

**THE INDUSTRIAL EFFICIENCY
OF INDIA.**

BY THE SAME AUTHOR

FACTORY LABOUR IN INDIA

FACTORY LEGISLATION IN INDIA

THE LABOUR MOVEMENT IN INDIA

HINDUSTANI WORKERS ON THE PACIFIC COAST
(*Walter de Gruyter & Co., Berlin, 1923*)

PRODUCTION IN INDIA (*Visva-Bharati Bookshop, Calcutta, 1924*)

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THE INDUSTRIAL EFFICIENCY OF INDIA

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TO MY WIFE

PREFACE

The Industrial Efficiency of India is a study in the productive capacity of India as compared with that of various industrially advanced countries, on the basis of their ability to utilise the natural, human and capital resources under the modern system of production. The object of the study is to ascertain the extent of India's efficiency and to analyse the causes of inefficiency and, further, to outline a scheme for the achievement of efficiency.

As stated in the preface of his books on *Factory Labour in India* (1923) and *Production in India* (1924), the subject-matter of the present treatise had occupied the author's mind for a long time. Deeply impressed in his early youth with the extreme poverty of the people, the author decided to inquire into its causes, and after five years of studies in Agriculture and Economics in the United States, came to the conclusion in 1912 that although over-population and foreign exploitation were among the contributory causes, the fundamental cause of India's poverty was her industrial inefficiency, or in-

ability of the people to make the best use of her potential resources for productive purposes.¹

This conclusion led the author to approach the economic problem of India from the point of view of her industrial efficiency. In 1913, a study in the efficiency of Indian factory labour was undertaken as doctoral dissertation, and although the project had to be given up in 1915 for lack of sufficient data for the purpose, the material thus collected was subsequently published in *Factory Labour in India*. In 1921-2, a study in comparative efficiency of Indian labour was also made in connection with the author's investigation of the condition of Hindustani (East Indian) workers in America on behalf of the United States Bureau of Labour Statistics, and published in his *Hindustani Workers on the Pacific Coast* (1923).

In the meantime, a study in the industrial efficiency of the nation as a whole was also begun, but for lack of time and means, as well as because of preoccupation with other subjects, the work was postponed. Some of the material collected was, however, published in the treatise on *Production in India* and also in the articles in the *Modern Review* on "Wastage of India's Man Power" (April 1927), and "The Nature of Industrial Effici-

¹ Vide Author's "The Problem of India's Poverty," *Modern Review*, September, 1929.

ency" (May 1927). Since the undertaking of the treatise there have been great changes in industrial conditions in India and a considerable portion of the original manuscript has been revised. Some parts of the present treatises have also been recently published in the *Modern Review*.

In presenting this volume to the public, the author would like to say that he has scarcely been able to produce a treatise which he had intended to write and for which he had waited so long. Besides the limited time and means at his disposal, the author has been seriously handicapped in his work by the lack of adequate and accurate statistics, especially in India, for comparative purposes. He hopes, however, that as in the case of his treatises on labour and production, the present study will open up a new field of research into the condition of India's industrial efficiency, which is of vital importance to the wealth and welfare of the people.

The author takes this opportunity to acknowledge gratefully the generosity and encouragement in the continuation of his work of the Association Sociale et Commerciale des Hindous in Paris. He also wishes to express his gratitude to Dr. Merle Eugene Curti, Associate Professor of History, Smith College, Northampton, Massachusetts, for reading the manuscript. But the author owes

most of all to his wife, whose suggestions, criticism and sympathy have made the completion and publication of this book possible.

RAJANI KANTA DAS.

GENEVA,
September, 1930

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INTRODUCTORY

CHAPTER I

NATURE OF INDUSTRIAL EFFICIENCY ¹

THE term "efficiency" means much more than mere ability to accomplish a thing. In every stage of social evolution, there develops, with the progress of science and art, a certain moral, intellectual and mechanical technique, which gives a man a better control of himself and his environment. Efficiency implies the application of this growing technique to the accomplishment of a thing so that while the standard of the achievement is maintained or even improved, there is at the same time a saving of time and energy. In other words, efficiency is the ability of accomplishing a thing by means of the best method known at a given time and place.

The most significant connotation of efficiency is, therefore, that it is relative and dynamic. There is nothing absolute and static about it. It always implies that one method is better or more economical than another. It is always in the state of becoming. The efficiency of yesterday may appear to be the inefficiency of to-day, and what is most efficient

¹ First published in the *Modern Review*, Calcutta, May 1927. The author expresses his gratitude to the editor for permitting the reproduction of this and other sections of the book referred to.

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to-day may prove to be most wasteful to-morrow. As soon as a new law is discovered or a new technique is invented, there appears an occasion for the rise of a new standard of efficiency. The fundamental principle in the development of efficiency is, as in the case of organic evolution, adaptation or the constant adjustment of old methods to new conditions.

Efficiency* is a general term which is applicable to all classes of activities, namely, social, political and industrial. It refers to the means of achievement rather than to the achievement itself. One can thus speak of the efficiency of machines, industries, institutions and governments with reference to the function which they have to perform. Industrial efficiency simply refers to industrial activities or productive energies.

✓ The industrial efficiency of an individual is the ability to mobilise all the physical, intellectual and moral forces at his command for achieving results in a productive process. It consists of several elements: First, health and vigour, the physical basis of efficiency. They depend partly upon the constitution, including the muscular and the nervous systems, and partly upon the proper development of the vital organs and their freedom from disease. Second, aptitude and adaptability, which are the psycho-physical features of efficiency and imply temperament and disposition. The former relates to one's liking for a particular kind of work in preference to others and the latter to the capability of adjustment to new conditions, including machines

and other surroundings. Third, application and perseverance, which, although psycho-physical in origin, refer to the moral qualities of efficiency inasmuch as they imply one's power to control the body and the mind. The former is the ability to concentrate one's energies, both physical and mental, to a particular work, and the latter is the capability of sustaining this concentration for a desired length of time. Fourth, skill and ingenuity, which relate to the intellectual aspects of efficiency. Skill is the combination of speed and precision, the former adding to the quantity and the latter to the quality of work. They are achieved through education and training and perfected through repetition and experience. Ingenuity is the ability to meet a new situation or to design a new method in a productive process, and is, therefore, the basic quality in invention. Both skill and ingenuity are the highest qualities in industrial efficiency.

When applied to an entrepreneur, industrial efficiency may best be defined as the ability to organise and manage a business for profitable purposes. In the case of self-sufficing economy, it is the capability of producing the largest amount of goods with the least expenditure of land, labour and capital. The efficiency of a housewife is similar to that of an individual engaged in the household production. It is the power of economising or getting the highest amount of satisfaction out of the stock of goods and services at her disposal. But in this age of exchange economy, production takes place mainly for market rather than for household,

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and efficiency in such cases may best be judged by the extent of profit, which in the final analysis is, however, nothing but one's command of other goods which one can obtain in exchange for one's own.

The organisation and management of a large business or corporate enterprise include several processes, such as location and installation of the plant, choice and utilisation of machinery and material, selection and organisation of workers, and marketing of finished products, the object in each process being the reduction of cost and increase of productivity. The movement for scientific management has also added some new phases to business organisation. The ability to co-ordinate land, labour and capital with a view to making the largest amount of profit in a given business enterprise, constitutes the efficiency of an entrepreneur or business manager.

The industrial efficiency of a nation has, however, a much larger connotation. First of all, national efficiency generally refers to the production of social wealth, while individual efficiency may imply merely acquisition for private gain. Second, a nation is more or less a permanent entity and its interest lies both in the present and future generations, while an individual is a temporary being and his interest may end in himself or may at best continue for his immediate descendants. While making the best use of its resources for the present generation, a nation must also conserve them for future generations.

Prosperity is, of course, the prime object of industrial efficiency. It is, however, more or less a relative term. There is no end to human wants.

In this age of growing aims and aspirations and of consequent increasing wants, it is hard to draw a line where poverty ends and prosperity begins. Beyond the supply of absolute necessities of life, the prosperity of a nation can best be judged from the point of view of its ability to maintain its social standard among other advanced nations. But there is no necessary correlation between efficiency and prosperity. Wealth is the product of factors other than human energy or labour alone. The same amount of labour applied to two countries of varying natural resources would result differently in national wealth. In order to maintain its national standard, a country of poor resources will have to increase its labour power or capital resources. Since capital is the product of past industry, the accumulation of capital resources is also determined by labour power or industrial efficiency.

The welfare of a nation depends not only upon the creation of economic values, but also upon that of other values, such as the ethical, æsthetic and religious. While devoting itself to the pursuit of wealth, a nation must also look after the moral and intellectual aspects of life. In fact, one of the principal aims of industrial efficiency is to release a part of national energy for activities other than industrial. Moreover, by facilitating the supply of the basic needs of life, industrial efficiency also creates opportunities for realising moral and intellectual ideals.

The industrial efficiency of a nation is therefore determined by several factors: First, utilisation

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and conservation of arable land, forests, fisheries and mines in the light of modern science and art. Second, encouragement to savings, transformation of the savings into productive instruments of the latest discoveries and inventions, and utilisation of these instruments or capital goods to the fullest extent. Third, development of the physical, intellectual and moral qualities of the people for productive purposes. Fourth, preservation of national standards among other advanced nations. Fifth, cultivation of the moral and intellectual aspects of life for the welfare of Society. In short, the industrial efficiency of a nation is its ability to conserve and utilise, in the light of the latest progress in science and art, all its natural, human and capital resources for both the absolute and relative wealth and welfare of its people.

