry. It was however not exploited systematically. Coal mining was developed mainly for the benefit of the railways. Iron mining too, did not receive any impetus for development until the beginning of the present century when industries in Britain called for larger quantities for their use.

4. There was an absence of mining of metalliferous minerals which were associated with chemical and metallurgical industries. This was obvious because no such industries were developed in the country. Only minerals required

by Britain's industries were extracted to a large extent. Mica and copper provide good examples of raw materials being exported in absence of industries in India.

5. However, the overall production of minerals show an encouraging trend towards the latter part of the period under study because industries which utilized them began to be established in India during this period.

Chapter 3

PATTERN OF FOREIGN TRADE

Introduction

3.1 Volume and Trend of Imports

3.2 Volume and Trend of Exports

3.3 Volume and Trend of Millwork and Machinery

3.4 Volume and Trend of Trade in Metals and Ores in Their Various Forms

3.5 Trend of the Total Imports and Exports

3.6 Balance of Trade

Conclusion

Chapter 3

PATTERN OF FOREIGN TRADE

During the nineteenth century a few advanced countries had emerged which had developed industrially, and which provided the rest of the world with manufactures in exchange for such raw materials as their native soil did not produce. Britain was one of the foremost amongst these countries and had acquired full control over the raw material base of India, a colony which had proved to be the "brightest jewel" in the imperial crown.[1]

In the following pages we shall attempt to analyse the structure and composition of the imports and exports of metals, ores, millwork and machinery that was taking place between India and the metropolitan powers during the period under investigation. Within the framework of the mineral enclave which we have outlined earlier, three hypotheses may be forwarded about this pattern of trade :

1. The exploitation of minerals in the enclave economy was not for local consumption but was geared to exports.
2. The minerals and ores were exported in the raw form so that primary and secondary processing industries could not develop locally.

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1. Raw Materials and Colonies, Information Department Papers, No. 18, p. 6.

3. Imports into the enclaves included a significant proportion of those manufactured and semi-processed goods which were based on the mineral resources that were being exported out of the Mineral Belt and which could have been produced locally.

In order to substantiate the hypotheses proposed about the unhealthy structure of India's foreign trade, the Indian trade in metals and ores have been broadly divided into three groups : ores, semi-processed and manufactured.[2] The present analysis of foreign trade is based on the data obtained from the Annual Statement of the Sea-Borne Trade of British India, available for the period 1888 to 1947. All the exports and imports accounted for, are from the Port of Calcutta, since it was the main outlet for the Mineral Belt.

It would be appropriate here to briefly discuss how the trade data used for this study has been composited and analysed. The number of principal and other articles (ores and metals) mentioned in the import list comes to about 88, and on the export list to about 30. Under the head of millwork and machinery about 54 items were imported. Its export, however, was almost negligible.[3] It may be noted that

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2. Ores are referred to mineral aggregates in their solid, natural form. The semi-processed form of an ore is the form it attains after preliminary processing. The semi-processed form becomes the raw material for a further processing that turns it into manufactured form fit for use by consumers.

3. Whatever little that was exported was from 1924-25 onwards.

prior to 1916-17, data was provided only in terms of the value of imports and exports. Thenceforth it was given both in terms of value and quantity.[4] From this value per unit could be gauged which had proved helpful in finding out the trend of the prices over the years.[5]

3.1 VOLUME AND TREND OF IMPORTS

Table 3.1 gives the position of the principal ores and metals in India's imports and indicates the changes in their absolute value and in their percentage share in the total value. The table shows that four metals, viz., iron, steel, copper and tin constituted almost the entire imports upto 1912-13.[6] Of these iron ore alone accounted for about half of the total imports in value. While the share of iron in the total value of metals imported was on the decline in general, its absolute value registered a constant increase from about £. 10 million in 1888-89 to £. 23 million in 1908-09.

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4. The value of imports and exports has been given in terms of rupees from 1924-25 onwards. For the earlier years it was in sterling figures which have been converted at various rupees rates.

5. The figures have been taken for the period 1888-89 to 1944-45, at intervals of four years. The fifteen points of time taken during a period of fifty six years is a good representation for the entire period. Data prior to 1888 has not been available.

6. The data upto 1912-13 provides the value of imports under the head of metals - wherein six metals are included. These are not sub-divided further into wrought and unwrought. However, the total figures for these two categories are given.

Table 3.1 The Shares of Principal Metals & Ores in the Total Value of Imports 1888-89 to 1944-45

Imports in	Iron		Steel		Copper		Tin		Iron or Steel Products		Brass	
	A	B	A	B	A	B	A	B	A	B	A	B
1888 - 89	10.10	55.63	1.03	5.70	3.30	18.06	1.32	7.33	-	-	-	-
1892 - 93	11.59	50.99	1.53	6.74	4.94	21.72	1.70	7.43	-	-	-	-
1896 - 97	16.44	55.05	4.75	15.90	4.72	15.81	1.30	4.34	-	-	-	-
1900 - 01	17.44	50.51	7.50	21.71	4.16	12.04	-	3.37	-	-	-	-
1904 - 05	19.60	42.97	11.96	26.27	7.69	16.85	2.19	4.81	-	-	-	-
1908 - 09	23.32	40.76	18.64	32.57	8.65	15.11	2.50	4.37	-	-	-	-
1912 - 13	2.35	3.05	7.76	10.08	8.33	10.82	3.12	4.05	50.41	65.49	-	-
1916 - 17	3.90	8.71	3.31	7.40	1.54	3.44	1.94	4.34	28.38	63.42	1.88	4.21
1920 - 21	3.38	2.27	29.27	17.63	5.84	3.52	3.78	2.28	105.75	63.71	11.14	6.71
1924 - 25	0.83	0.85	10.35	10.66	3.90	4.02	5.45	5.60	60.31	62.07	8.87	9.13
1928 - 29	-	-	-	-	-	-	-	-	-	-	-	-
1932 - 33	0.54	1.79	2.67	8.80	2.60	8.54	2.78	9.15	13.14	43.22	2.99	9.83
1936 - 37	0.09	0.23	3.56	9.21	3.36	8.68	4.15	10.72	17.96	46.38	1.69	4.36
1940 - 41	0.10	0.14	2.65	3.92	8.33	12.32	6.83	10.10	27.70	40.97	1.73	2.56
1944 - 45	0.04	0.07	7.42	15.02	15.63	31.63	0.12	0.01	19.31	39.09	0.44	0.90

A - Value in (million) rupees, B - %age to total value

Table 3.1 cont'd.

Imports in	Zinc		Lead		Aluminium		Others		Total	
	A	B	A	B	A	B	A	B	A	B
1888 - 89	0.35	1.94	1.29	7.15	-	-	0.75	4.19	18.14	100.0
1892 - 93	4.43	1.28	5.63	5.63	-	-	0.69	3.06	22.73	100.0
1896 - 97	0.44	1.48	1.33	4.45	-	-	0.88	2.97	29.87	100.0
1900 - 01	0.73	2.11	1.66	4.81	-	-	1.92	5.55	34.53	100.0
1904 - 05	0.89	1.95	1.50	3.30	-	-	1.82	3.85	45.65	100.0
1908 - 09	0.79	1.39	2.45	2.53	-	-	1.86	3.27	57.21	100.0
1912 - 13	1.46	1.90	1.25	1.62	-	-	2.30	2.98	76.98	100.0
1916 - 17	0.82	1.83	2.10	4.78	-	-	0.87	1.95	44.74	100.0
1920 - 21	1.32	0.80	1.41	0.85	2.16	1.30	1.56	0.98	166.01	100.0
1924 - 25	1.60	1.64	0.97	1.08	3.25	3.35	1.64	1.59	97.17	100.0
1928 - 29	-	-	-	-	-	-	-	-	-	-
1932 - 33	3.10	10.17	0.14	0.46	1.29	4.24	1.15	3.35	30.40	100.0
1936 - 37	4.42	11.41	0.16	0.42	2.01	5.20	1.32	4.35	38.72	100.0
1940 - 41	8.65	4.74	7.01	7.01	2.50	3.70	4.38	6.48	67.61	100.0
1944 - 45	2.12	0.24	0.24	0.49	1.42	2.88	3.86	7.79	49.43	100.0

Copper was the second principal metal after iron, to be imported. It occupied this position till 1892-93. Similarly the third metal in order of importance in terms of value of imports was tin, and remained so till 1892-93. It may be noted that tin figured again in the third place, forty-eight years later, i.e., in 1940-41.

During the period 1896-97 and 1924-25, and again in 1944-45, steel ranked second in the total value of imported metals. The import of steel showed a steady increase upto 1908-09, as shown in fig. 3.1. After this period the share of steel in the total value of imports declined. The most obvious reason for this appears to be the manufacture of steel by the Tata Iron and Steel Company (at Jamshedpur) from 1911 onwards. But after the first world war, in 1920-21, there was a tremendous increase (of Rs. 26 million) in the value of steel imported. During the war, TISCO had earned substantial profits. But in the 1920s the problem of finance became acute. During the war prices of machinery and equipment had soared high and shipments of machinery were at times lost at sea. To make matters worse the price of steel imports fell from 1921 onwards and cheap continental steel flooded the Indian market.[7] At a later period the share of U.K. steel in the Indian market decreased being displaced by steel from Belgium, Germany and the U.S.

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7. S.K. Sen, House of Tata, 1975, p. 44.

Table 3.1 further shows that from 1920-21 to 1936-37 sheets and plates (made from iron and steel) ranked first in the value of imports.[8] This accounted for 28 per cent of the total value of imports in 1920-21 and 39 per cent in 1924-25. After this year, the share of sheets and plates continued to decrease so that in 1944-45, it was as low as 5.7 per cent.

Brass entered into prominence at two points - 1920-21 and 1924-25. It occupied the third place in the total value of imports of principal ores and metals. It was mostly wrought brass that was imported and this included brass rods, sheets, tubes and wire. Import of unwrought brass was in a very small quantity.

Another important item which gained a second position in the list of imports in 1932-33 and 1936-37 was zinc or spelter. In 1932-33 it accounted for 10 per cent of the total value of imports of metals and ores from the chief port of Calcutta. Almost all the zinc imported was in an unwrought form. In 1940-41 zinc accounted for the highest share in the value of imported metals and ores, i.e., 12.8 per cent. The share of zinc in the total imports showed a very gradual increase every four years, but in absolute value it had nearly doubled. In 1936-37, the value of zinc imported

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8. Sheets and plates included galvanised, non-galvanised sheets and plates, corrugated and plain sheets and tin plates.

was about Rs. 4 million, and this doubled to Rs. 8 million in 1940-41. Zinc was of basic importance among non-ferrous metals because a large part of it was used in the manufacture of galvanised iron. It may be noted that during these two years, galvanised iron products showed a marked decline in imports as compared to earlier years. It appears that increased quantities of zinc imports were utilised in galvanising iron at home - thus bringing down the imports of the latter item.

The import of copper showed a phenomenal increase in 1944-45, accounting for about 32 per cent of the total value of imports of metals and ores. In 1940-41 its share was about 12 per cent. The figures showing imports of copper indicated that most of the imports were in the wrought form. (In 1944-45 no unwrought copper was imported). Among wrought copper products, the highest quantity and value of import was that of copper rods. Other items included copper sheets and tubes.

It has been noted that on the import side there were seven principal items, viz., iron, steel, sheets and plates, tin, copper, brass and zinc. From 1888-89 to 1912-13, four metals - iron, steel, copper and tin constituted 80% - 85% of the total value of imports of metals. The trend (in terms of value) in their imports can be seen in fig. 3.1. Beyond this period, six metals and ores constituted not more than 60 per cent of the total value of imports. This shows that

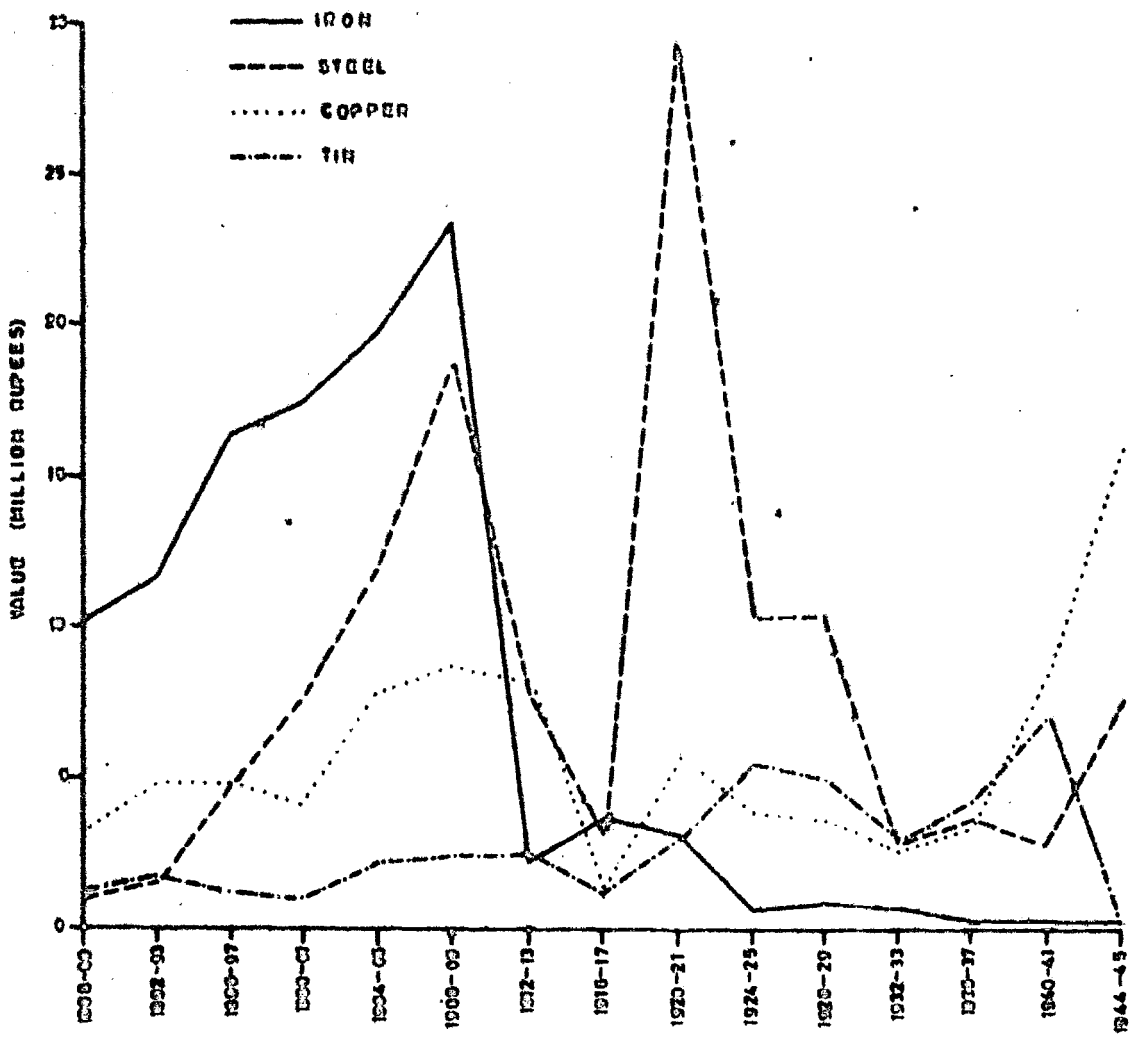

FIG. NO. 3.1

VALUE OF IMPORTS OF PRINCIPAL ORES AND METALS (1888-89 TO 1944-45)

a larger variety of articles were being imported, though in small quantities. Some of these metals included aluminium, lead and antifriction metal. (see Appendix 3)

3.2 VOLUME AND TREND OF EXPORTS

On the export side the picture was quite different. As shown in Table 3.2 and fig. 3.2 the only item of export from 1888-89 to 1912-13 was coal. The quantity of exports was not given. There was an almost continuous rise in the value of coal exports. In 1888-89 the value of coal exported from Bengal was Rs. 0.15 million. There was a hike in exports in 1896-97 when this value rose to Rs. 1.4 million. It further rose four-fold to Rs. 5.9 million four years later. In 1912-13 this value went up to Rs. 8.8. million. The balance of trade in coal was always in favour of India (i.e., the trade from Calcutta port). The import of coal to Calcutta port was negligible in comparison to its exports. Bengal Coal was exported to 28 foreign ports. Some of these included Aden, Ceylon, Fiji, Hamburg, Hong Kong, Singapore and the U.K.[9]

From 1916-17 onwards there were three other principal export items, besides coal. These were manganese ore, pig iron and mica. Manganese ore ranked first in the total value of exports in 1916-17 and 1920-21. It accounted for about 47 per cent and 58 per cent respectively in the total value

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9. G.A. Stonier, Report of the Chief Inspector of Mines in India - 1901, Table No. 17, 1902.

Table 3.2 The Share of Principal Metals and Ores in the Total Value of Exports 1888-89 to 1944-45

Exports in	Coal		Manganese Ore		Pig Iron		Mica		Others		Total	
	A	B	A	B	A	B	A	B	A	B	A	B
1888 - 89	0.15	100.0	-	-	-	-	-	-	-	-	-	-
1892 - 93	0.16	100.0	-	-	-	-	-	-	-	-	0.15	100.0
1896 - 97	1.37	100.0	-	-	-	-	-	-	-	-	0.16	100.0
1900 - 01	5.92	100.0	-	-	-	-	-	-	-	-	1.37	100.0
1904 - 05	4.63	100.0	-	-	+	-	-	-	-	-	5.92	100.0
1908 - 09	5.05	100.0	-	-	-	-	-	-	-	-	4.63	100.0
1912 - 13	8.83	100.0	-	-	-	-	-	-	-	-	8.83	100.0
1916 - 17	-	-	5.58	34.02	5.66	32.59	4.46	27.20	0.71	6.16	15.70	100.0
1920 - 21	-	-	9.39	37.30	5.63	22.41	9.91	35.98	0.22	4.58	24.93	100.0
1924 - 25	-	-	9.46	27.29	21.60	50.43	8.89	20.58	1.25	1.70	39.95	100.0
1928 - 29	7.18	13.97	11.58	22.53	21.13	4.10	7.42	14.44	4.10	7.96	47.31	100.0
1932 - 33	4.37	22.77	-	-	7.43	38.73	2.60	13.57	4.78	24.93	14.40	100.0
1936 - 37	9.44	24.19	4.39	11.25	12.90	33.07	8.28	21.22	4.00	10.27	35.01	100.0
1940 - 41	18.40	22.84	3.40	4.22	26.25	32.58	13.37	16.60	19.16	23.75	61.42	100.0
1944 - 45	1.41	8.94	0.12	1.28	7.87	49.97	4.87	30.93	4.87	8.88	14.27	100.0

A - Value in (million) rupees, B - %age to total value

of metals and ores exported. Manganese ore was exported largely due to the absence of a large number of steel industries. Coal, however, gained a prominent place in exports again after 1932-33. (see Appendix 4)

Pig iron occupied the highest share in the total value of exports from 1924-25 onwards. In that year it accounted for about 67 per cent of the total value of exports of ores and metals from the Calcutta port. Japan was the principal customer of pig iron since the market for pig iron in India was small.[10] Table 3.2 shows the share of pig iron and other items in the total value of exports. The table also shows the value of each export. Though the percentage share of pig iron was highest in almost every year, it kept on varying from about 22 per cent in 1920-21 to about 50 per cent in 1924-25 and 1944-45.[11] In 1940-41 pig iron accounted for 33 per cent of the total value of exports which was lower than the value in 1944-45 by 17%. However, the absolute value of pig iron exports in 1940-41 was much higher (Rs. 26 million) than in 1944-45 (Rs. 8 million). This shows that in 1944-45 the quantity of exports has declined very much (from 5.2 lakhs tons in 1940-41 to 1.6 lakhs tons in 1944-45). The second world war provides the obvious reason. The decline

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10. S.K. Sen, op. cit., p. 46.

11. It should be noted that the price per unit of pig iron increased three fold since 1920-21 in 1944-45.

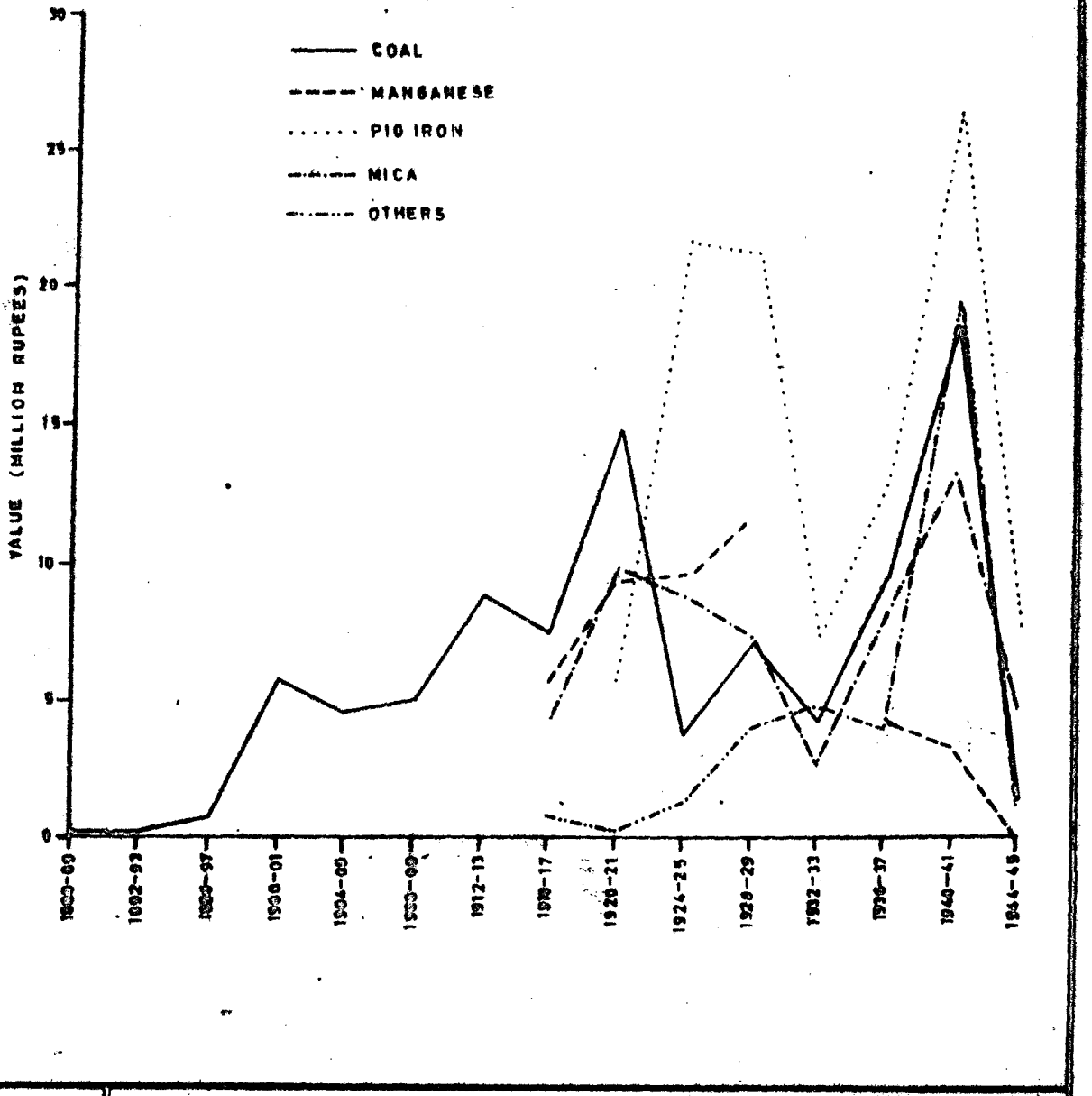

FIG. NO. 3.2

VALUE OF EXPORTS OF PRINCIPAL ORES AND METALS (1888-89 TO 1944-45)

in exports may be explained by the decline or loss of India's important overseas markets and also by an increase in consumption within the country.

Another significant item of export from 1916-17 to 1944-45 was mica. There was, however, a fluctuating trend in the share of mica export, the lowest share (13.57 per cent) being recorded in 1932-33 and the highest (35.98 per cent) in 1920-21. But the value of mica exports in 1932-33 was three times that in 1920-21. Mica fittings rather than blocks formed the bulk of the mica exports. In 1940-41 and 1944-45 scrap mica was also exported. The mica market in India was often termed a Buyer's Market. Inspite of India (or rather the region under our study) being the premier producer in the world, her international trade was largely dictated by her principal customers, viz., the U.S.A., the U.S.S.R., England and Japan. Its trade was subject to vast fluctuations resulting in retrenchment of labour in times of depression.[12]

3.3 VOLUME AND TREND OF MILLWORK AND MACHINERY TRADE

The imports of machinery were of great significance to India from the standpoint of the changing character of her economic structure.[13] There were 54 items which were imported.

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12. P. Pandey, op. cit., 1970, p. 70.

13. S.A. Palekar, Trade of India, 1944, p. 164.

The export of millwork and machinery on the other hand was almost negligible. It began being exported only from 1924-25. Whereas its imports had started much earlier, i.e., from 1916-17.

Table 3.3 Share of Principal Machineries in the Total Value of Imports 1916-17 to 1944-45

Type of Machinery	1944-45	1940-41	1936-37	1932-33	1928-29	1924-25	1920-21	1916-17
Electrical	16.0	12.4	12.9	8.1	7.7	9.7	12.7	8.3
Boilers	6.8	3.1	9.2	4.1	9.8	7.4	7.6	1.2
Mining	7.7	1.1	0.4	0.7	1.0	1.7	1.0	0.6
Jute	7.0	11.2	13.0	9.4	18.7	21.1	25.1	43.7

Table 3.3 shows the imports of those mill and machineries which had a fairly significant share in the value of total imports. These included electrical machinery[14], boilers, mining machinery and jute machinery. While electrical and mining machinery showed a constant increase in their share in total imports, jute machinery registered a drastic decline (from 44 per cent in 1916-17 to 7 per cent in 1944-45). The share of boilers in the total imports showed no constant trend. The trend in their imports is shown graphically (figure 3.3). This is a clear indication of the growing

14. Electrical machinery includes control and switchgear, generators, motors, transformers, turbo-generating sets and others.

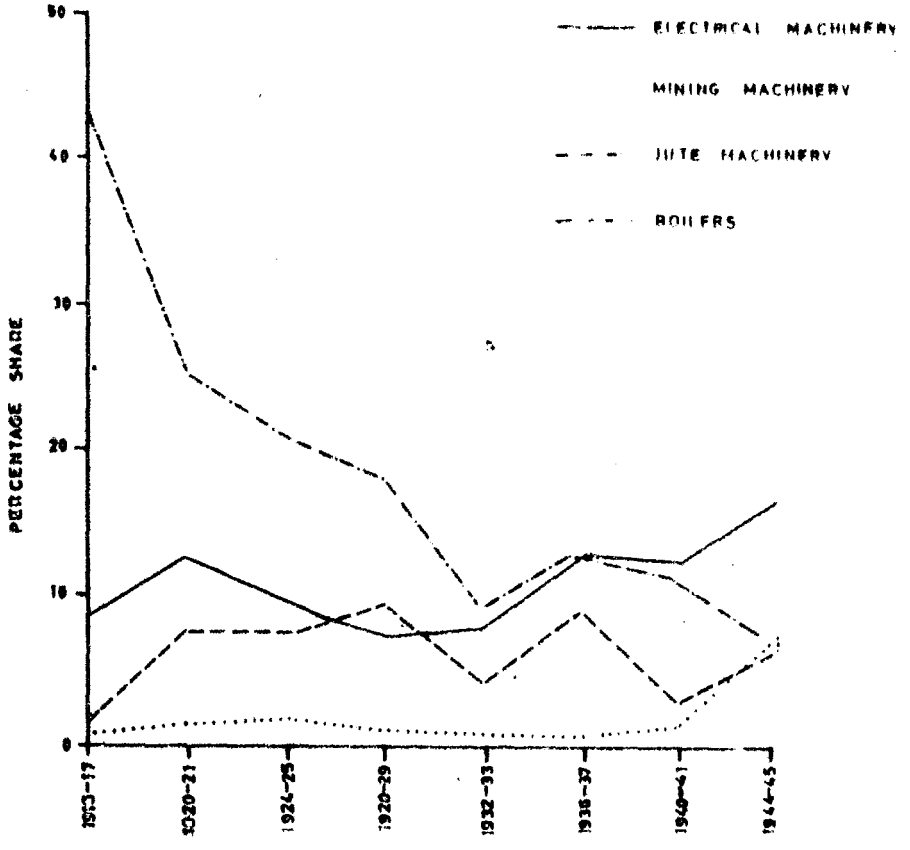

FIG.NO. 3.3

SHARE OF SELECTED MACHINERIES IN THE TOTAL VALUE OF MILL AND MACHINERY IMPORT (1916-17 TO 1944-45)

importance of these industries within the region.

Some other imports of millwork and machinery included prime movers, agricultural machinery, boot and shoe manufacturing machinery, leather tanning and curing machinery, machinery for oil crushing and refining, flour mill, rice mill, cotton mill, typewriters and their parts and other accessories. (see Appendix 5)

Table 3.4 Total Value of Imports of Millwork and Machinery 1888-89 to 1944-45

Year	Value ('000 B.)
1888-89	9.0
1892-93	8.8
1896-97	18.8
1900-01	10.7
1904-05	21.9
1908-09	31.2
1912-13	22.2
1916-17	1.6
1920-21	10.4
1924-25	44.0
1928-29	69.3
1932-33	38.1
1936-37	56.0
1940-41	53.8
1944-45	78.8

The total value of imports of millwork and machinery shows no particular trend. This is confirmed on seeing Table 3.4 and fig. 3.4. The value of imports varies from Rs. 2 million in 1916-17 to Rs. 79 million in 1944-45.

What follows from the above description is that the import of prime movers, boilers etc. were due to the absence of engineering industries in India. The lack of familiarity with the use of machinery among the people generally accounted for the fact that, though India's largest industry was agriculture, the demand for agricultural machinery was limited to the products of a few small local manufacturers, supplemented by imports valued rather low.[15]

At the turn of the century when the industrial revolution was in full sway in the west, India could not even make nails or screws nor could she manufacture some of the essential parts of the electrical machinery. India relied on foreign supplies for iron chains, steel springs, and for wire ropes, a vital necessity of her mining industry. There were shops for making small pumps, sugar mills and a variety of odds and ends but the basis of their manufacture did not enable them to compete with imported goods of similar character to the extent of excluding the latter.[16]

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15. Indian Industrial Commission, Report, op. cit., p. 50.

16. Ibid., p. 55.

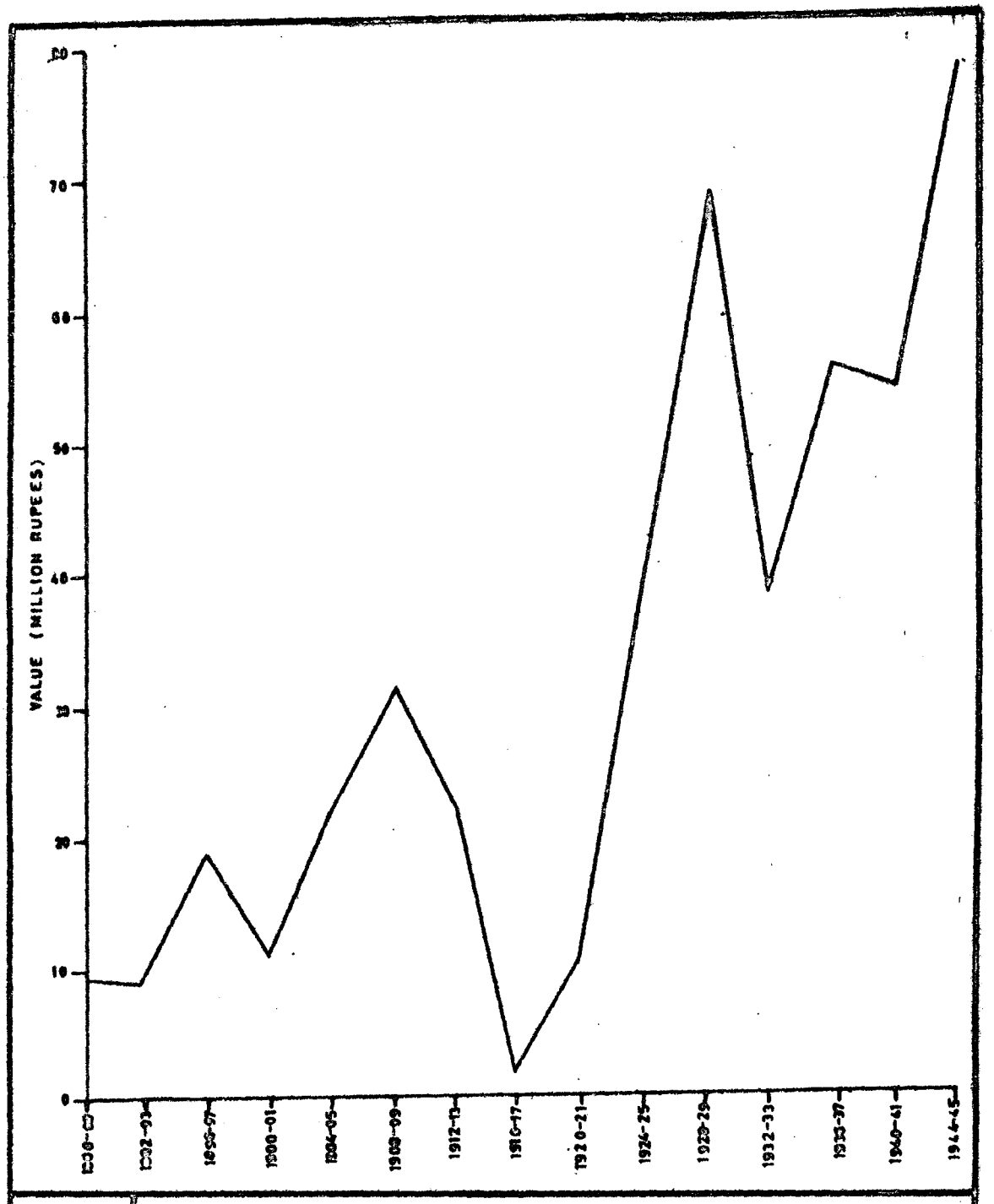

FIG. NO. 3.4

THE TOTAL VALUE OF IMPORTS OF MILLWORK AND MACHINERY (1888-89 TO 1944-45)

3.4 VOLUME AND TREND OF TRADE IN METALS AND ORES IN THEIR VARIOUS FORMS

Table 3.5 shows the total value of imports of metals, ores, millwork and machinery in their various forms from 1888-89 to 1944-45. Table 3.6 shows the total value of exports of the same. As mentioned earlier metals and ores have been divided into ores, semi-processed, manufactured (excluding millwork and machinery) and millwork and machinery.