I. SIGNIFICANCE OF EFFICIENCY

Efficiency is the goal of all evolutionary processes. They all tend to the gradual differentiation and specialisation of the organism on the one hand, and to a greater interdependence and co-ordination of the parts to the whole on the other, resulting in increasing efficiency in functional process. While the organic evolution furnishes one of the best examples in functional development, equally illustrative is social evolution, which through the development of different institutions, such as the family and the State, has led to the progress of Society. The function of industrial evolution is the augmentation of social wealth. The development of the

factory system from hunting and pasturing, of modern exchange from primitive barter, and of international economy from the self-sufficing household or village, have all tended towards the increase of national prosperity.

The significance of efficiency in national life is best indicated by its functions, which might be classified under two heads, namely, direct and indirect: The direct function of industrial efficiency is threefold: First, the supply of the basic needs of life, especially food, in the face of the proportionately decreasing natural resources as a result of increasing population. Second, supply of increasing requirements of the growing individuality in the process of social progress. Third, preservation of the prosperity and prestige of a nation as well as its economic independence in the growing competition among different nations.

The indirect function of industrial efficiency upon a nation is also very great: First, the physical, intellectual and moral qualities constituting industrial efficiency also form the basis of national character. Second, efficiency by saving time in the supply of necessities and requirements secures needed leisure for intellectual and moral activities. Third, both material prosperity and moral and intellectual development are essential for national liberty and social progress.

2. ESTIMATION OF EFFICIENCY

There is scarcely any standard by which the industrial efficiency of a nation can be measured

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with any degree of accuracy. Some rough idea may nevertheless be had from different systems of estimation. Since efficiency is a relative term, such estimates must be based upon comparison.

The *per capita* incomes of different countries might give some idea of comparative efficiency. But they refer to nominal or money income, which differs in different countries, and not to real income. Moreover, they give no idea of the relative importance of labour in productive processes, which forms the subject-matter of a study in efficiency.

Attempts have been made to estimate efficiency by the productivity of an industrial unit. Thus the yield of crop per acre has been made the basis of relative efficiency. The defect of this system lies in the failure of taking into consideration the relative importance of the other factors of production, namely, labour and capital. Similarly defective is the system of estimating the efficiency of labour from the products of factories using the same kind of machinery. Such estimates disregard differences in the conditions of work, nature of raw material, rates of wages, and similar other factors.¹

The relative efficiency of labour may also be estimated by employing different groups or gangs of workers in the different branches of the same industrial plant, such as factory, mine, farm or orchard, or in the same plant at different times. Such a method is quite practicable in the United

¹ This is the basis of calculation of the efficiency of Indian labour as compared with the British. See Author's *Factory Labour in India*, Berlin, 1923, pp. 107-25.

States, where workers of practically all nationalities are available. The weakness of the system is that age, health, education and training of different workers of different nationalities are often disregarded. But as most of the immigrants are in the prime of life and some consideration is made of the experience of the workers, such a method offers a fair basis of comparison. But it is hardly possible to apply this method to a nation as a whole.

Another method is the estimation of the potential productivity of a country with the probable application of the latest industrial technique, including discoveries and inventions, as compared with the actual productivity. Such methods would include the effect of machinery on the technique or labour proper. But the inability of a nation to apply the best machinery to productive processes is also a sign of its industrial inefficiency. This system is, however, too theoretical to be of any practical use.

A practical method is to take as a base the average productivity of various industries in several advanced countries, including as many commodities as possible, and to compare the efficiency of a particular nation by index number. But the difficulty arises in the fact that there is no common basis of collecting statistical data in different countries. Moreover, exact data on a sufficiently large number of commodities are available only in few countries. It must also be mentioned that a large number of commodities escape statistical calculation even in the most advanced countries.

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There are several other methods by which the industrial efficiency of a country may be indicated: First, general economic condition of a country. For example, the starvation of the majority of the people in India cannot fail to indicate its industrial inefficiency. The presence of a few extremely rich people implies only a defective system in distribution rather than sufficiency in production. Second, absence of the latest technique and of up-to-date machinery from the productive system of a country is another indication of its industrial inefficiency. Obsolete and antiquated tools and implements and century-old industrial systems and methods in this age of the world competition and international economy show that India is still far behind other nations in industrial development. Third, wastage of natural, human and capital resources is still another indication. In a country like the United States, where there is superabundance of natural resources in comparison with man-power, private economy has necessarily led to a certain amount of wastage. But in a country like India, where famine is constantly present in some part of the country or other and where the majority of the people are always on the verge of starvation, the wastage of the resources in any form is the direct result of her industrial inefficiency.

PART I. CONDITION OF EFFICIENCY

CHAPTER II

EXTENT OF EFFICIENCY

LAND, labour and capital are the factors of production, and national prosperity depends upon the ability to utilise them for productive purposes. The industrial efficiency of a nation may thus be estimated by roughly determining the potential productivity as determined by these factors and its actual productivity or the extent to which these elements are utilised. •

I. WASTAGE OF LAND ¹

Natural resources are those objects of nature which are obtainable without any human effort and which are known to be useful for productive purposes. Although the supply of these resources is limited, yet within the range of this limit there is a good deal of flexibility. With new discoveries and inventions, there always develops a new technique for the utilisation of the new material or for more intensive utilisation of the old, including the

¹ A recapitulation of the Author's thesis in *Production in India*; also published as "Wastage of India's Natural Resources," *Indian Review*, July, 1930. The Author wishes to thank the editor for permitting the publication of the article.

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by-products. The natural resources might be classified under four categories, namely, arable land, forests, fisheries, and minerals.

According to the Census of 1921, the total land area in the whole of India amounts to 1,164 million acres, of which 670 million acres or 57 per cent. of the total belong to the British Provinces and 494 million acres or 43 per cent. to the Indian States. Since only a few Indian States return agricultural statistics, they have been left out of consideration in this treatise.¹

✓ Out of 670 million acres of land, according to the professional survey in British Provinces, the village papers record only 667 million acres. The following calculation is based upon the latter data. Of the total area of 667 million acres, 148 million acres or 22 per cent. are not available for cultivation, 87 million acres or 13 per cent. are devoted to forestry, and the remaining 432 million acres or 65 per cent. are arable land.²

Of the total area of 432 million acres of the arable land, 155 million acres or 36 per cent. are cultivable waste, that is, land which is capable of cultivation, but has not yet been brought under cultivation, or that which was once cultivated and has been given up

¹ *Agricultural Statistics of India*, Calcutta, 1927, 1, p. ii.

² *Ibid.*, 1926-7, I, p. iii, and also *Agricultural Statistics, British India*, 1928-9, p. 2. These and similar figures in the following pages refer to the year 1928-9. Non-cultivable land consists of land which is absolutely barren, or covered with buildings, water and roads, or appropriated for purposes other than agriculture. All of it is not, therefore, unproductive. Most of this barren land lies in the hilly tracts in the southern, north-western and south-eastern regions.

afterwards, 49 million acres or 11 per cent. are laid fallow, and only 228 million acres or 53 per cent. are sown with crops, as shown in the table below :

ARABLE LAND IN BRITISH INDIA

Classes of Land.	Area in millions of Acres.	Per cent. of total.
Cultivable waste . . .	155	35.9
Current fallow . . .	49	11.3
Area cropped . . .	228.0	52.8
Total . . .	432	100.0

The net area actually sown with crops amounts to 228 million acres or 53 per cent. of the total arable land, as shown above. But if the areas sown more than once are taken as separate areas for each crop, the total gross area sown would amount to 262 million acres. Thanks to the climatic conditions, a considerable proportion of the arable land is adaptable to more than two crops a year, but on the other hand, a part of this area is not cultivable more than once and some may not be available for cultivation even for once for some time to come. It may therefore be assumed that, on the average, all the arable land is fit for two crops a year. The potential area of arable land would thus amount to about 864 million acres, of which only 262 acres or about 30 per cent. are utilised for productive purposes, and 602 million acres or 70 per cent. are wasted.

Next to arable land, the forests are the most important natural resources. They not only conserve moisture, moderate temperature and prevent inundation and erosion, but also supply fuel, timber,

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feed and other material of highly commercial value. Thanks to territorial expansion, high altitude, heavy rainfall and long coastal line, nearly all classes of forests are to be found in India, such as the deciduous, evergreen, alpine and tidal. Of the trees of commercial importance, there are about 2,000 species, which might broadly be classed as soft and hard wood trees.

The forest areas in India amount to about 25,000 square miles or 23 per cent. of the total area of the country. These areas contain, however, a large proportion of unoccupied waste often devoid of trees. On the supposition that the actual area under forests is represented by that reported by agricultural statistics, which is 87 million acres or 13 per cent. of this area, it might be assumed that only about 56 per cent. of the total forest land is actually under forestation.¹ The area of merchantable forests is only 40 per cent. of the total, and the present annual cut is also about one-third of the annual growth. According to some authorities, not more than 10 per cent. of the forest resources of Madras have yet been tapped.² Whether this remark is equally applicable to other parts of the country is hard to decide. But taking the most liberal view of the case, it might be said that not

¹ *Agricultural Statistics of India, 1926-7, I, p. iii.* Although certain village and other lands, not covered by forests but worked by the Forest Department, are not treated as forests in the returns of agricultural statistics, the latter include, in addition, forest areas administered by district officers, local boards, municipalities, etc.

² Mr. Clyde S. Martin, the United States Government Forest Engineer. See *Statesman*, Calcutta, 25 July, 1925, p. 23.

EXTENT OF EFFICIENCY

more than 25 per cent. of the forest resources are utilised for productive purposes and the remaining 75 per cent. are wasted.

As far as fisheries are concerned, India is immensely rich. The fresh-water fisheries of Bengal, Bihar and Orissa alone have an area of about 8,000 square miles, which are more than doubled during the rainy seasons due to the fact that to the existing rivers, canals, brooks, jheels, and tanks are added the enormous marshes and rice-fields. To these must also be added fisheries of other provinces, especially of Madras. In fact, the inland water fisheries of India are not excelled either in area or in potentiality by any other fisheries except those of the United States. There are also large areas of brackish water fisheries, the most important of which are the Sundarbans, occupying an area of 5,700 square miles. The richest fisheries of India are, however, the marine, including both the foreshore and deep water, along the 4,500 miles of the coastline. Madras alone has a shallow water area of 40,000 square miles. Similar large shallow-water fisheries exist near Bengal, Bombay and Burma. Under scientific methods of culture and catch, these fisheries might prove almost inexhaustible.¹

Under the present system of production and preservation, a considerable proportion of the fish resources of India remain unavailable to the people. Allowing on the average 4 ounces of fish per person per day, the total amount of fish required per person would be over 91 pounds a year. But the

¹ See Author's *Production in India*, p. 31.

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actual consumption is far short of the requirements. In 1922-3, for instance, the fish-supply to the Calcutta market amounted to only 35·7 million pounds¹ for a population of 1,323,000, of whom 80 per cent. or 1,062,600 were fish-eaters, i.e., only 33·5 pounds per head per year, or about 37 per cent. of the required amount. Assuming that the fish-eating population of India receives the same proportion of fish supply as that of Calcutta—a supposition which becomes more apparent when it is considered that fish supply in the country is not so regular as in cities like Calcutta, it might be concluded that the fish supply fell short of the required amount by 63 per cent. Since this amount could be supplied from the fish resources of the country, the wastage of fisheries might be estimated to be about two-thirds a year.²

India possesses also a considerable amount of mineral resources, of which the most important are gold, iron, coal, petroleum and water. Of the other minerals, India has a very wide range of resources in variety, though not in volume. In certain minerals, such as mica and manganese, India has the virtual monopoly.

Of the world's estimated resources of 3,500,000 million metric tons of coal, India possesses 87,000 million metric tons, and of 45,055 million barrels of petroleum, India possesses 995 million barrels. The richest mineral resources of India are, however, iron and water. The iron-ore deposits amount,

¹ *Statistics of Fish imported into Calcutta, 1922-3*, p. 1.

² See Author's *Production in India*, pp. 170-1.

according to a conservative estimate, to 3,000 million tons¹ and are surpassed only by those of America and France, which have respectively 9,885 and 4,369 million tons. Of other important countries, Great Britain has 2,254 million tons, Sweden 1,548 million tons, Germany 1,374 million tons, and Russia 1,032 million tons. India's iron-ores are so immense in volume and so rich in iron contents, that they might be said to be wasted if not utilised at present, for her production might be the same as the average production of other countries, such as the United States, Great Britain, Germany, Sweden, Spain, and Russia, in which the average production was 16.2 million tons in 1926-7 as compared with 1.8 millions in India.² In other words, the production in India was only a little over 11 per cent.³ of what it should have been and 89 per cent. might be regarded as wastage.

India suffers a still greater loss in her water-power resources. Among the industrially advanced countries India stands second only to the United States, having 27 million horse-power as against 35 millions horse-power of the latter.⁴ Unlike most of the other minerals, the non-utilisation of water resources in the form of light, heat and power, or for the use

¹ According to Mr. Cecil Jones, of the Geological Survey of India, see *Capital*, Supplements, 19 December, 1929, p. 14.

² Cf. *The World Almanac*, New York, 1928, p. 361.

³ The iron-ore production in millions of long tons was 67.6 in the United States (1926), 9.6 in Sweden, 6.6 in Germany, 4.9 in Spain, 4.9 in Russia, and 4 in Great Britain (including ironstone), thus giving an average of 16.2 million tons. Compiled from the *Statesman's Year-book* for 1929.

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of irrigation and navigation, might be regarded as wastage. India utilised only 225,000 horse-power of the water reserves, i.e., .8 or less than one per cent. as compared with 72 per cent. by Switzerland, 55 per cent. by Germany, 47 per cent. by Italy, 37 per cent. by France and Japan, 33 per cent. by the United States, and 25 per cent. by Spain and Canada. On the basis that India ought to have produced at the least the average proportion of the water-power of the above countries, i.e., 41 per cent. instead of .8 per cent., the wastage of India's water-power resources would amount to over 99 per cent.¹

Among these wastages must also be included that of various by-products: first, edible plants and animals, including mushrooms, oysters, mussels and frogs; second, wood for the manufacture of power alcohol and other commodities; third, fruits and flowers for apiculture, i.e., for the production of honey and wax; fourth, algæ and larvæ which

¹ WATER POWER RESOURCES OF CHIEF COUNTRIES
(in millions of horse-power).

Country.	Potential.	Developed	
		Quantity.	Percentage of the total.
United States	35.0	11.7	33
Canada	18.2	4.5	25
France	5.4	2.1	37
Japan	4.5	1.7	37
Spain	4.0	1.0	25
Italy	3.8	1.8	47
Switzerland	2.5	1.8	72
Germany	2.0	1.1	55
Total	75.4	23.7	41

Cf. *The World Almanac*, 1928, p. 726.

grow in plenty under the tropical heat and rainfall, and which could be transformed into food by aid of fish and poultry.¹

From the wastage of fertility, forestry, fisheries and minerals, the latter being represented by iron and water, some rough idea may be had of the total wastage in India's natural resources, although it is more or less based on guess-work. It has been shown that India loses about 70 per cent. of soil fertility, 75 per cent. of her forestry, 63 per cent. of fisheries, and 94 per cent. of minerals, as indicated by the loss of water and iron resources. The total wastage in natural resources would thus amount to over 75 per cent.

2. WASTAGE OF LABOUR²

The greatest assets of a nation are, however, its human resources, and upon their conservation and utilisation depend, to a large extent, both its progress and prosperity. That part of the human resources of a nation which is directly concerned with the creation of social values, such as ethical, religious, æsthetic and economic, is often called man-power. Sometimes this term is applied exclusively to that section of the population which is occupied in the creation of economic values or national wealth, and in this sense man-power is equivalent to labour. That labour is the directing

¹ Cf. Author's *Production in India*, p. 167.

² Modified from Author's "Wastage of India's Man-power" in the *Modern Review*, April 1927.

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factor in the productive process is too evident to require any discussion.

The period of life between the ages of 15 and 60 might be regarded as the most active in the creation of social values, including national wealth, and all persons of this period may be said to represent a nation's man-power or the labour force including the managerial staff and entrepreneurs. From this point of view, the volume of India's man-power in 1921 amounted to 178 million persons out of a total population of 319 millions, consisting of 92 million men and 86 million women. In comparison with some advanced countries, the proportional man-power is rather low in India, being 56 per cent. as compared with 61 in France and England and Wales, 60 in the United States and Belgium, 59 in Spain, and 58 in Germany.

According to the Industrial Census of 1921, 146 million persons, consisting of 100 million men and 46 million women, that is 46 per cent. of the total population, are actual workers, the rest being dependants.¹ In comparison with other countries, the proportion of workers to dependants does not seem to be unfavourable to India. It is lower than that of France, Austria and Italy, where the proportion is 55 per cent., 53 per cent., and 47 per cent. respectively, but is the same as that in England and Wales and is higher than that of Germany and Belgium, where it is respectively 45 and 43 per cent.

¹ Of the 319 millions of India's population, occupational statistics are available only for 316 millions, of which 46 per cent. are workers. It has been assumed that the remaining 3 millions have the same proportion.

It must be remembered that owing to the lack of compulsory primary education, a large number of children aged 12 and helping in field work are included among active workers, and several thousand children from 9 to 12 years of age were also employed in factories. If these children are excluded from among the workers, as in the case of other countries, the proportional number of workers would be much lower.

There is a still more fundamental defect in the classification of the people as workers and dependants. In the census the household workers are classed as dependants, although they are as active in the production of social wealth as any other class which is engaged in the so-called gainful occupations.

The figures for workers are, however, too low. Even the number of the persons aged between 15 and 50, which is regarded by the industrial census to be roughly the working age period in India,¹ would amount to 156 millions or about 49 per cent. of the total, that is, 10 millions more than the figures given in the industrial census. But the working period lasts beyond the age of 50 or even 55, the last age being the maximum for Government officials in India. There is no doubt that most of the officials can work and often do work efficiently beyond that age. So that the period between the ages of 15 and 60 assumed for man-power in general can also be safely taken for active work in gainful occupations. According to this view, the number

¹ *Census of India, 1921, Report I, p. 241.*

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of active workers in India would amount to 178 millions, including 92 million men workers and 86 million women workers, instead of 100 millions and 46 millions respectively, as given in the industrial census. Among the 86 million women workers are included 46 million workers in gainful occupations and 40 million workers in households. It must be remembered that most of the gainfully employed women workers are also household workers, and women begin household work much earlier than 15. These changes in the numbers of workers and dependants would make very little difference in this calculation.

Owing to the vastness of human resources, India has also the largest volume of man-power in the world, with the exception of China. But for the lack of conservation and utilisation of these resources for productive purposes, the very national assets have become national liabilities. There are three principal causes by which India's human resources or man-power are wasted: namely, ill-health, ignorance, and unemployment.

Ill-health, as brought about by disease and starvation, is one of the most outstanding features of India. Lethargy and inertia as well as infant mortality and premature death are some of the phenomena of national ill-health. Of course, in every country, there is a class of people who are defective or disabled or have become senile or infirm through old age. Persons who have reached the age of 70 or more might roughly be classed as infirm persons. The number of such persons in India

amounted to 5 millions or 1.7 per cent. of the total in 1921. Owing to the high rate of mortality, the proportional number of infirm persons is the smallest in India. To this must be added the defectives, such as the insane, deaf-mutes, blind and lepers.