Table 3.5 Total Value (in Rs.) of Imports of Metals, Ores, Millwork and Machinery in Their Various Forms 1888-89 to 1944-45

Year	Ore	Semi-manufactured	Manufactured	Millwork & Machinery
1888-89	Not specified	37,40,130	1,43,33,160	89,98,760
1892-93	- do -	52,77,310	1,74,58,550	88,32,120
1896-97	- do -	54,87,036	2,43,80,061	1,88,40,198
1900-01	- do -	40,93,215	3,04,38,827	1,06,96,590
1904-05	- do -	78,20,679	3,77,88,311	2,19,38,337
1908-09	- do -	77,95,702	4,94,17,603	3,12,29,337
1912-13	- do -	81,89,951	6,87,86,791	2,22,31,892
1916-17	11,873	2,04,666	26,53,53,593	1,16,42,424
1920-21	69,284	7,63,250	1,56,27,840	1,03,77,787
1924-25	56,104	92,51,500	8,56,46,158	4,39,95,802
1928-29	1,10,212	81,90,262	9,47,15,608	6,93,03,156
1932-33	48,295	57,42,338	2,34,36,885	3,81,02,099
1936-37	1,41,772	89,16,456	2,85,43,834	5,59,94,288
1940-41	7,48,058	22,16,796	3,92,06,954	5,38,44,800
1944-45	1,57,207	26,39,510	4,18,92,891	7,87,95,985

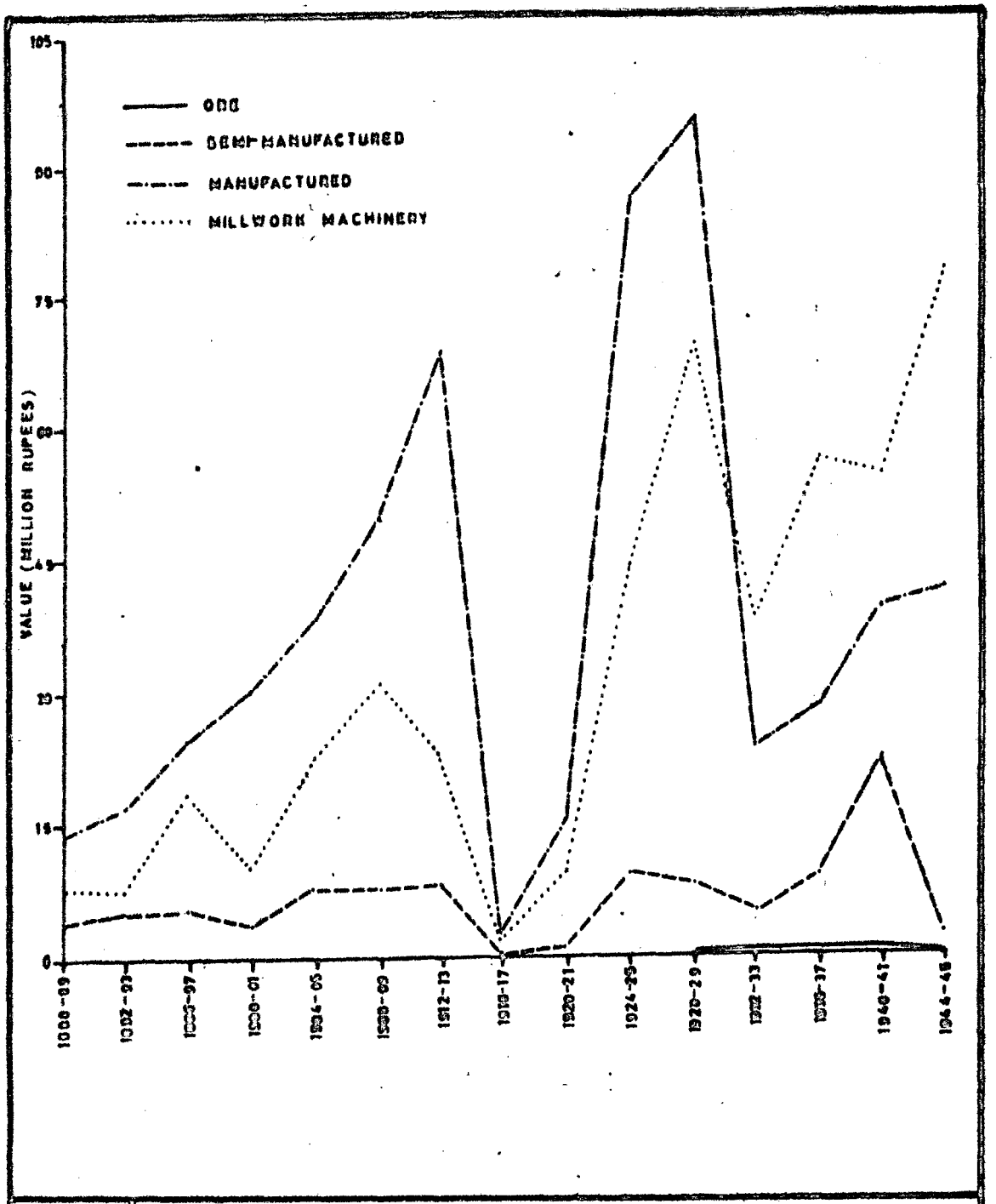

FIG. NO. 3.5

TOTAL VALUE OF IMPORTS OF METALS, ORES, MILLWORK AND MACHINERY IN THEIR VARIOUS FORMS (1868-69 TO 1944-45)

On the import side, the largest proportion is that of manufactured goods. It contributed the largest share in the total value of trade (ranging from 53 per cent to 69 per cent) from 1888-89 to 1928-29. From 1932-33 onwards, the value of imports of millwork and machinery far exceeded that of manufactured goods. The increasing imports of machinery signified the increase in industrialisation in the eastern parts of the country (it must be remembered that the imports were mainly to the port of Calcutta). A comparative idea of the trend of imports may be had from fig. 3.5.

Table 3.6 Total Value (in Rs.) of Exports of Metals, Ores, Millwork and Machinery in Their Various Forms 1888-89 to 1944-45

Year	Ore	Semi Manufactured	Manufactured	Millwork & Machinery
1888-89	1,50,796	No Exports	No Exports	No Exports
1892-93	1,57,882	- do -	- do -	- do -
1896-97	13,75,587	- do -	- do -	- do -
1900-01	59,22,541	- do -	- do -	- do -
1904-05	46,35,348	- do -	- do -	- do -
1908-09	50,47,282	- do -	- do -	- do -
1912-13	88,31,370	- do -	- do -	- do -
1916-17	4,01,411	3,61,175	28,905	- do -
1920-21	9,39,964	6,34,384	35,475	- do -
1924-25	25,44,401	2,82,72,573	6,72,304	72,626
1928-29	2,09,40,294	2,69,20,609	24,25,933	33,800

Cont'd.

Table 3.6 cont'd.

1932-33	58,26,789	90,01,824	38,75,796	60,125
1936-37	1,85,91,182	1,78,32,216	22,02,856	42,671
1940-41	2,68,31,190	3,57,95,247	1,64,60,370	2,83,067
1944-45	42,81,556	1,10,41,606	2,23,061	6,432

Coming to the other side of trade, i.e., to the export of metals and ores, the picture is entirely different. Table 3.6 shows the proportion of ores, semi-processed, manufactured and millwork and machinery in the total value of exports. Upto 1912-13 coal was the only item which was exported from the Calcutta port. During 1916-17 and 1920-21 ores formed the greater bulk of exports. From 1924-25 onwards, the semi-manufactured goods constituted the largest share in the total exports. This implies that some sort of primary processing of raw materials was done at intermediate points between the mines and the port, and then exported to U.K., only to be brought back in the manufactured form at higher prices. This sort of primary production (extractive) was a stage of colonial expansion. Such mining enclaves were meant for export oriented primary production.[17] The trend of export for the various categories can be seen in fig. 3.6.

3.5 TREND OF THE TOTAL IMPORTS AND EXPORTS

Table 3.7 shows the total values of all imports and

17. Ignacy Sachs, Foreign Trade and Economic Development of Under-developed Countries, 1965, pp. 28-29.

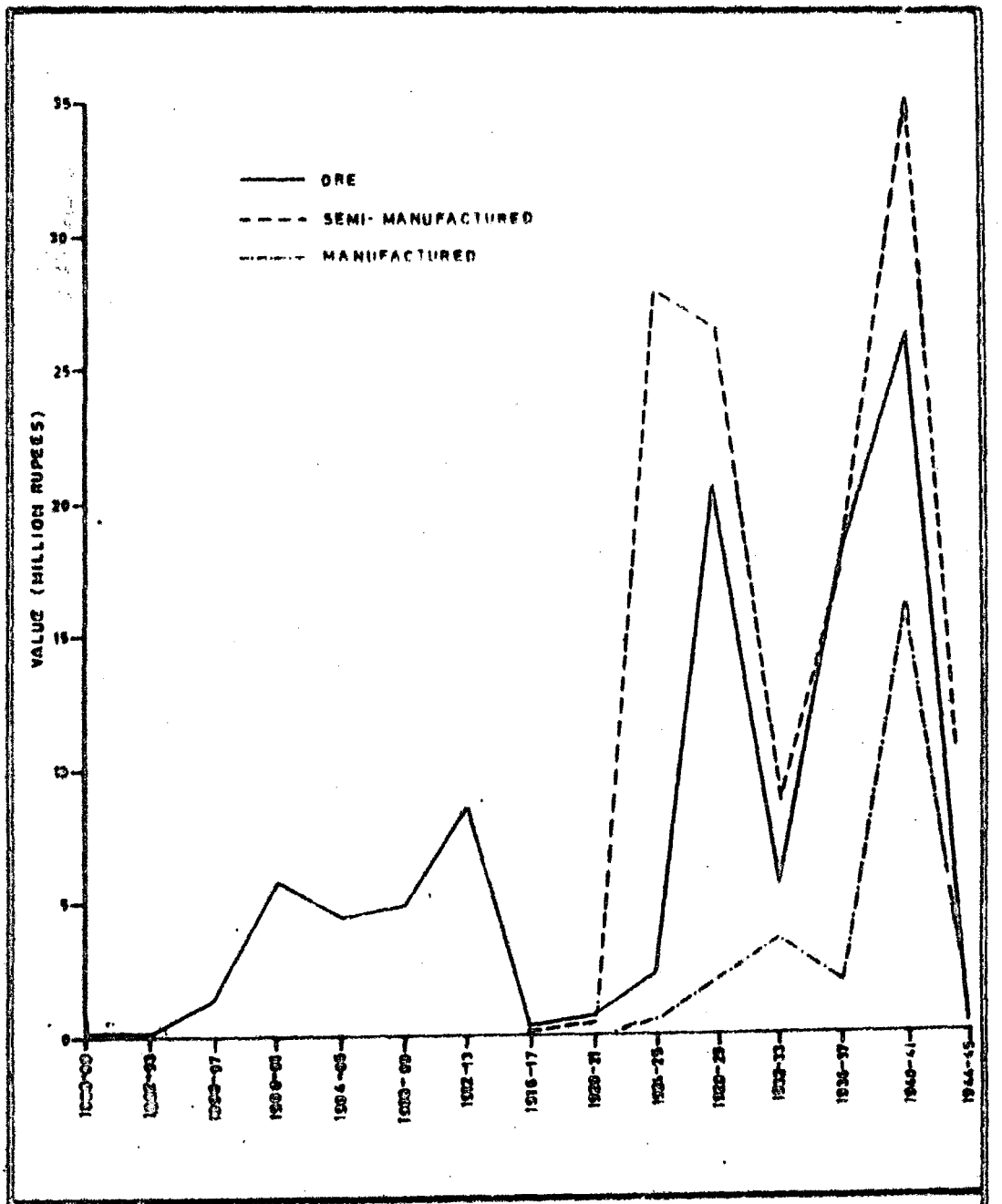

FIG.NO. 3.8

TOTAL VALUE OF EXPORTS OF ORES AND METALS IN THEIR VARIOUS FORMS (1888-89 TO 1944-45)

exports from 1888-89 to 1944-45, at four-year intervals. It can be seen that the total value of imports had more than trebled in 1908-09. The largest value of imports was recorded in 1920-21, which was of the order of Rs. 269 million. And the lowest value of imports (Rs. 27 million) was in 1888-89.

Table 3.7 Total Value (in million Rs.) of All Imports and Exports 1888-89 to 1944-45

Year	Imports	Exports
1888-89	27.07	0.15
1892-93	31.57	0.16
1096-97	48.71	1.37
1900-01	45.23	5.92
1904-05	67.55	4.63
1908-09	88.44	5.05
1912-13	99.21	8.83
1916-17	67.69	11.87
1920-21	269.07	16.09
1924-25	138.95	31.56
1928-29	172.32	50.32
1932-33	190.81	18.76
1936-37	93.60	38.67
1940-41	115.96	79.37
1944-45	123.48	15.55

On the export front, the highest figures were reached in 1940-41 (Rs. 79 million). The lowest value of total exports

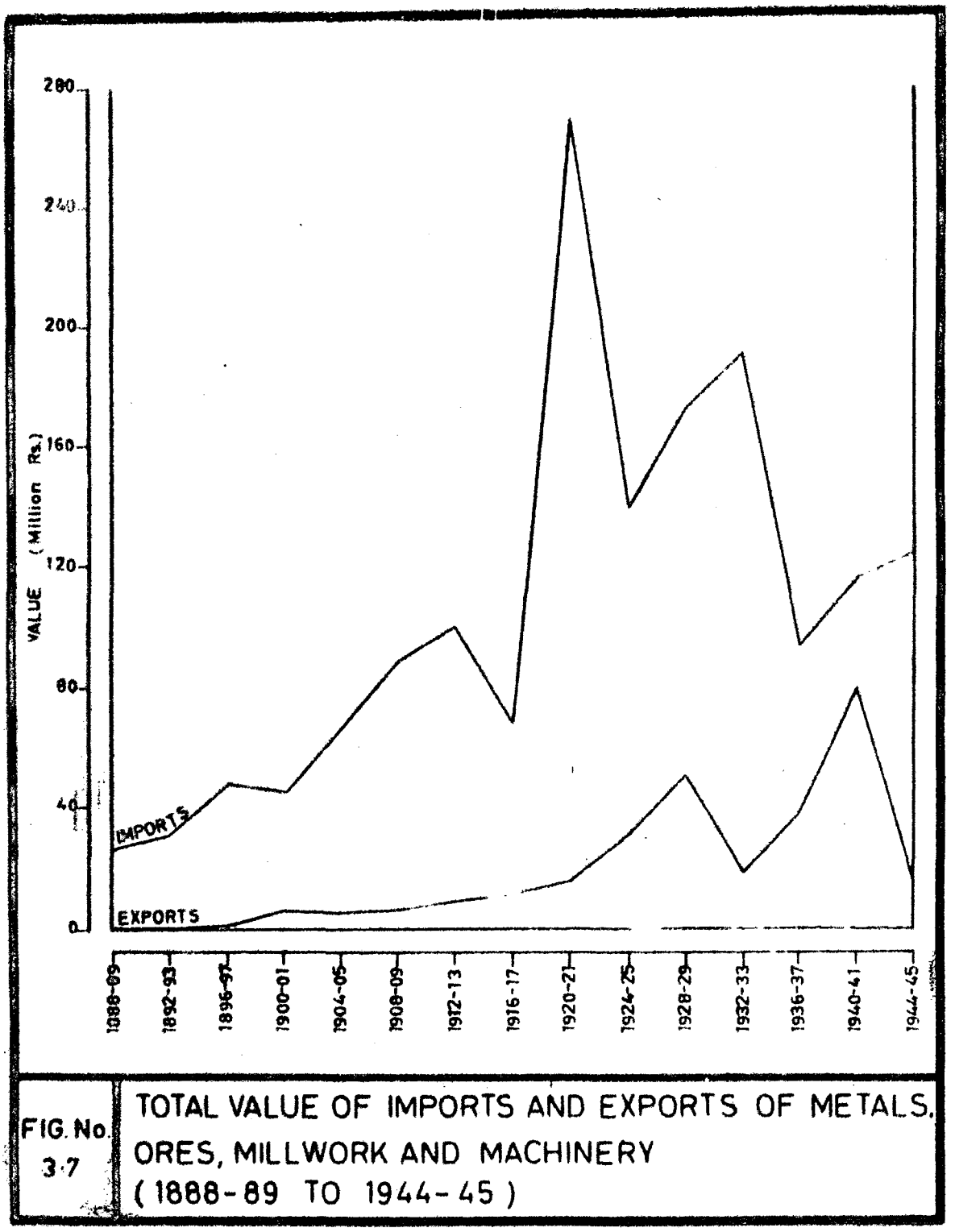

FIG. No. 3·7

TOTAL VALUE OF IMPORTS AND EXPORTS OF METALS, ORES, MILLWORK AND MACHINERY (1888-89 TO 1944-45)

was recorded in 1916-17 (Rs. 12 million). However, no regular trend was observed. But from 1916-17 to 1928-29, the total value of exports had been on a constant increase and had risen four times. As shown on fig. 3.7 two steep declines have been registered - one in 1932-33 and the other in 1944-45.

3.6 BALANCE OF TRADE

Table 3.8 shows the balance of trade separately for ten metals and ores[18], as well as for the total of all the items traded in. If iron and steel are taken together the balance of trade was always favourable except in 1920-21 when imports exceeded exports. Similarly in the trade of mica, manganese and coal the balance was always favourable. But for the other items there was a deficit in the balance of trade. The category of un-enumerated ores and metals showed that for almost the entire period under study there was a surplus in balance of trade. Tin stands in a category of its own. There was no surplus in its balance of trade between 1916-17 to 1928-29. The situation, however, had reversed after 1928-29.

However, when the total balance of trade was reviewed, the picture looked dismal - there was never a surplus. The difference between exports and imports (in favour of imports) ranged from Rs. 26 million in 1908-09 to Rs. 69 million in 1928-29.

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18. These include aluminium, brass, tin, copper, iron, coal, steel, lead, zinc and mica.

Table 3.8 Balance of Trade in Selected Metals and Ores 1916-17 to 1944-45

	1944 - 45				1940 - 41			
	Import	Export	Balance		Import	Export	Balance	
			Import	Export			Import	Export
Aluminium	18896				16589			
Brass	4204	45	4159		31413	111		
Copper	321370	1			185635	1224	184411	
Iron	59				345			
Coal	28	83718		83690	1304	1912126		1910822
Steel	37485				13883			
Lead (cwts)	9081	1738	7343		250912	13744	237168	
Tin	17	2080			38196	23397	14799	
Zinc	23358				406896	3843	403053	
Mica	3297	47516		44210	4319	128237		123918
Iron or Steel	33129				71198	619982		548784
Metals Unenumerated	5226				10692	1286	9406	
Ores Unenumerated	71	15403			902	11968		11066
Total value of Metals and ores	49426590	8469740	39956850		67610946	48266239	19342707	

Table 3.8 cont'd.

1936 - 37				1932 - 33				1928 - 29			
Import	Export	Balance		Import	Export	Balance		Import	Export	Balance	
		Import	Export			Import	Export			Import	Export
27643				44603				46643			
55004	2300	52704		90920	466	90454		124656	6805	117851	
103621				70192	4560	65632		67975	1923	47953	
516				4043				3644			
2441	248825		246384	575	451564		450989	3468	638774		635306
35244				28056				89563			
7908	6148	1760		8241				12286	25853		13567
29991	59503		29512	28697	103126		74429	32183	15586	16597	
431356	17525	413831		283948				104687	3325	101362	
524	163071			195	34354		34159	971	84661		83690
98591	647298		162547	70734	330527		259793	399731	515600		115869
7840	10306		2466	16069	2162		13907	13775	54332		40557
41	31908		31867	60	3741		3681	2	2529		
38722484	20861434	17861050		30400917	15903821	14497105		106041651	36757809	69283842	

Table 3.8 cont'd.

1924 - 25				1920 - 21				1916 - 17			
Import	Export	Balance		Import	Export	Balance		Import	Export	Balance	
		Import	Export			Import	Export			Import	Export
29553				17026							
184054	864	183190		148453	1065	147388		36469	2183	34286	
75101	1640	63461			554				1315		
3619				12359				13867			
1850	228117		226267	4579	980492		975913		498012		
74510				90964				11802			
28957	4887	24070		37320				64031			
33719	7580	26139		24308				13937			
62832	2653	60179		34547				13552			
	71685				62257				52890		
238511	348896		110385	232240	49239	183001		79897	109572		29675
14200	3943	10257		13824	46	13778		4535	1305	3230	
	47			13824	33	139		228	1028		800
97168074	32304832	64863242		2982733	1610467	1372265		275002	796363		521361

Conclusion

Having seen the volume and trend of imports and exports of various metals and ores, in their various forms during the period under investigation, certain facts are revealed :

1. The total value and quantum of imports of all the ores, metals, millwork and machinery exceeded that of their exports during the entire period under study. In the initial years (upto 1912-13) a few metals constituted the major share of the total imports. But during the latter part of the period under study the number of items imported increased considerably.
2. The composition of imports showed that manufactured goods (including millwork and machinery) formed the major bulk of the total value of imports. The machinery and tools for industrial activities were mainly imported.
3. Minerals either in the form of ore, or semi-processed constituted the major share in the total value of export. Till the beginning of the 1920s, ores had formed the greater bulk of exports. From the mid-1920s, semi-processed goods constituted the largest share in the total exports. This implies that some form of primary processing of the raw materials was done at the intermediate points between the mines and the exporting port, before being exported finally to the U.K. This sort of primary production was one of the initial stages of colonial industrial expansion.

Summing up these conclusions, it becomes very clear once again about the exploitative character of the imperial policy. Raw materials or semi-processed minerals were exported from the country in the absence of local industries which could have utilised them for domestic consumption. And back came the same export in a finished form to their original destination. One can say that at the root of all this lay the narrow technological base of the industrial sector which ruled out the production of specialised as well as essential products.

Chapter 4

RESOURCE BASE AND THE REGIONAL ECONOMY AND INFRASTRUCTURE

Introduction

4.1 Sectoral Distribution of Workers

4.1.1 Distribution of Industrial Workers

4.1.2 Distribution of Industrial Categories into Component Groups

4.1.3 Relation Between Manufacturing and Trade of Commodities

4.2 District-wise Distribution of Industrial Workers

4.3 Railways and Development of Resources

4.3.1 Considerations Affecting Rail Construction in the Region

4.3.2 Railway Growth in the Mineral Belt - 1855 to 1945

Conclusions

Chapter 4

RESOURCE BASE AND THE REGIONAL ECONOMY AND INFRASTRUCTURE

In the following pages an attempt has been made to find out the structure of the occupations of the work force in the Mineral Belt during the period 1872-1931.[1] It has also been attempted to establish whether the development of the resource base brought about any transformation in the economic structure of the Region in terms of vertical shifts in its occupational structure.

It should be noted that owing to changes in the classificatory schemes adopted for the enumeration of the occupation of the people at the various censuses, it is very difficult to analyse precisely what changes have occurred in the occupational distribution since 1872.[2] However, despite these drawbacks, the census remains the sole source of comprehensive occupational statistics at our disposal.

4.1 SECTORAL DISTRIBUTION OF WORKERS

Before proceeding to give a detailed account of the occupational change in the Mineral Belt, it would be appropriate to

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1. As mentioned in the first chapter, detailed data on occupation was not tabulated in the 1941 Census.

2. The changes in the occupational classification from time to time has been written in Appendix-6.

give a brief sketch of the distribution of workers on the aggregated sectoral level, i.e., in terms of the primary, secondary and tertiary sectors.[3]

Table 4.1 Sectoral Distribution of Total Workers 1872 - 1931

Year	Primary	Secondary	Tertiary
1872	59.11	13.02	27.87
1881	62.39	10.96	26.65
1891	69.76	11.29	18.95
1901	75.00	12.96	9.23
1911	73.65	13.26	13.09
1921	80.26	10.07	9.67
1931	79.47	12.43	8.10

Source : Based on Census of India, Part II, Imperial Tables on Occupation by Districts

Table 4.1 and fig. 4.1 show the percentage of persons engaged in each of the three sectors for a period of seventy years. The figures in the table indicate that there was a constant increase in the primary sector, while the secondary sector was more or less stagnant and the tertiary sector registered a general decline with minor fluctuations. It should also be observed that the tertiary sector was twice as large as the secondary sector in the first three decades. In the

3. These three sectors have been defined in Appendix 7 .

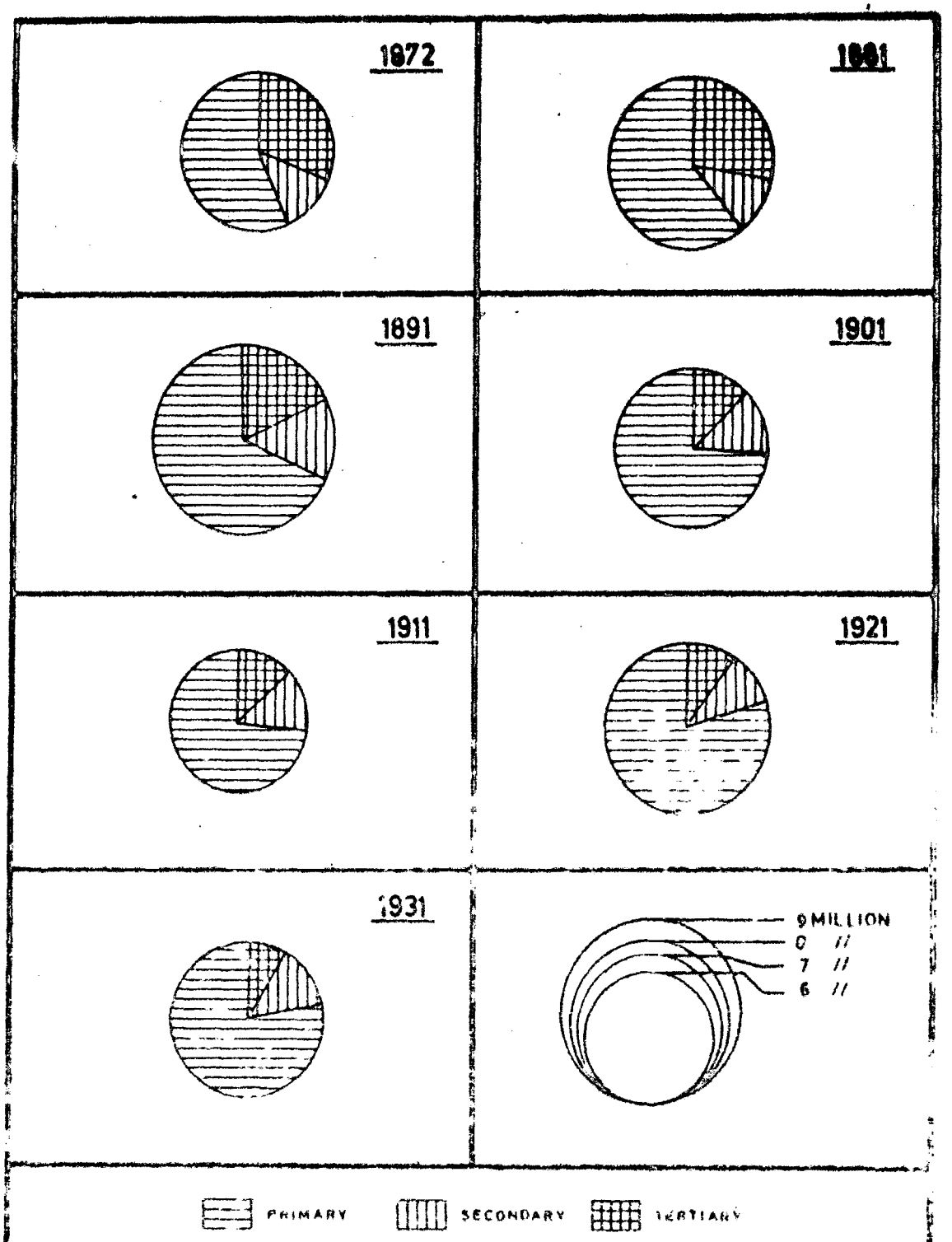

FIG. NO. 4.1 SECTORAL DISTRIBUTION OF TOTAL WORKFORCE (1872-1931)

developed countries the trend was just the contrary, where the secondary sector absorbed the highest proportion of the work force, the primary sector gradually became insignificant and there was a substantial increase in the proportion of the tertiary workers, which however remained lower than the proportion of secondary workers.

4.1.1 Distribution of Industrial Workers

In this section we will analyse the industrial base of the Mineral Belt in terms of the structure of employment in the industrial group of occupations. It should be noted here that the term 'industrial' is being used in a very limited sense because the development of industries in the Region was of a low order, usually consisting of processing of local raw materials. These industrial activities have been categorised into elementary, secondary and tertiary processing for the purpose of the present study.[4] Table 4.2 shows the number and percentage of workers in the various sectors of processing for the period 1901-1931.

The table indicates that :

1. the percentage of workers in elementary processing

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4. Elementary or primary processing implies those processes which dealt directly with the raw materials and which did not produce final goods. It also involved a very high level of unskilled labour. On the contrary secondary processing produced final goods using those products which were the outcome of elementary processing. It involved some sort of mechanisation, industrial organisation and skilled labour.

Table 4.2 Percentage of Workers in Various Industrial Sectors 1901 - 1931

Sectors of Processing		1901	1911	1921	1931
Primary	No.	341200	455531	263601	185424
	%	47.66	55.61	34.26	40.36
Secondary	No.	306335	284901	383470	200024
	%	42.79	34.78	49.84	43.54
Tertiary	No.	68370	78721	122336	73964
	%	9.55	9.61	15.90	16.10
Total	No.	715905	819153	769407	459412
		100.00	100.00	100.00	100.00

Source : Based on Census of India, Part II, Imperial Tables on Occupation by Districts.

(like oil pressers, ghee preparers, potters, wood cutters, to name a few)[5] were highest in 1901 and 1911. In 1911 about 56% of the industrial workers were engaged in primary or elementary processing. This shows the lack of secondary industries in the Region.

2. In 1921 and 1931 secondary processing had an edge over primary processing. This shows a shift from elementary to secondary processing.

3. there was a constant increase of the tertiary group of industries which included the activities of the

5. The various components of the industrial group as given in the 1921 Census is given in Appendix 8 .

barbers, washermen, tailors, sweepers etc.[6] An increase in this group of activities may have possibly been the result of urban growth where tertiary activities could really thrive and multiply.

4.1.2 Distribution of Industrial Categories into Component Groups

The manufacturing activities in the Mineral Belt were generally confined to the production of traditional goods for which the main factor for localisation was a sizeable market. The artisan industries were more closely associated with the distribution of population. By their nature artisan industries tended to produce goods for local markets in fields such as clothing, foodstuffs and ceramics. The indigenous handicrafts which survived were[7] (a) services following population, which included carpenters, smiths, potters, tailors; (b) some luxury trades, like makers of the finest silk saris, skilled jewellers, ivory-carvers etc; (c) crafts which had a market 'sheltered by its poverty' or which dealt in raw materials not worth processing by modern methods. The survival of such trades included the making of 'bidis' etc.

Table 4.3 gives the distribution of workers in various industries from 1901 to 1931. If the table is analysed in the

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6. In America, occupations like those of sweepers, scavengers would hardly be classed as "industries". (see D.H.Buchanan, op. cit., p. 75).

7. O.H.K. Spate, India and Pakistan : A General and Regional Geography, 1967, p. 306.

Table 4.3 Break-up of Industrial Categories into Component Groups 1901-1931

Manufacturing Groups	1901		1911		1921		1931	
	No.	%	No.	%	No.	%	No.	%
Textile	242351	33.86	200474	24.48	241226	31.34	96489	21.00
Hides, Skins	2609	0.36	3203	0.39	5219	0.68	2318	0.50
Wood	134843	18.83	85543	10.44	79777	10.37	68173	14.85
Metals	31760	4.44	67752	8.27	91071	11.84	79588	17.32
Ceramics	46152	6.45	143064	17.46	42071	5.47	28361	6.18
Chemical Products	-	-	37186	4.54	25301	3.29	10928	2.38
Food Industries	135889	18.98	130495	15.93	104982	13.64	62926	13.70
Industries of Dress and Toilet	94243	13.16	91837	11.22	141614	18.41	79412	17.28
Furniture	-	-	14	0.00	7	0.00	13	0.00
Building Industries	7036	0.98	22677	2.77	15368	2.00	10555	2.30
Construction of Means of Transport	-	-	256	0.03	211	0.03	519	0.11
Production and Trans. of physical forces	-	-	15	0.00	473	0.06	459	0.10
Other Undefined and Misc. Industries	21022	2.94	36637	4.47	22087	2.87	19671	4.28
TOTAL	715905	100.00	819153	100.00	769407	100.00	459412	100.00

Source : Based on Census of India, Part II, Imperial Tables on Occupation by Districts

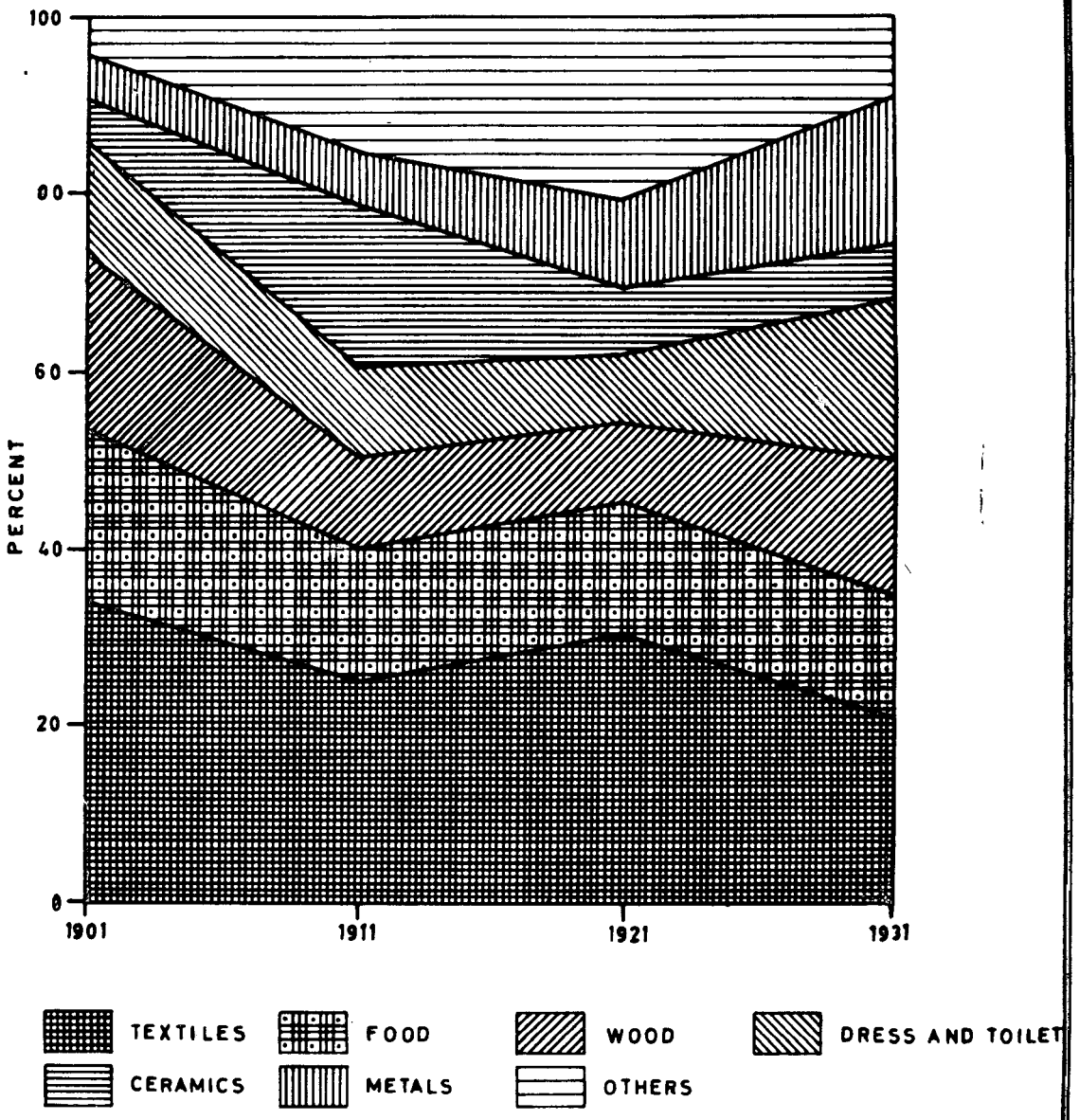

FIG.NO. 4.2 BREAK-UP OF INDUSTRIAL WORKFORCE INTO COMPONENT GROUPS (1901-1931)

light of the information obtained from the various gazetteers and census reports it will be found that :

1. on an average about 30% of the industrial workers in the Mineral Belt were engaged in the indigenous textile industry, which always employed the largest proportion of industrial workers (see fig. 4.2). However, it is important to note that the number of workers engaged in the textile industry declined by more than fifty per cent in 1931. The weaving and spinning industry had become so much less profitable than they used to be formerly, that weavers and spinners were taking over to agriculture or general labour.[8] The reason for the diminishing profits of the indigenous textile worker was the large-scale influx of imported mill made textiles which captured the market of Indian textiles, completely displacing the latter.
2. besides textiles, the bulk of the industrial workers were engaged in industries dealing with food, dress and toilet, wood, ceramics and metals. The food industry consisted largely of pounders, huskers, grinders and parchers - all dealing with raw materials. The proportion of workers in this industry was seen to be declining with time. The ceramic industry was a prominent one, being mainly composed of potters. Crude pottery was an

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8. J.W. Chisolm, Census of India, Central Provinces - Report, 1872, p. 42.

essential item in the life of an Indian, which was used in the form of dishes and vessels in everyday life. In the wood industry most of the workers were listed as carpenters, turners, joiners etc. A majority of the carpenters were actually more of fixers than makers.[9]

3. the percentage of workers engaged in the metal industry shows a constant increase. On an average about 10% of the total industrial workers were engaged in this industry. Within the metal industry, the makers of tools and implements constituted a major share, followed by workers who rolled and forged iron. Table 4.4 shows the various components of the metal industry, and the percentage share of workers in each to the total metal workers.

4. very few persons were engaged in the building industry which consisted mainly of brick layers, lime burners and well sinkers. The building industry was one of the few industries in which the number of workers engaged increased since 1901.

5. it is important to note that the total number of workers (engaged in the industrial sector) showed a general declining trend. This implies that a large number of displaced workers from the manufacturing sector drifted towards the primary sector - constituted by land agriculture.

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9. D.H. Buchanan, op. cit., p. 78.

Table 4.4 Proportion of Workers in the Various Branches of the Metal Industry 1901 - 1931

Branches	1901	1911	1921	1931
Forging and Rolling of Iron	72.15	2.92	1.83	3.20
Implements and Tools	-	72.51	62.83	60.35
Brass, Copper, Bell-Metal	8.02	4.47	14.43	10.49
Tin, Zinc, Lead	0.60	2.99	0.91	1.16
Gold, Silver and Precious Stones	19.23	17.11	20.00	23.80

Source : Based on Census of India, Part II, Imperial Tables on Occupation by Districts

4.1.3 Relation Between Manufacturing and Trade of Commodities

An attempt has been made here to find out whether there was any link between the trend of growth in the manufacturing and the pattern of trade in some important industrial products in the Mineral Belt. Table 4.5 shows the number and percentage of persons engaged in the trade of various manufactured products (mentioned earlier).

The table indicates that :

1. traders in food industries constituted a major share of the trading community. On an average, about 58% of the total traders were engaged in trade of foodstuffs. The traders in food included largely grocers, grain and pulse dealers, sellers of betel, cardamom and arecanut,

2. while trade in most of the products showed a decline (a trend which coincides with the number of persons engaged in manufacturing industries), the undefined and miscellaneous trades (such as general shopkeeping, pedlars and vendors) showed a significant increase. In 1901 this category of trade constituted about 6% of the total trade whereas in 1931, it increased five fold - to 31% of the total trade;
3. if textile manufacturing and textile trade are compared it becomes clear that the number of people engaged in trade in textile was smaller than persons engaged in its manufacturing implying that most of the cloth manufactured may not have entered the local markets. Whereas the case was contrary for the food industry. There was a surplus of food traders over food manufacturers;
4. the number of people engaged in the trade in metals was almost negligible. On an average, hardly 0.3% of the total workers in trade were in the metal trade. While manufacturing of metals showed a constant increase and constituted more than 10% of the total workers engaged in manufactures.

4.2 DISTRICT-WISE DISTRIBUTION OF INDUSTRIAL WORKERS

The occupational structure for 11 British districts (spread over the present states of Bihar, West Bengal, Orissa and

Table 4.5 Break-up of Trade Groups

Trade Groups	1901		1911		1921		1931	
	No.	%	No.	%	No.	%	No.	%
Textile	9975	4.71	15448	4.50	12789	3.42	13616	5.34
Hides, Skins	4632	2.18	5690	1.66	2210	0.59	1349	0.53
Wood	41594	19.62	50735	14.79	42069	11.25	12375	4.86
Metals	793	0.37	669	0.20	1403	0.37	915	0.36
Ceramics	5918	2.79	5428	1.58	5913	1.58	1945	0.76
Chemical Products	-	-	10747	3.13	3327	0.89	5353	2.10
Food Industries	137081	64.67	203573	59.34	223746	59.81	124708	48.94
Industries of Dress and Toilet	-	-	1472	0.43	4879	1.30	5392	2.12
Furniture	-	-	326	0.09	887	0.24	2027	0.79
Building Industries	-	-	1042	0.30	365	0.10	523	0.20
Construction of Means of Transport	-	-	-	-	865		1134	0.46
Fuel	-	-	-	-	-	-	5443	2.14
Other undefined & Misc. Trades	11959	5.66	47924	13.98	75630	20.21	80034	31.40
Total	211952	100.00	343054	100.00	374083	100.00	254814	100.00

Source : Based on Census of India, Part II, Imperial Tables on Occupation by Districts.

Madhya Pradesh) and 10 feudatory states of Central Provinces,[10] has been considered in this analysis. It would be repetitive to deal with every district separately because the percentage of workers engaged in some of the industrial sectors, like textiles and food was found to be high in all the districts, while sectors like furniture, building, construction of means of transport and hides and skins was found to be low in all the districts. A districtwise analysis has, therefore, been attempted only for the metal industry, an industry which is of direct concern to us in this study.

Table 4.6 Proportion of Workers in the Various Branches of the Metal Industry, 1901-1931

State/ District	Forging & Rolling of Iron	Workers in Iron and hard ware	Makers of implements	Workers in brass, Copper Bell Metal	Workers in tin and zinc and Lead	Workers in Gold, Silver and precious str
Bengal						
Burdwan						
1901	-	42.68	-	13.16	0.66	43.50
1911	4.26	-	34.06	7.45	17.60	36.63
1921	60.22	-	16.42	5.22	0.15	17.93
1931	0.69	-	62.93	12.17	-	24.21

Cont'd

10. The Census does not provide data for each of the feudatory states of Bihar and Orissa. The aggregated figures are given under two main heads : Orissa States, Chota Nagpur States.

Table 4.6 cont'd

Bankura						
1901	-	42.0	-	34.50	0.41	23.09
1911	-	-	35.64	37.76	0.81	25.79
1921	-	-	29.18	38.92	0.18	31.72
1931	0.91	-	40.16	37.17	-	21.76
Bihar & Orissa						
Hazaribagh						
1901	-	59.22	-	20.54	0.14	20.10
1911	-	-	59.32	20.19	2.63	17.86
1921	3.72	-	56.07	13.85	2.84	23.57
1931	-	-	49.39	14.36	-	36.25
Ranchi						
1901	-	71.04	-	14.09	0.87	14.00
1911	-	-	70.40	12.96	0.09	16.55
1921	0.66	-	86.90	5.98	0.08	6.38
1931	-	-	85.46	4.72	-	9.82
Palamau						
1901	-	69.66	-	7.53	-	23.21
1911	-	-	67.54	10.11	0.23	22.12
1921	-	-	57.42	8.83	3.13	30.62
1931	-	-	58.11	5.03	-	36.86
Manbhum						
1901	-	83.76	-	7.52	0.05	8.67
1911	-	-	84.37	7.60	-	8.12
1921	0.90		68.31	7.74	6.76	16.29
1931	10.53	-	62.71	6.02	-	20.74

Cont'd.

Table 4.6 cont'd.

Singhbhum						
1901	-	65.59	-	22.44	0.37	11.60
1911	-	-	78.70	9.43	-	11.87
1921	72.12	-	22.40	3.49	0.18	1.81
1931	86.93	-	10.25	1.45	-	1.37
Sambalpur						
1901	-	64.37	-	20.73	0.90	14.00
1911	-	-	54.00	20.18	11.09	14.73
1922	-	-	42.37	36.79	-	20.84
1931	-	-	48.92	29.12	-	21.96
Central Provinces						
Raipur						
1901	-	72.03	-	11.60	0.41	15.96
1911	5.54	-	51.52	21.50	1.46	19.98
1921	5.43	-	46.88	13.72	0.95	32.95
1931	5.43	-	46.97	13.82	-	32.97
Bilaspur						
1901	-	68.41	-	13.60	-	17.99
1911	14.86	-	43.12	19.93	0.54	21.55
1921	10.11	-	53.74	8.47	-	27.67
1931	10.16	-	54.08	7.94	-	27.82
Durg						
1901	-	-	-	-	-	-
1911	0.13	-	63.83	18.32	0.20	17.52
1921	-	-	76.68	-	0.74	22.52
1931	-	-	77.25	-	-	22.75

Cont'd.

Table 4.6 cont'd.

Balaghat						
1901	-	60.04	-	8.05	0.20	31.81
1911	0.09	-	54.67	9.84	0.63	34.77
1921	-	-	55.63	7.07	0.03	37.27
1931	-	-	57.29	4.35	-	38.36

1. In the 1901 Census group 2 was entered, while group 1 and 3 were not defined. From 1911 onwards the latter two were shown.

Table 4.6 shows the percentage of industrial workers engaged in various branches of the metal industry in the 11 British districts of the Mineral Belt for the period 1901-1931. In 1901, almost all the metal workers of Burdwan district were divided between iron workers and gold, silver and precious stone works. In 1911, a sizeable number of workers in tin, zinc and lead was recorded. A major shift to forging and rolling of iron was seen in 1921 when about 60% of the metal workers were engaged therein. And in the next decade they shifted over to implements and tool making. While in Bankura district three branches of the metal industry featured distinctly in 1901 - iron; brass, copper, bell metals; gold, silver and precious stones. With mild fluctuations the proportion of workers remained almost the same during the entire period under study.

In all the seven districts of Bihar and Orissa workers engaged in the making of implements and tools constituted the

bulk of the metal industry. However, in 1921 and 1931, the Singhbhum district stood outside this category. In 1921, about 72% and in 1931, almost 87% of its metal workers were engaged in forging and rolling of iron. The only possible reason for this seems the employment of a large number of workers in the Tata Iron and Steel Company which went into production in 1911. The gold, silver and precious stones industry too absorbed a significant percentage of workers, ranging from about 8% (in Manbhum district in 1911) to 31% (in Palamau district in 1931).

In the four districts of the Central Provinces, under our study, the majority of the metal workers were engaged in making tools and implements. Of the districts, Durg district had the largest percentage of workers engaged in this branch - which kept on increasing in every Census - from about 64% in 1911 to 77% in 1931. The next largest group of workers were those engaged in gold, silver and precious stone workings. It should be noted that the proportion of workers in this branch increased constantly in all the four districts, in each of the Census taken. The largest proportion of workers in gold, silver and precious stones were found in Balaghat district (38% in 1931).

Table 4.6 and the foregoing account indicates that :

1. the majority of the metal workers in almost all the districts were engaged in making implements and tools. Following up this branch were the workers in gold, silver and precious stones.

2. workers in brass, copper, bell metal etc. too constituted a substantial percentage (ranging from about 5% to 50%) of the total metal workers. In Bankura district, this branch of the metal industry constituted 37% (1931), to 50% (1911) of its total workers. The workers in this category were engaged mainly in the making of utensils.

3. workers in tin, zinc, lead etc. constituted the lowest percentage of metal workers. These metals did not enter into the daily life of the people, perhaps due to the complexity in their use. For example, zinc is used in the process of galvanising iron - and this process was not feasible to be carried out at indigenous workshops. Similarly, lead and tin too, were not of basic importance during that time.

The regional economy of the Mineral Belt shows that while industrial resources were being exploited, there were no vertical shifts in terms of its occupational structure.

4.3 RAILWAYS AND DEVELOPMENT OF RESOURCES

The important role to be played by the transport in accelerating economic change was the main rationale and led to the construction of railways. From the middle of 1850s until 1930, railway development was one of the chief symbols and hopes for accelerated growth throughout the country. The concentration of railways had a great impact in shaping the Indian economy. Not

till their establishment could the British wholly penetrate Indian life, link India with the growing world market, and set it on the path of capitalist development.[11]

While the rate of railway development differed greatly between areas, the basic motivation behind construction was very similar. Principally, this was to provide routes for primary export products and imported manufactured goods. While this aim was often sufficient to encourage extensive railway construction, it was rarely sufficient to lead to the evolution of a network linking all parts of the country. Areas where export production was insignificant or where there was little demand for imports, remained isolated and dependent upon more traditional forms of transport.[12]

In developed countries, the railways had led to inter-regional specialization. In India such specialisation was mainly in the form of raw material production, both mineral and agricultural. The pattern of railway development was one oriented towards export production and international trade. For industrial development to be successful, a larger market was required which was possible only if the major population centres were linked together by an efficient transport network. This was hardly so because the third and fourth stages of trans-

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11. B. Chandra, op. cit., p. 171.

12. A. Gilbert, op. cit., p. 181.

port development identified in the Taaffe model[13] were lacking in the Mineral Belt.

4.3.1 Considerations Affecting Rail Construction in the Region

The railway lines in the Mineral Belt were laid down after meticulous investigation of every square mile by British investigators such as Hamilton, Ball, Buchanan, Thomas Holland, Blanford and others.[14] By the mid nineteenth century, when the construction of railway tracks started, the relative scale of information about the agricultural, mineral and demographic endowments of the Region and the degree to which they could be subjected to exploitation must have played a decisive role in

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13. The nature and role of railways have differed substantially in the metropolitan and the colonial countries. In this direction a spatial model of network development in underdeveloped countries has been worked out by Taaffe, Morrill and Gould. They have based their model on their study of Tanzania, Nigeria, Kenya, Ghana, Malaya and Brazil. In this model, the spatial evolution of land transport networks is seen to fit into four stages. The initial stage describes the manner in which early colonial conquest creates a system of settlements along the coast wherever adequate sites are available. Gradually, a second stage evolves, as penetration routes are constructed which link the best-located of these ports to the mining and population centres inland. This stage is linked with the development of an efficient administrative system and especially with the evolution of export production. Gradually, the process of export-based growth stimulates growth in the interior and a number of intermediate centres evolve along the principal access routes. This process gives rise to the third stage of transport evolution, i.e., the growth of feeder routes and links from the inland centres. Finally, as the economy becomes more integrated the transport system continues to evolve and a further stage is reached where all the principal economic and population centres are inter connected. (For details see, E.J. Taffe, R.L. Morrill and P.R. Gould, "Transport Expansion in Underdeveloped Countries : A Comparative Analysis", Geographical Review, 53, October, 1963, pp. 503-29.

14. S. Munsi, Railway Network Growth in Eastern India, 1854-1901, Occasional Paper No. 3, Centre for Studies in Social Sciences, 1974, p. 6.

determining the communication network which ultimately took shape.

The factors which affected rail construction in the Region were mainly resource exploitation and trade. A few illustrations would prove this. The laying down of a track in the Mineral Belt called for a number of considerations. It was stated in 1881 that Purulia (the capital town of the prosperous and fertile district of Manbhum) through which the railway line would pass would help to generate a considerable grain traffic which previously (in the 1870s) found outlets from Raniganj and Midnapore.[15]

Between Chaibasa and Sambalpur the line would traverse forests of magnificent sal timber. Sambalpur is a considerable mart, doing a steady trade with Cuttack, which is carried on chiefly by tedious and dangerous river carriage. There can be little doubt that a considerable amount of trade would avail itself speedily of a direct communication with Calcutta. The trade at Sambalpur and Raipur is carried on with the southern country, almost to the Godavari Valley, by means of Banjara's pack-bullocks and a large amount of grain is carried to the coast by this means, salt being brought into the Central Provinces in return.

The plan to lay down rail lines in the mining areas was preceeded by the following considerations. "The starting

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15. Railway Construction Proceedings, Railway Department, Government of India, Nov., 1881, p. 3.

point of a proposed line at Barakar would be in the neighbourhood of some of the mines of the Raniganj coalfield, while a short branch could be made to connect the line with the Jharia field which contains excellent coal that has not yet been worked. In Sambalpur again, the line would be in close proximity to the Hingir and Korba fields, the coal from which would be available for the new line up to a point where its cost would be equal to that of the coal raised at Warora"[16] (outside the Mineral Belt).

Many of the mineral resources were not known at that time and none of them were very likely to exercise an appreciable influence on the traffic. But there was one deposit which certainly deserved consideration - that of copper. Of this the proceedings states, "Copper deposits of Singhbhum is the most extensive deposit of its kind in India. Two attempts by English to work these failed but that was a time when communications were very difficult. With a line of railway actually crossing the run of the deposit, and in close proximity to the most favourable points for works, the prospect of success, which these altered circumstances would afford, is such as to warrant a belief that the probable development of copper manufacture on a large scale in that part of the country would quickly follow on the construction of the line. The mine would prove a source of revenue to the railway".[17]

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16. S. Munsi, op. cit., p. 8.

17. Railway Construction, Proceedings, op. cit., p. 17.

It is clear from the aforesaid proceedings that the chief motive of the British was to tap the resources of the region through which the railways would run, and finally to transport them to the Indian ports from where they would be despatched thousands of miles away from Indian shores.

4.3.2 Railway Growth in the Mineral Belt - 1855 to 1945[18]

The first rail line within the Mineral Belt was laid down in 1855 from Khana to Raniganj (45 miles in length). The East Indian Railway line (which commenced in 1854) was laid to run through the coal-bearing regions of the Damodar Basin, which gave an impetus to the mining industry and new pits were opened in large numbers.[19] It was natural that coal mining received an impetus with the building of the railways.[20] Not only because before this there was little demand for coal for industrial purposes but also because it was impossible to transport coal from these districts cheaply enough without the help of railways. The railways themselves needed enormous amounts of fuel.[21] In Raniganj, surface workings

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18. The data is compiled from History of Indian Railways Constructed and in Progress Upto March 1947, Government of India, 1949.

19. J.E. O'Connor, Review of the Trade of India, 1878-79, p. 22.

20. In African railway development the critical aim was said to be her mineral resources, like Mauritanian, iron-ore, Ugandan copper and Cameroons manganese. In the Mineral Belt under investigation coal certainly played a significant role in the direction of the initial thrust of railway development. The first railway line in the Region to be opened was one connecting Calcutta with the Raniganj coal-fields in 1855.

21. D.R. Gadgil, op. cit., p. 58.

were carried on as early as 1820 but the East India Railway, determined to produce its own coal, opened up the Raniganj field.

One of the outstanding contrasts between the course of industrialisation in India and the West was that in India the large scale production of coal and iron had followed large scale textile production and transport development, instead of preceding it. For instance, in England, the first rails were laid in order to facilitate coal transport, whereas in India, the mining of coal on a large scale did not begin until the opening of the first portion of the East India Railway (1854) which made the eastern portion of the great coal belt of India accessible.[22]

In the next decade 1865-75 a small rail track was lined (20 miles) connecting Siarsol (near Asansol) to Barakar, via Sitarampur. These were coal mining centres. Table 4.7 shows the railway mileage, the number of mines connected and the total number of railway stations opened in a decade, starting from 1855-65 to 1935-45.[23] A very remarkable increase in railway mileage is seen in the decade 1885-95. The extension

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22. V. Anstey, The Economic Development of India, 1929, p. 24.

23. The names of the railway section, date of opening and miles laid is shown in Appendix 9 . The names of mines connected and railway stations opened in each decade may be seen in Appendix 10.

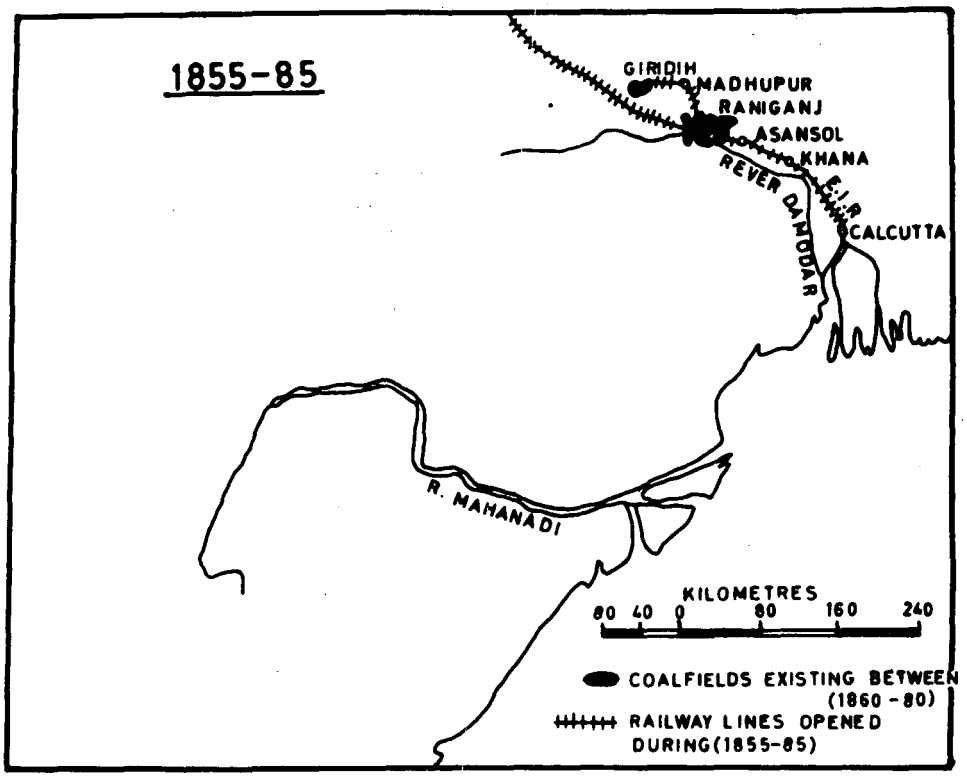
Table 4.7 Growth of Railways and Mines Connected

Year	Railway Mileage	No. of Mines connected	Total number of railway stations opened
1855 - 65	46	1	2
1865 - 75	20	2	2
1875 - 85	27	1	2
1885 - 95	717	4	21
1895 - 1905	168	8	20
1905 - 15	758	5	32
1915 - 25	370	3	32
1925 - 35	428	5	25
1935 - 45	54	1	5
Total	2588	30	141

Source : Derived from History of Indian Railways, 1947

of railways during this period coincided with the growth of the coal industry. The growth of the latter was most remarkable during the year 1893-94.[24] The four mines that were connected during the decade were all coal fields, viz., Katras, Damodar, Sanctoria and Umaria. The railway mileage laid down during 1885-95 was very high perhaps because the coalfields

24. Gadgil, op. cit., p. 79.



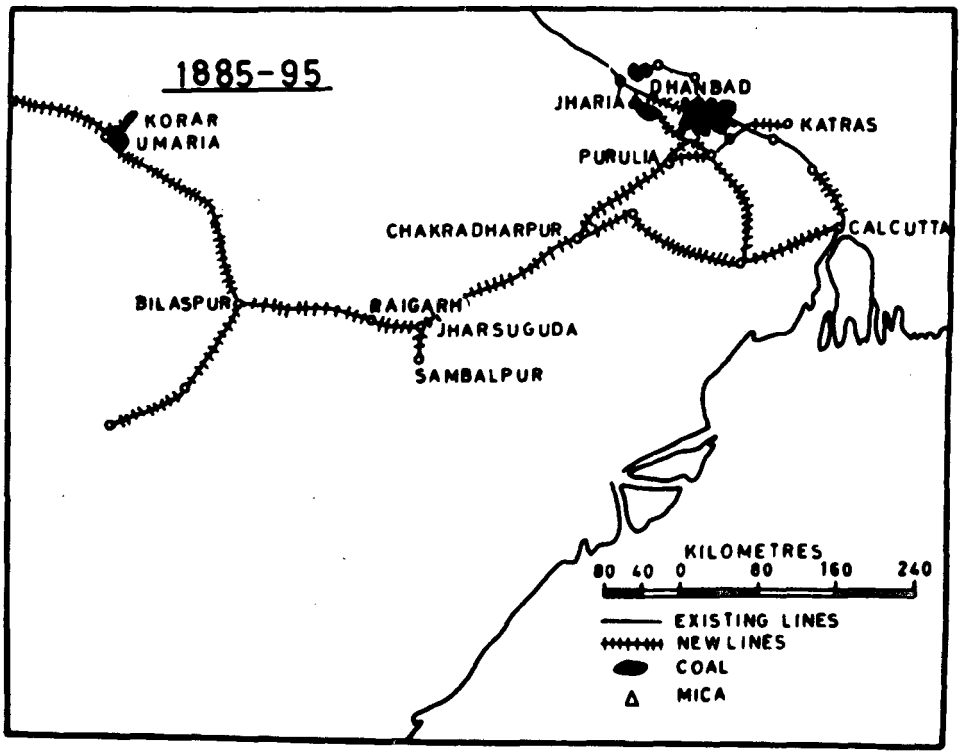
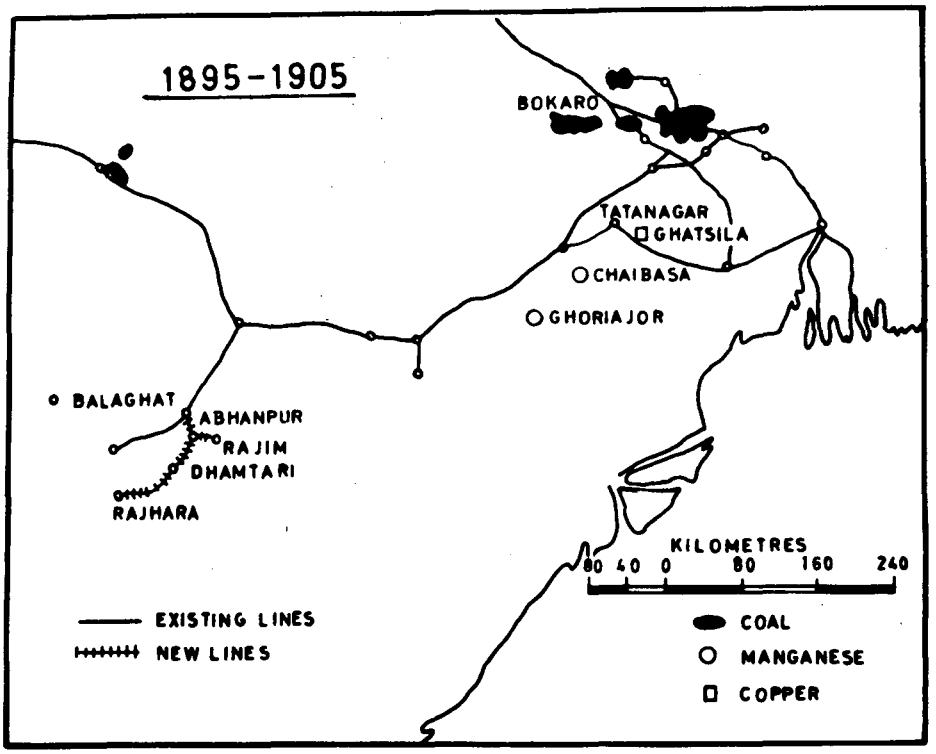


FIG.NO. 4.3 A

RAILWAY GROWTH AND OPENING OF MINES (1855-85 AND 1885-95)



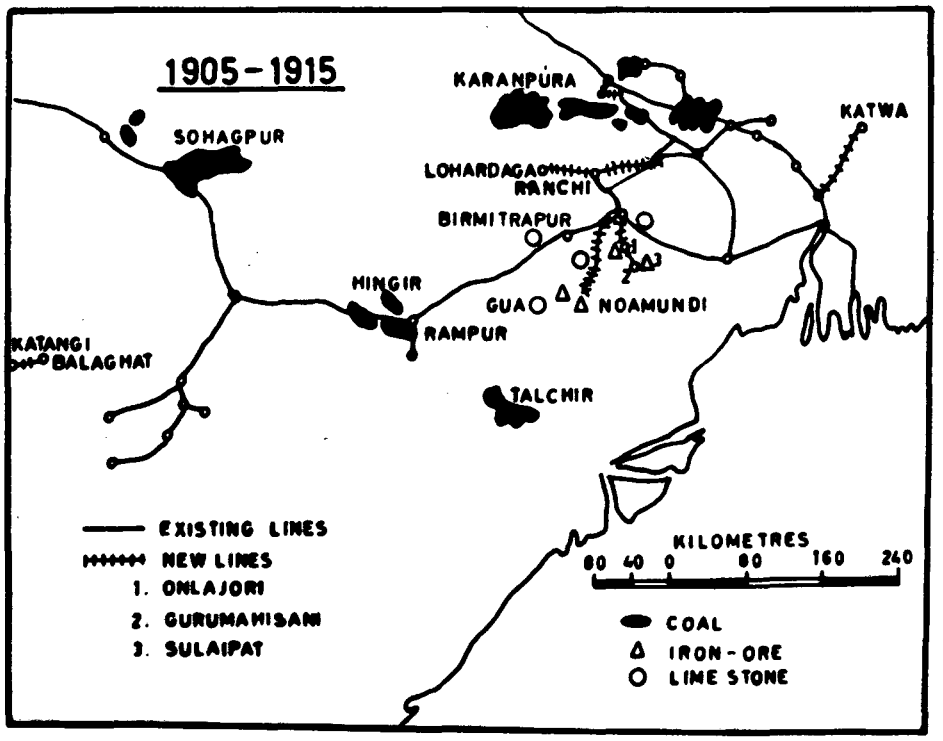
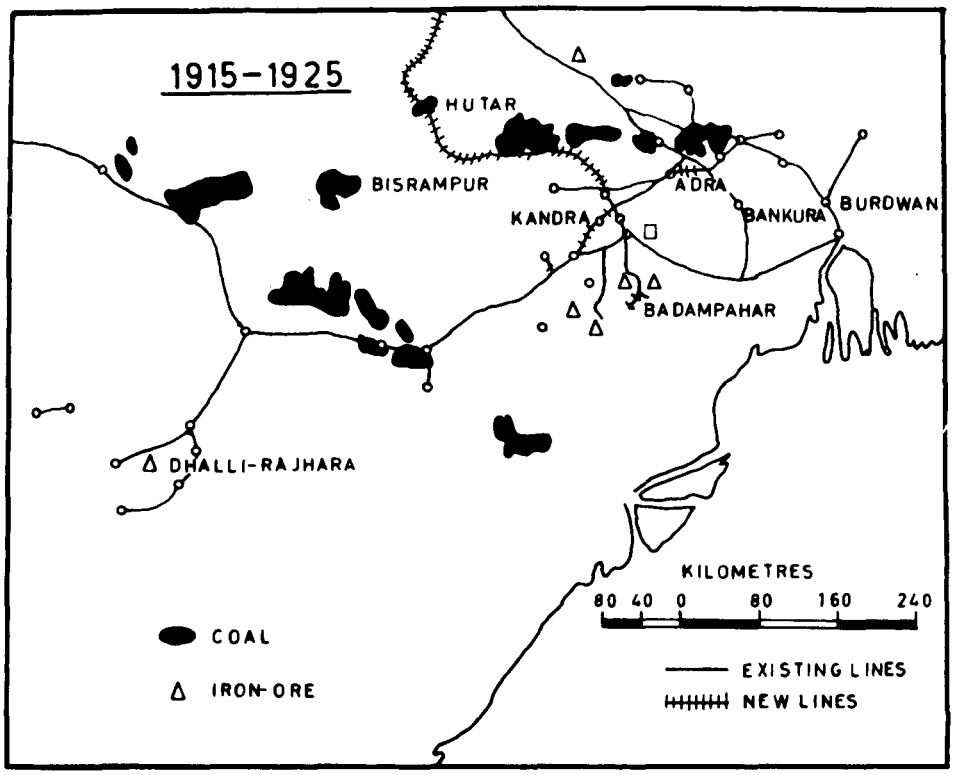


FIG.NO.	RAILWAY GROWTH AND OPENING OF MINES (1895-1905 AND 1905-1915)
4.3 B	



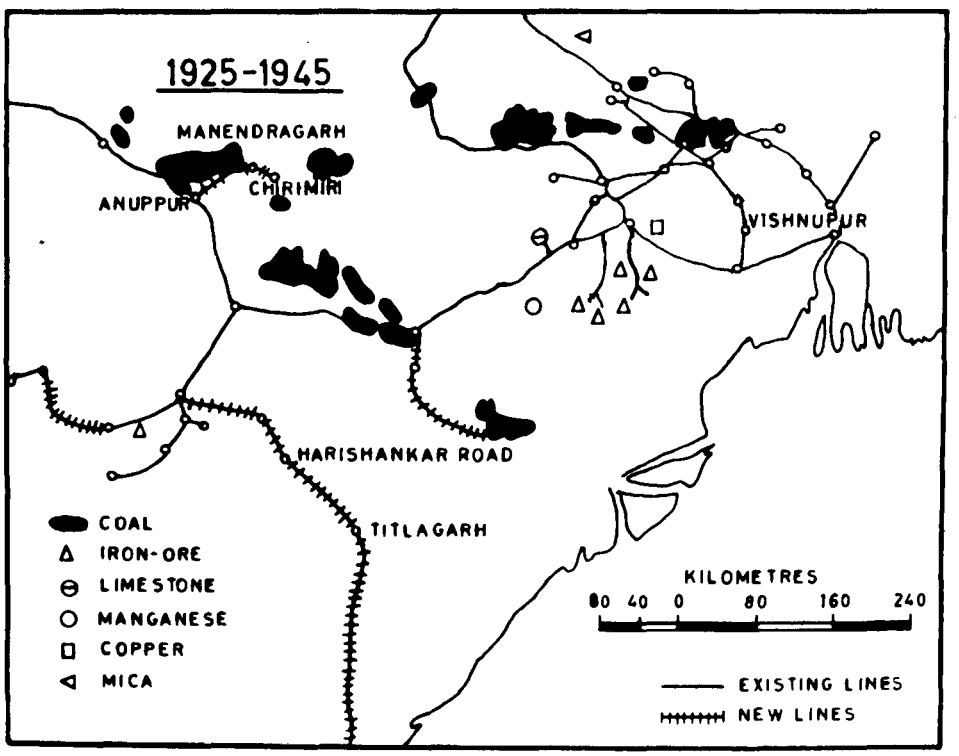


FIG.NO.	RAILWAY GROWTH AND OPENING OF MINES
4.3 C	(1915 - 25 AND 1925 - 45)

which were linked were widely distributed. The number of railway stations which were opened were also distributed almost equally in the four states (now named West Bengal, Bihar, Orissa and Madhya Pradesh).

During the period 1895-1905 the maximum number of mines (8) were opened, but the railway mileage was very small (168 miles). This is because all the mines which were opened were located within the Damodar Basin in close proximity to each other. Moreover, all these coal mines were located in a single district (now Dhanbad). Of the twenty railway stations opened, all except three were opened in the beginning of the present century. In the next decade, 1905-15 and beyond this decade there was a shift from the rail connections in coal mines to that of iron-ore mines. It was during this period that the largest Indian owned industry of the country began production in this Region. The Tata Iron and Steel Company required large quantities of iron ore. It obtained ore from Onlajori, Gurumahisani, Badampahar and Gua by railways. Map numbers 4.3 A,B & C show the decade-wise location of railway lines and the mines which had been connected. The last shows the entire railway connections in the Mineral Belt and the mines which had been linked with the railways upto 1945.

The maps clearly indicate that the railway lines were oriented towards mines. Vast areas were seen having no rail connections whatsoever. The first decade (1855-65) saw the railways moving toward the coalfields of Raniganj. The mineral-

rich areas of the Chotanagpur Plateau had to wait for several decades to be linked by railways. The mica-rich area falling within Hazaribagh district was linked by railway in the 1870s. The coalfields of Dhanbad and the iron-ore areas of Singhbhum and Mayurbhanj were first reached by the railways during 1895-1905 and 1905-15 respectively. Thus there was a gap of about thirty years between the linking of the Raniganj coal-fields and those of Dhanbad and Jharia. Another forty years elapsed before the iron-ore resources could be profitably used either in large scale iron smelting operation at Jamshed-pur (1911) or for export. Coal traffic assumed large scale dimensions only during the first world war, and the expansion and growth of railways in the Bengal-Bihar coalfields was a development of the early years of the present century.