There is also another class of so-called dependant persons, who have retired from active participation in gainful occupations, but who are still useful members of Society. All persons between the ages of 60 and 70 might roughly represent this class. There were 11.4 million such persons, or 3.6 per cent. of the total, in India in 1921. As in the case of the infirm persons, the proportional number of such persons in India is also the lowest owing to the high rate of mortality.

Because of knowledge and experience in different branches of social activities, this class of people is a source of great benefit to every country. But India is deprived of their experience for two reasons: First, owing to the lack of facilities for education and training either as children or as adults, they fail to acquire in the active period of their life the same socially beneficial experience as in other countries. Second, there scarcely exists any organisation for utilising their experience for social purposes. Although a few of them are engaged in different kinds of social work, the experience of the majority of them is lost to the country.

One of the most important causes of the loss of India's man-power is premature death. The average

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longevity of men in India is 24·8 years, and of women 24·7 years, or an unweighted average of 24·75 years for both men and women.¹

Compared with other countries, the longevity or mean life is the shortest in India. The mean life, for instance, in countries such as Norway, South Africa, Holland, England and Wales, United States, France, Germany, Italy, and Japan, varies from 55·6 years to 44·3 years, as against 24·7 years in India. Taking the average longevity of all these countries, which is 50 years, as base, the index of India's longevity is only 45.² It is thus seen that in order to keep up her social population, India has to spend 122 per cent. more energy than the average of other countries under consideration.

The real loss to the country is, however, still higher. If the first fourteen years of childhood, forming the debit side of life, are subtracted, the man-power period becomes only about 11 years in India as against 36 years in other countries.

¹ Census of India, 1921, Report I, p. 128.

² AVERAGE LONGEVITY IN VARIOUS COUNTRIES.

Country.	Year.	Average Longevity.	Index No.
Norway	1915	55·6	111
South Africa	1920	55·6	111
Holland	1915	55·1	110
England and Wales	1910	51·5	103
United States	1910	50·0	100
France	1910	48·5	97
Germany	1910	47·4	95
Italy	1910	47·0	94
Japan	1910	44·3	88
India	1921	24·7	45

Annuaire Statistique, France, 1924, pp. 200, 204 and 205;
Statistical Abstract for British India, 1926, p. 341.

It might be pointed out here that the low mean life in India also cuts down the old age period as compared with other countries. This consideration would, however, make so little difference in this calculation that it might be neglected. It is thus seen that the average active period of India's manhood or womanhood is only 31 per cent. as compared with that in other countries. But the actual loss is still greater. Since the usefulness of a person to Society increases with his growth in knowledge and experience, he becomes more valuable in the later period than in the earlier. The average man or woman in India does not get the chance of acquiring this higher social usefulness.

Useless motherhood is another source of the loss of India's man-power. The propagation of race is a natural phenomenon. But the number of women who take part in the propagation of children varies in time and place. The progress of hygiene and medicine has decreased the death-rate in almost all advanced countries within the last half century or more, and, at the same time, there has been a gradual diminution in the birth-rate. In the course of fifty years, the average birth- and death-rates in eight European countries, namely, England and Wales, Germany, Austria, Hungary, Belgium, France, Spain and Italy, fell from the quinquennial averages of 3.72 and 2.97 per cent. for the years 1871-5 respectively to 2.53 and 1.67 per cent. in 1921. The birth- and death-rates in India varied from the averages of 3.58 and 2.74 per cent. for

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1885-90 respectively to 3.22 and 3.06 per cent. in 1921.¹

Now, in the ideal condition of society, fecundity should be adaptative, i.e., regulated according to social needs. Most of the countries scarcely need any increase in population, and such an ideal condition has been more or less achieved by France. The population of India is already too large to need any augmentation, at least for the next half a century. Her birth-rate could be adapted to her death-rate with a small margin for safety. If her death-rate could be brought down from 3.06 per cent. to 1.67 per cent., which is the average death-rate of the countries under consideration, her birth-rate could also be reduced from 3.22 per cent. to 1.67 per cent., that is, her birth-rate could be decreased by 51 per cent. In other words, 49 per cent. of the women annually undergoing motherhood in India could be saved from unnecessary gestation and lactation and the consequent troubles.

¹ VARIATIONS IN BIRTH- AND DEATH-RATES IN VARIOUS COUNTRIES, 1870-5 TO 1921.

Country.	Births per 100 Inhabitants.		Deaths per 100 Inhabitants.	
	1871-5	1921	1871-5	1921
England and Wales	3.55	2.24	2.20	1.21
Germany	3.89	2.61	2.82	1.48
Austria	3.93	2.28	3.26	1.71
Hungary	4.28	2.29	4.54	1.93
Belgium	3.26	2.19	2.34	1.35
France	2.55	2.07	2.50	1.77
Spain	3.65(a)	3.05	3.09(a)	2.15
Italy	3.69	3.04	3.05	1.75
Average	3.72	2.53	2.97	1.67
India	3.58(b)	3.22	2.74(b)	3.06

Adapted, *Annuaire Statistique*, France, 1922, pp. 199-200, (a) for 1866-70; (b) for 1885-90.

At the birth-rate of 3.22 per cent. the number of mothers in India would amount to 10.2 millions in 1921, out of which about 5 million women could thus be saved from unnecessary motherhood. It must be remembered that the largest number of the infants born every year die before they reach childhood or youth. The extent of loss to a mother through the loss of her child cannot be determined in material terms. But if the gestation, lactation, rearing and devitalising cause a mother to lose at least six months of her time, the loss to India through 5 million unnecessary or unsuccessful mothers would amount to the productive and creative energy of 2.5 million women a year.

The most important cause of ill-health is the prevalence of disease, such as cholera, small-pox, influenza, diarrhoea, dysentery and malaria. To this might be added the weakness arising from insufficient nutrition or starvation on the part of the majority of the population. Aside from death, the annual loss of India's man-power resulting from sickness and starvation, is hard to determine. But there are instances in the Ceylon and Darjeeling tea-gardens showing that the output of the labour forces has increased by 25 per cent. as the result of the hookworm treatment with vermifuges.¹ "On the railways absenteeism traceable to malaria," says the *Capital*, "is so continuous and extensive that in most sections of the subordinate staff it is necessary to employ a labour force 25 per cent. larger than would be required if the disease referred

¹ *Report of Indian Industrial Commission, 1916-18, p. 162.*

to could be controlled by the methods so successfully applied in Panama, Malaya and elsewhere.”¹ Considering the prevalence of starvation and sickness throughout the country, it may be very safely estimated that at least one-fourth of man-power is lost to the country from these causes. This estimate is more or less corroborated by the opinion of the All India Conference of Medical Research Workers. Said the Conference in 1924: “The percentage loss of efficiency of the average person in India from preventable malnutrition and disease is not less than twenty per cent.”² This proportion will be materially increased if the effect of diseases is taken into consideration. The loss of one-fourth of labour power means that out of 61·2 million men and 30·6 million women nominally employed in the production of national wealth in India, the labour power of only 45·9 million men and 23 million women is actually and efficiently employed.

Apart from ill-health, the fundamental cause of India's industrial inefficiency is ignorance or lack of education. Out of 316 million population in 1921, for which statistics are available, only 22·6 millions were returned as literate and the remaining 293·4 million or over 92 per cent. of the total were illiterate. If it is assumed that 8·3 million scholars in that year were among the literate, the proportion of the illiterate among the working population between the ages of 15 to 60, which was 178 millions

¹ The *Capital*, Calcutta, 28 February, 1929, p. 448.

² Quoted from the *Report of the Royal Commission on Agriculture in India*, 1928, p. 481.

in 1921, would amount to a still larger figure. Besides the lack of general education, there is also a lack of industrial or technical education.

What is the actual loss of efficiency from ignorance it is hard to estimate. Attempts have been made to show the industrial inefficiency of the workers in India as compared with those in other countries. It has been pointed out that in factories and mines, the work done by two or even three Indians would amount to that done by one European or American worker.¹ The defect of such comparisons without taking into consideration the conditions of work, raw material, machinery, management, and social and other conditions, will be shown later.²

The fact remains, however, that owing to ignorance, the production of an Indian worker under the present conditions does not amount to more than half of what is generally produced in America or Europe. In the same way, it can also be pointed out that agriculture in India is only 86 per cent. as efficient as the average production in the important countries of the world. But compared with most of the European countries it would be scarcely more than 50 per cent. as efficient. It might, therefore, be roughly concluded that whatever might be the cause, the *per capita* actual production in India is only half of that in other advanced countries.

The loss of 25 per cent. of efficiency has already

¹ *Great Britain Parliamentary Papers*, 1909, Vol. 63, Cd. 4519, pp. 313-14; *Indian Coal Statistics*, 1928, pp. 43-4.

² See Author's *Factory Labour in India*, pp. 118-25.

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been ascribed to ill-health or diseases. The other 25 per cent. must be ascribed to ignorance or lack of education and training. That is, out of 61·2 million men and 30·6 million women engaged in productive processes, the work of another 15·3 million men and 7·6 million women must respectively be subtracted.

Under-employment including unemployment is a third important cause of the loss of India's man-power. The lack of sufficient work for the people is a common complaint in India. According to the estimates made by various authorities, the work done by the average cultivator during the year would amount to the full labour of only about 5 months in the Punjab,¹ 4·5 months in Bengal,² 5 months on the one-crop land and 8 months on the two-crop land in Madras,³ 7 months in the United Provinces,⁴ 8 months in some other provinces.⁵ Even when occupied, the idea of the Indian cultivator of what constitutes a full day's work falls far short of the standard of that achieved in more progressive Western countries.⁶ The same is more or less true of the artisans. At a very liberal estimate, the average cultivator or artisan in India does not have work for more than 7 months in the year.