The total railway mileage built during a period of ninety years in the region was 2,588 miles, through which thirty mines were connected, and 141 railway stations were opened. The pattern of route expansion shows that railways were not deve-loped to foster industrial development, as in Germany and Japan.[25] Locational economists are of the view that the general characteristics of railways should be such as to promote inter-regional linkages, exchange and specialisation.[26]

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25. V.B. Singh, op. cit., p. 328

26. S. Munsi, op. cit., p. 25.

But this was not observed in the trend of railway growth in colonial India. On the contrary, the network aided by the freight policy introduced a two-step flow system between the metropolitan economy and the raw material producing region via the port of Calcutta. The railways were instrumental in tying up the Mineral Belt with the metropolitan economy within the framework of an international division of labour by dictating the direction of the movement of goods in its favour.[27] The absence of a circuitous network of railways in the Region can be explained only on the basis of such an analysis.

4.4 Conclusions

If the sectoral distribution of the work force of resource regions of developed countries (e.g. the Ruhr, Cleveland, Saxony, Westphalia etc.) is analysed for the nineteenth and early twentieth century it will be found that the secondary sector in these regions was the dominant sector.[28] But in contemporary India, the most important mineral resource region remained backward and undeveloped and was characterised by the dominance of the primary sector. This was due to the policies of the British Government towards resource exploitation and utilisation in the Mineral Belt whose characteristic underdevelopment was clearly reflected in the occupational structure. The foregoing analysis indicates that :

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27. Ibid., p. 25.

28. A.F. Weber, The Growth of Cities in the Nineteenth Century, 1967, p. 189.

1. The decrease in the total number of industrial workers over the decades confirmed the process of de-industrialisation in the country, which had begun to be felt in the nineteenth century. While industrial workers showed a decline in numbers, there was a corresponding increase in the number of workers engaged in primary and tertiary activities.
2. The majority of the workers were engaged in small, indigenous industries (if these may be termed 'industry' at all!), in the absence of large factories in the Region. The goods which were produced catered to the local demands of the people.
3. There was a dominance of elementary processing activities which dealt with raw materials directly and which required a very low level of skill. Under normal conditions, the secondary sector of processing in a resource-region, should have increased. But in the Mineral Belt the secondary processing sector remained more or less stagnant. The goods produced therein could not compete with the finesse and cheapness of imported goods and had to face stagnation or decline.
4. On an average about one third of the industrial workers were engaged in the indigenous textile industry mainly cotton. It always ranked first in terms of employment of industrial workers. Yet, the number of workers engaged in the industry continued to decline

with time.

5. The only encouraging trend was seen in the metal industry where the percentage of workers employed showed an increase in every census. Within the metal industry, the makers of tools and implements constituted a major share.
6. As a general trend, the decrease in number of workers engaged in the manufacturing sector coincided with the decline in number of traders engaged in the trade of those manufactured products.

The growth of the railways and the development of resources shows that :

1. The basic objective behind the construction of the railways in the Mineral Belt was trade and the exploitation of resources. The lines connected the mineral regions to the exporting port - Calcutta, from where the primary products could be despatched thousands of miles away from Indian shores. The freight rate policy of the government was designed to ensure a smoth two-step flow system between the metropolitan economy and the raw material producing region via the port of Calcutta. Areas lacking in exportable resources remained isolated and dependent upon more traditional forms of transport.
2. The exploitation of minerals in the Region was dependent on the development of railways. This was in

direct contrast to the situation that had prevailed in the West. In England the first rails were laid in order to facilitate coal transport, whereas in India, the mining of coal on a large scale did not begin until the opening of the railways.

3. In the initial period (1855-1904) the railways primarily connected the coal mines. From 1905 onwards there was a shift from the rail connections in coal mines to that of iron ore mines due to the establishment of the latter industry in the Region.

Chapter 5

PATTERN OF INDUSTRIAL DEVELOPMENT IN A RESOURCE ENCLAVE

Introduction

5.1 Traditional Industrial Base

5.2 Emergence of the 'Modern' Industrial Sector

5.3 Development of Leading Industries

- 5.3.1 Coal
- 5.3.2 Iron and Steel
- 5.3.3 Industries of Secondary Importance

5.4 Government's Participation in Industrialisation

5.5 Employment Characteristics and Level of Technoloy Used by the Industrial Establishments

- 5.5.1 Covenanted Employees in T.I.S.C.O
- 5.5.2 Technology Used
- 5.5.3 Level of Technology in Coal Mining
- 5.5.4 Level of Technology in the Iron Industry
- 5.5.5 Level of Technology in Other Industries

Conclusions

Chapter 5

PATTERN OF INDUSTRIAL DEVELOPMENT IN THE RESOURCE ENCLAVE

The mineral resources hold an important place in shaping the industrial pattern of a region. In India industries based on indigenous resources had existed even when England was principally an agricultural country. William Digby rightly observed "England's industrial supermacy owes its origin to the vast hoards of Bengal and the Karnatik being made available for their use. Lancashire spinning and weaving were on par with the corresponding industry in India so far as machinery was concerned, but the skill which had made Indian cottons a marvel of manufacture was wholly wanting in any of the western nations. As with cotton so with iron, industry in Britain was at a very low ebb, alike in mining and in manufacture".[1]

After the establishment of British rule in India two processes took place which affected and shaped the pattern of industrialisation in the country. Firstly, the traditional base of the indigenous industries was destroyed under strict competition from goods imported from the metropolitan countries and secondly the 'modern' sector that developed had an enclave character which could not generate impulses of further industrialisation.

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1. W. Digby, Prosperous British India, 1901, pp. 30-31.

The following hypotheses can therefore be put forth about the trends and patterns of industrialisation in the mineral enclaves :

1. A general decay of the local industries set in.
2. The 'modern industrial sector acquires the characteristics of a derivative enclave and develop in isolation of the regional economy.
3. The Government's participation in the process of industrialisation of the region is negligible. Though the raw material is primarily controlled and exploited by the government, efforts at industrialisation usually come from the local entrepreneurs.
4. Technology used by the developing industries is rudimentary, production is low and most of the technical work is performed by imported personnel.

These hypotheses are tested in the following pages.

5.1 TRADITIONAL INDUSTRIAL BASE

The type of industries which existed in the Region in the nineteenth century and earlier were mainly forest based. Mineral based industries were operated on a small scale. During the last decade of the nineteenth century the forest based industries faced a decline and mineral based industries showed a gradual development.

The silk industry was one of the traditional industries of the Region. Singhbhum (Bihar) and its neighbourhood were

described as the heart of the tasar weaving industry of the country where tasar sericulture was pursued in its completeness and where some of the best practices prevailed.[2] In Bilaspur district (Madhya Pradesh) there were six principal centres of the tasar silk industry from where silk was exported to various parts of India and China.[3] Tasar silk weaving was the principal industry of Sambalpur (Orissa) from 1850 to the beginning of the twentieth century. The culture of the tasar silk was carried on in almost every jungle village and atleast seven and a half million cocoons were produced annually. Only one-third of the cloth remained in the district, the rest were exported to the districts of Cuttack, Ganjam, Raipur, Bilaspur, etc.[4] The silk industry was located in Katwa (Burdwan district) too from where silk was sent to Calcutta and there it was either sold or exported.[5] Silk weaving was a prosperous industry at Bishnupur, Bankura, Sonamukhi etc. (all in Bankura district).[6]

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2. L.S.S. O'Malley, Bengal District Gazetteer - Singhbhum, Seraikela and Kharsawan, 1907, p. 140.

3. A.E. Nelson (Ed.), Bilaspur District Gazetteer, Vol. A, 1910, pp. 162-63.

4. L.S.S. O'Malley, Sambalpur District Gazetteer, 1901, p. 146.

5. J.C.K. Peterson, Burdwan District Gazetteer, 1910, p. 117.

6. L.S.S. O'Malley, Bankura District Gazetteer, 1908, p. 110.

It may be noted that the tasar silk industry declined in all these centres due to some reason or the other. The most common reason was the prohibitive duty levied on rearing cocoons in the forest, closer conservation of government forests and clearing of village forests.

Another important forest industry was that of lac collection and manufacture. In the Ranchi district this was the only industry of some importance besides the industries of the village artisans.[7] Hazaribagh district too housed the lac industry. Chatra was an important centre for collection.[8] Sonamukhi was the chief centre of the lac industry.[9] In Manbhum district there were 118 regular lac factories in 1909, employing 6,000 workers. The export of lac was valued at R. 40-50 lakhs. There were numerous factories at Purulia and Balrampur.[10]

Metal work was carried on in a number of districts. Vessels of copper, brass and bell metal were made through indigenous operations. Brass work was carried out at Raipur, Dhamtari and Nawapara (all in Raipur district).[11] Gold work was done at Bilaspur, Champa and Ratanpur (all in Bilaspur district).[12] Brass and bell metal utensils were manufactured

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7. H.G. Hallett, Ranchi District Gazetteer, 1917, p. 171.
8. E. Lister, Hazaribagh District Gazetteer, 1917, p. 135.
9. L.S.S. O'Malley, Bankura District Gazetteer, 1908, p. 108.
10. H. Coupland, Manbhum District Gazetteer, 1911, p. 157.
11. A.E. Nelson (Ed.), Raipur District Gazetteer, 1909, p. 178.
12. A.E. Nelson (Ed.), Bilaspur District Gazetter, 1910, p. 167.

at Patrasaer, Bishnupur and Bankura (all in Bankura district).[13]

Iron smelting, by primitive methods was carried on in a number of places. In Palamau district the aboriginal tribes - the Agarias smelted iron under tamarind trees. The iron was made into axes, plough-shares, well brackets, agricultural implements and guns.[14] In Ranchi district the tribes utilised the iron for making weapons.[15] Tandwa, in Hazaribagh district was the centre of iron smelting in 1863. There were almost twelve small furnaces operating which produced nearly 264 pounds of pig iron per day.[16]

In Burdwan district, iron utensils were made locally. The blacksmith who had not specialised in any branch of his trade, required next to no tools or outfit. Cutlery was manufactured in Burdwan town which housed the best cutlery shops in Bengal.[17] In Sambalpur district iron was worked by primitive methods by means of charcoal. The iron was used for making agricultural implements.[18] Singhbhum was noted

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13. L.S.S. O'Malley, Bankura District Gazetteer, 1908, p. 110.

14. L.S.S. O'Malley, Palamau District Gazetteer, 1907, p. 109.

15. M.G. Hallett, op. cit., p. 170.

16. W.W. Hunter, Statistical Account of Bengal, Vol. XVI, 1877, p. 158.

17. J.C.R. Peterson, op. cit., p. 118.

18. L.S.S. O'Malley, Sambalpur District Gazetteer, 1909, p. 147.

for its copper enterprise.[19]

Some other industries which existed included bangle making, rope making, bamboo work, etc. There was a pottery works at Raniganj since 1866, a lime works at Andal and brick and tile works at Durgapur. In 1891 Bengal Paper Mills was opened at Raniganj. In Burdwan district there were seven oil mills which were worked by mechanical power.[20]

5.2 EMERGENCE OF THE 'MODERN' INDUSTRIAL SECTOR

Inspite of the rich endowments, large industrial establishments were almost absent till as late as 1907. The turn of the century saw the introduction of large scale industries, based on minerals. (Earlier, the only large industry was that of coal mining). With an increased number of successful surveys, newer areas of mining were opened up - especially in Bengal. Further surveys opened up was in the eastern portions of Central Provinces (now Madhya Pradesh). A region of mining and primary processing had feebly started emerging.

Those stray pockets of mining were more enclaves in the sense that they were a closed system with no interaction what so ever with their surroundings. It was seen that the minerals which were extracted went through the most primitive processing

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19. Bengal District Gazetteer, Singhbhum, 1910, pp. 180-44.

20. J.C.K. Peterson, op. cit., p. 119.

whereby the raw material was exported to developed countries. In places where industries were set up, infrastructure developed and transport lines were laid. This though created a semblance of industrial development in the country, it did not lead to the structural transformation of the Region.[21]

The mineral enclaves were introduced with the British rule and intrusion of their capitalist enterprises in the nineteenth century. As a consequence the indigenous iron industry of the Region became extinct and a new extractive industry developed. However, there was a vast difference between the two industries. The indigenous iron industry had provided employment for the local people, it was decentralised in many small-scale workshops and it was geared to indigenous demand. The coal industry, on the other hand, was imposed on the area, the local people were only marginally involved in it. It was concentrated in a major coalfield and it became an isolated enclave. The steel towns of a later period were similarly isolated.[22] These enclaves had only very tenuous links with their surroundings because the economic activity prevailing therein was derived from an exogenous impact. In fact economic impact exerted on the enclave hinterland was a negative one.

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21. V.L. Tyagunenko (ed.), Industrialisation of Developing Countries, p. 254.

22. D. Rothermund, D.C.Wadhwa (ed.), Zamindars, Mines and Peasants, 1978, p. 2.

The coal mines may be said to be a typical instance of a derivative enclave, i.e., they catered to the needs of the primary enclaves.[23] This implies that the coal which was produced was used for the railways, the tea and jute industries etc. within the country and was not exported in large quantities whereas the tea plantations were geared to a demand from abroad. Labour for this enclave was often recruited from a great distance. This sort of migrant labour force accentuated the isolation of the enclave.[24] Thus, the people of the hinterland established a sort of marginal co-existence with the enclave with no change of any kind in this relationship. K. Berrill notes that in such situations the home market of a low wage country does not expand and there is a leakage (into the mother country) of the larger part of the income created.[25] This was very true of the mining enclaves under the British colonial rule.

The urban enclaves that gradually emerged in the Region also did not stimulate any development in the neighbourhood.

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23. Ibid., p. 3.

24. The local labour was used only for temporary and casual work. He was given low wages and his attendance was never regular. While the worker who came from far away had to submit to the regulations imposed on him by the terms of his contract or indenture.

25. K. Berrill, "International Trade and the Rate of Economic Growth", in Economic History Review, 2nd series, 12, 1959-60.

There was only the 'coolie linkage' which emerged between the immediate hinterland and the new urban centre.[26] The urban enclave which emerged under the British rule was controlled by entrepreneurs who were not interested in developing the area and who extracted more than they invested in it.

5.3 DEVELOPMENT OF LEADING INDUSTRIES

In this section, a brief account will be given of the two leading industries which were established in the Mineral Belt. These industries were coal and iron and steel. Some other mineral industries like copper and cement which came up in the Region have also been briefly discussed.

5.3.1 Coal[27]

The growth of the coal industry in the country took place by fits and starts, not by any planned policy for the industry as a whole or by any conscious choice of investment over a long period under the individual initiative of firms. The low quality of Indian coal, transport inefficiency and deficiency, fluctuating prices, inelastic and erratic demand, low return on investment and the refusal of government to intervene ruled out any long term investment policy.[28]

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26. D. Rothermund, Op. cit., p. 226.

27. A more detailed account is given in the section dealing with 'technology'.

28. R.K. Ray, Industrialisation in India, 1979, p. 115.

The pace of industrialisation in India during the period under study was not such as to ensure a rapidly growing market for coal. That market was characterised by lack of steadiness and inelasticity of demand, the single most important factor in determining the pattern of development in the coal industry.[29] The railways were the most important customer of coal. In the early 1920s the railways consumed about 6 - 6.5 million tons of coal per year. By 1944 this figure stood at 10 million tons. (The export market was always fluctuating). The most notable event during the period from the view of the coal industry was the emergence into importance of the iron and steel industry. The coal industry had applied for protection in 1925. But this claim could not be sustained in view of the low level of imports and the majority report of the Tariff Board expressed the opinion that the coal industry had benefited to a far greater extent from the protection granted to steel than it could possibly do from any protective duty on coal.[30] A measure specially adopted by the government to stimulate internal demand was the setting up of the Indian Soft Coke Committee for promoting and improving the method of manufacture of soft coke.[31] This was manufactured from relatively inferior grades of coal and was sought to be made popular as domestic fuel in Indian cities.

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29. Fifty Years of Coal, op. cit., p. 8.

30. D.R. Gadgil, op. cit., pp. 277-78.

31. Ibid., p. 278.

5.3.2 Iron and Steel

The first heavy industry to be established in the Mineral Belt was that of iron and steel. The British iron and steel industry had found for its product a large and growing market in India. However, when railways were introduced in India, the attention of British merchants, capitalists and to some extent of the government, was drawn towards the establishment of the iron industry in India.[32] There was no problem of the raw materials concerned. A number of experiments were undertaken by the government for the manufacture of iron but public investments in these was on a small scale.

In the first half of the eighteenth century an iron works was opened at Porto Novo. The works failed for lack of capital and due to the difficulty in procuring charcoal fuel. Large scale manufacture of iron could not become an economic proposition till coal was being used for smelting purposes. Similarly, the Kumaon Iron Works which started in 1855-56, failed because of the limited supply of vegetable fuel.[33]

R.H. Mahon (first steel expert in India according to Curzon) stressed the need for a large iron plant. He noted that the mechanical operations connected with the manufacture of steel were already being carried on in India on a small

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32. S.K. Sen, op. cit., p. 28.

33. S.K. Sen, op. cit., p. 30.

scale. For the success of steel works an essential condition was that of manufacturing on a large scale. Moreover, the iron mills had to be modernized and it was necessary for the management to consist of persons combining expert knowledge with local experience.[34]

Production of steel started in 1912 and the opening of TISCO was the pioneering effort by private enterprise in India. Before Tata Steel came into existence, practically no steel and only about 40,000 tons of pig iron was produced annually. This was an infinitesimal fraction of the world total. However, the significance of the plant lay not in the quantity produced but in the inclusion of India on the world steel map. Also it marked an industrial breakthrough for the economically backward countries of the world.[35]

The growth of the steel industry in the Region, or perhaps in the entire country, may be analysed with reference to the growth of the TISCO, because upto 1940 it was the only big company which produced steel in India. Table 5.1 shows the various indices of growth from its inception upto 1947-48.

5.3.3 Industries of Secondary Importance

The Tata Iron and Steel Company stimulated the growth of a number of related industries in Jamshedpur. During the

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34. Sen, op. cit., p. 30.

35. Tata Steel Diamond Jubilee, 1967, p. 34.

Table 5.1 Key Indices of the Growth of T.I.S.C.O. (average annual values)

Period	Output of Finished Steel ('000 tons)	Daily Employment (No.)	Gross Profit (Million £.)	Output per man (tons)
1912-13 to 1917-18	74.8	9,478.5	5.9	7.89
1918-19 to 1923-24	125.0	22,664.8	7.3	5.52
1924-25 to 1934-35	414.5	20,178.9	11.9	20.54
1935-36 to 1939-40	701.4	19,309.2	35.8	36.32
1940-41 to 1947-48	767.8	21,795.0	69.3	35.23

Source : Tata Steel Diamond Jubilee, p. 139.

first world war (1914-18) the Indian Steel and Wire products was established. In 1920 the Indian Cable Company Ltd., and in 1921 the Engineering and Machine Manufacturing Company was set up. A year later in 1922 the Tinplate Company which was the first of its kind in the country was established.[36]

The copper industry was raw material oriented. The Smelting plant was set up at Maubhandar in 1924 which was about two miles from Chatsila Railway Station.[37] The Indian Aluminium Company was based on the local resources of bauxite. It was established in 1937 to produce aluminium at Muri (Bihar).

36. J. Layshon, Report on the Tinplate Industry in Bihar and Orissa, Bulletin No. 2, Misc. Industrial Resource Series, 1934, p. 2.

37. P. Pandey, op. cit., p. 135.

In 1942 a plant was set up at Jaykaynagar near Asansol, which obtained all the bauxite from Lohardaga (46 miles west of Ranchi). The Indian Aluminium Company established an aluminium ware industry at Hirakud (Orissa) in 1938. Initially, it had started as a private enterprise under the sponsorship of a Canadian aluminium firm.[38] Associated Cement Company established a factory in 1936 at Khalari. In 1947 the Company started another factory at Jhinkpani near Chaibasa. All these factories obtained their raw materials from nearby sources.[39]

The glass industry in the country dates back to 1890, but in the Region the enterprise began in Chota Nagpur much later. In 1941, a glass works was established at Chirkunda near Dhanbad. Another works was set up near Dhanbad in 1943. Two years later two more glass factories were established - one at Jharia and the other near Ramgarh. A government tannery was established in 1943 at Titlagarh (Orissa). Its main function was the collection of raw hides and production of tanned leather.[40]

5.4 GOVERNMENT'S PARTICIPATION IN INDUSTRIALISATION

The government's participation in the process of industrialisation of the Mineral Belt was negligible.[41] If there

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38. Orissa Government Gazetteer, Sambalpur, 1971, p. 213.
39. Brown and Dey, op. cit., p. 427.
40. Orissa District Gazetteer, Bolangir, 1968, p. 204.
41. Report of the Indian Industrial Commission, 1916-18, p. 4.

had been any green signal by the government to foster industrial enterprise, this Region, with all its minerals and other resources would have regenerated the economy of the entire country, to a very large extent. But this failed to happen because the resources that were explored and exploited, were not being utilized within the Region, but were building up the metropolitan economy outside the nation. England had little raw materials and expanding industries. It was due to this state of affairs that the policy of the government lay in encouraging the export of raw materials for the growing industries of Britain.

It should be noted that due to the government's initiative, nations like Japan, Germany, Austria and the United States had made enormous progress in manufacturing industries since 1870. This progress was the result of their devising and carrying out a system of general and technical education for their people, accompanied by a system of state aid and encouragement to industries. These and other states took full advantage of the policy of free trade by which Indian had to export raw material and her markets were flooded with their manufactured goods. India was thus exposed to an ever-extending commercial subjugation by these nations, without being armed and equipped to offer a resistance and without being protected by any fiscal walls. This long continued attack affected her agricultural as well as manu-

facturing industries.[42]

The history of the evolution of new industrial methods in the West which culminated in the rapid and striking changes on the latter half of the eighteenth century shows that a large part was played therein by the educated as well as by the capitalist classes. The encouragement of scientific research and its practical application by the Royal Society and the Society of Arts was closely paralleled by the fresh industrial ventures constantly being set on foot by merchants and other persons with capital at command. When the results began to reach India in the shape of machine-made imports, the movement had passed beyond the stage where imitation might have been easy and where the gradual evolution which had taken place in England could be readily imitated in India.[43] To create an industrial organisation in India comparable to that of western countries to build up an industrial community capable of working such an organisation, certain positive measures were required including the provision of industrial and technical education.

The system of education introduced by the government was, at the outset, mainly intended to provide for the administrative needs of the country and encouraged literary and

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42. M.M. Malviya, in a note in the Report of the Indian Industrial Commission 1916-18, pp. 305-306.

43. Report of the Indian Industrial Commission, p. 104.

philosophic studies to the neglect of those of a more practical character. As a result it created a disproportionate number of persons possessing a purely literary education, at a time when there was hardly any form of practical education in existence. Throughout the nineteenth century the policy of the government was controlled by the doctrine of laissez faire in commercial and industrial matters and its efforts to develop the material resources of the country were largely limited to the provision of improved methods of transport and the construction of irrigation works.[44] Except in Bombay, the introduction of modern methods of manufacture was almost entirely confined to the efforts made by the European community. The non-existence of a suitable education to qualify Indians for posts requiring industrial or technical knowledge was met by the importation of men from Europe who supervised and trained illiterate Indian labour in the mills and factories that were started. From this class of labour it was not possible to obtain the higher type of artisan capable of supervisory work. The system of technical education which had grown up on the continent of Europe had already attracted the attention of manufacturers in Great Britain, and it was natural that a demand should be made in India for government to provide similar facilities. Even when the necessity for action began to be perceived clearly by government, the magnitude

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44. Ibid., p. 105.

of the problem was hardly appreciated, it was by no means sufficiently recognised that technical education is by itself incapable of creating industries.[45]

5.5 EMPLOYMENT CHARACTERISTICS AND LEVEL OF TECHNOLOGY USED BY THE INDUSTRIAL ESTABLISHMENTS

It has been noted earlier that the indigenous industry was uprooted in the face of the competition meted out by the imported goods. With the loss of their trade, the artisans, craftsmen, weavers lost their traditional skills. This was contrary to what had happened in Britain, France or Germany where the displaced workers had acquired new skills in factories and the state had taken the initiative to provide elementary education to all. In India the really skilled occupations in factories were controlled by Europeans (or Americans) and were not open to the local people. The meagre educational facilities of the latter produced a "new type of dependence on foreigners".[46]

In the following pages an attempt will be made to outline the employment and the level of technology and the technological development that took place in some of the major industrial establishments of the Mineral Belt.

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45. Ibid.

46. A.K. Bagchi, "Choice of Techniques and Technological Development in Underdeveloped Countries", Occasional Paper No. 14, 1977, pp. 16-17.

5.5.1 Covenanted Employees in TISCO

The best example regarding imported technical personnel, is afforded by the T.I.S.C.O - the largest industry of the Region. For the establishment of the huge iron and steel plant, initial capital was not the only problem, there was the problem of obtaining machinery and of the recruitment of technical personnel. Machinery was purchased from Germany because of the Company's failure to obtain blast furnaces from England.[47] America provided most of the technical personnel. The crew of the steel plant and the superintendent came from Germany, only the clerical staff was recruited from among the Indians (Parsis and Bengalis).[48]

In 1901-10, the number of covenanted employees was thirty-one, and by 1914-15 the number rose to 121.[49] As the production processes became more complex the need of foreign experts increased. It was in the 1920s that the Tatas realized the danger of foreign dependence, and the heavy financial burden it incurred on the Company. The educational backwardness of the country was reflected in the problem faced by the TISCO.[50] The government refused any financial assistance to the proposal of the Tatas for

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47. Report of the Indian Industrial Commission, 1916-18, Minutes of Evidence, Vol. 2, p. 78.

48. F.R. Harris, J.N. Tata, 1958, p. 202.

49. S.K. Sen, The House of Tata (1839-1939), 1975,

50. Ibid., p. 67.

setting up a technical institute at Jamshedpur. Though eventually an institute was set up, it was a small one. In 1931, the institute was recognised and provision was made to train students as fitters, blacksmithers, welders and moulders.[51] Indians gradually replaced the foreigners in the lower cadre jobs so that the numbers of covenanted employees was reduced from 161 in 1926 to 64 in 1934.[52] It was only in 1937 that an Indian General Manager was appointed for the first time.[53] However, the T.I.S.C.O. became independent from foreign technical personnel by 1946.[54]

5.5.2 Technology Used

Till the latter part of the nineteenth century, minerals were extracted and processed by the most primitive methods whereas in Britain and many other countries innovations were continuously being made in this sphere.[55] As a consequence

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51. Ibid., p. 68.

52. Annual Report of the TISCO - 1933-34, p. 27.

53. Tata Steel Diamond Jubilee, op. cit., p. 39.

54. V. Elwin, The Story of Tata Steel, 1958, p. 60.

55. In the course of the industrial revolution, steam power was the greatest of the technical innovations because it became the agent and instrument for applying basic innovations in so many industries and transport. It was a known fact that great technical progress could be achieved in applying the iron machinery and steam engine to more and more processes in more and more industries. (See P. Mathias, The First Industrial Nation, 1969, p. 134). In Britain the great nineteenth century turning point for the coal industry was the 1840s. The

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substantial reserves of minerals were prospected in the Region but their output was very low when compared to the output in other industrial regions of the world. For example if we see the production of coal in India and in Britain from 1880-1940, given in Table 5.2 and graph 5.1, we find that the production figures for Britain are much higher as compared to India's. A significant reason for the low production (inspite of high reserves) may be attributed to the use of antiquated methods of extraction.

5.5.3 Level of Technology in Coal Mining

There were numerous collieries where machines were not used at all. The coal was brought to the surface by primitive means and was carried in baskets on the heads of the labourers. The labour force in the collieries was composed of men, women and children. Men cut the coal, women and children carried it to the tubs, and as a rule also pushed the tubs to the shaft or incline, horses or ponies being rarely used for this purpose. The Census indicates that

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Footnote 55 cont'd.

great expansion of the railway network provided a new and enormous market for steam coal while it facilitated both mining in and the supply of coal to interior Britain. Britain output increased almost four-fold to reach 30 million tons between 1830-60. And by the latter date Britain's share of world production was three-fifths. This was the very foundation of Britain's mid-century growth and pre-eminence. (For details refer to P.J. Perry, A Geography of Nineteenth Century Britain, 1975, pp. 55-58).

Table 5.2 Coal Output in U.K. and the Region 1878-80 to 1945-46

Year	Output in Millions tons		
	U.K.	Region	North-East Coal-field[1]
1878 - 80	133.6*	0.95	29.5
1880 - 84	156.4	1.1	36.1
1885 - 89	165.2	1.4	36.2
1890 - 94	180.3	2.1	38.6
1895 - 99	201.9	3.8	43.3
1900 - 04	226.8	6.5	46.8
1905 - 09	256.1	10.2	53.1
1910 - 14	270.0	13.6	53.3
1915 - 19	243.1	17.5	42.2
1920 - 24	237.1	17.4	44.6
1925 - 29	223.2	19.8	42.6
1930 - 34	220.0	18.6	43.2
1935 - 39	229.6**	20.5	45.2
1940 - 44	205.4	22.7	35.8
1945 - 46	182.8	24.1	31.6

* U.K. output for 1875-79
** U.K. output for 1935-38

1. Northumberland and Durham

Source : U.K. - Mitchel & Deane, Abstract of British Historical Statistics, 1971, pp. 115-117.
India - Indian Coal Statistics, C.I.S.D., 1880-194(

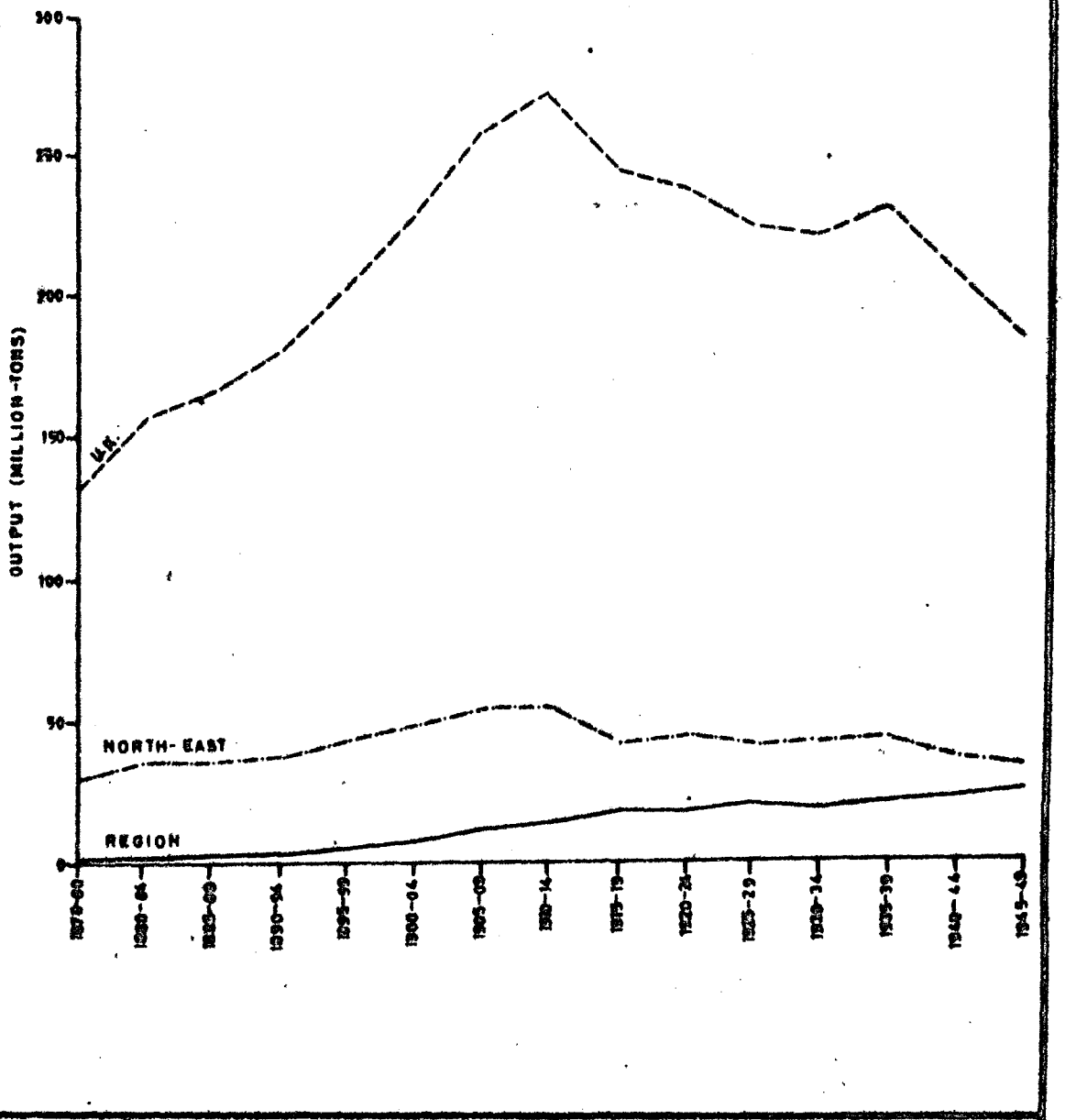

FIG. NO. 5.1	COAL OUTPUT IN U.K. AND THE REGION (1878-80 TO 1945-46)

among unskilled labourers, women outnumbered men and there was one boy or girl below 14 years of age to every 6 workers aged 14 and over.[56] The daily output per miner was very small compared with that of England, both because the miners were not so industrious and skillful and also because they worked for fewer days. The result of this was that a mine in Bengal required two and a half times more underground workers than an English mine. The Indian miner never worked more than 4-5 days a week. His logic was simple, i.e., he earned enough to fill his family's stomach.[57]

Table 5.3 Output of Coal Per Person Employed in Various Countries

Period	U.K.	France	Belgium	Germany	U.S.
1874-78	270	154	135	209	327
1879-83	319	187	163	257	427
1884-88	319	196	173	269	398
1889-93	292	201	168	257	444
1894-98	287	208	174	262	447
1899-1903	289	198	169	247	542
1904-08	283	194	162	251	568
1909-13	257	195	159	256	636

Cont'd.

56. Census of India, 1911, Bengal, Vol. V, Part I, Report p. 539.

57. Ibid., pp. 540-41

Table 5.3 Cont'd :

1914-18	252	152	125	287	710
1919-23	195	132	135	163	623
1924	220	149	136	209	655
1925	217	152	141	234	N.A.

Source : Report of the Royal Commission on the Coal Industry 1925, Vol. I, p. 127.

Table 5.3 and graph 5.2 show the output of coal per person employed in some countries. The table shows that from 1879-83 to the War, output in America rose sharply; French, German and Belgian outputs remained substantially unchanged, i.e., about 200,250 and 165 tons respectively and the British output fell from 319 to 257.[58] British mining was thus losing ground to other European countries and to America. It may be noted that British coal had to face growing competition directly in the export trade and indirectly in all manufactures based on coal, on the one hand and on the other hand, had to maintain those advantages in comfort and leisure for the British miner which once had seemed to be his birthright.[59]

Table 5.4 shows the output per worker in the coal, iron ore, copper, manganese, limestone and mica mines in

58. The miners were either deliberately restricting their output or else were declining in personal efficiency.

59. Report of the RCCI, op. cit., p. 128.

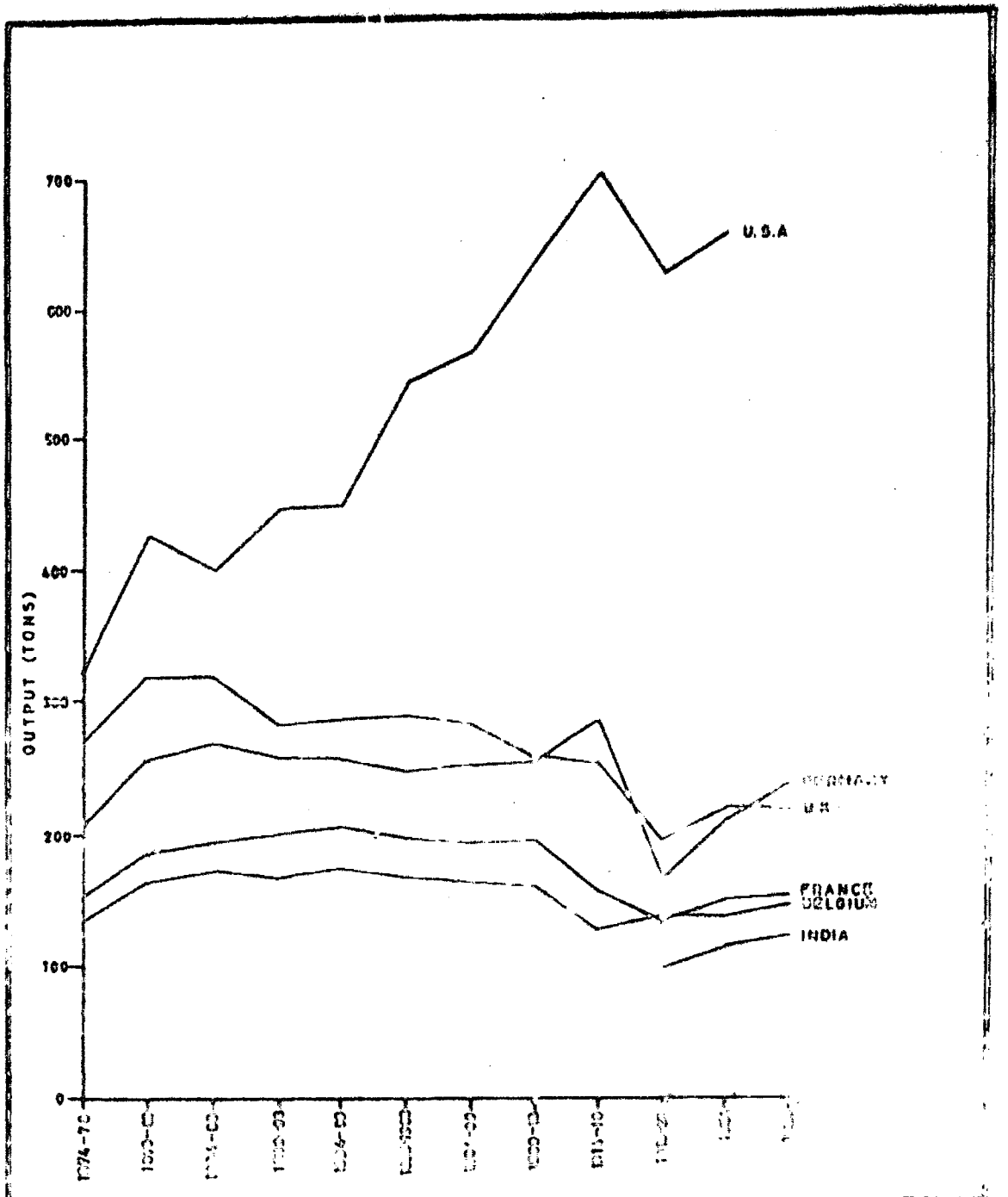

FIG.NO. 5.2 OUTPUT OF COAL PER PERSON EMPLOYED IN VARIOUS COUNTRIES (1874-1925)

Table 5.4 Output* Per Person of Various Minerals in the Region 1920-45

Year	Coal	Iron-ore	Copper	Manganese	Limestone	Mica
1920	102	87	13	40	32	1.8
1921	101	104	11	32	47	1.7
1922	74	123	11	34	27	1.5
1923	108	89	3	35	39	3.0
1924	111	97	N.A	28	21	2.0
1925	120	161	N.A	28	14	2.0
1930	104	N.A	114	37	32	3.0
1935	128	141	126	41	69	2.5
1945	152	N.A	99	21	145	3.0

* unit of output for all minerals is tons except for mica (Cwt.)

N.A - Not available

Source : Based on data obtained from the Annual Reports of the Chief Inspector of Mines (1920-45).

the Region. No particular trend is seen in any of them except that output per miner had increased in 1945 over that of 1920.

It may be noted that between 1890 and 1920 no significant technological change took place in Indian coal mining (with the exception of a small number of mines with deep shafts). In 1919, 587 mines were being worked in Jharia and Raniganj.

The mines (86 in number) worked by public limited companies accounted for 68 per cent of production (1,35,000 tons per year).[60] The methods employed in the production of coal in India were generally extremely labour-extensive, human labour was employed on an extensive scale to hew and haul coal. Before the first world war electrical equipment was practically unknown. The coal was often very near the surface in thick seams, and labour costs being extremely low, owners or managers did not deem it necessary to use much mechanical or electrical equipment or power.[61]

Mines working with no mechanical equipment, accounted for 43 per cent of all the mines in 1919. 55 per cent were equipped with steam power and only 2 per cent worked with electrical energy. Mines with electrified equipments accounted for 7 per cent of the production whereas those with steam power accounted for 85 per cent of production. There were only 4 mines - 2 in Raniganj and 2 in Jharia which were equipped with cutting machines, the remaining mines had very little technical equipment.[62]

In order to see whether there was any relation between mechanisation and production in the coalfields, three major

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60. Henner Papendieck, British Managing Agencies in the Indian Coalfield, 1978, p. 188.

61. D.H. Buchanan, Development of Capitalistic Enterprise in India, 1934, p. 246.

62. Report of the Coalfield Committee, Calcutta, 1920, Relevant Statistical Information, 1919, p. 200.

Table 5.5 Number of Mines and Quarries in British India Worked without any Mechanical Power 1902-1920

Year	Total no. of Mines*	No. worked without any mechanical Power	Their %age to Total Mines
1902	305	72	24
1903	295	64	22
1904	289	72	25
1905	280	69	25
1906	307	63	20
1907	414	153	37
1908	510	248	49
1909	511	297	58
1910	433	160	37
1911	450	174	39
1912	527	251	48
1913	602	288	48
1914	610	284	46
1915	583	249	43
1916	565	233	41
1917	694	342	49
1918	719	352	49
1920	714	348	46

* Registered under Act VIII of 1901

Source : Derived from the Annual Reports of the Chief Inspector of Mines (1902-1920).

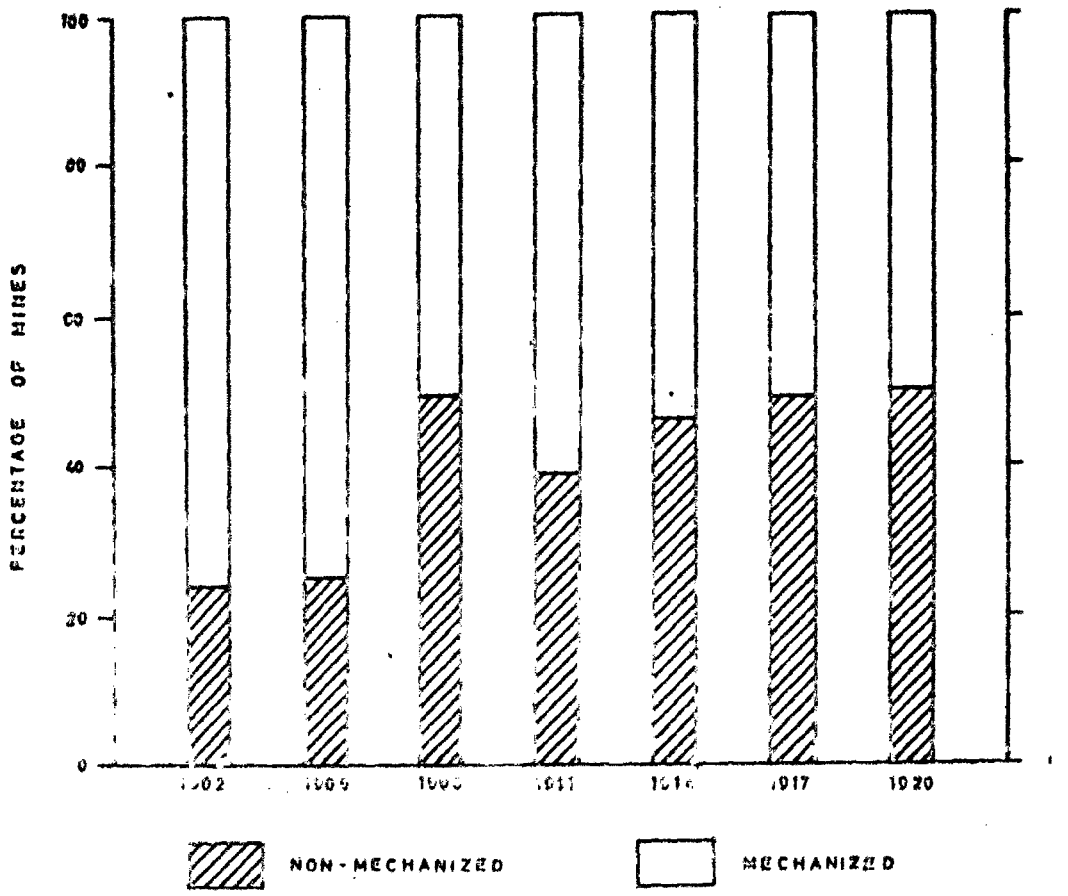

FIG.NO. 5.3 PERCENTAGE OF MECHANISED MINES (1902-1920)

coalfields in the Mineral Belt have been selected. Table 6.6 gives the percentage of mines which were mechanised in the Raniganj (Burdwan district), Jharia (Hazaribagh district) and Bokaro-Ramgarh (Hazaribagh district) coalfields and the growth in the production of coal (in tons). A glance at fig. 5.4 indicates that on the whole increase in mechanisation coincided with increase in production.

Table 5.6 Extent of Mechanisation and Production in Selected Coalfields - 1920 and 1945

Name of coalfield	1920		1945	
	Mechanised Mines (%)	Production (Million tons)	Mechanised Mines (%)	Production (Million tons)
Burdwan-Raniganj	77	4.20	54	7.28
Hazaribagh-Jharia	50	0.13	57	0.69
Bokaro-Ramgarh	40	0.86	75	2.17

Source : Derived from the Annual Report of the Chief Inspector of Mines (1920, 1945)

However, the tendency for the mining production to concentrate in larger mechanised units was absent. The development of mining in the region meant that small mines with poor technical equipment kept multiplying each year. The Indian capital invested in coal mining grew because of the simultaneous growth in the number of small coal mining companies. The average capital outlay of these companies in fact decreased

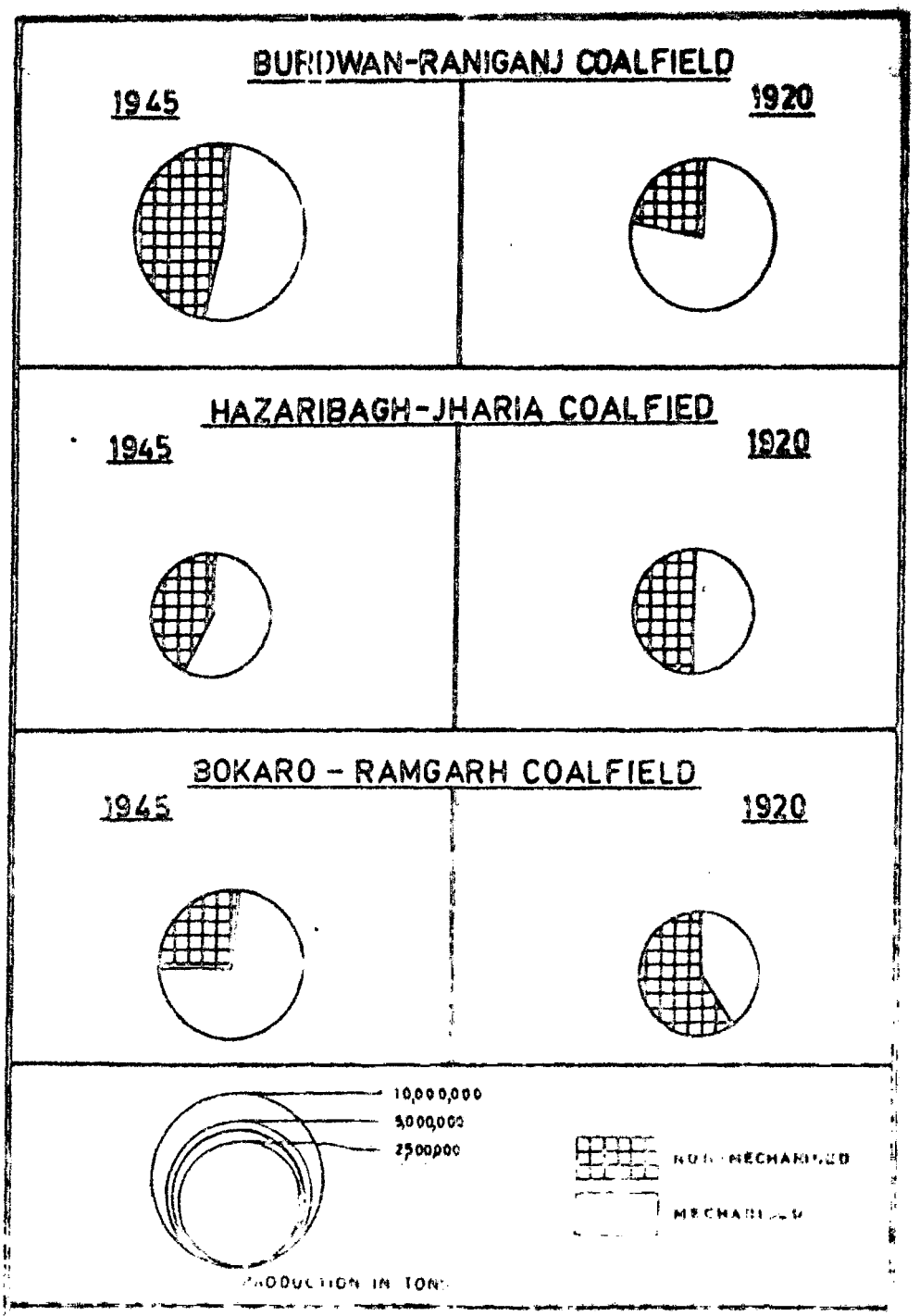

FIG.NO. 5.4 COAL PRODUCTION AND EXTENT OF MECHANISATION IN SOME COALFIELDS (1920-1945)

during the period ending with the first world war.[63]

During the years of the first world war (1914-18) the demand for coking coal increased due to increased production in the steel mills. This period was also marked by the introduction of machine mining. Prior to this period there were only few collieries working deep seams. Seams having a depth of more than 2,000 feet were often abandoned. Due to increased demand of coal, collieries which worked open cast mining switched over to underground mining. In order to increase the supply of coal, many of the coalfields were electrified and two central power houses were set up.

Improvements were also effected in the sphere of proper ventilation and sanitation of working places. After the war mechanisation had set in in the big collieries with a rapid tempo (they equipped their works with steam or electrical winding engines, haulage engine pumps, coal-cutting machines, screening plants and efficient boilers). Some of the collieries also started using electricity instead of steam as motive power for hauling and winding coal, for lighting pits and for pumping out water from galleries and coal faces.[64]

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63. H. Papendieck, <u>op. cit.</u>, p. 222.

64. V.B. Singh (ed.), <u>Economic History of India</u>, 1975, p. 313.

5.5.4 Level of Technology in the Iron Industry

Smelting of iron has been prevalent in India since time immemorial. Till as late as the end of the nineteenth century iron was smelted by indigenous methods and was a widespread industry. H. Sanyal has given a good account of the indigenous iron industry of Birbhum, Bengal.[65]

He notes that there were two types of iron manufacturing in Birbhum - one was done by the tribes, who had small furnaces which were used for short periods. This was so, because the iron smelting tribals were of the migrating types and who moved continually from place to place in search of spots having a ready supply of ore and timber. The second type of manufacturing was done by the Bengali - speaking people. The furnaces used by them though were technically not superior to the former, but were on a much larger scale. No flux was used and smelting was done entirely with charcoal. The iron which was produced was of a pure quality.

In 1845 W. Jackson had found that smelting was done in two stages in circular kilns. Each smelting took four days and four nights and 25 maunds of unrefined pig iron could be turned out in a week from one single furnace. This iron was sold to the refineries for conversion into 'pakka' form by

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65. H. Sanyal, "The Indigenous Iron Industry of Birbhum", Indian Social and Economic History Review, 1968, pp. 101-108.

way of refining in open hearths. The refining was akin to the puddling process.[66] Ten maunds of 'kachha' iron were said to yield 7 maunds and 10 seers of 'pakka' iron.

The high quality of iron was renowned everywhere. In 1879 Farquhar and Matte established their factory in Birbhum to produce shot, shells and canon etc. The soft quality of the iron was very suitable for every work in cast iron.

In Birbhum, three stages were found in the production process, i.e., mining, smelting and refining, which were conducted by different sets of people, each functioning independent of the other.

Buchanan has given a detailed account of the number of men employed and of the distribution of the product at one of the primitive smelting centres. He writes that at each set of works about 20 men were employed and each of them produced 16 lbs. of iron daily. Compared to this, at one of the modern iron works, 1800 hands produced 700 tons of pig iron daily, i.e., each man produced 777 lbs. daily.[67]

The market for the indigenous Birbhum iron contracted with the arrival of European iron in Bengal. Imports of

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66. The process has been described in the section dealing with the British Iron Industry. This process was introduced in Britain at the end of the eighteenth century.

67. D.H. Buchanan, op. cit., 1934, pp. 276-77.

British and Swedish iron through the port of Calcutta amounted to 12,111 tons in 1849 and rose to 16,537 tons, two years later (1851).[68] In 1852, there were 70 furnaces in Birbhum which could produce about 1900 tons of refined iron.

The decline of the indigenous iron industry was quickened around 1855 when Mr. Mackey started his iron works to produce charcoal iron by the European method. Moreover, he leased the woods in an area of 7 square miles, thus depriving the indigenous manufacturers of the sources of fuel. He also employed some of the indigenous smelters at his works.

The major drawbacks which the iron industry of Birbhum suffered were primitive techniques of production and stunted growth of the enterprise. The iron was not suited to any heavy work due to its extreme malleability. Since the rate of profit was extremely low, the industry could not be improved upon. Despite all the hazards, the industry did exist, catering to the needs of the village folk. It could, however, satisfy only a limited and unsophisticated market.

It was true that the supply of fuel was limited. But the shift to the use of coal of which there were such rich deposits nearby was never attempted, because it would have meant fundamental changes in the technology of the Indian smelters.[69]

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68. Sanyal, op. cit., p. 105.

69. Bridget and Raymond Allchin, The Birth of Indian Civilization, 1968, p. 285.

Technologically, the state of iron and steel making in India till the eighteenth century was roughly comparable to that of Europe. But the parting of ways came in the middle of the nineteenth century. A series of discoveries in the West (such as the Bessemer Converter in 1856 and the basic open hearth process in 1878) revolutionised the iron and steel making processes there, and changed the ironsmith's craft into a large-scale industry on scientific lines. The average output of steel in U.K. in 1871-4 was about 0.5 million tons. By 1890-94 it had reached about 3 million tons and it increased to about 5 million tons in 1900-04.[70] While these epoch-making events were taking place in Europe, the industry in India was in a moribund condition and the indigenous iron industry was practically destroyed. Table 5.7 and graph 5.5 indicate the vast gap in production of steel in the two countries at comparable points of time.

Table 5.7 Steel Output in the U.K.* and the Region** 1910-14 to 1935-39

Year	Output in '000 tons	
	U.K.	Region
1910-14	7007	23
1915-16	8771	123
1920-24	7067	155

Cont'd

70. P. Mathias, on. cit., p. 484.

Table 5.7 cont'd

1925-29	7647	367
1930-34	6733	495
1935-39	11,257	682

Source : * Mathias, op. cit., p. 483.
** Annual Report of TISCO

Iron making technology advanced through a process of gradual continuous change rather than through a series of sharp, discrete innovations.[71] The diffusion of new technology became rapid with growing years. As time passed the lag between the initial innovation and its widespread adoption became noticeably shorter . At the time of the initial innovation (1709) the time lag was of fourty years, while

71. In 1709 Abraham Darby successfully smelted with coke. It was in the 1750s that this technique was widely adopted. The next major innovation, the potting process (desiliconized iron were put into covered pots with a flux such as lime which would absorbs surplus from the metal. Then these pots would be put in a furnace and heated. The pots would finally break and then the metal removed from the furnace and then consolidated under the forge hammer. Coke was used instead of raw coal in the refinery fire. New elements in the process included the use of pots, hence the name), was patented in 1761 and was adopted after two decades. The gestation period for the puddling process (In this process, iron was refined without the use of pots or fluxes. The fuel did not come into contact with the metal but instead, the heat generated by the coal fire was reflected off the ceiling of the furnace into the metal. The molten pig iron formed a pool or puddle in the reflected furnace, giving the process its name. The metal coming

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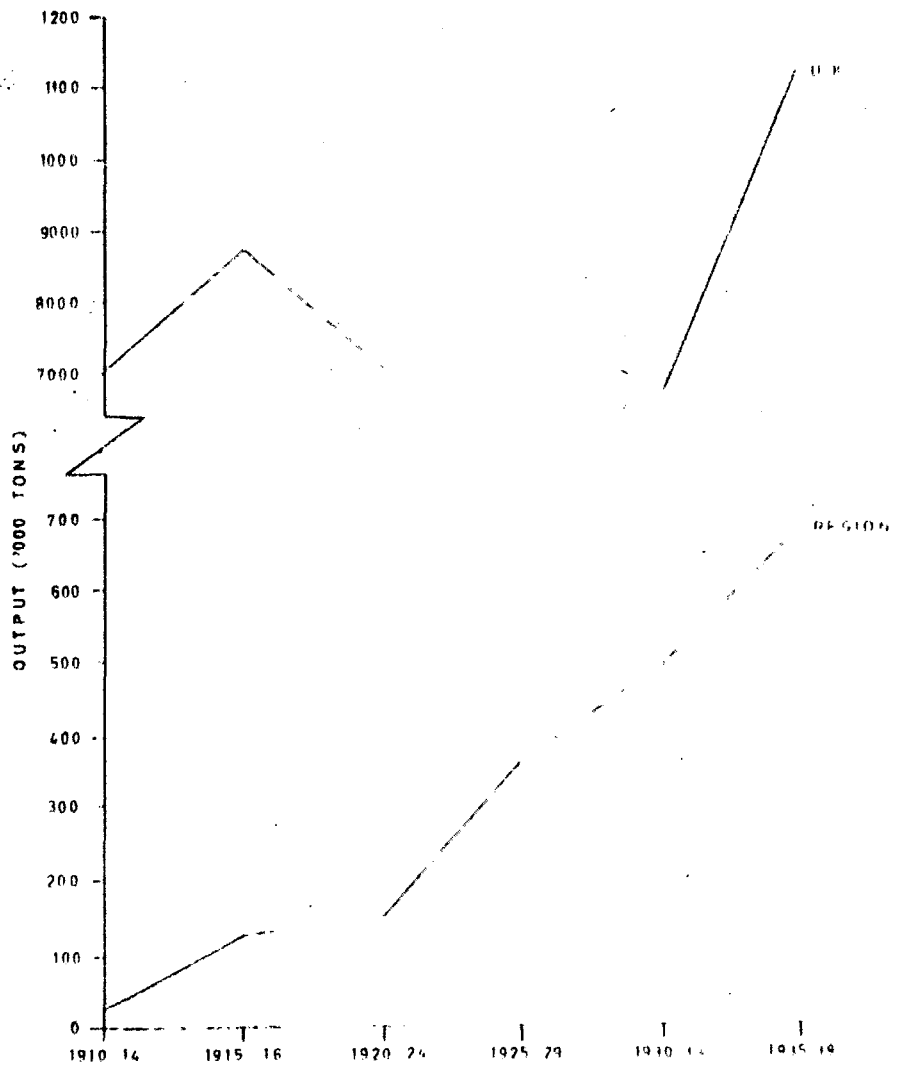

FIG.NO. 5.5

STEEL OUTPUT IN U.K. AND THE MINERAI BELT (1910-14 TO 1935-39)

in the later one it was just five or six years.[72]

The iron ore production of U.K. increased from about 9 million tons (average of 1855-59) to almost double (about 17 million tons) in the period 1880-84.[73] In the 1890s, Germany and the U.S.A. had made remarkable advance in the iron and steel industry, and both these countries had surpassed Britain in output of iron and steel.[74]

5.5.5 Level of Technology in Other Industries

In the Mineral Belt, the other important industries were cloth-weaving and metal working. These industries were widespread but were carried on a small scale and tended to decline in the face of competition with factory made goods.

Mr. Drake Brockman, the Deputy Commissioner of Raipur district (Madhya Pradesh) observed that, 'there had been no development during the decade under the head of manufactures, but on the contrary the indigenous industries of making vessels of copper, brass and bell metal, of weaving and dyeing cloth and of making bangles have all suffered and appear to be on

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Footnote 71 cont'd

from the puddling furnace was a pasty mass containing lumps of wrought iron mixed with slag. This was further made into slabs and then bars), was only about ten years. The last major innovation, the hot blast, enjoyed widespread popularity (at least in Scotland) within five or six years after the initial innovation.

72. C.K. Hyde, Technological Change and the British Iron Industry 1700-1870, 1977, pp. 193-196.
73. Mathias, op. cit., p. 483.
74. S.K. Sen, op. cit., pp. 34-35.

the decline. The weaving class have taken to labour and begging'.[75]

In Bilaspur district (Madhya Pradesh) coarse khadi was manufactured in ten centres, including Bilaspur, Mungeli and Champa. There was no separate dyeing industry, so the threads were coloured before being woven.[76] The hand weaving industry in Bengal was more developed. Besides the cotton handloom industry, there were several cotton spinning and weaving mills in the province. The handlooms used were of two types: (i) looms in which the shuttle was passed across the warp from hand to hand, (ii) mechanically operated looms which had fly shuttles. Burdwan district had 51 per cent of the looms which had fly shuttle and Bankura district 30 per cent.

Conclusions

A review of the foregoing chapter shows that :

1. With the establishment of the Imperial rule in India, the traditional industrial base of the country was either destroyed or distorted seriously. The industries which suffered most included the indigenous iron industry, metal industry (bell metal, brass, copper), silk and cotton weaving industries. With the loss of their trade, the artisans, craftsmen and weavers lost their

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75. A.E. Nelson (Ed.), Raipur District Gazetteer, Vol. A, 1909, p. 177.

76. A.E. Nelson, Bilaspur District Gazetteer, Vol. A, 1910, p. 164.

traditional skills. This was contrary to what had happened in Britain, France or Germany where the displaced workers had acquired new skills in factories and the state had taken the initiative to provide elementary education to all.

2. The destruction of indigenous industries was accompanied by the growth of a 'modern' sector of industry which had all the features of a derived enclave, i.e., it catered to the needs of the primary enclaves which were geared to an international demand such as the tea and jute industries. This kind of industrial activity did not generate impulses of further industrialisation in the Region.

3. The growth of large scale industries were a belated phenomena in the Region. No official policy was set forth for its proper development. Inspite of several efforts, the government was unable to establish an iron and steel industry in the Region. It was solely dye to the initiative of Indian enterprise that an iron and steel industry was established.

4. The level of industrial technology was very low. A very large proportion of industrial establishments were non-mechanised which resulted in a low output per worker. The tendency for the mining production to concentrate in larger mechanised units was absent. The development of mining in the Region meant that small mines with poor technical equipment kept multiplying each year. The

introduction of modern methods of manufacture was confined largely to the efforts made by the Europeans, who exercised their control over the illiterate Indian labour.

5. The system of education introduced by the government was mainly intended to provide for the administrative needs of the country and encouraged literary and philosophic studies to the neglect of those of a more practical character. The absence of a suitable education to qualify Indians for posts requiring industrial or technical knowledge was met by the importation of men from Europe who supervised and trained illiterate Indian labour in the mills and factories that were started.

It may be concluded that a distorted commercial policy and technological backwardness put a brake on the industrial growth of the Region in the long run. The industrial base of British India remained in Birmingham and Manchester instead of developing in the Mineral Belt which possessed all the primary resources.[77]

M.M. Malviya while stressing the need for industrial development of India quoted the generous and wise words of Sir Frederick Nicholson, which read as follows :

"I beg to record my opinion that in the matter of Indian industries we are bound to consider Indian interests

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77. D. Schwerin, "Control of Land and Labour in Chota Nagpur 1858 - 1908", in Rothermund and Wadhwa (ed.), op. cit., p. 67.

firstly, secondly and thirdly - I mean by 'firstly' that the local raw products should be utilised by 'secondly' that industries should be introduced and by 'thirdly' that the profits of such industry should remain in the country".[78]

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78. M.M. Malviya, op. cit., p. 355.

Chapter 6

CHARACTERISTICS OF URBANISATION

Introduction

6.1 Degree of Urbanisation

6.2 Concentration of Urbanisation

6.3 Speed of Urbanisation

6.4 Movement of Towns in Terms of Size Classes

6.5 Growth Rates of Towns in Each Size Class

6.6 Variability of the Ranks of Urban Areas

6.7 Origin of Towns

- 6.7.1 Administrative Towns
- 6.7.2 Administrative Towns of the Pre-British Period
- 6.7.3 Administrative Towns of the British Period
- 6.7.4 Railway Towns
- 6.7.5 Trading Towns
- 6.7.6 Industrial Towns
- 6.7.7 Mining Towns
- 6.7.8 The Declining Towns of the Region

Conclusions

Chapter 6

THE CHARACTERISTICS OF URBANIZATION

A great deal of attention has been devoted by social scientists to the relationship between urbanization and developmental change. In this chapter an attempt has been made to study the various aspects of urbanization in a resource region during the colonial period.

It has been observed in the developed countries that the resource regions were also the regions to urbanize first and in most of these countries the largest town aggregates developed around the coal and iron belts.[1] The coal towns of Pennsylvania, West Virginia and Kentucky were among the first urban centres of U.S.A.[2] In the Ruhr and Saar (Germany) nine cities owed their initial growth to their favourable location in relation to natural resources.[3]

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1. D.R. Gadgil, op. cit., p. 155.

2. Similarly the opening of an iron mine in Minnesota (export industry) stimulated the growth of a whole new town. (See W.R. Thompson, "Urban Economic Growth and Development in a National System of Cities", in P.M. Hauser and L.F. Schmore (ed.) The Study of Urbanization, 1967, p. 447). The growth of the local iron industry in Middlesbrough (U.K.) gave a tremendous spurt to its population - from a mere 7431 in 1851 to 91,302 in 1901 (See A. Briggs, Victorian Cities, 1968, p. 247).

3. J.J. Lee, "Aspects of Urbanization and Economic Development in Germany 1815-1914", in P. Abrams and E.A. Wrigley (ed.), Towns in Societies, 1978, p. 230.

In the Mineral Belt in India, however, the experience was on the contrary. The exploitation of resources was not able to enhance the speed of urbanization nor create any linkages in the Region. As it has been hypothesized earlier, the opening up of resources did not give a spurt to urbanization as it had in the developed countries. To verify this hypothesis a few statistical techniques have been applied to measure the following :

(a) the degree, speed and concentration of urbanization;

(b) the movement (or otherwise) of towns within various size classes; and

(c) the rates of growth of towns in each size class

6.1 DEGREE, SPEED AND CONCENTRATION OF URBANIZATION

The degree of urbanization generally refers to the relative or absolute number of people who live in places defined as urban. There are a number of indices for measuring the degree of urbanization.

The most commonly used index is the percentage of urban population to the total (level of urbanization). It is represented by -

$$PU = 100 \frac{U}{P}$$

U representing the urban and P representing the total population of any unit.

Table 6.1 gives the levels of urbanization from 1872-1941 for all the districts. The table indicates that :

Table 6.1 Levels of Urbanization in the Mineral Belt (1872-1941)

	No. of Districts and Feudatory States							
	1872	1881	1891	1901	1911	1921	1931	1941
Above 6.00	-	-	-	-	-	1	3	4
5.00 - 5.99	-	1	-	-	-	1	1	-
4.00 - 4.99	-	-	1	2	-	3	3	6
3.00 - 3.99	3	1	1	4	6	5	3	1
2.00 - 2.99	1	3	3	-	3	2	2	4
1.00 - 1.99	1	5	4	4	4	3	4	2
0.00 - 0.99	2	-	1	2	3	1	1	1
0.00	11	8	8	6	2	2	1	-

Source : Based on Census of India (1872-1941) Part II, Imperial Tables for Population in Districts.

(i) degree of urbanization was low;

(ii) the degree of urbanization increased in all the districts. It is seen that each and every district registered a net gain during the period. The highest level reached was 18.6 per cent in 1941 (in Singhbhum district). From 1921 onwards this district recorded the highest level of urbanization in the region. The main reason for this being the establishment of the TISCO at Jamshedpur;

(iii) at the beginning of the period there were 11 districts with no urban population. This number decreased constantly so that in 1941 there were none.

Another index, used to measure urbanization, is the ratio of urban to rural population. The ratio indicates the number of urban inhabitants for each rural person in a country.[4]

Table 6.2 gives the urban-rural ratios for the districts of the Region for the period 1872-1941. The table shows that all the districts have very low urban-rural ratios. The highest UR is 0.23 recorded in 1941 in the Singhbhum district.

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4. The ratio is expressed as -

$$UR = U/R$$

where U and R are the urban and rural populations respectively.

Table 6.2 Ratio of Urban-Rural Population in the Mineral Belt (1872-1941)

District	1872	1881	1891	1901	1911	1921	1931	1941
Hazaribagh	0.03	0.02	0.02	0.03	0.03	0.04	0.03	0.05
Ranchi	0.01	0.01	0.02	0.03	0.03	0.04	0.04	0.05
Singhbhum	-	0.01	0.01	0.01	0.02	0.11	0.14	0.23
Dhanbad	0.01	0.01	0.02	0.03	0.03	0.04	0.07	-
Palamau	-	0.01	0.01	0.01	0.02	0.03	0.03	0.02
Kalahandi	-	-	-	-	0.01	0.01	0.01	0.02
Sambalpur	-	-	-	-	0.02	0.03	0.03	0.03
Dhenkanal	-	-	-	-	0.00	0.05	0.05	0.05
Keonjhar	-	-	-	-	0.00	0.00	0.00	0.02
Mayurbhanj	-	-	-	-	0.01	0.01	0.01	0.01
Bastar	-	-	-	-	0.00	0.00	0.02	0.02
Surguja	-	-	-	-	-	-	-	0.04
Bilaspur	-	-	-	-	0.03	0.03	0.03	0.04
Durg	-	-	-	-	0.01	0.01	0.02	0.04
Balaghat	-	0.01	0.01	0.02	0.02	0.01	0.02	0.03
Raipur	-	-	-	-	0.04	0.04	0.05	0.07
Raigarh	-	-	-	-	0.04	0.04	0.06	0.04
Bankura	0.04	0.06	0.05	0.05	0.05	0.06	0.07	0.08

Source : Based on Census of India (1872-1941) Part II, Imperial Tables for Population in Districts.

The degree of urbanization has been measured by an index formulated by Arriaga (1970), which is a product of the urban proportion of the population and the mean city size of residence of this population.[5]

Table 6.3 gives the degree of urbanization measured as the mean city population size for the various districts of the region for 8 decades. The degree of urbanization found according to this method gives us additional information, i.e., the mean size of the urban centres.

Map 6.1 and the table show that in the entire period only one district, i.e., Singhbhum had a mean city (MC) population size between 10,000 and 19,999. It is found that during the 8 decades there were only 6 per cent districts with an MC between 5,000 and 20,000; 7 per cent - 13 per cent of the districts had an MC between 2,000 - 5,000; 7 per cent - 27 per cent had an MC between 1,000 - 2,000; 7 per cent - 37 per cent had an MC between 500 - 1,000; and 7 per cent - 75 per cent of the districts had an MC 1 - 500 and 13 per cent - 47 per cent of the districts (in 4 decades) had no urban population

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5. Arriaga measures the degree of urbanization by obtaining the average of the size of cities where the population resides. The statistical concept of this index is the expected value of the size of the cities. The index is expressed as,

$$U = \sum_{i=1}^{N} Ci^2 / P$$

where Ci is the population of the ith city, N is the total number of cities, P is the total population of the region for which U is being calculated.

Table 6.3 Degree of Urbanization in the Mineral Belt (1872-1941)

Mean City Population Size	No. of Districts and Feudatory States							
	1872	1881	1891	1901	1911	1921	1931	1941
10,000 - 19,999	-	-	-	-	-	-	-	1
5,000 - 9,999	-	-	-	-	-	-	1	-
2,000 - 4,999	-	-	-	-	-	1	1	2
1,000 - 1,999	-	-	-	1	1	3	4	4
500 - 999	3	3	3	3	4	4	2	1
1 - 499	5	8	9	9	10	7	7	7
Total	8	11	12	13	15	15	15	15

Source : Based on Census of India (1872-1941) Part II, Imperial Tables for Population in Districts.