The other classes of the people fare scarcely better.

¹ Calvert, see *Census of India, 1921, Report 1, 245.*

² Jack, *Economic Life of a Bengal Village*, London, 1927, p. 39.

³ Slater, *Some South Indian Villages*, Madras, 1918, p. 16.

⁴ See Author's "Wastage of India's Man-power," *Modern Review*, Calcutta, 1927, April, p. 399.

⁵ *India in 1923-4*, Calcutta, p. 197.

⁶ *Census of India, 1921, Report 1, 245-270-1, 274.*

Unemployment among the middle classes is a well-known fact and has already received the attention of several provincial Governments. The Governments of Bengal, Bombay, Madras, the Punjab and the United Provinces have the reports of their commissions on unemployment under consideration. Nothing is definitely known about the extent of unemployment among workers in organised industries. But some idea of it may be had from a few facts: First, absenteeism has been found by the Bombay Labour Office to amount to 10 per cent. or more in Bombay factories. Second, as noted by the present writer in *Factory Labour in India*, labour turnover amounts to about 100 per cent. in some of the mills at Madras. Third, strikes and lock-outs cause an immense loss of working days. From 1921 to 1929 these losses averaged over 9·3 million working days a year.¹

It is thus seen that there exist both under-employment and unemployment among the people in India and that they have scarcely sufficient work for more than 6 or 7 months in the year. It may be very conservatively said that the average man or woman in gainful occupations in India loses about 4 months in the year.² In other words, out of 92 million men and 46 million women engaged in gainful occupations, only 61·2 million men and

¹ Compiled from *Bulletins of Indian Industries and Labour*, No. 43, p. 21; and *Labour Gazette*, Bombay, April 1930, p. 829.

² A large majority of cultivators have at least from two to four months absolute leisure during the year. The *Report of the Royal Commission on Agriculture in India*, Abridged Edition, 1928, p. 70.

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30.6 million women might be said to be actually employed throughout the year.

For the above reason, there occurs a similar loss of labour power among women employed in household work. Out of 86 million women between 15 and 60, 40 millions are, as noted before, household workers. All of the household workers are regularly employed. The loss of their energy or labour arises from two causes: First, they are as much subject to sickness and diseases as the workers in other occupations in India. Second, they lose as much time owing to the lack of education and training as those engaged in so-called gainful occupations. In any case, they cannot be expected to be more efficient than the men and women in other occupations in India. Thus, partly owing to ill-health and partly owing to ignorance, the household workers lose about half of their efficiency. That is, out of 40 million women in household work, only 20 millions might be said to be effectively employed.

It is difficult to estimate with any pretence to accuracy the extent of India's total wastage in human resources or man-power. A very rough idea may, however, be had from a few chief sources of wastage:

First, India's womanhood consists of 86 million persons between the ages of 15 and 60, thus forming 56 per cent. of her 155 million women of all ages. Of these 86 million women, 46 millions are engaged in gainful occupations and 40 millions in household work. Of the 46 millions gainfully occupied, in-

sufficiency of work causes a loss of labour equivalent to one-third of the total number, i.e., 15.3 millions. Of the remaining 30.6 millions in gainful occupation and 40 millions in household work, ill-health causes a loss of labour equivalent to one-fourth or 17.6 millions, and ignorance another one-fourth or 17.6 millions, and useless motherhood still another 2.5 millions. In other words, out of 86 million women, the labour or energy resources of about 60 million women might be said to be lost.

• Second, of the total number of 92 million men between 15 and 60, there occurs a loss of labour or energy from several causes and this loss might be estimated to be equivalent to the following amounts : (1) under-employment—one-third or 33.3 millions ; (2) ill-health—one-fourth of the remainder or 16.1 millions ; (3) ignorance—another one-fourth or 16.1 millions. In other words, out of 92 million men, India loses the labour or energy of 65.5 million men.

It is thus seen that out of the total man-power of 178 million persons, consisting of 92 million men and 86 million women, India loses annually the labour or energy resources equivalent to 45.9 millions through under-employment, 32.9 millions through ill-health, another 32.9 millions through ignorance, and 2.5 millions through useless motherhood. In other words, the labour or energy resources of 114 million persons, or 64 per cent. of the total man-power, is annually lost to the country.

To this must also be added the loss of the major portion of the energy of 7 million persons between 60 and 70, whose valuable knowledge and experience

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could be very well utilised for social benefit through adequate means. The last but not the least wastage of India's man-power comes through premature death. The mean length of life in India is about 24·7 years as against 50 years in several advanced countries and, as compared with these countries, India thus loses 112 per cent. more of her energy in order to preserve her social population. But what is of the greatest importance is that the average period of activity for India's man-power is only 11 years as against 36 years in other countries. At a very conservative estimate the wastage of India's man-power might be put at 66 per cent. of the total.

3. WASTAGE OF CAPITAL.¹

One of the essential factors of production is Capital, or the sum total of all those past products or saved up wealth which are utilised for further production. The very conception of capital implies that the capital resources of a country depend upon its capacity of production, desire for savings, and the ability to transform these savings into means of further production.

That the productive power of India is low can easily be imagined by the comparatively low national income. Thus in 1924, for which year such data are available for a number of countries, the *per capita* national income was only Rs 74² in India

¹ First published in the *Modern Review*, April 1930.

² Refers to the year 1921-2. Cf. Shah and Khambata, *Wealth and Taxable Capacity of India*. According to Professor Findlay Shirras, the *per capita* national income in India was Rs 107 in 1921 and Rs 116 in 1922. But these figures have been seriously questioned by several economists as being too high.

as compared with Rs 294 in Japan, Rs 351 in Italy, Rs 537 in Germany, Rs 741 in France, Rs 1,319 in England, and Rs 1,717 in the United States.¹

Savings are, however, determined by the margin of income over expenditure. But it is still more difficult to estimate national expenditure than national income. A few estimates made of the family budgets throw some light on the question.

The budget of an average man worker on Assam tea-gardens was estimated to be Rs 7.32 in 1921-2, which would give the amount of expenditure of Rs 87.84 per annum.² On the other hand, the average monthly budget of a family of 4.2 persons based on 2,473 families was found to be about Rs 52.3 in Bombay city in 1921-2,³ giving a *per capita* annual expenditure of about Rs 149. Cost of living is, of course, the higher in Bombay. Moreover, it must be remembered that the average expenditure *per capita* for rural communities and the country as a whole is much lower than that of labourers even on Assam gardens.

The *per capita* income of Rs 74 a year does not seem to leave a very large amount of savings in India as indicated by the family budget, but in spite of the low income a considerable amount of savings accumulates in India as in fact in all other

¹ According to the Statistical Bureau of Japan. See *The Economic Review*, Kyoto University, July 1929, p. 40. 100 yens = Rs 135.

² *Report of the Assam Labour Enquiry Committee*, 1921-2, p. 69.

³ *Report of an Enquiry into the Working Classes' Budget in Bombay*, Bombay Labour Office, 1923, p. 41.

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countries, owing to the unequal distribution of wealth and the capitalistic system of industrial organisation. In fact, the most important thing in favour of capitalism is that it has encouraged the accumulation of social capital.

While savings create a source of capital, capital itself depends upon the investment of the surplus in actual production. The productivity of capital is, however, determined by intelligent and effective organisation. By far the largest proportion of national capital accumulates annually without any conscious effort on the part of society and in the normal operation of industrial undertakings, such as farms and plantations, forests and orchards, workshops and factories, mines and quarries, roads and railways, irrigation and waterways, docks and harbours, and other similar undertakings.

The farms in India are too small in size for economic utilisation of modern implements or machinery. By far the largest amount of capital is invested in livestock, in the possession of which India is one of the leading countries of the world, having in 1925, for instance, 187 million cattle and buffaloes out of the world's 547 millions, and 88 million sheep and goats out of the world's 601 millions, that is, 34 and 14 per cent. respectively.¹ Another important agricultural investment is the irrigation system by which an area amounting to

¹ Computed, *The Report of the Royal Commission on Agriculture in India*, Abridged Report, London, 1928, p. 20; *Annuaire internationale de Statistique Agricole*, 1926-7, p. xx. The figures for India refer to British India and about half of the Indian States.

about 48 million acres or about one-fifth of the country's sown area was irrigated in the whole of India in 1926-7, including 23 million acres in the British Provinces at a total capital expenditure of over 108 crores of rupees up to the end of that year.¹ Closely connected with agriculture are the plantation industries, of which tea, coffee and rubber cultivations are the chief. The capital invested in these industries in British India amounted in 1927-8 to 12.3 crores of rupees and £29 million as represented by the joint-stock companies registered in India and abroad respectively.²

Next to agriculture, manufacture is the most important industry. It is still largely carried on in cottages. The most important of the cottage industries is hand-loom weaving. According to the census of 1921, the number of hand-looms in all provinces except Bombay, the United Provinces and the Central Provinces and Berar, amounted to about 2 millions.³ It has been estimated that about one-fourth of the cotton fabrics consumed in the country is produced by hand-looms,⁴ and the value of hand-woven fabrics has been estimated to be about £50 million a year.⁵ But it is not possible to ascertain the actual capital investment in weaving

¹ *Statistical Abstract for British India*, 1928, p. 599.

² *Ibid.*, 1930, pp. 593, 597.

³ Computed: the total number is actually 1,931,072. *The Census of India*, Report I, p. 270.

⁴ *Report of the Indian Tariff Board on the Cotton Textile Industry Enquiry*, 1927, Report I, p. 239.

⁵ *Memorandum on the claim of India to be among the eight States of Chief Industrial Importance*. India Office, London, 1920, p. 6.

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and other cottage industries. Of the modern large-scale industries, the textile industries are the most important, having in 1926-7 207,000 looms and 9,500,000 spindles, or 4·8 and 5·1 per cent. of the world's totals respectively.¹ The paid-up capital in the cotton and jute mills amounted to Rs 44 crores and Rs 25 crores respectively in 1927-8.²

Of the transport industries the most important is the railway system, which had in 1927-8 a length of about 40,000 miles, being the fourth largest system of railways in the world. The total cost up to that year on the railway system was Rs 822 crores.³ Mining is another modern industry in which Rs 39 crores have been invested by the joint-stock companies registered in British India and £72 million by those registered abroad. Of the other important industries must be mentioned the following: (1) banking, in which, besides the investment of indigenous banks and foreign or exchange banks, the paid-up capital of the Imperial Bank and the joint-stock banks amounted, in 1927, to Rs 12·5 crores, the working capital of the co-operative societies to Rs 25 crores, and the total deposits to over Rs 209 crores; (2) commerce, in which besides the investment of individual enterprise, the paid-up capital of the joint stock companies together with that in manufactures registered in British India

¹ Computed. *Annuaire Générale*, France, 1927, p. 57.

² The paid-up capital in jute mills in 1927-8 consisted of 18 crores of rupees, 2·5 million pounds and 12 million dollars. *Statistical Abstract for British India*, 1930, pp. 647, 657.

³ *Statistical Abstract for British India*, 1930, p. 427; *The World Almanac*, 1928, pp. 348, 229.

amounted to Rs 88 crores ; and (3) forestry, which is largely a State enterprise.¹

It is not possible to estimate the total value of India's capital investment. By far the largest part of India's capital is invested in agricultural industries chiefly in such forms as live stock, irrigation, ploughs, tools, implements, and barns, but there exist no records of their total value. The second important class of industries are arts and crafts, or the cottage industries, and records are again lacking as to the value of tools, implements and workshops. The third important class of enterprises are the large-scale industries including transport systems, which are carried on both by private enterprise, such as individuals and joint-stock companies, and by public and semi-public agencies. No records are available as to the value of individual investments. Of the joint-stock companies, the total paid-up capital for the companies registered in British India amounted to Rs 267 crores in 1927-8, besides the paid-up capital of £617 million of the joint-stock companies registered abroad but operating in India.² Since some of the foreign joint-stock companies also operate in other countries, the exact amount of their capital operating in India is not known. Besides, there are also investments by central and provincial governments as well as by municipalities and other public and semi-public organisations.

An attempt is nevertheless made to estimate the

¹ *Statistical Abstract for British India*, 1930, pp. 284, 593, 597 ; *Report of the Royal Commission on Agriculture in India*, abridged edition, 1928, p. 51.

² *Statistical Abstract for British India*, 1930, pp. 593, 597.

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capital investment in large-scale industries. The largest part of the capital invested in such industries is foreign, or more strictly British. There is, however, a good deal of speculation as to the exact amount of foreign capital in India. It was estimated to be £470 million in 1909,¹ and Rs 600 crores or £400 million in 1923.² According to the latest estimate, the present British investment in India would amount to over £600 million, consisting of £261 million of Government loans, £10 million municipal and port trusts borrowings, £17 million of the balance of India's contribution towards the 5 per cent. War Loans, £120 million guaranteed railway debts, £75 million investment in companies registered in India, and £100 million investment in companies operating in India, but registered outside.³ It is thus seen that the foreign capital invested in industrial, commercial and railway enterprises would amount to £295 million. To these must be added the profits of the foreign capitalists re-invested in India and other investments not accounted for above. At a very conservative estimate, the foreign capital invested in India's large-scale industries would be over £300 million or about Rs 400 crores.

It is more difficult to estimate the indigenous

¹ See *The Economist*, 20 February, 1909.

² Professor K. T. Shah, *Trade, Tariff and Transport*, 1923, p. 184.

³ Sayer, M. C. B., *The Financial Times*, London, 9 January, 1930, p. 5. The British investment of all kinds including public loans has been estimated to be £700 millions. In the evidence tendered before the Statutory Commission, the sum was put as high as £1,000 millions.

investment in large-scale industries. Of the Rs 267 crores invested by joint-stock companies in British India, £75 million or Rs 100 crores are foreign, as noted above, and only Rs 167 crores are indigenous. To these must be added the investment by Government and private individuals. According to the census of 1921, the number of industrial concerns employing 20 persons or more amounted to 15,606, of which only 3,292 were owned by registered companies, and of the remaining, 677 by Government and 11,637 by private individuals.¹ It must be borne in mind that although the establishments owned by the Government are about one-fifth of the registered companies, some of them are as large as the latter, and also that although the establishments owned by private individuals are small in size, they are three and a half times as many as the registered companies. Including the establishments employing less than 20 workers, the number of the establishments owned by private individuals would be still larger. Moreover, there has been a great increase in the number of indigenous investments since 1921. It might be safely said that the indigenous capital, both public and private, in large-scale industries would be at least Rs 300 crores. The total capital, both foreign and indigenous, invested in all kinds of large-scale industries, might thus roughly be estimated to be Rs 700 crores.

While the capital invested in large-scale industries and in agricultural and cottage industries might give

¹ *Census of India, 1921, Report 1, pp. 266 and 292; Statistical Abstract for British India, 1928, p. 668.*

some rough idea of the amount of investment, it does not indicate how much of it is actually utilised for productive purposes. The unutilised part of the capital goods, the unproductive investment, and the unmobilised social savings constitute what might be called the wastage of India's capital resources.

Unproductive investment is, in fact, one of the most important causes of the wastage of India's potential capital. The most important example of the unproductive investment is the purchase of gold for hoarding, either as metal itself or in the form of ornaments. In spite of the fact that the average annual value of the domestic production of gold from 1924-5 to 1928-9 amounted to Rs 2.25 crores, its average annual net import amounted to Rs 33.40 crores a year for the same period. From 1872 to 1928-9 the total absorption of gold, including production and imports, amounted to Rs 666 crores.¹ In 1926, when the world's estimated gold stock amounted to \$20,310 million, or Rs 5,484 crores, India possessed gold worth Rs 632 crores or about 12 per cent. of the total.²

Now a certain amount of gold is used in arts and industries in all countries, and about 31 per cent. of the world's stock has been estimated to be used in that connection in Europe and America in 1924.³ In most of the countries gold is also the standard of value, and large quantities of gold are used for this purpose. India has no actual gold

¹ *Review of the Trade of India, 1928-9*, pp. 143, 221.

² *The World Almanac, 1928*, p. 286. \$100 = Rs 270.

³ Cf. G. F. Shirras, *The Economic Journal*, London, June 1927, p. 243.

standard, and except in the year 1918-19, when 5·1 crores worth of gold money was coined, her gold stock is scarcely used for monetary purposes. Even if the gold standard is used, that would relieve India of a considerable amount of silver. Granting that India needs the same proportion of gold for arts and industries as the other countries, it may be shown that at least 66 per cent. or 444 crores of rupees worth of gold, is tied up unproductively and might be regarded as lost to the country for all practical purposes.

Another source of India's wasteful investment comes from the livestock which represents by far the largest item of India's agricultural capital. Livestock serves a very important function in national economy, and supplies energy, food, and raw material. The most important function of livestock in India is the supply of energy, but the number of cattle, including buffaloes, kept in India is too large and is a pressure upon the food supply. Says the Royal Commission on Agriculture in India : " A comparison of the number of cattle kept in India with those kept in other countries indicates the possibility of reducing the number of working bullocks without necessarily reducing the existing standard of cultivation." ¹

Because of the poor quality of the breed, the productive power of the livestock is also comparatively very poor. Moreover, on account of the prejudice against killing livestock, especially cattle, there exists on Indian farms a considerable number

¹ *Op. cit.*, *The Abridged Report*, Calcutta, 1928, p. 20.

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of old, disabled and unfit cattle, which are nothing but "boarders." The wastage from livestock in India thus comes in three distinct ways, namely, excessive number, poor breed, and old and disabled stock.

What is the extent of wastage in India's livestock is difficult to estimate. The best period of productivity among the cattle is from the fourth to the twelfth year, depending upon the type and breed as well as upon the kind of work they have to perform, but most of the cattle in India are left alive until they die a natural death. Supposing they live an average life of fifteen years, and their active life is only twelve years, including the early years before maturity, it is easily seen that about one-fifth of the cattle is superfluous, pressing upon the feed, and thus reducing the quantity of food for the other four-fifths. Moreover, a good breed of cattle would yield milk about eight or ten times as much, and would labour two or three times as much as the average cattle in India. On a conservative basis it can be said that India can do without one-third of her cattle.

The non-utilisation of by-products is still another source of India's wastage in potential capital. The most conspicuous example of this wastage is the almost universal practice of burning the barn-yard manure. Manure is one of the most important by-products of animal husbandry. It is not only very rich in nitrogen, phosphoric acid, and potash, but contains them in the most available form. At a very liberal estimate, not more than one-fifth of

it is utilised as manure, and its fuel value, when burnt, scarcely amounts to more than one-tenth of its manuring value. It is thus seen that, speaking very liberally, not more than 30 per cent. of the barn-yard manure is utilised in India. Granting that the value of the manure per head of cattle is Rs 20 a year, it would appear that the loss from 187 million head of cattle would amount to about Rs 260 crores a year. The wastage from the other sources of by-products is equally great. It has been estimated that the wastage of linseed stalk alone cost India about Rs 6 crores.¹ Similar wastage occurs in the other by-products of farms, plantations, forests, households, workshops and factories.

Another cause of the wastage of India's capital resources is under-employment in agricultural and cottage industries. The loss of human resources or labour from under-employment has been estimated at one-third of the total. A similar proportion of loss may be attributed to the capital goods employed in these industries.