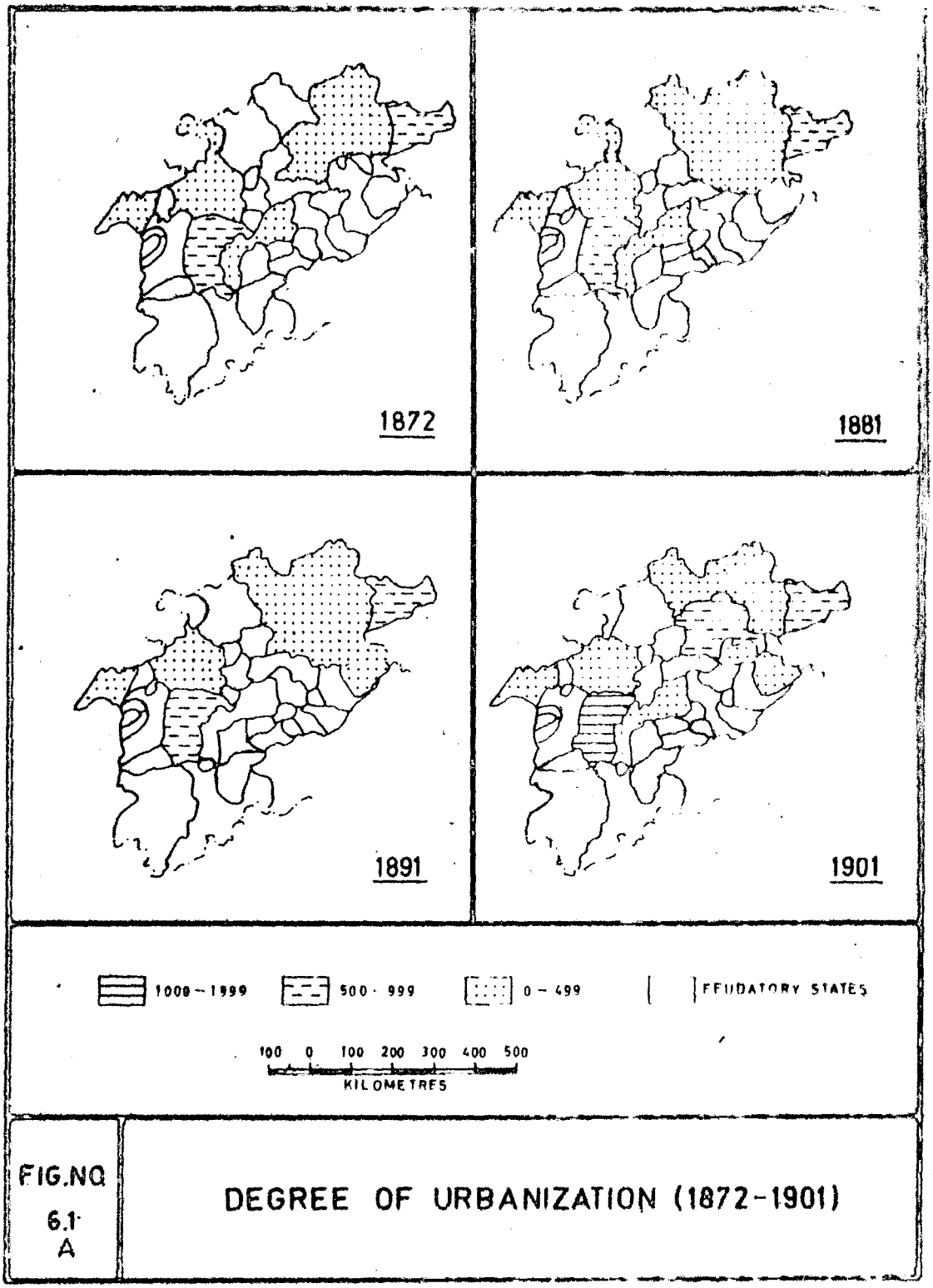

FIG.NO 6.1 A

DEGREE OF URBANIZATION (1872-1901)

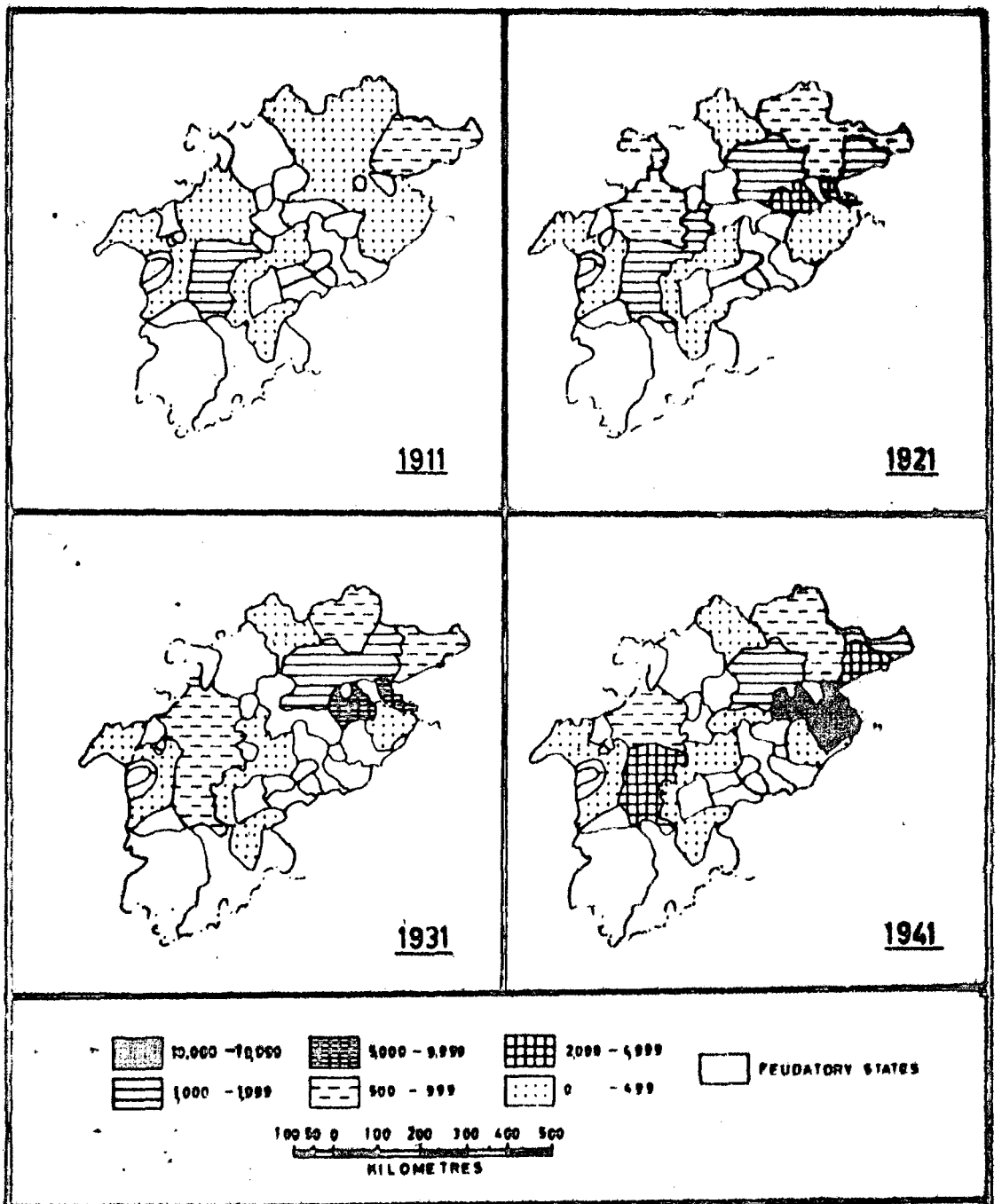

FIG.NO 6.1 B

DEGREE OF URBANIZATION (1911-1941)

at all.

This indicates that -

(i) districts with a relatively higher degree of urbanization account for a very small percentage in the total; and

(ii) there was a very low degree of urbanization in the region in the initial decade of the period under investigation which was, however, followed by a constant increase manifested in the net increase of urban population during the entire period.

6.2 CONCENTRATION OF URBAN POPULATION

The index of concentration of urbanization is based on the concept of the mean city population size[6] (written above). The city concentration index can be obtained by applying the method given by Arriagax.[7]

The index of concentration of urbanization in the mineral belt of the four states is given in Table 6.4. The index values which were obtained were so small that they had to be indicated in units 10^3, which means that the scale of concentration ranges from 0 - 1,000.

The city concentration index shows that only about 7.0 per cent of the districts had concentration values of more

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6. S. Goldstein and D.F. Sly (ed.), The Measurement of Urbanization and Projection of Urban Population, p. 71.

7. CC = MC/P, where MC is the degree of urbanization and P is the total population.

Table 6.4 Index of Concentration of Urbanization in the Mineral Belt (1872-1941)

Index x 10^3	No. of Districts and Feudatory States							
	1872	1881	1891	1901	1911	1921	1931	1941
Above 10	-	-	-	-	-	-	-	2
7.00 - 9.99	-	-	-	-	-	-	-	-
1.50 - 6.99	-	-	-	-	-	-	-	-
1.00 - 1.49	-	-	-	1	1	1	4	3
0.50 - 0.99	5	4	4	4	5	5	3	2
0.00 - 0.49	3	7	8	8	9	9	8	8
0.00	7	4	3	2	-	-	-	-
Total	15	15	15	15	15	15	15	15

Source : Based on Census of India (1872-1941) Part II, Imperial Tables for Population in Districts.

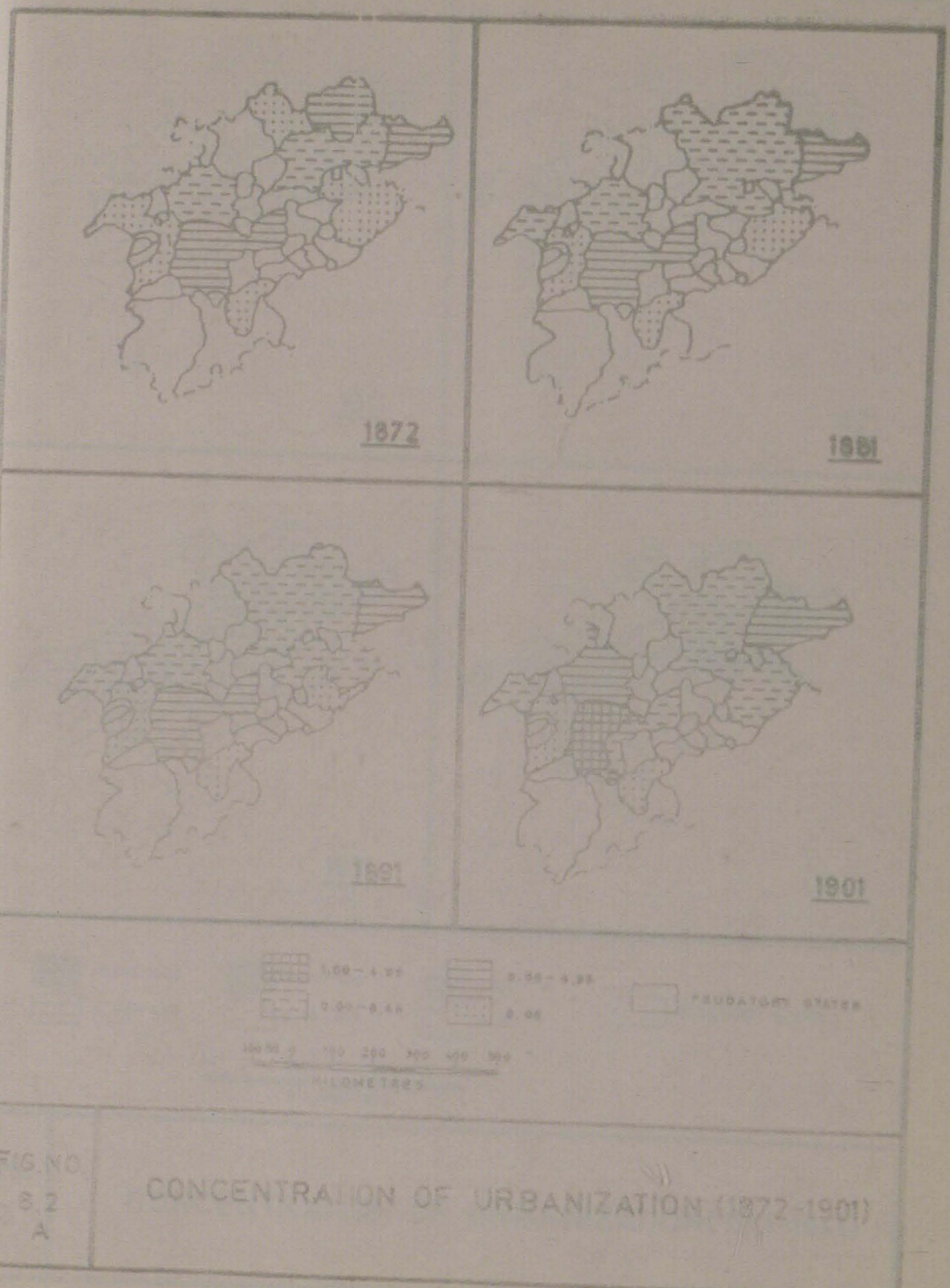

FIG. NO. 8.2 A

CONCENTRATION OF URBANIZATION (1872-1901)

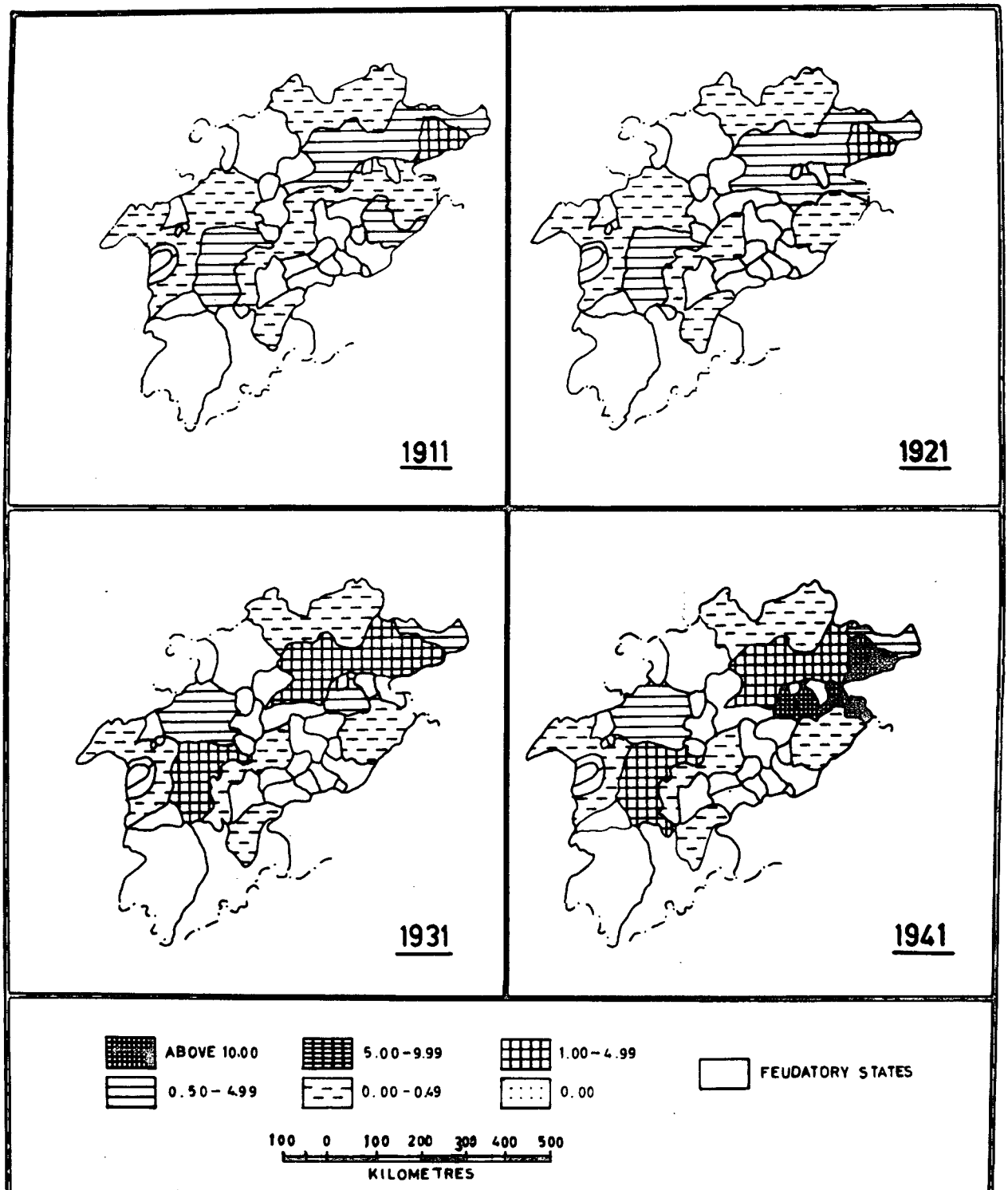

FIG. NO. 6.2 B

CONCENTRATION OF URBANIZATION(1911-1941)

than 0.0015 on a concentration scale ranging from 0-1. The highest concentration value attained by any district was in 1941, that of 0.018 by Bankura district, followed by Singhbhum district (0.017) in the same decade.

The table and map 6.2 shows that -

(i) the index of concentration was very low in all the districts;

(ii) the maximum value of concentration (0.018) was insignificant on the 0-1 scale; and

(iii) concentration of urbanization was increasing in the region, though at a very slow pace.

Another measure of concentration used is the index of location quotients.[8] This index indicates the concentration of urban population of each district vis-a-vis the region as a whole.

The location quotient of urban population for all the districts for the period 1872-1941 is shown in Table 6.5.

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8. The quotient is calculated as - $\frac{ei}{et} / \frac{Ei}{Et}$

where, ei - urban population of district A
et - total population of district A
Ei - urban population of the region
Et - total population of the region

The quotient for the region is constant at 1, against which the concentration for the districts is measured. If a district's quotient is greater than 1, it indicates that the district has a higher concentration of urban population than the region as a whole, and vice-versa.

Table 6.5 · Location Quotients for Urban Population in the Mineral Belt (1872-1941)

Quotients	No. of Districts							
	1872	1881	1891	1901	1911	1921	1931	1941
3.00 - 3.99	-	-	-	-	-	-	-	1
2.00 - 2.99	3	2	1	3	-	1	-	-
1.00 - 1.99	1	3	5	3	8	7	6	3
0.00 - 0.99	3	4	4	6	8	8	10	14
0.00	11	9	8	6	2	2	1	0

Source : Based on Census of India (1872-1941) Part II, Imperial Tables for Population in Districts.

Table 6.6 Location Quotients for Urban Population for Selected Districts of the Mineral Belt (1872-1941)

Districts	Location Quotients							
	1872	1881	1891	1901	1911	1921	1931	1941
Singhbhum	-	0.72	0.71	0.56	0.81	2.89	3.37	3.78
Ranchi	0.60	0.76	1.38	2.03	1.29	0.99	1.13	0.94
Sambalpur	1.54	1.38	1.34	0.96	0.91	0.89	0.91	0.57
Mayurbhanj	-	-	0.54	0.54	0.31	0.24	0.19	0.17
Raipur	2.21	2.00	1.80	2.87	1.49	1.30	1.28	1.27
Bilaspur	0.99	1.13	0.95	1.92	1.04	1.00	0.91	0.77
Bankura	2.22	2.97	2.68	2.80	1.93	1.76	1.72	1.45

Source : Based on data computed for Table 6.5.

These indicate that -

(i) there was a very low concentration of urban population in the districts. Singhbhum district was the only one in the entire region to record a quotient of more than 3 during the entire period under study;

(ii) the number of districts with 0.0 quotient remained the highest uptil 1921. Though in absolute terms their number was seen to decrease constantly and gradually over the decades;

(iii) it is seen that about 50 per cent of the districts showed a net decline in their location quotients during the period.

Table 6.6 shows the location quotients for selected districts. The decline is obvious from this table.

6.3 SPEED OF URBANIZATION

The speed or tempo of urbanization refers to the change in the degree of urbanization during a time period (in this case from 1872 to 1941). This index shows the annual rate of change in the number of people in the towns per 1,000 population in the district[9] (see map 6.3).

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9. The speed of urbanization has been calculated as follows :

$$SR = \frac{1}{n}\left(\frac{PU^{t}\ r}{PU^{t}} - 1\right) \times 100$$

where n is the number of years, and PU is the percentage of urban population at the years t (base year) and t r. (Goldstein and Sly, op. cit., p. 39.)

Table 6.7 Speed of Urbanization in the Mineral Belt (1872-1941)

	1872-81	1881-91	1091-1901	1901-11	1911-21	1921-31	1931-41
Above 25.00	-	-	2	3	4	4	4
10.00 - 24.99	-	1	1	1	3	5	5
5.00 - 9.99	2	1	2	2	1	1	3
0.00 - 4.99	4	3	2	2	4	2	3
0.00	-	-	-	-	-	-	-
0.00 - (-4.99)	1	3	3	3	3	2	1
Below -5.00	-	2	-	-	-	1	-
A. Districts with positive speed	6	5	7	8	12	12	14
B. Districts with negative speed	1	5	3	4	3	3	1
C. Ratio of A/B	0	1	2.3	2	4	4	14

Source : Based on Census of India (1872-1941) Part II, Imperial Tables for Population in Districts.

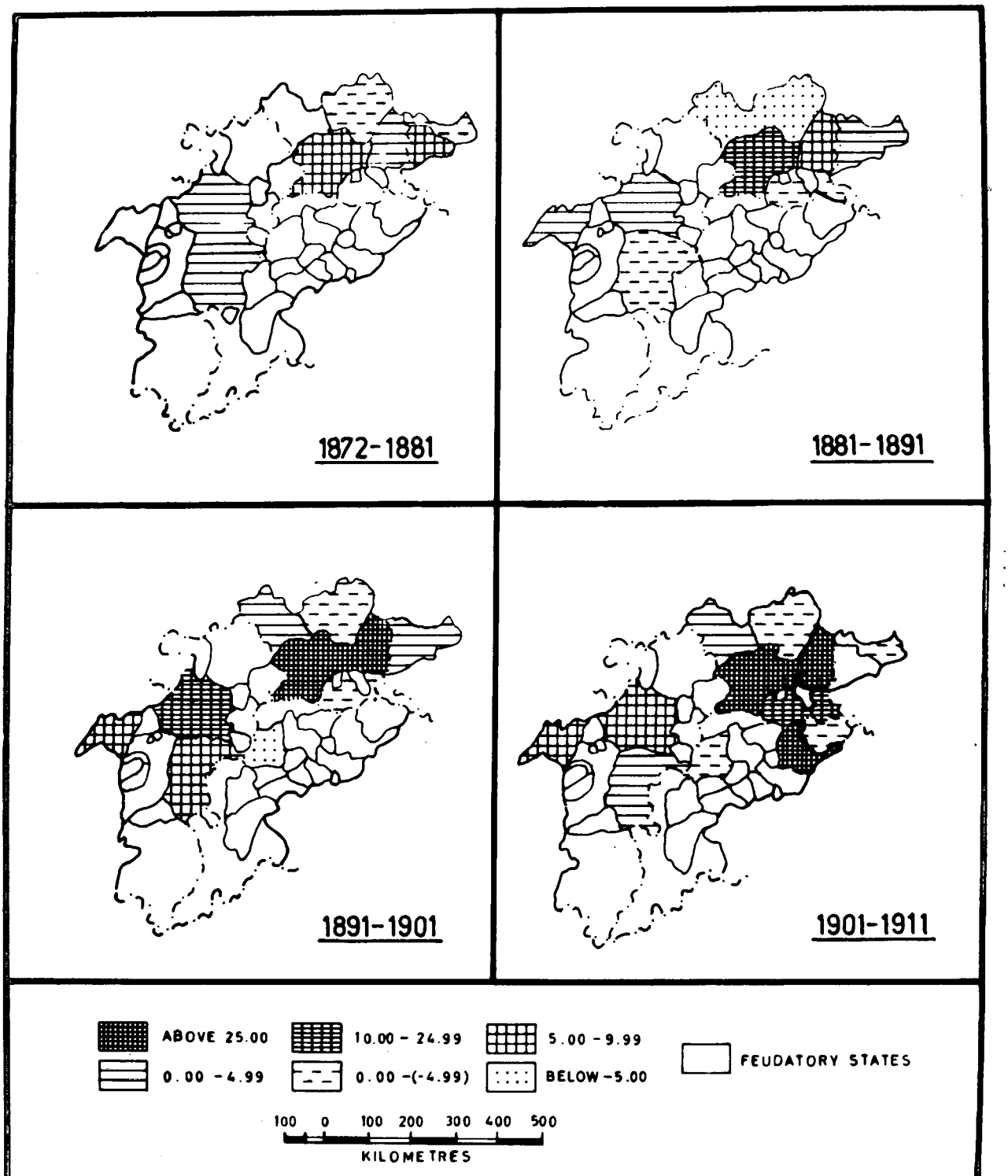

FIG.NO. 6.3 A

SPEED OF URBANIZATION (1872-1881 TO 1901-1911)

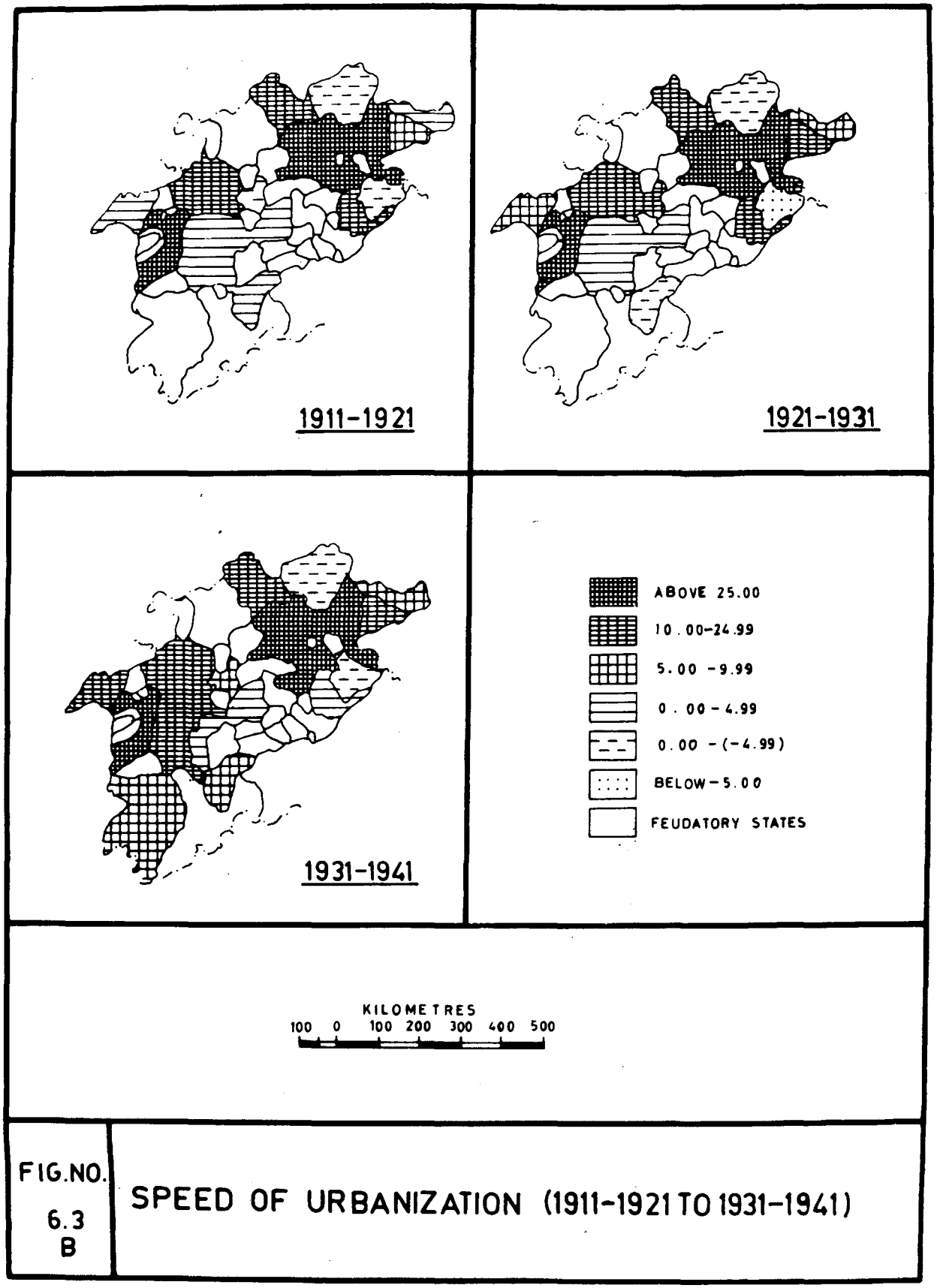

FIG.NO. 6.3 B

SPEED OF URBANIZATION (1911-1921 TO 1931-1941)

Table 6.7 gives the speed of urbanization for all the districts. It indicates that -

(i) the speed of urbanization was increasing in all the districts;

(ii) there were very few districts which experienced a negative speed of urbanization. The ratio between the districts having positive speed to those having zero or negative speed was generally on the increase; and

(iii) in the earlier decades, districts having a negative speed of urbanization were relatively more in number (in absolute terms) as compared to the latter part of the period under study;

(iv) in the earlier decades the forces of urbanization were almost absent.

6.4 MOVEMENT OF TOWNS IN TERMS OF SIZE CLASSES

In this analysis is shown the movement of urban centres in terms of their size class, from one decade to another. However, the number of towns which were created or declassified in each decade have not been accounted for. This is because more often than not, the changes in the Census definitions brought about a change in the status of a place termed as urban.

Table 6.9 and Fig. 6.4 shows the movement of towns classwise whether the towns shifted to a higher or a lower class

Table 6.8 Transition Matrices : Numbers of Towns in Population Size Groups at Successive Dates

Size Group		VII	VI	V	IV	III	II	I	Total
					No. in 1881				
	VII	27	4	5	0	0	0	0	36
	VI	0	0	1	0	0	0	0	1
No.	V	1	0	4	1	0	0	0	6
in	IV	0	0	0	6	1	0	0	7
1872	III	0	0	0	0	1	0	0	1
	II	0	0	0	0	0	0	0	0
	I	0	0	0	0	0	0	0	0
Total		28	4	10	7	2	0	0	21/15
					No. in 1891				
	VII	26	1	1	0	0	0	0	28
	VI	1	0	3	0	0	0	0	4
No.	V	2	1	4	3	0	0	0	10
in	IV	0	0	0	6	1	0	0	7
1881	III	0	0	0	0	2	0	0	2
	II	0	0	0	0	0	0	0	0
	I	0	0	0	0	0	0	0	0
Total		29	2	8	9	3	0	0	22/23

Cont'd ...

Table 6.8 cont'd.

Size Group		VII	VI	V	IV	III	II	I	Total
					No. in 1901				
No. in 1891	VII	20	4	4	1	0	0	0	29
	VI	0	2	0	0	0	0	0	2
	V	1	0	6	1	0	0	0	8
	IV	0	0	0	8	1	0	0	9
	III	0	0	0	0	3	0	0	3
	II	0	0	0	0	0	0	0	0
	I	0	0	0	0	0	0	0	0
Total		21	6	10	10	4	0	0	30/22
					No. in 1911				
No. in 1901	VII	16	3	2	0	0	0	0	21
	VI	1	2	3	0	0	0	0	6
	V	1	0	7	2	0	0	0	10
	IV	0	0	2	5	3	0	0	10
	III	0	0	0	0	4	0	0	4
	II	0	0	0	0	0	0	0	0
	I	0	0	0	0	0	0	0	0
Total		18	5	14	7	7	0	0	33/20

Cont'd. ..

Table 6.8 cont'd.

Size Group		VII	VI	V	IV	III	II	I	Total
					No. in 1921				
No. in 1911	VII	8	3	5	1	0	1	0	18
	VI	1	1	3	0	0	0	0	5
	V	1	1	11	1	0	0	0	14
	IV	0	0	0	6	1	0	0	7
	III	0	0	0	1	6	0	0	7
	II	0	0	0	0	0	0	0	0
	I	0	0	0	0	0	0	0	0
Total		10	5	19	9	7	1	0	41/33
					No. in 1931				
No. in 1921	VII	8	1	1	0	0	0	0	10
	VI	1	2	2	0	0	0	0	5
	V	1	1	13	4	0	0	0	19
	IV	0	0	0	7	2	0	0	9
	III	0	0	0	0	6	1	0	9
	II	0	0	0	0	0	1	0	1
	I	0	0	0	0	0	0	0	0
Total		10	4	16	11	8	2	0	41/41

Cont'd...

Table 6.8 Cont'd.

Size Group		VII	VI	V	IV	III	II	I	Total
				No. in 1941					
No. in 1931	VII	6	0	3	1	0	0	0	10
	VI	1	0	3	0	0	0	0	4
	V	0	0	13	3	0	0	0	16
	IV	0	0	2	7	2	0	0	11
	III	0	0	0	0	5	3	0	8
	II	0	0	0	0	0	1	1	2
	I	0	0	0	0	0	0	0	0
Total		7	0	21	11	7	4	1	44/41

Note : Each matrix shows the number of places which start the decade with populations in one size class and end the decade with populations either in the same or some different size class. The column entries show, for each size class at the end of the decade, in which size class the places had started the decade; the row entries show, for each size class, the classes in which towns ended the decade. (Based on B.T. Robson, "Urban Growth : An Approach", 1973, pp. 35-63).