The inefficiency of the tools and implements used in industrial processes, such as farm operations and cottage industries, including household work, is another source of wastage. The types and patterns of most of the tools and implements have come down from hundreds of years and are now obsolete and antiquated. The plough is practically the same to-day as two thousand years ago, and the same is true of other tools and implements on farms, work-

¹ Dr. Fowler's speech. See *Madras Weekly Mail*, 18 July, 1929, p. 51.

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shops and households. The reason why they are still there is that nobody has tried to improve them. Even the Spinners' Association has found the *charka* too inefficient and has offered one lakh of rupees for the invention of an improved pattern.¹

What is the extent of the loss from inefficient tools and implements cannot be estimated. One of the reasons why Indian artisans remain idle is that they are unable to compete with the improved implements and machinery of the industrially advanced countries. In addition to the loss of one-third of the total capital resources due to unemployment, another third of loss must be attributed to their inefficiency.

The inability to transform the social savings into social capital is, however, the most important cause of the wastage of Indian capital resources. While a part of the social surplus, amounting to 666 crores worth of gold, is hoarded, as noted before, the major part of it remains unmobilised and unorganised. There is no possible way of knowing the extent of this potential wealth. The very fact that besides the net progressive absorption of gold which has arisen from 1.8 crores in 1873-4 to 666 crores in 1928-9,² the amount of rupee loans increased from 101 crores in 1886-7 to 412 crores in 1927-8, the capital invested in joint-stock companies increased from 29 crores in 1895-6 to 267 crores in 1927-8, the deposits in the Postal Savings Banks increased from Rs. 10 crores in 1900-1 to Rs 32.6 crores in

¹ See the *Madras Weekly Mail*, 8 August 1929, p. 116.

² *Review of the Trade of India, 1928-9*, p. 143.

1927-8,¹ and India keeps a gold standard reserve amounting to £40 million in London for meeting the unfavourable balance of trade,² indicates that there are surplus savings in India which could be mobilised for productive purposes. "There is sufficient potential capital in India," observed the External Capital Committee, "to meet the larger part of India's industrial requirements."³ Sir Basil Blackett, the former Finance Minister of India, thinks that the annual savings of India are sufficient for all possible new capital expenditure. "India could not only supply the whole of her capital requirements," he adds, "but might also become the lender of capital for the development of other countries."⁴ While the last statement may be too optimistic, it can safely be said that there exists at present in India considerable potential capital, large enough to take care of all the present industrial activities in large-scale enterprises without the help of foreign capital. The hoarded gold of Rs 444 crores alone, if mobilised, would have been sufficient to do away with the imported capital. Assuming that the value of the capital investment in these industries amounts to Rs 700 crores, of which only 300 or 43 per cent. are raised in the country, the remaining 400 crores or 57 per cent. which are at present supplied by foreign countries but could be

¹ Excluding the provisional loan, which was Rs 16 crores in 1928. *Statistical Abstract for British India, 1930*, pp. 117, 593, 608.

² Wadia and Joshi, *Wealth of India*, London, 1925, p. 396.

³ Cf. *The Ninth Session of the Indian Economic Conference*, Madras, 1926, p. 183, quoted.

⁴ *Ibid.* See also the *Statesman*, Calcutta, 6 June, 1929.

raised in the country itself, lie dormant, and might be said to be lost to the country.

The wastage of India's capital resources thus takes place in three distinct ways : (1) lack of mobilising the social savings ; (2) lack of economic investment, and (3) lack of full utilisation of the existing capital goods. The extent of the wastage of all these capital resources is difficult to estimate. As noted before, there exist no authentic data either for capital resources or for actual investments. But some very rough idea may be had from the foregoing analysis. In the first place, it has been estimated that agricultural capital remains idle for lack of work for at least four months in the year, causing a loss of one-third of its total utility. To this must be added a loss of another third for inefficiency. The wastage in the livestock alone, which is the largest item of agricultural capital, causes a loss of one-third of its total value, and the non-utilisation of the barnyard manure causes similarly a loss of two-thirds of its value. In the second place, the wastage in the capital investment of cottage industries also showed that about two-thirds of it are wasted for lack of employment and inefficiency. In the third place, the wastage due to the inability to mobilise social savings for investment in the large-scale industries, indicate a loss of about two-thirds. The hoarding of gold alone causes a loss of about 66 per cent. of the capital invested therein. The total wastage in India's capital resources, including unmobilised savings, uneconomic investment and unutilised capital, would thus amount to two-thirds of the total capital resources.

4. WASTAGE AND EFFICIENCY

In the foregoing pages, it has been shown that India loses about 75 per cent. of her natural resources due to inability to make full use of them, about 66 per cent. of her human resources or man-power due to ill-health, ignorance and under-employment, and 66 per cent. of her capital resources due to inability to mobilise social savings into national capital, to introduce modern implements and machinery, and to make full use of the existing capital goods. The total wastage of the productive factors, i.e., land, labour and capital, would thus amount to 69 per cent. or over two-thirds, and only less than one-third of them are being actually utilised for productive purposes. In other words, India is only one-third as efficient as she might possibly be as compared with the average standard of productivity achieved in most of the industrially advanced countries.

This estimate of India's standard of efficiency roughly corresponds with similar other estimates. In 1927-8, for instance, the per hectare production of rice was only 13.9 quintals in India as compared with 35.7 quintals in Japan; or 39 per cent. ; of cotton was only 2.5 quintals in India as compared with 8.5 quintals in Egypt, or 29 per cent., and of wheat was only 7.2 quintals in India as compared with 28 quintals in Belgium, or 26 per cent.¹ In fact, the agricultural productivity of India, which is by far

¹ *International Yearbook of Agricultural Statistics* for 1927-8, pp. 119, 139, 181.

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the most important industry, is only 45 per cent. of the average of Belgium, United Kingdom, and Germany.¹

The productivity of some other industries shows a similarly low standard. For instance, for 1921-5, the quinquennial average production per person employed of coal, which is by far the most important mining industry in the country, was only 100 tons in India as compared with 109 tons in Japan, 137 tons in Belgium, 141 tons in France, 176 tons in Germany, 207 tons in the United Kingdom, and 617 tons in the United States, i.e., only 40 per cent. of the average production of the most important coal-producing countries.² The productivity in cotton mills, India's premier industry, is also very low as compared with that of other countries. For instance, it has been estimated that for about the same production, a Madras mill would employ 2,622 workers as compared with 932 workers in a Lancashire mill, or 1.67 per cent. more workers. The productive power of an Indian mill worker, according to such estimate, would amount to 37 per cent. of that of a British mill worker.³ It must be noted that in the above estimates, the differences in machinery, material, management and working conditions between India and other countries have not been taken into consideration.⁴ They can, therefore, scarcely give any idea as to the potential

¹ *Year-book of the U.S. Department of Agriculture*, 1919, p. 735.

² Compiled from *Indian Coal Statistics* in 1928, pp. 43, 44.

³ *Report of the Indian Factory Labour Commission*, 1908, 2, 314.

⁴ Cf. Author's *Factory Labour in India*, pp. 118-23.

industrial efficiency of Indian workers. But these estimates indicate that India wastes a large part of her land, labour and capital resources also in organised industries.

It must be remembered that the productive power of a country depends not so much upon the volume of the natural, human and capital resources as upon the ability to organise them for productive purposes, and that the net productivity after the deduction of the cost increases faster than the increase in the volume of these factors. The loss of national wealth in India is therefore much greater than that indicated by the wastage in the volume of land, labour and capital.

CHAPTER III

CAUSES OF INEFFICIENCY

In the foregoing chapter, the wastage of India's land, labour and capital has been estimated and the extent of her industrial inefficiency indicated. The present state of her inefficiency has been brought about by a variety of direct and indirect causes, of which the most important are racial characteristics, physical environment, poverty and disease, illiteracy and inexperience, religious inadaptability, social maladjustment, political subjugation and industrial backwardness.

I. RACIAL CHARACTERISTICS

The cause of the industrial inefficiency of a nation must first be sought in the racial characteristics of its people. The racial traits are more or less permanent and can scarcely lend themselves to any remedial measures. Any difference in industrial inefficiency due to racial features must be admitted, and the remedy for inefficiency must be sought after.

The common origin of mankind is an established fact. All the human races are the descendants of the same primary group, which was dispersed from original habitat through internal and external forces,

and which developed, under various environmental influences, different characteristics, such as colour, stature and other physical features. These features are too self-evident to need any discussion, but the important questions which arise are these: (1) Are there any differences in the innate mental qualities among the races? (2) Granting that there are differences, are some of the races, due to these differences, inferior to others? (3) Is the intermixture of races, especially of those having divergent physical features, as Africans and Europeans, detrimental to their progeny or to Society as a whole? These are still open questions. Theories have been advanced by some and contradicted by others that all races are potentially equal in quality, and that race mixtures often lead to the development of vigorous new races.

As far as India is concerned, it might be said that it is a land of race mixture. Various races, such as the Kolarians, Mongolians, Iranians, Dravidians and Aryans, specially the last two, have contributed to the present composition of Indian population. In spite of the caste system and religious diversity, there has been a good deal of intermingling of these races and there is no such thing as a pure race in India, nor, in fact, in any part of the world. Since it cannot be proved that in innate mental qualities these races are inferior to one another or to other races of the world, the only way to prove their equality is by comparison of their achievements, past and present, with those of the other nations.

It must be mentioned, first of all, that due to

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the difference in physical features, all the races are not able to do the same kind of work with an equal degree of efficiency, but in this machine age these physical variations scarcely make any essential difference in industrial efficiency. If they do, India has races of divergent features, and, with the present facilities for transportation, these differences can be easily taken advantage of in organising an efficient industrial system. In fact, this is being done in India even to-day. The jute industry of Bengal, the tea industry of Assam, and the coal, iron and steel industry of Bihar and Orissa, are only a few examples.