Table 6.9 Movement of Towns in Their Size Classes*

	No. of Towns at the end of the Decade													
	1872-81		1881-91		1891-1901		1901-11		1911-21		1921-31		1931-41	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Towns Remaining in the same class	11	79	12	60	19	90	18	64	24	77	29	74	26	68
Moving to Lower class	0	0	1	5	0	0	2	7	2	16	1	2	0	0
Moving to Higher class	3	21	7	35	2	10	8	29	5	17	9	24	12	32
Total	14	100	20	100	21	100	28	100	31	100	39	100	38	100

* No. of Towns born or dead have not been included

Source : Based on transition matrices given in Table 6.8

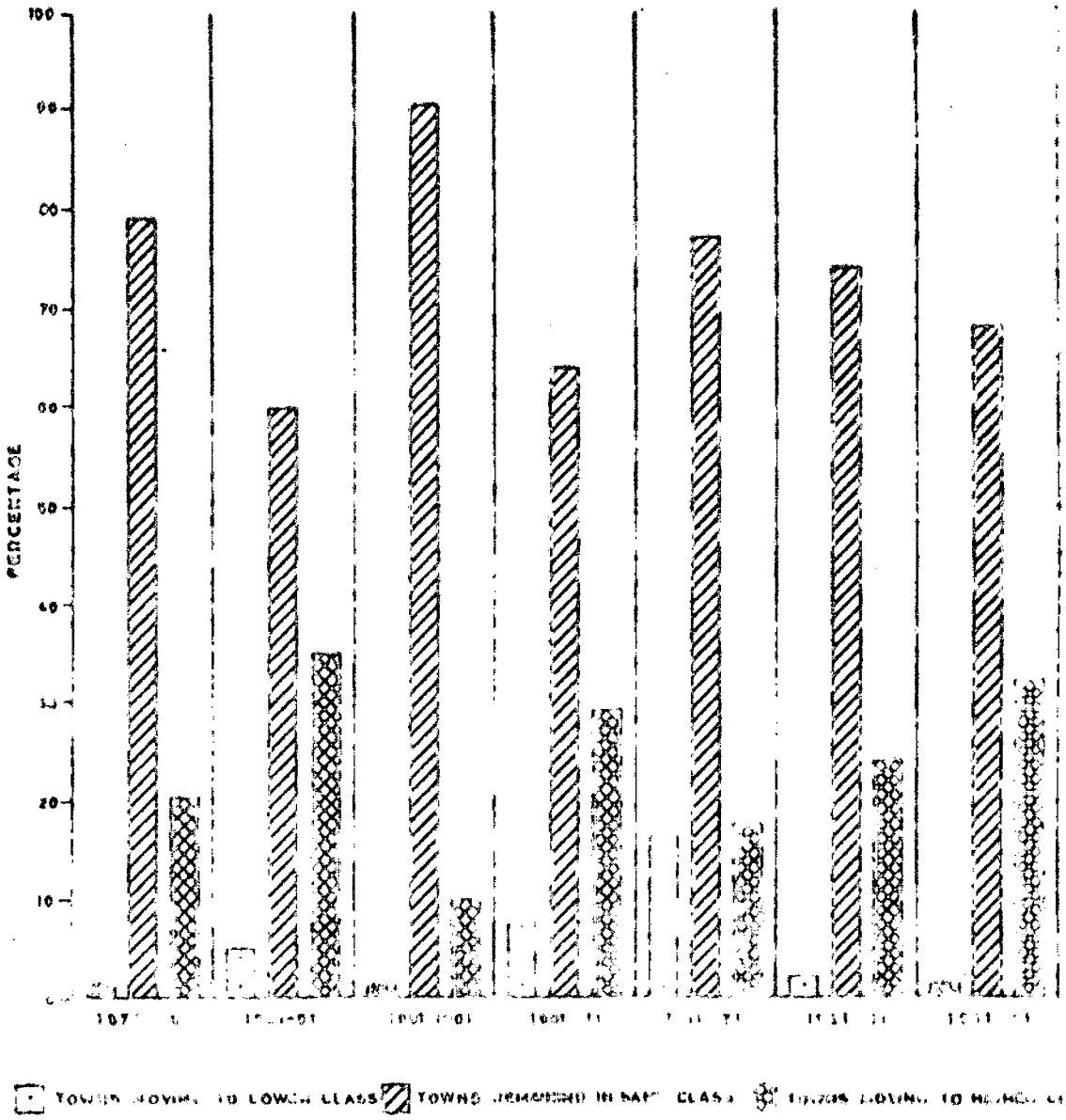

FIG.NO. 3.4 MOVEMENT OF TOWNS IN THEIR SIZE CLASSES (1872-81 1931-41)

or remained in the same class with the passage of time. The table itself is based on transition matrices (see Table 6.8) for seven decades - 1872-81 to 1931-41. The matrices, besides showing the movement of towns among the six class sizes, also indicate the number of towns which were born, or died in course of time. Towns which are dead and cease to exist have been put under class VII.

Table no. 6.9 indicates that -

(i) over the decades between 60 per cent and 90 per cent of the towns in the region remained in the same class though their population was on an increase;

(ii) there were quite a few towns which moved to higher classes. The proportion of such towns was 10 to 35 per cent;

(iii) very few towns showed a downward shift in their size class. The percentage of towns which registered a decrease in size, ranged between 0 - 7 per cent.

The transition matrices given in Table 6.8 show -

(i) the number of towns in class VII tended to decline with time. Between 1872-81 the number of towns which remained in this category was as high as 27. Maintaining a constant decline their number in 1931-41 fell to 6;

(ii) a shift to higher classes among the cities was visible only after 1911-21.

6.5 GROWTH RATES OF TOWNS IN EACH SIZE CLASS

The growth rate of the population of urban centres by their size classes has been shown in Table 6.10. The table indicates that -

(i) growth rates of towns in the higher size classes (i.e., class IV and above) were seldom negative during the period. There were only two exceptions in the higher category. In 1901-11, class IV towns and in 1931-41, class III towns showed a negative rate of growth. Whereas class VI towns showed a negative rate of growth in 4 of the 7 decades;

(ii) growth rates in all the classes for the entire period showed great variability from one decade to another; and

(iii) it may be noted that there was no class I city upto 1931. Similarly there was no class II town until 1911. The first town to emerge in these classes was Jamshedpur which in 1921 became a class II town and in 1941 a class I city.

6.6 VARIABILITY OF THE RANKS OF URBAN AREAS

There are three measures of the degree of variability - the average rank of the town during 1872 - 1941, the average deviation of the ranks and the range of the town's rank. Table 6.11 gives these three measures and also indicates the net gain or loss in rank during the eight decades, as well as the ratio of population between 1872 and 1941, for

Table 6.10 Growth Rate of Towns According to Size Class in the Mineral Belt 1872-81 to 1931-41

Class	1872-81		1881-91		1891-1901		1901-11		1911-21		1921-31		1931-41	
	No.	Growth Rate (%)	No.	Growth Rate (%)	No.	Growth Rate (%)	No.	Growth Rate (%)	No.	Growth Rate (%)	No.	Growth Rate (%)	No.	Growth Rate (%)
I	-		-		-		-		-		-		-	
II	-		-		-		-		-		1	46.00	2	87.0
III	2	83.0	3	33.0	4	45.00	6	68.00	6	10.00	8	7.00	6	50.00
IV	7	0.74	9	19.0	9	2.50	7	-26.00	8	23.00	12	61.00	13	94.00
V	10	100.00	9	-20.0	10	120.00	14	31.00	18	15.00	17	-10.00	22	-33.00
VI	4	246.00	1	-71.0	6	690.0	4	-66.00	5	110.00	4	-16.00	-	-
Total	23		22		29		31		37		42		43	

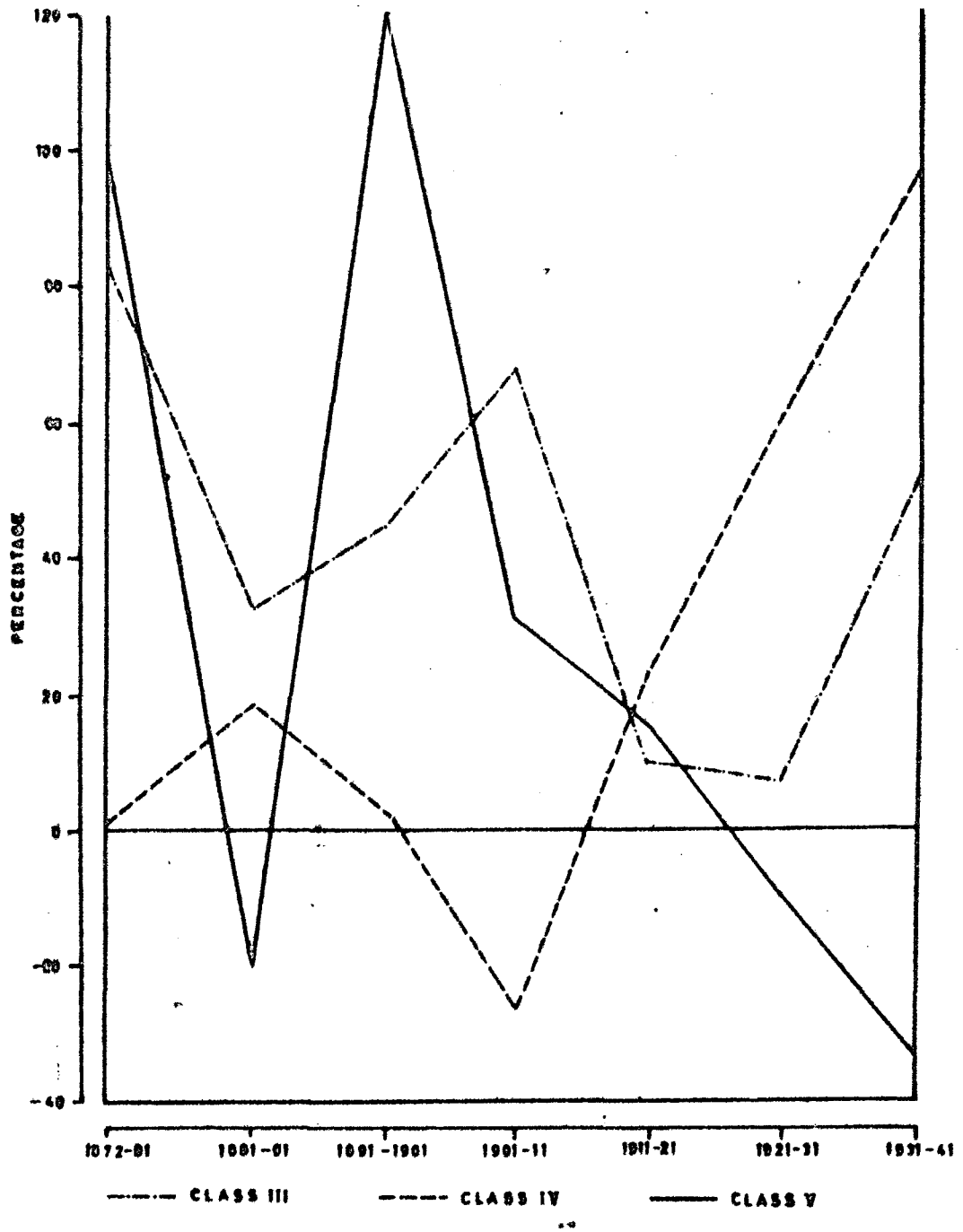

FIG.NO. 6.5 CLASS-WISE GROWTH RATE OF TOWNS(1872-81-1931-41)

Table 6.11 Variability of Ranks of Selected Towns* at Each Census

Towns	Ranks in 1872	1881	1891	1901	1911	1921	1931	1941	Average Rank	Average Deviation	Range of Rank	Net gain or loss during period	Population in 1872	Population in 1941	Ratio 1941/1872
Burdwan	1	1	1	1	1	3	3	2	1.62	0.78	2	1	32321	63465	1.96
Raniganj	2	8	8	6	6	8	7	7	6.50	1.37	6	-5	19578	62910	3.21
Raipur	3	2	2	2	2	2	2	1	2.00	0.25	2	2	19116	54178	2.83
Vishnupur	4	3	5	5	5	5	6	5	4.75	0.59	3	-1	18047	46617	2.58
Bankura	5	5	4	4	4	4	4	4	4.25	0.37	1	1	16794	24961	1.49
Ranchi	6	4	3	3	3	1	1	3	3.00	1.00	5	3	12086	24918	2.06
Hazaribagh	7	6	6	7	7	6	5	6	6.25	0.56	2	-1	11050	22839	2.07
Sambalpur	8	7	7	8	8	7	8	8	7.62	0.47	1	0	11020	17079	1.55

* The largest 8 towns in 1872 were selected and their ranks were noted for the subsequent decades.

the largest urban centres which existed in this region in the earlier decades.

The table reveals that -

(i) of the 8 towns, 50 per cent (Burdwan, Raipur, Bankura and Ranchi) showed a net gain in rank. There were three towns with a net loss (Raniganj, Vishnupur and Hazaribagh). Raniganj showed a drastic decline in rank which decreased from 2 to 7 in 1941. Sambalpur was the only town that maintained the same rank at the two points of time;

(ii) 75 per cent of the towns showed a general stability of rank and moved in terms of 0 to 2 positions; and

(iii) if the net gain or loss of ranks of cities is compared with the net gain or loss of their population between 1872-1941, it is found that all the towns, irrespective of their net loss or gain of ranks, showed a gain in their population. Raniganj which showed the highest net loss (-5) in rank also showed the highest net gain (3.21) in terms of the ratio of population (1941/1872).

It may be noted that a number of large towns (besides those listed above) came into being later in the period, i.e., after 1911. Hence they have been excluded from the analysis.

6.7 ORIGINS OF TOWNS

An increase in the level of urbanization in the region was brought about either by the emergence of a number of towns

during the period under study or by the increase in the population of the towns which already existed (see map 6.6).

At this point it becomes necessary to find out what were the factors which brought about the emergence of towns in the region during this period. The number of towns at the time of the first Census (1872) was only 15. In the last (1941) decade of the period under study this number rose to 78. This shows that there was a five-fold increase in the number of towns in a span of about 70 years.

There were a number of factors related to the origin of these towns. These factors include :

1. administration;
2. advent of railways;
3. trade;
4. establishment of industry; and
5. exploitation of mineral resources

In the following pages an attempt will be made to trace out the origin of all the towns which came up in the Region between 1872-1941. Table 6.12 gives the number and names of these towns and the factors that were responsible for their origin (see map 6.6).

The table shows that a sizable number of towns had existed before the first regular Census of 1872. However, the number of these towns cannot be established with certainty. According to the information derived from the various gazetteers,

Table 6.12 Factors Related To The Origin of Towns (with Numbers and Names) in the Mineral Belt upto 1941

Year of Origin	Administration		Railway	Trade	Industry	Mining	Total
	Early	British					
	1	2	3	4	5	6	
a Before 1872	18						18
b 1872		3	2	4	2	1	12
c 1881		3	-	2	-	-	5
d 1891		-	-	-	1	-	1
e 1901		1	1	6	1	2	11
f 1911		1	1	2	1	-	5
g 1921		-	-	4	-	-	4
h 1931		-	-	2	2	-	4
i 1941		-	1	5	1	11	18
Total	18	8	5	25	8	14	78

1 a - Vishnupur, Raipur, Dhenkanal, Sambalpur, Titlagarh, Palamau, Palkot, Jajpur, Kawardha, Balaghat, Baripada, Jagdalpur, Dongargarh, Kanker, Sakti, Sarangarh, Sonepur, Bhawanipatna.

2 b - Ranchi, Hazaribagh, Purulia

2 c - Chaibasa, Daltonganj, Patrasaer

2 e - Rajnandgaon, Deogarh

3 b - Bhatapara, Dhamtari

3 c - Asansol

3 f - Dhanbad

Cont'd ..

Table 6.12 cont'd

3	i	Adra
4	b	Chatra, Bilaspur, Bankura, Burdwan
4	c	Lohardaga, Mungeli
4	d	Garhwa, Dainhat, Kalna, Katwa, Raigarh, Kharsia
4	f	Bargarh, Bhuban
4	g	Chakradharpur, Champa, Jeypore, Jharsuguda
4	h	Bolangir, Ondal
4	i	Gunupur, Shahdol, Wara Seoni, Seraikela, Keonjhar
5	c	Bundu
5	b	Raghunathpur, Sonamukhi
5	d	Jhalda
5	h	Burnpur, Kulti
5	i	Balarampur
6	b	Raniganj
6	e	Giridih, Umaria
6	i	Ambikapur, Chirimiri, Mahendragarh, Chhuikhadan, Kota, Talcher, Barakar, Bermo, Noamundi, Manoharpur, Mosabani

the number of towns existing in the Mineral Belt before 1872 may be put up at about 26. Most of these towns existed basically for purposes of administration.

6.7.1 Administrative Towns

A large number of towns originated as seats of administration. Towns falling in this category may be classed into two, according to the period in which they originated :

(a) administrative centres which emerged during the pre-British period; and

(b) administrative centres which emerged during the British period

6.7.2 Administrative Towns of the Pre-British Period

There were 18 towns which emerged for defence or administrative purposes. A number of these towns still have forts within them which were built earlier on defensible sites. Some of the important towns of this period were Vishnupur, Raipur, Dhenkanal, Sambalpur, Titlagarh, Palamau and Palkot. Vishnupur was the ancient capital of the native Rajas of Bankura and was magnificent in beauty.[10] Raipur was made the headquarters of Chhatisgarh in 1818. The town is believed to have existed since the ninth century.[11] Dhenkanal (Nijgarh) was the capital of the Orissa Tributary State of the same name. The town was founded at the end of the sixteenth century. The town still contains the residence of the Raja.[12] Sambalpur was founded before 1693.[13] Titla-

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10. W.W. Hunter, Imperial Gazetteer of India, (IGI), 1885, Vol. III, p. 16.

11. I.G.I., 1908, Vol. XXI, pp. 59-61.

12. I.G.I., 1908, Vol. XI, p. 320.

13. W.W. Hunter, Imperial Gazetteer of India, (I.G.I), 1887, Vol. XII, p. 185.

garh is a very old town having its origin in the fifth century B.C.[14] Palamau (now in Bihar) was the capital of the 'Chero' chief in the first quarter of the seventeenth century. The 'Chero' Kingdom once extended over a larger part of Gaya, Hazaribagh and the entire district of Palamau.[15] Palkot was the seat of the Raja of Chotanagpur since 1725. It had a fairly dense population. Its location amidst wilderness afforded it a natural defence due to its impenetrable nature.[16]

6.7.3 Administrative Towns of the British Period

There were eight urban centres which emerged as a result of tremendous changes brought about by the British Government. In establishing their headquarters, it seemed that they gave priority to the areas which were rich in mineral resources and were easily accessible. Typical examples of such towns are afforded by the towns of the Chotanagpur division.[17] This includes the towns of Ranchi, Hazaribagh, Chaibasa and Daltonganj (see map 6.7).

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14. Orissa District Gazetteer, Bolangir, 1973, p. 487.

15. L.S.S. O'Malley, Bengal District Gazetteer, Palamau, 1907, p. 22.

16. M.G. Hallett, Bihar and Orissa District Gazetteer, Ranchi, 1917, p. 252.

17. This name to the division was given in 1854 by the Act XX of that year and a Commissioner was appointed as the executive head of the division with its headquarters at Ranchi. (I.G.I., Provincial Series, Bengal, Vol. II, 1909, p. 324).

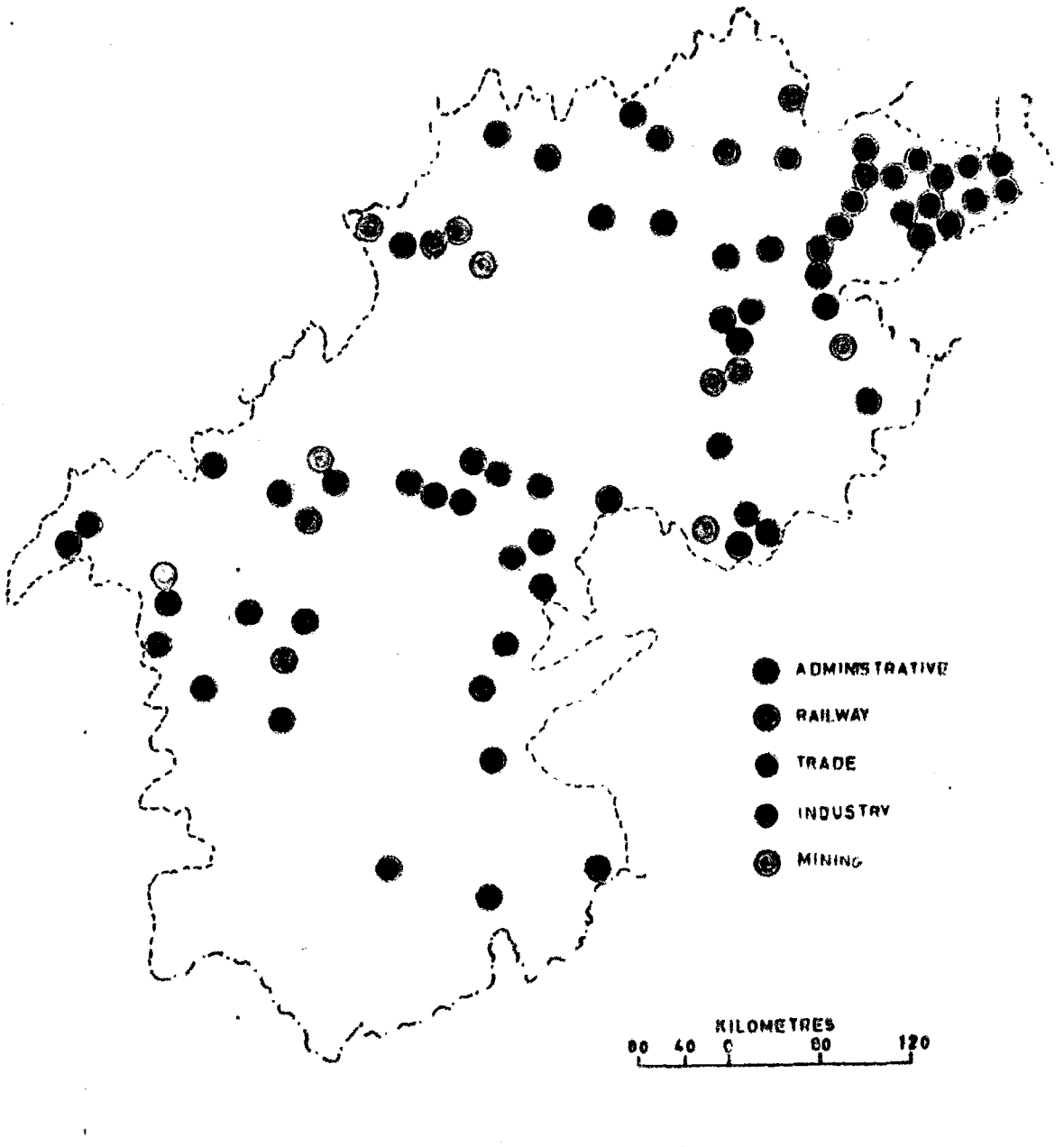

FIG.NO. 6.6

FACTORS SHOWING ORIGIN OF TOWNS

Ranchi was the headquarter of the district and also of the Chotanagpur division. It was the station of the Lucknow division of the Eastern Command, and the wing of a native infantry regiment was stationed in the cantonments.[18] The history of the development of Ranchi into a town reflects the history of the British administration.[19] The population of the town increased especially after 1911 by the flux of officers, clerks and menials employed in the Secretariat.

Hazaribagh town owed its existance to the raising of the Ramgarh Batallion in 1780. In 1841 it was for some time the headquarters for the regiment of Queen's infantry.[20] Chaibasa was chief town and the administrative headquarters of Singhbhum district.[21] Daltonganj was the headquarters of Palamau district. It was named after col. Dalton who was at one time the Commissioner of Chotanagpur.[22]

These towns housed the divisional, sub-divisional or district headquarters. Information collected from the various gazetteers show there were 18 towns which were constituted a municipality before 1872.

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18. I.G.I., 1908, Vol. XXI, pp. 210-11.
19. H.G. Hallett, op. cit., p. 74.
20. Thornton's Gazetteer of India, 1854, Vol. II, p. 484.
21. W.W. Hunter, I.G.I., 1885, Vol. III, p. 324.
22. I.G.I., 1908, Vol. XI, p. 128.

6.7.4 Railway Towns

A number of settlements assumed an urban status after the introduction of railways. It created new trade centres through the areas it transversed. There were three towns which emerged solely due to the railways. These towns were Bhatapara[23], Dhamtari[24] (both in the Raipur district of Central Provinces) and Dhanbad. The construction of railways brought fortune to these towns and they emerged as important trade centres of the district.

Dhanbad was a small village until 1890.[25] With the opening of the Jharia field in 1891, the East India Grand Chord Line was constructed in 1894 and Dhanbad attained significance as a railway station. Due to its twin facilities (i.e., railway connection, and the proximity to the Jharia coalfield), it became the principal distribution centre of Jharia coal to various parts of India. It gradually became an important junction from where a number of branch lines linked the neighbouring coalfields. Two other towns which owe much to the opening of the railways include Asansol (1901) and Adra (1941). Asansol on the East India Railway is located in the centre of the Raniganj coalfield and was one of the

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23. M.P. District Gazetteer - Raipur, 1973, p. 538.

24. Ibid., p. 544.

25. H. Coupland, District Gazetteer of Manbhum, 1911, pp. 270-71.

most important railway centres in Bengal. In 1881 the town was a rural tract. The locomotive shops were said to be the largest in the world. There was a large European community connected with the railway.[26]

6.7.5 Trading Towns

There were a number of towns which had existed as small centres in the region. But their importance increased tremendously with the introduction of railways. There were 25 towns in this category. Most of these commercial centres were successors of the local markets. Formerly these centres were villages where weekly markets were held and goods were produced locally on a small scale for consumption in the neighbouring village.

About 40 per cent of the total towns in the region, owed their origin to commercial functions which were closely linked with the introduction of railways. Towns in this category included Chakradharpur, Bankura, Bilaspur, Lohardaga and Garhwa.

The importance of Chakradharpur as a trade centre increased greatly with the opening of the railway in 1890.[27] In Bankura, considerable trade was carried on since early days, but the

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26. L.S.S. O'Malley, District Gazetteer of Burdwan, 1910, p. 185.

27. L.S.S. O'Malley, Bihar and Orissa District Gazetteers, Singhbhum, 1917, p. 38.

opening of the railways caused an expansion in trade.[28] Bilaspur was the eighth largest town in the Central Provinces in 1901. It was a leading centre in the district for the distribution of imports. Its trade was principally with Bombay due to good railway connections.[29] Lohardaga was the headquarter of the district till 1843. It was the most important market in the north-west of the district. Much timber passed through the town from the forests in the vicinity. Trade in rice and oilseeds was also conducted on a large scale. The importance of the town was enhanced by the opening of the Ranchi-Lohardaga railway branch of the Bengal Nagpur Railway in 1913.[30]

The growth of Garhwa (in the Palamau district) as a town was largely accounted for by its nodal location.[31] It was located on the convergence of three principal roads leading to Surguja Estate in the west, Mirzapur in the north-west and Gaya in the north-east. It was the collecting centre of lac, bamboo, timber, silk and other forest products.

It is seen in the table that towns in this category emerged in every decade. As mentioned already the towns in

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28. L.S.S. O'Malley, Bengal District Gazetteer, Bankura, 1908, p. 153.

29. W.W. Hunter, I.G.I., 1884, Vol. II, p. 453.

30. W.W. Hunter, I.G.I., 1886, Vol. VIII, p. 487.

31. L.S.S. O'Malley, Bihar and Orissa District Gazetteer, Palamau, 1917, p. 151.

this category initially carried on trade with their surrounding country. It was with the introduction of the railways that these leading towns attained larger dimensions. Without transportation, trade was on a small scale within the region.

6.7.6 Industrial Towns

Another factor which determined the origin of towns was the setting up of industries. In the developed countries the emergence of industries was the most important factor for the growth of towns. But in the Mineral Belt, towns which owed their origin to industry were very few in number. Only about 10 per cent of the towns were included in this category.

A good example of such a town in this region is that of Jamshedpur in the Singhbhum district of Bihar. This town emerged entirely as a result of the establishment of the iron and steel factory - set up by J.N. Tata in 1908.[32] In 1901 this town did not exist at all. In the next decade it emerged as a class V town (5,772) and by 1921 it shot up as a class II town with a population of 57,360. There were two other towns which emerged due to the setting up of iron and steel factories. These were Burnpur and Kulti which were treated as towns only in the 1931 census.

There were three towns which rose to prominence due to forest industries. Raghunathpur[33] (Manbhum district)

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32. S.K. Sen, The House of Tata, 1975, p. 38.

33. I.G.I., 1908, Vol. XXI, p. 36.

which emerged as a town in 1872 was the centre of the tasar silk industry. Jhalda[34] (Manbhum district) and Bundu[35] (Ranchi district) were important centres of lac industry. In Manbhum district alone there were 118 lac factories in 1909 employing 6,000 workers. In the same year lac (in the form of stick lac) was exported from here of a value of Rs. 40.50 lakhs.[36] Numerous lac factories were located at Purulia and Balarampur in the same district. Bundu emerged as a town in 1901. It was important as a centre of the lac industry and contained several factories for the conversion of lac into shellac.

It is obvious that there were very few industries in the region. And when compared to the very fast resources available, the number of industries specially heavy industries was almost negligible. Many of the towns had some indigenous industries but these operated on a very small scale and produced consumption goods such as vessels of brass, copper and bell metal and coarse cloth.

6.7.7 Mining Towns

Towns which originated as a result of the exploitation of minerals in their vicinity, emerged suddenly in the 1941

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34. H. Coupland, Bengal Gazetteer - Manbhum, 1911, pp. 270-71.

35. H.G. Hallett, Bihar and Orissa District Gazetteers, Ranchi, 1917, pp. 171-72.

36. H. Coupland, Bengal District Gazetteer - Manbhum, 1911, p. 158.

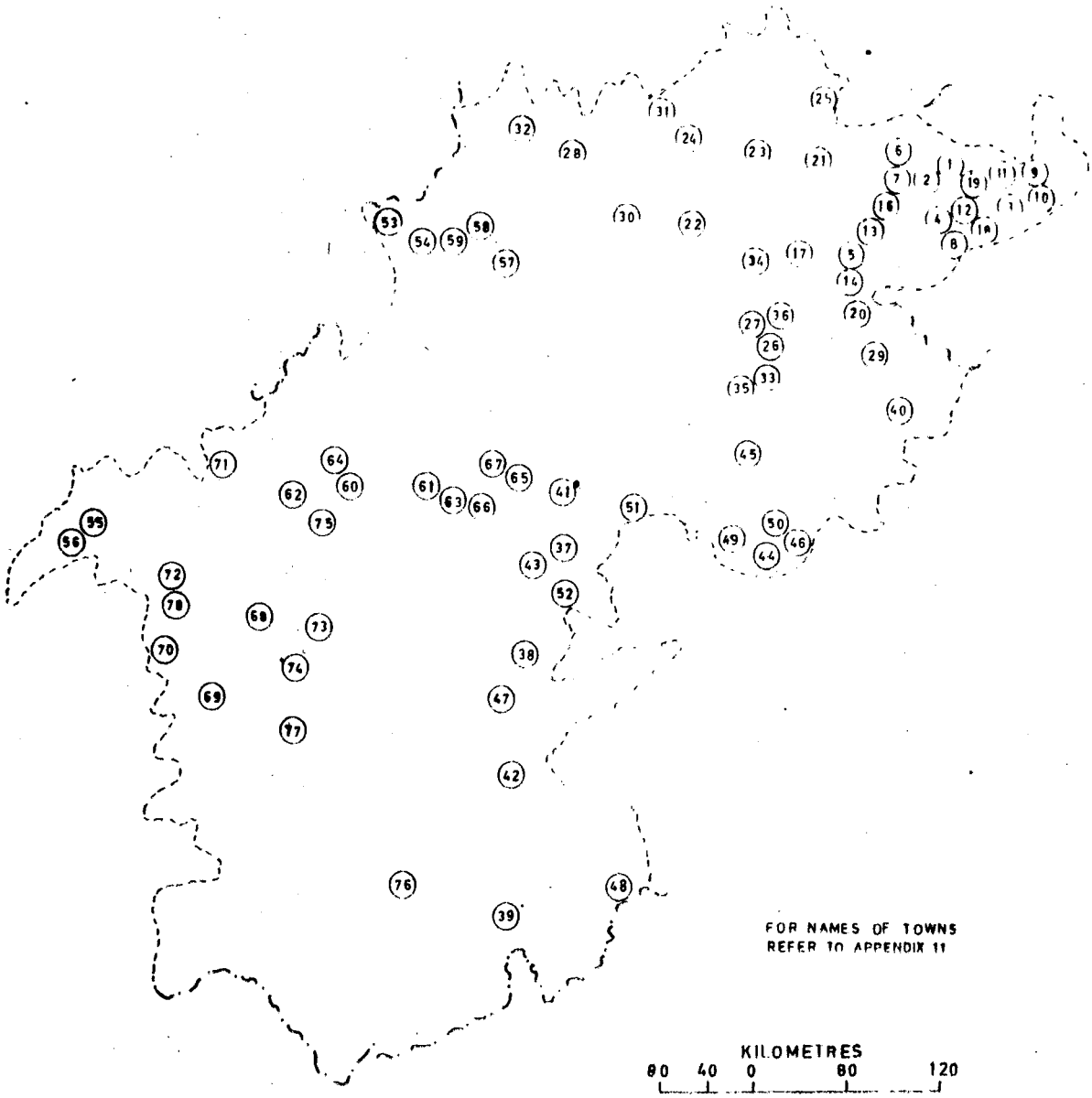

FIG.NO. 6.7

LOCATION OF TOWNS (1941)

census. About 80 per cent of the mining towns (which existed during the period under our study) emerged in 1941. Whereas from 1872-1931 there were only 3 towns in the entire region which emerged as the result of mining activities. These 3 towns were Raniganj in West Bengal, Giridih in Bihar[37] and Umaria in the Central Provinces. The first two towns were located within the largest coal belt of the country. Giridih also housed one mica splitting and dressing industry. Umaria was located within the coalfields of Central Provinces.

Of the 14 mining towns in the region, as many as 11 were linked with coal mining. Most of these towns belonged to the states of Bihar and Madhya Pradesh. Iron-ore mining gained impetus after the establishment of the T.I.S.C.O. at Jamshedpur (Singhbhum district). As a result of this a number of small settlements sprung up. Noamundi (6389) and Manoharpur (4397) were good examples of towns which emerged due to iron-ore mining. Another town which owed its origin to mining, in this case, of copper mining, was Musabani (Singhbhum district). The town came into existence in 1941 and had a population of 8270, half of which was engaged in extraction of copper ore.

The emergence of 11 towns in 1941 as a result of mining activities was a healthy sign and an initial step towards

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37. At the time when Raniganj and Giridih were classified as towns, they belonged to the same province - Bengal. The partition of Bengal came about in 1912 when a separate state, viz., Bihar and Orissa was made.

the development of the region. In the above description it has been mentioned that towns owing their origin to mining activities came up suddenly in 1941. It is known that the process of mineral exploitation in the region had started formally in the mid-nineteenth century. But this hardly contributed to the urbanization of the region. It was only in the last decade of the period under study (1872-1941) that small towns based on mineral exploitation emerged. However, the effect of this on the urbanization in the Mineral Belt was almost imperceptible.

6.8 The Declining Towns of the Region

Though the number and size of towns in the region was generally on the increase, yet there were certain towns which either were declassified or lost their earlier importance.

There were 4 towns which completely ceased to exist as towns. These towns were Ichak, Arang, Palkote and Ratanpur. All (except Palkote) were classified as towns in the 1872 census. Ichak in the Hazaribagh district declined in population and fell into decay due to infighting arising within the ruling Ramgarh family.[38] Arang in Raipur district was formerly a big seat of lac trade. But the jungles were cleared and hence it diminished in importance.[39]

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38. Bihar and Orissa District Gazetteers - Hazaribagh, 1917, p. 128.

39. A.E. Nelson, District Gazetteer - Raipur, Vol. A, 1910, pp. 258-59.

The number of towns which declined in importance (yet remained towns) were 4. All these towns, viz., Sonamukhi, Dainhat, Kalna and Katwa were in the state of West Bengal.

Sonamukhi (Bankura district) declined in prosperity with the introduction of English piece goods which led to the abandonment of its cotton industry which was unable to compete with the imported fabrics. Earlier, it was the centre of cotton weaving and spinning.[40] Sonamukhi was also the chief centre of the lac industry. But the manufacture of lac declined due to the competition of cheap foreign lac.[41]

The remaining 3 towns - Kalna, Katwa and Dainhat (all in Burdwan district) were river ports and important trade centres. All these towns declined since the opening of the East India Railway. The railways diverted the traffic from these port towns and took over the bulk of the trade.[42] A small proportion of the trade was carried by river. Besides, the introduction of the railways, silting of the Bhagirathi river below Katwa affected the trade of Katwa town seriously. At Dainhat and Katwa too the river receded thus hampering trade.[43]

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40. W.W. Hunter, I.G.I., 1888, Vol. XIII, p. 58.

41. L.S.S. O'Malley, Bengal District Gazetteer - Bankura, 1908, p. 110.

42. J.C.K. Peterson, Bengal District Gazetteer - Burdwan, 1910, p. 119.

43. Ibid., pp. 60-63.

It was seen that quite often the exigencies of railway construction made it essential that the old towns be left aside from the main line. This naturally resulted in a diversion of the old channels of trade, thus spelling the decay of old towns.[44]

6.9 CONCLUSIONS

1. The Mineral Belt experienced an increase in the degree and pace of urbanization. But nevertheless, the degree, speed and concentration of urbanization was very low.
2. There was a general tendency for the larger towns to show positive rates of growth and for the smaller towns to show negative rates of growth. However, on the whole there were a large number of towns moving to higher class size.
3. Though a number of towns existed in the Region, a strong regional capital could not emerge to provide the regional population with facilities of a metropolitan standard. There was a very limited development of functional linkages within the Region. In the absence of a strong centre in the Region, the entire area was linked to Calcutta. The dominance of the latter in the field of trade, transport,

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44. D.R. Gadgil, op. cit., p. 145.

specialised business, finance, service and advanced learning was overwhelming.

4. The noticeable absence of mining towns until 1941 was a clear indication of the little importance that was attached to the development of mines (except for export). The towns which did emerge had a small population. Mining was one of the oldest indigenous industry in parts of the Region. While the indigenous metal industries were forced to decline, efforts to develop mining on a large scale was lacking for a very long period.

5. The origin of the non-mining towns in the Mineral Belt shows that a large number of towns had a short history behind them. Most of the towns which existed before 1872 owed their emergence to administration purposes. During the period under study, a large proportion of the towns emerged as a result of trading activities which were further promoted with the advent of the railways. There was a notable absence of manufacturing towns (with very few exceptions) specially those based on heavy industries. A substantial number of traditional centres of indigenous industries declined. This was the result of the capitalist-commercial domination which destroyed the indigenous productive activities of these urban centres.

Summary of Findings

1.1 Mineral resource regions constituted an important element in the regional structure of colonial India and were one of the important channels of expropriation of surplus from the colonial economy. The superimposition of the mining economy on the traditional subsistence economy of the Mineral Belt led to the emergence of islands or enclaves in space which were unrelated or weakly related to the regional economy and were linked through export - oriented commodity flows with ports.

1.2 The impact of the imperialist rule on the development of the resource base in colonial India may be understood within the framework of two explanations, viz., the dependency model and the diffusion model. The dependency model views foreign penetration as the cause of under-development, while the latter suggests that backward countries will develop as a result of external influence and assistance. In India the process of colonization and resource development is more aptly explained by the dependency model. The role played by the metropolis viz-a-viz the colonial economy was characterized by a system of complete dominance. The process of colonization of the Indian economy revolved around two crucial coordinates. The first was the system of extraction of surplus and the second was the nature of British imperialism which was itself subject to evolution as the British

economy was transformed under the impact of the Industrial Revolution. Seen in these terms the Indian economy was subjected to various phases of exploitation which lasted for almost two centuries and which determined the trends and patterns of resource development and utilisation in the country.

2.1 Since the basic objectives of the British Government was to exploit indigenous raw materials for Britain's industrial use and to expand the Indian market for goods manufactured in Britain, their commercial policy was framed to achieve the aforesaid objectives. The commercial exploitation of minerals in the Region began as late as in the latter half of the nineteenth century when Britain's industries needed India's minerals. The regulations laid down by the Government for the grant of licences for exploitation and prospecting of mineral resources were designed in a manner which encouraged British subjects to carry on mining while deterring the Indians to do the same.

2.2 The ownership of coal mines in the Mineral Belt shows that the Europeans not only stimulated large scale coal mining initially, but also owned and controlled the larger coal companies. Whereas the bulk of the small and indigenous collieries (which were temporary in nature) were owned by the Indians.

2.3 Coal was the first of the minerals to be exploited and eventually it became the most important mining industry. It was however not exploited systematically. Coal mining was developed mainly for the benefit of the railways. Iron mining too, did not receive any impetus for development until the beginning of the present century when industries in Britain called for larger quantities for their use.

2.3 There was an absence of mining of metalliferous minerals which were associated with chemical and metallurgical industries. This was obvious because no such industries were developed in the country. Only those minerals required by Britain's industries were extracted to a large extent. Mica and copper provide good examples of raw materials being exploited in absence of industries in India.

2.4 However, the overall production of minerals show an encouraging trend towards the latter part of the period under study because industries which utilised them began to be established in India during this period.

3.1 The total value and quantum of imports of all the ores, metals, millwork and machinery exceeded that of their exports during the entire period under study. In the initial years (upto 1912-13) a few metals constituted the major share of the total imports. But during the latter part of the period under study the number of items imported increased considerably.

3.2 The composition of imports showed that manufactured goods (including millwork and machinery) formed the major bulk of the total value of imports. The machinery and tools for industrial activities were also imported.

3.3 Minerals either in the form of raw or semi-processed ores constituted the major share in the total value of export. Till the beginning of the 1920's, ores had formed the greater bulk of exports. From the mid-1920's, semi-processed goods constituted the largest share in the total exports. This implies that some form of primary processing of the raw materials was done at the intermediate points between the mines and the exporting port, before being exported finally to the U.K. This sort of primary production was one of the initial stages of colonial industrial expansion.

4.1 The decrease in the total number of industrial workers over the decades confirmed the process of de-industrialisation in the country, which had begun to be felt in the nineteenth century itself. While industrial workers showed a decline in numbers, there was a corresponding increase in the number of workers engaged in primary and tertiary activities.

4.2 The majority of the workers were engaged in small, indigenous industries in the absence of large industries in the Region. The goods which were produced catered to the local demands of the people.

4.3 There was a dominance of elementary processing activities which dealt with raw materials directly and which required a very low level of skill. Under normal conditions, the secondary sector of processing in a resource region, should have increased. But in the Mineral Belt the secondary processing sector remained more or less stagnant.

4.4 On an average about one third of the industrial workers were engaged in the indigenous textile industry, mainly cotton. It always ranked first in terms of employment of industrial workers. However, the number of workers engaged in the industry continued to decline with time. The goods produced therein could not compete with the finesse and cheapness of imported goods and had to face either stagnation or decline.

4.5 The only encouraging trend was seen in the metal industry where the percentage of workers employed showed an increase in every census. Within the metal industry, the makers of tools and implements constituted a major share.

4.6 As a general trend, the decrease in number of workers engaged in the manufacturing sector coincided with the decline in the number of traders engaged in the trade of those manufactured products.

4.7 The growth of the railways and the development of resources shows that the basic objective behind the construction of the railways in the Mineral Belt was trade and the exploi-

tation of resources. The lines connected the mineral regions to the exporting port - Calcutta, from where the primary products could be despatched thousands of miles away from Indian shores. The freight rate policy of the Government was designed to ensure a smooth two-step flow system between the metropolitan economy and the raw material producing region via the port of Calcutta. Areas lacking in exportable resources remained isolated and dependent upon more traditional forms of transport.

4.8 The exploitation of minerals in the Region was dependent on the development of railways. This was in direct contrast to the situation that had prevailed in the West. In England the first rails were laid in order to facilitate coal transport, whereas in India, the mining of coal on a large scale did not begin until the opening of the railways.

4.9 In the initial period (1855-1904) the railways primarily connected the coal mines. From 1905 onwards there was a shift from the rail connections in coal mines to that of iron ore mines due to the establishment of the latter industry in the Region.

5.1 With the establishment of the Imperial rule in India, the traditional industrial base of the country was either destroyed or distorted seriously. The industries which suffered most included the indigenous iron industry, metal

industry (bell metal, brass, copper), silk and cotton weaving industries. With the loss of their trade, the artisans, craftsmen and weavers lost their traditional skills. This was contrary to what had happened in Britain, France or Germany where the displaced workers had acquired new skills in factories and the State had taken the initiative to provide elementary education to all.

5.2 The destruction of indigenous industries in the region though was accompanied by the growth of a 'modern' sector of industry but this sector had all the features of a derived enclave, i.e., it catered to the needs of the primary enclaves which were geared to an international demand, such as the tea and jute industries. This kind of industrial activity did not generate impulses of further industrialisation in the Region.

5.3 The growth of large scale industries was a belated phenomena in the Region. No official policy was set forth for its proper development. Inspite of several efforts, the Government was unable to establish an iron and steel industry in the Region. It was solely due to the initiative of private Indian enterprise that an iron and steel industry was established.

5.4 The level of industrial technology was very low. A very large proportion of industrial establishments were non-

mechanised which resulted in a low output per worker. The tendency for the mining production to concentrate in larger mechanised units was absent. The development of mining in the Region meant that small mines with poor technical equipment kept multiplying each year. The introduction of modern methods of manufacture was confined largely to the efforts made by the Europeans, who exercised their control over the illiterate Indian labour. The system of education introduced by the Government was mainly intended to provide for the administrative needs of the country and encouraged literary and philosophic studies to the neglect of those of a more practical character. The absence of a suitable education to qualify Indians for posts requiring industrial or technical knowledge was met by the importation of men from Europe who supervised and trained illiterate Indian labour in the mills and factories that were started.

6.1 The Mineral Belt experienced an increase in the degree and pace of urbanisation. But nevertheless, the degree, speed and concentration of urbanisation was very low.

6.2 There was a general tendency for the larger towns to show positive rates of growth and for the smaller towns (population below 10,000) to show negative rates of growth. However, on the whole there were a large number of towns moving to higher class size.

6.3 Though a number of towns existed in the Region, a strong regional capital could not emerge to provide the regional population with facilities of a metropolitan standard. There was a very limited development of functional linkages within the Region. In the absence of a strong centre in the Region, the entire area was linked to Calcutta. The dominance of the latter in the field of trade, transport, specialised business, finance, services and advanced learning was overwhelming.

6.4 The noticeable absence of mining towns until 1941 was a clear indication of the little importance that was attached to the development of mines (except for export). The towns which did emerge had a small population. Mining was one of the oldest indigenous industry in parts of the Region. While the indigenous metal industries were forced to decline, efforts to develop mining on a large scale was lacking for a very long period.

6.5 The origin of the non-mining towns in the Mineral Belt shows that a large number of towns had a short history behind them. Most of the towns which existed before 1872 owed their emergence to administration purposes. During the period under study, a large proportion of all towns emerged as a result of trading activities which were further promoted with the advent of the railways. There was a notable absence

of manufacturing towns (with very few exceptions) specially those based on heavy industries. A substantial number of traditional centres of indigenous industries declined. This was the result of the capitalist-commercial domination which destroyed the indigenous productive activities of these urban centres.

What follows is that the exploitation of resources did not bring about any transformation in the economy of the Mineral Belt and only depleted it of its resources.

Though an attempt has been made in this study to analyse a number of aspects of the development and utilisation of resources in a colonial setting, it has not been possible to comprehensively elucidate the pattern of interaction of the mining region with other sub-regions of the national space economy. Hence a more detailed analysis is called for through which the pattern of internal trade, (i.e., the flow of resources from the Mineral Belt to the areas of consumption in India), the movement of mining labour and the sequential development of industries in the Region could be spatially studied. This would not only give an insight into the pattern of interaction and interdependencies that existed between the mining region and the surrounding regions but would also tell us how the spatial organisation of the Region underwent changes with the development and utilisation of resources.

APPENDICES

Appendix 1 Total Imports and Exports of British India

Period	Imports	Exports
1834-35 to 1838-39	24,396,510	37,775,330
1839-40 to 1843-44	34,845,340	47,508,540
1844-45 to 1848-49	40,697,920	55,651,830
1849-50 to 1853-54	52,837,800	66,723,750
1854-55 to 1858-59	89,508,490	86,158,240
1859-60 to 1863-64	136,876,540	143,907,620
1864-65 to 1868-69	164,382,450	192,214,750
1869-70 to 1873-74	137,670,335	192,809,985
1874-75 to 1878-79	160,739,520	200,448,755
1879-80 to 1883-84	206,045,810	268,033,555
1884-85 to 1888-89	250,447,570	300,925,495
1889-90 to 1893-94	295,653,110	362,223,660
1894-95 to 1898-99	295,194,445	379,766,210
Totals	1,889,295,840	2,334,147,730

Balance of Trade in favour - 444,851,690

Add 10 per cent trade profit - 44,485.169

£ 489,336,859

Appendix 2 Principal Import and Export Duties Fixed by Act XIII of 1871

Import Duties

Apparel, arms, cabinet-ware, candles, carriages clocks, cotton	7½ per cent
Cotton twist	3½ per cent
Price goods	5 per cent
Medicines	7½ per cent
Colouring materials	7½ per cent
Fruit, glass, skins, jewellery, ivory and leather	7½ per cent
Beer	1½ d per gal.
Spirits	6 s per gal.
Wines	3 s per gal.
Iron	1 per cent
Other Metals	7½ per cent
Naval stores, oils, paints, perfumery, porcelain, provisions and oilman's stores	7½ per cent
Silk	7½ per cent
Sugar	7½ per cent
Tobacco	10 per cent
Woolen piece goods	5 per cent

Export Duties

Grain of all sorts	4½ d per maund
Hides	3 per cent
Indigo	6 s per maund
Shell lac, lac dye	4 per cent
Oils	3 per cent
Seeds and spices	3 per cent

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gal. - gallons

Appendix 3 Total Import Quantity and Value of Metals and Ores

Principal Articles	1888-89 V	1892-93 V	1896-97 V	1900-01 V	1904-05 V	1908-09 V	1912-13 V	1916-17 Q	1916-17 V
Aluminium (cwts)	-	-	-	-	-	-	-	-	-
Brass, Bronze etc.	-	-	-	-	-	-	-	36479	0.13
Copper	3.26	4.94	4.72	4.16	7.69	8.64	8.33	-	0.10
German Silver (cwts)	-	-	-	-	-	-	-	171	0.001
Iron	10.05	11.59	16.44	17.44	19.60	23,32	23.49	13867	0.30
Steel	1.03	1.53	4.75	7.50	11.95	18.64	7.76	11802	0.22
Lead (cwts)	1.29	1.28	1.33	1.66	1.50	1.45	1.25	64031	0.14
Quicksilver (lbs)	-	-	-	-	-	-	-	45970	0.01
Solder (cwts)	-	-	-	-	-	-	-	2230	0.01
Tin (cwts)	0.35	1.69	1.30	1.13	2.19	2.50	3.12	13937	0.13
Zinc	0.35	1.01	0.44	0.73	0.89	0.79	0.14	13552	0.05

Q ; Quantity in tons, unless specified

V ; Value in Million Rs.

Appendix 3 cont'd.

1920-21		1924-25		1928-29		1932-33		1936-37		1940-41		1944-45	
Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
17026	0.22	29553	3.25	46643	3.76	44603	1.29	27643	2.01	16589	2.50	18896	1.42
148453	1.11	184054	8.87	124656	5.77	90920	2.99	55004	1.69	31413	1.73	4204	0.44
-	0.58	65101	3.90	67975	3.58	70192	2.60	103621	3.36	185635	8.33	321370	15.63
1449	0.02	4227	0.46	5286	0.47	3662	0.30	7283	0.37	14265	0.50	2	0.00
12359	0.38	3619	0.83	3644	0.70	4043	0.54	516	0.08	345	0.09	59	0.03
90964	2.93	74510	10.35	89563	10.33	28056	2.67	35244	3.56	13883	2.65	37485	7.42
37320	0.14	28957	0.97	12286	0.29	8241	0.14	7908	0.16	250912	4.74	9081	0.24
62608	0.02	82442	0.17	83137	0.32	101138	0.33	40068	0.09	7515	0.01	51966	0.49
658	0.005	222	0.02	608	0.05	1119	0.06	1569	0.13	153	0.02	194	0.02
24308	0.38	33719	5.45	32183	5.07	28697	2.78	29991	4.15	38196	6.83	17	0.008
34547	0.13	62832	1.59	104687	1.94	283948	3.09	431356	4.42	406896	8.65	23358	1.05

Appendix 4 Total Export (Quantity and Value) of Metals and Ores

Principal Article	1888-89 V	1892-93 V	1896-97 V	1900-01 V	1904-05 V	1908-09 V	1912-13 V	1916-17 Q	1916-17 V
Coal	0.15	0.16	1.37	5.92	4.63	5.05	8.83		7.47
Brass, Bronze etc. (cwts)	-	-	-	-	-	-	-	2188	0.01
Chromite	-	-	-	-	-	-	-	-	-
Copper (cwts)	-	-	-	-	-	-	-	1315	0.006
Ferro Manganese	-	-	-	-	-	-	-	-	-
Iron or Steel	-	-	-	-	-	-	-	109572	0.38
Manganese ore	-	-	-	-	-	-	-	233337	0.37
Mica (cwts)	-	-	-	-	-	-	-	52890	0.30
Lead (cwts)	-	-	-	-	-	-	-	-	-
Tin (cwts)	-	-	-	-	-	-	-	-	-
Zinc (cwts)	-	-	-	-	-	-	-	-	-

Appendix 4 cont'd.

1920 - 21		1924 - 25		1928 - 29		1932 - 33		1936 - 37		1940 - 41		1944 - 45	
Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
	14.70	228117	3.71	638774	7.13	451564	4.37	248825	9.44	1922126	18.40	83718	1.41
1065	0.02	864	0.14	6805	0.37	466	0.03	3842	0.13	54919	0.33	45	0.01
500	0.002	-	-	538	0.02	5219	0.20	5214	0.14	1	0.00	-	-
554	0.007	1640	0.18	1923	0.16	4560	0.07	-	-	1224	0.10	1	0.00
3873	0.07	1567	0.28	1506	0.16	-	-	-	-	4	0.00	-	-
49239	0.57	348896	21.95	515600	23.11	330527	11.01	647298	14.84	619982	42.69	-	-
375582	0.94	326399	9.46	398471	11.58	-	-	244613	4.39	113778	3.40	1918	0.12
62257	0.90	71685	8.89	84661	7.42	34354	2.60	163071	8.28	128237	13.37	47516	4.87
-	-	4887	0.07	25853	0.85	17356	0.35	6148	0.03	13744	0.50	1738	0.20
-	-	7580	0.04	15586	0.13	10312	0.29	59503	0.02	23397	0.48	2080	0.41
-	-	2653	0.03	3325	0.01	-	-	17525	0.04	3843	0.09	-	-

Appendix 5 List of Machinery and Millwork Imported to the Chief Port of Calcutta

Prime Movers (non-electrical)

Oil Engines

Parts of Oil Engines

Steam Engines

Parts of Steam Engines

Railway locomotive Engines

Parts of Railway locomotive Engines

Oil Engines for marine purposes

Electrical Machinery

Control and Switchgear

Generators

Motors

Transformers

Turbo-generating Sets

Aerated Water making machinery

Agricultural Machinery

Agricultural Tractors and parts

Ploughs and parts

Other sorts

Boilers

Boot and shoe manufacturing machinery

Leather tanning and curing machinery

Metal working machinery

Machine Tools

Appendix 5 cont'd.

Machine Tools

Mining Machinery

Coal Machinery

Other sorts

Oil crushing and refining machinery

Paper mill

Pumping machinery

Reciprocating

Centrifugal

Others

Refrigerating machinery

Domestic refrigerating machinery

Others

Flour mill machinery

Rice mill machinery

Sewing, knitting and parts

Sewing machinery

Knitting machinery

Parts and accessories

Sugar machinery

Tea machinery

Cotton spinning machinery

Other cotton machinery

Jute machinery

Appendix 5 cont'd.

Shuttles

Wool machinery

Other Textile machinery

Typewriters

Typewriter parts and accessories

Appendix 6 Change in Occupational Classification in Various Census

The decennial census, though inadequate remains the only source of comprehensive occupational statistics at our disposal. The Provincial Superintendent of the Lower Provinces of Bengal in the 1890s declared , "The compilation of the statistics (of occupation) was the most tedious, complicated and delicate task in the whole of the operations of the census. While its details were so bewildering, and the mass of figures involved was so enormous, that it was found necessary to interpolate many intermediate processes of examination between the first returns and the final tables, and to subject the figures to reieterated and exhaustive checking. It is not too much to say that the single subject of occupation must be debited at least one third of all the labour, time and money expended upon the preparation of the census tables. No regret would be felt for all the labour and money lavished on these tables, could it be believed that they furnished an adequate return; but unhappily that is not the case".[1]

In the economic field the censuses of India taking during 1872 to 1931 were confused on the concepts of work, occupation

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1. C.J.O'Donnell, Census of India - 1891, Vol. III, Lower Provinces of Bengal and Their Feudatories - The Report, 1893, p. 271.

industry, earning receipt of income and source of support. The occupational characteristics were embodied in the expression : "Means of Livelihood" or alternatively "Means of Subsistence". Both expressions were used in the census of 1891, in a manner which illustrated the nature of the confusion. Thus the economic column in the 1891 Schedule was headed "Occupation or Means of Subsistence". The instructions were to "enter the exact occupation or means of livelihood of all males and females who did not work but received income. The instructions continued : "In the case of children and women who do not work, enter the occupation of the head of their family, or of the person who supports them, adding the word, 'dependent', but do not leave this column unfilled for anyone, even an infant".[2] In this way, the census of 1891 threw together in one broad grouping those who had either an occupation or an income and those who had neither.

Treatment of persons who worked but did not thereby secure an income were counted as "actual workers" or "earners", together with persons who actually worked in one occupation or another. Treatment of persons who worked but did not thereby secure an income in their own right (e.g. unpaid family workers or helpers) varied from census to census. According to some census instructions such persons were to be adjudged "workers",

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2. Indian Population Bulletin, April 1969, Vol. 1, Office of the Registrar General of India, pp. 68-81.

in others, they were to be called "dependents". In all these censuses except that of 1931, persons who neither worked nor received income were nonetheless assigned to one or another occupation (under the rubric, "Occupation on which Dependent"), according to the work or source of income of the persons who supported them.

Scheme of Occupations

In 1881 the English scheme was devised and substituted in 1891 which included 478 groups. In 1901 this scheme was overhauled and expanded - the number rose to 520. By this time experience had shown that such an elaborate classification was not only not required in Indian circumstances but was liable to be actually misleading. Therefore, in 1911 an elaborate revision took place and practically a new scheme based on a scheme approved by the International Statistical Institute was introduced, consisting of 4 classes, 12 sub-classes, 55 orders and 169 groups.[3] This scheme was followed in 1921 too. But in 1931 there was a slight modification and the number of groups stood at 195.[4]

Limitations of the Data Base : In the developed countries

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3. P.C. Tallents, Census of India - 1921, Vol. III, Bihar and Orissa - Part I, Report, 1923, p. 249.

4. W.C. Lacey, Census of India - 1931, Vol. VII, Bihar and Orissa - Part I, Report, 1933, p. 178.

various sectors such as agriculture, manufacture, transport, trade, professions and services were clearly differentiated and highly individualized whereas in India, the patterns of life and work of village families did not lend themselves readily to breakdown by industrial sectors. The characteristic unit was not an individual worker doing a particular job, but an entire household which may carry on a round of related activities extending through the full economic spectrum.[5] The same fishing family, for example, make their own nets, take their boats out to the sea for the catch, cure the fish and hawk it.

Among potters, brass workers, blacksmiths and other artisans, the same family and often the same individual both makes and sells. In the censuses of 1881, 1891 and 1901, these workers were recorded variously as "makers", "sellers", or "makers and sellers" of specified products.

Main Principals of Classification

Where a person both makes and sells, he is classified under the manufacturing or industrial head, the commercial one being reserved for trade pure and simple.

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5. Daniel and Alice Thorner, Land and Labour in India, 1962, p. 72.

Industrial and trading occupations were divided into two main categories - (a) those where the occupation was classified according to the material worked, (b) those where it was classified according to the use it serves in.

Ordinarily, the first category was reserved for the manufacture or sale of articles, the use of which was not finally determined, but it also included that of specified articles for which there was no appropriate head in the second category. Thus while shoe-making (group 82) was classed with other industries of dress and toilet, the manufacture of certain leather articles such as water bags, saddlery etc. fell within group 51, "working in leather".

Appendix 7 Classification of Various Sectors of the Economy

In the analysis on occupational structure, the data has been obtained from the imperial tables on "Occupation or Means of Livelihood of the People" given for districts in the Census of India, 1872-1931. The methods of enumeration, tabulation and compilation of these tables changed over time. Therefore, the data has been analysed at the disaggregated level of groups. However, at the sectoral level, it has been aggregated in terms of primary, secondary and tertiary sectors. These sectors have been defined in accordance with the United Nations Classification given below*.

Primary Sector	-	Agriculture, hunting, forestry and fishing
Secondary sector	-	Mining and quarrying, manufacturing electricity, gas, water, construction
Tertiary sector	-	Commerce, transport, storage and communication, financing, insurance, real estate and business services, community social and personal services, activities not adequately defined

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* Department of Economic and Social Affairs, Statistical Office of the United Nations, "International Standard Industrial Classification of all Economic Activities", Statistical Papers (1968), Series M No. 4, Rev. 2, New York.

Appendix 8 Break-up of the Industrial order into Component Groups and their classification into Elementary and Secondary Processing (Tertiary activities included in the industrial groups are also Identified)

Census group No. 1921	Sl. No. I	Textiles
25	1	Cotton ginning, cleaning pressing (Elementary)
26	2	Cotton spinning (Secondary)
27	3	Cotton sizing and weaving (Secondary)
28	4	Jute spinning and weaving (Secondary)
28-A	5	Jute pressing (Elementary)
29	6	Rope twine and string (Elementary)
30	7	Other fibres (flax, hemp etc.) (Elementary)
31	8	Wool carding and spinning (Secondary)
32	9	Weaving of woolen blankets (Secondary)
33	10	weaving of woolen carpets (Secondary)
34	11	Silk spinners (Secondary)
35	12	Silk weavers (Secondary)
36	13	workers in hair camel and horse hair (Elementary)
37	14	Dying, bleaching, printing (Secondary)
38	15	Lace, crepe, embroideries (Elementary)
	II	Hides Skins and Hard Materials from the Animal Kingdom
39	16	Tanners, curriers, leather dressers and dyers (Elementary)
40	17	Makers of leather articles (Secondary)

Appendix 8 cont'd.

41	18	Furriers and brush makers (Elementary)
42	19	Born, ivory, horn, shell (Elemantary)
	III	Wood
43	20	Sawyers (Elementary)
44	21	Carpenters, turners, joiners (Elementary)
45	22	Basket makers, thatchers, bamboo (Elementary)
	IV	Metals
46	23	Forging and rolling of iron (Secondary)
47	24	Makers of arms guns (Secondary)
48	25	Implements and tools (Secondary)
49	26	Brass, copper, bell metals (Secondary)
50	27	Tin, Zinc, lead etc. (Secondary)
51	28	Workers in mints, die sinkers (Secondary)
	V	Ceramics
52	29	Makers of glass and crystal ware (Secondary)
53	30	Glass bangles, glass beads, necklace (Elementary)
54	31	Procelein and crockery (Secondary)
55	32	Potters and earthern pipe (Elementary)
56	33	Brick and tile (Elementary)
57	34	Mosaic, talc, alabaster etc. (Secondary)
	VI	Chemical Products, properly so called and analogous
58	35	Manufacture of matches, explosives (Secondary)
59	36	Erated and mineral water, ice (Secondary)

Appendix 8 cont'd.

60	37	Dyes (Secondary)
61	38	Refining of vegetable oil (Elementary)
62	39	Refining of mineral oil (Elementary)
63	40	Paper card-board and paper mache (Secondary)
64	41	Soaps, candles, perfumes etc. (Secondary)
	VII	Food Industries
65	42	Rice pounders, huskers, and floor grinder (Elementary)
66	43	Bakers and biscuit makers (Secondary)
67	44	Grain paarchers (Elementary)
68	45	Butchers (Elementary)
69	46	Fish curers (Elementary)
70	47	Butter, cheese, ghee makers (Elementary)
71	48	Sugar, molass and gur (Secondary)
72	49	Sweet meat makers, jam, condiments (Secondary)
73	50	Brewers and distillers (Secondary)
74	51	Toddy drawers (Elementary)
75	52	Tobacco, opium and ganja (Secondary)
	VIII	Industries of Dress and Toilet
76	53	Hat cap and turban makers (Elementary)
77	54	Tailors, milliners, darners, embroidery (Tertiary)
78	55	Shoe, boot and sandal makers (Elementary)
79	56	Gloves, socks, gaiters, tumblers, umbrellas, canes etc. (Secondary)

Appendix B cont'd.

80	57	Washing, cleaning, dyeing (Tertiary)
81	58	Barbers, hair dressers and wig makers (Tertiary)
82	59	Tatoolers, shampocers, bath houses (Tertiary)
	IX	Furniture Industries
83	60	Cabinet makers and carriage painters (Secondary)
84	61	Upholsrerers and tent makers etc. (Secondary)
	X	Building Industries
85	62	Lime burners, cement workers etc. (Secondary)
86	63	Excavators and well sinkers (Elementary)
87	64	Stone cutters and dressers (Elementary)
88	65	Brick Layers and masons (Elementary)
89	66	Painters, decorator of houses, plumbers (Elementary)
	XI	Construction of means of Transport
90	67	Engaged in making, repairing vehicles (Secondary)
91	68	Carriage, cart, palki, wheel wrights (Secondary)
92	69	Ship, boat, etc. (Secondary)
	XII	Production and Transmission of Physical Forces (heat, light, electricity, motive power etc.)
93	70	Gas works, electric light and power (Secondary)
	XIII	Other Undefined and Miscellaneous Industries
94	71	Painters, lithographers, engravers (Secondary)
95	72	Book binders, stichers, envelope makers (Secondary)
96	73	Makers of musical instruments (Secondary)

Appendix 8 cont'd.

97	74	Makers of watches, clocks, optical, surgical instruments (Secondary)
98	75	Precious stones, enamel artificial jewellery (Secondary)
99	76	Toy kite, cage, fishing tackle
100	77	Spangles, rosaries, lingams, sacred threated (Elementary)
101	78	Theatres and places of entertainment (Tertiary)
102	79	Contractors for disposal of refuse, dust etc. (Tertiary)
103	80	Sweepers, scavengers etc. (Tertiary)

Appendix 9 Decade-wise List of Railway Lines Opened with Their Mileage

Decade	Railway Section	Date of Opening	Miles Opened
1855 - 65	Khana to Raniganj Jn.	1855	45
	Raniganj - Siarsol	1863	1
1865 - 75	Siarsol - Sitarampur	1865	15
	Sitarampur - Barakar	1865	5
1875 - 85	Madhupur - Giridih Jn.	1871	27
1885 - 95	Umaria - Katni	1886	36
	Raipur - Rajnandgaon	1888	43
	Asansol - Damodar	1889	4.6
	Damodar - Purulia	1889	4.6
	Damodar - Sanctoria	1889	8
	Bilaspur - Raipur	1889	68
	Purulia - Chakradharpur	1890	71.8
	Chakradharpur - Goilkera	1890	21.2
	Jharsuguda - Raigarh	1890	43
	Raigarh - Bilaspur	1890	82
	Bilaspur - Umaria	1890	19
	Goilkera - Jharsuguda	1891	105
	Bilaspur - Birsingpur	1891	142
	Jharsuguda - Sambalpur	1893	30
	Barakar - Dhanbad	1894	26
	Dhanbad - Katrasgarh	1894	9

Appendix 9 cont'd.

1895 - 1905	Kusunda - Jharia	1895	3
	Jharia - Pathardih	1896	3
	Jamadoba - Loop	1899	2.5
	Kendwa	1899	3
	Raipur - Kurud	1900	32
	Kurud - Dhamtari	1900	13
	Abhanpur - Rajim	1900	10
	Katni - Marwara Jn.	1901	0.56
	Son - Rajhara	1902	67
	Rajhara - Daltonganj	1902	11
	Dhanbad - Jharia	1903	4
	Bhojudih - Bhaga	1903	7
	Bhaga - Malkera	1903	9
	Malkera - Mohuda	1904	3
1905 - 15	Dhanbad - Paharpur	1906	104
	Ondal - Sainthia	1906	44
	Bhowrah Branch	1906	3
	Bhojudih - Pathardih	1907	3
	Bhojudih - Gomoh	1907	26
	Mohudero Colliery	1907	4
	Purulia - Ranchi	1907	73
	Raniganj - Asansol	1907	4
	Tatanagar - Onlajori	1911	34
	Onlajori - Gurumahisani	1911	6

Appendix 9 cont'd.

1905 - 15	Bandel - Nabadwip	1912	40
	Nabadwip - Katwa	1912	24
	Katwa - Jangipur Road	1913	67
	Ranchi - Lohardaga	1913	42
	Mohuda - Chandrapura	1913	9
	Balaghat - Katangi	1913	36
	Sudamdih - Bhowrah	1914	2
1915 - 25	Burdwan - Katwa	1915	32
	Chandrapura - Bermo	1915	12
	Bankura - Adra	1916	33
	Bankura - Indas	1916	42
	Kandra - Gamharia	1919	6
	Onlajori - Badampahar	1922	21
	Koel Bank - Birmitrapur	1922	16
	Kargali - Gowai	1922	7
	Gamharia - Kharkai Bridge	1923	4
	Adra Avoiding line	1924	2
	Sini - Chakradharpur	1924	22
	Anara - Purulia	1924	16
	Purulia - Tamna	1924	4
	Tamna - Kantadih	1924	5
	Kantadih - Nimdih	1924	19
	Nimdih - Kandra	1924	14
	Rajkharsawan - Dangoaposi	1924	47

Appendix 9 cont'd.

1925 - 35	Dangoaposi - Gua	1925	19
	Chakradharpur - Goilkera	1925	21
	Gowai - Bhojudih	1925	1
	Bermo - Danea	1925	21
	Danea - Barkakana	1926	22
	Barbil branch	1926	4
	Rourkela - Koel Bank	1926	2
	Gomoh - Chandrapura	1927	10
	Barkakana - Chandil	1927	72
	Goilkera - Manharpur	1927	16
	Asansol - Barakar	1927	2
	Bijuri - Manendragarh	1929	10
	Barkakana - Barwadih	1929	96
	Barwadih - Daltonganj	1929	17
	Raipur - Jonk	1929	63
	Jonk - Harishankar Road	1930	25
	Harishankar Road - Titlagarh	1930	35
	Manendragarh - Chirimiri	1931	14
	Kharkai Bridge-Tatanagar	1932	2
1935 - 45	Anuppur - Bijuri	1938	30
	Vishnupur - Bankura	1945	19

Appendix 10 Decade-wise List of Mines Connected by Railways

Period	Names of Mines*
1855 - 65	Raniganj
1865 - 75	Sitarampur, Barakar
1875 - 85	Giridih
1885 - 95	Katras, Damodar, Sanctoria, Umaria
1895 - 1905	Kusunda, Jharia, Pathardih, Bhojudih, Jamadoba, Bhaga, Malkera, Rajhara
1905 - 15	Onlajori, Gurumahisani, Sulaipat, Noamundi, Gua (all iron ore), Mohundero Colliery, Karanpura, Sohagpur, Rampur, Hingir, Talchir
1915 - 25	Badampahar (iron ore); Kargali, Birmitrapur (limestone)
1925 - 35	Gua, Barbil (iron ore), Bijuri, Manendragarh, Chirmiri
1935 - 45	Anuppur

* Mines not specified show that they are coal mines.

Appendix 11 Name of Towns in the Mineral Belt* 1941

Bengal

1. Asansol
2. Buxmpur
3. Burdwan
4. Bankura
5. Purulia
6. Kulti
7. Barakar
8. Vishnupur
9. Katwa
10. Kalna
11. Ondal
12. Sonamukhi
13. Adra
14. Balarampur
15. Dainhat
16. Raghunathpur
17. Jhalda
18. Patrasaer
19. Raniganj

Bihar

20. Jamshedpur
21. Dhanbad
22. Ranchi
23. Bermo
24. Hazaribagh
25. Giridih
26. Chaibasa
27. Chakradharpur
28. Daltonganj
29. Musabani
30. Lohardaga
31. Chatra
32. Garhwa
33. Hoamundi
34. Bundu
35. Manoharpur
36. Seraikela

Orissa

37. Sambalpur
38. Bolangir
39. Jeypore
40. Baripada
41. Jharsuguda
42. Bhawanipatna
43. Bargarh
44. Dhenkanal
45. Keonjhar
46. Jajpur
47. Titlagarh
48. Gunupur
49. Talcher
50. Bhuban
51. Deogarh
52. Sonepur

Central Provinces

53. Umaria
54. Shahdol
55. Balaghat
56. Wara Seoni
57. Ambikapur
58. Chirimiri
59. Mahendragarh
60. Bilaspur
61. Champa
62. Mungeli

Appendix II cont'd.

63*	Sakti	71.	Kawardha
64.	Kota	72.	Chhuikhadan
65.	Raigarh	73.	Raipur
66.	Sarangarh	74.	Dhamtari
67.	Kharsia	75.	Bhatapara
68.	Durg	76.	Jagdalpur
69.	Rajnandgaon	77.	Kanker
70.	Dongargarh	78.	Khairagarh

* For the location of these towns see fig. 6.7.

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