But the fundamental question still remains to be answered. In modern times the industrial efficiency depends more upon mental abilities, such as skill, ingenuity and inventive genius, rather than upon physical characteristics. The past experience of India in theoretical sciences, such as algebra, trigonometry, geometry and astronomy, and applied sciences, such as medicine and architecture, show that India was one of the leading countries in ancient times. Like Europe, India has also passed through dark ages. Invasions, conquests, and foreign rule have contributed largely to the intellectual and moral degeneration of her people. Modern India is again showing her physical prowess and mental capacities. Neither in intellectual fields nor on the playgrounds have the Indians proved themselves inferior to other nations. While universities like those of Oxford and Cambridge will bear testimony to the former, the playgrounds of Calcutta and Bombay, and the

Olympic games of several European towns, will bear testimony to the latter.¹

As far as industrial efficiency is concerned, it might be said that the Indians have never had proper conditions in which they could prove their efficiency to the best advantage. Neither the coalfields of Bihar and Bengal nor the factories of Madras and Bombay offer a similarity of conditions for comparing the efficiency of the Indians with that of any other race.² The only places where the Indians have had equality of opportunity, to a limited extent, have been the farms and orchards of California, and the logging camps and lumber mills of Oregon, Washington and British Columbia, where the Indians have proved that they were as good as, if not better than, the Chinese, the Japanese, the Mexicans, the Canadians and the Americans.³

2. PHYSICAL ENVIRONMENT

Physical environment has a great influence upon the human mind and human culture. Temperature, moisture, fertility, flora and fauna, and topography, not only affect the development of racial characteristics, as we have seen, but also determine, at least in the early stage of civilisation, social attitudes and social institutions, which directly or indirectly influence industrial efficiency.

¹ Every year there are some matches both in cricket and football, in which Indian teams often come out victorious against European teams.

² See Author's *Factory Labour in India*, pp. 107-24.

³ See Author's *Hindustani Workers on the Pacific Coast*, pp. 45-52.

It was the sub-tropical regions with temperate climate and fertile soil, which attracted primitive nomadic groups to settle down into communities, and eventually became cultural centres. The valleys of the Euphrates and the Nile, for instance, became the cradles of civilisation. While climate and food worked upon the physical features of man, geographical elements, such as mountains, oceans, rivers, deserts, prairies and forests, and physical forces, such as tempests, tornadoes and lightning, influenced his character and determined his attitude as evidenced in religion, poetry, legends, myths and other institutions, such as ceremonies, customs and manners. In a word, social traditions are greatly influenced by physical environment, especially in the early stage of their growth.

Physical elements have direct influence upon health and vigour, which are the basis of industrial efficiency. First, heat and humidity, affecting the physiological functions of the body, cause premature old age and shorten life. Industrial skill, the achievement of which requires long preparation, especially in these days of scientific advancement and international competition, is wasted before full realisation, thus causing much loss to the industrial efficiency of a nation. Second, the tropics, by encouraging the growth of various pathological organisms, bring about diseases, such as cholera, smallpox, malaria and hookworm, which cause premature death or sap the national vitality. Third, heat and humidity enervate the people and make the application of sustained and intensive energy both difficult and

injurious. Fourth, the monotony of Nature fails to invigorate man with the idea of change and causes him to lose ambition and inspiration, and initiative and alertness.

Nature has thus a threefold effect upon man, or rather upon his heredity, tradition and health, each of which is an element in industrial efficiency. While the influence upon the first two is more or less indirect, that upon health is direct. The effect of heredity or racial characteristics upon industrial efficiency has already been discussed, and that of tradition will be discussed later on. It might be pointed out here that the tradition of a people is neither fixed nor permanent. It is always in a state of flux, although the process may be very slow. But this change can be accelerated by a social crisis and social will. Consider, for instance, nationalism, which was more or less unknown in India a generation ago, but which has become one of the most important social forces in modern times.

The effect of Nature upon health is only too obvious to need discussion. It has been asserted by some that a true civilisation can only grow in a temperate climate. All the industrial centres of modern times, such as London, Berlin, New York and Tokyo, according to them, are in the regions which are visited by extreme heat and cold. In short, real civilisation, according to this theory, can only develop in temperate regions. This theory, however, assumes that there should be only one type of civilisation and that a civilisation different from that of modern Europe will be necessarily

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inferior. It also denies the fact that man, by acquiring knowledge in science and art, can conquer Nature and control many of its adverse effects.

Natural phenomena and laws, although more or less unchangeable, can be greatly modified by human intelligence. Pathologic micro-organisms can be brought under human control and many diseases can be eliminated, as has already been done in Panama and Manila, and many other parts of the world. The arid and hot atmosphere of a workshop may be changed into a comfortable place by refrigeration and humidification. By change of working hours from the midday to early hours of the morning, and the late hours of the evening, a great deal of work can be accomplished with a fair amount of efficiency. The intensive work may be continued with periodical relaxations. Moreover, every region, with its climatic conditions and natural resources, determines the nature of industry by which the people can develop its own regional economy and its own particular industrial efficiency.

3. POVERTY AND DISEASE

One of the fundamental causes of India's industrial inefficiency is the ill-health of the people, to which has been ascribed one-fourth of the loss of national energy in the previous chapter. This national ill-health has been brought about by two distinct factors, namely, extreme poverty or deficient nutrition on the one hand, and the lack of sanitary measures on the other.

The outstanding feature of India's economic life is the abject poverty of the people. The existence of poverty among the masses of India's population has been admitted even by Government. "There is a vast amount," says the Statement exhibiting the Moral and Material Progress and Condition in British India in 1927-8, "of what can only be termed dangerous poverty in the Indian villages—poverty, that is to say, of such a kind that those subject to it live on the very margin of subsistence."¹ One of the most important indications of India's absolute poverty is the frequent outbreak of famine which visited India seven times from 1860-1 to 1899-1900 and affected an area varying from 54,000 square miles to 475,000 square miles, and a population varying from 20 millions to 68 millions.² No widespread famine has been recorded in the first quarter of the present century, but the existence of scarcity in some part of the country or the other is a constant factor.³

While famine is one of the greatest calamities which can befall a people, its effect is more or less temporary. What is much more deleterious to both its physical and moral strength is perpetual starvation. The *per capita* food supply in India, as indicated by the yield of the principal crops, amounts to .83 million calories instead of 1.27 million calories

¹ *Op. cit.*, p. 97.

² The area (in thousand square miles and the population in millions in brackets) were as follows: 54 (20) in 1860-1, 180 (48) in 1865-7, 296 (45) in 1868-70, 54 (22) in 1873-4, 257 (59) in 1876-8, 307 (68) in 1896-7, and 475 (60) in 1899-1900. *Imperial Gazetteer of India*, 1908, 3: 483-95.

³ *India in 1923-4*, Calcutta, p. 189.

as required by the human body.¹ The average annual total of grain available for food from 1900 to 1922 was only 48·7 million tons as compared with 81 million tons required for the population.² In other words, food production in India fell short of the requirement by more than one-third. That the Indian people are underfed is also proved by the fact that food supplied to a Madras prisoner amounts to 741 pounds a year as compared with 2,664 pounds consumed by an average American,³ and it is a well-known fact that the *per capita* amount of food consumed by the Indian masses falls far short of the prison ration. Moreover, the quality of food is much poorer in India than in the United States.

There exist divergent views as to whether there has been any amelioration in the conditions of the people in recent years. According to the official view there has been an appreciable improvement in the standard of living of Indian agricultural masses during the past quarter of a century.⁴ The increase in bank deposits, industrial investments and merchandise imports is most probably responsible for this conclusion. According to Indian authorities the contrary is the truth.⁵ Some of the studies in the economic life of the villages seem to favour

¹ Finch and Baker, *Geography of the World's Agriculture*, Washington, 1919, p. 45.

² Zutshi, "Population and Subsistence in India," *Modern Review*, Calcutta, 1927, September, pp. 262-3.

³ Cf. Author's *Factory Labour in India*, p. 163.

⁴ *India in 1927-8*, Calcutta, p. 97.

⁵ Cf. Mahatma Gandhi, *Amrita Bazar Patrika*, quoted from *Young India*, 19 March, 1929, p. 5, and late Lajpat Rai, *The People*, Lahore, 2 August, 1928, p. 28.

this view. "An average year seems to leave the village," says Dr. Mann, "underfed, more in debt than ever, and apparently less capable than ever of obtaining, with the present population and present methods of cultivation, a real economic independence."¹ The very fact that the average length of life for the past 40 years has been practically the same, as will be shown later on, also indicates that there has scarcely been a material improvement in the condition of the Indian masses.²

Like starvation, prevalence of diseases in India is also an acknowledged fact. Epidemics like cholera, small-pox and influenza are always present in some part of the country or other. Tuberculosis is found in large industrial centres, especially in overcrowded slums. The prevalence of hookworm has been revealed by investigation, and it has been found that practically all the rural population in Madras and 70 per cent. of the population in Bengal are infected with hookworm.³

The most common and destructive disease is, however, malaria. In 1927, 14·29 out of 24·89 deaths per 1,000 of the population were ascribed to fevers, of which the most important was Malaria.⁴ "No part of India," says the Statement exhibiting the Moral and Material Progress and Condition in India in 1927-8, "is free from this scourge and the

¹ Mann, H. H., *Land and Labour in a Deccan Village*, Study No. 2, p. 158.

² *Census of India, 1921, Report 1*, 128.

³ *Report of the Indian Industrial Commission, 1916-18*, p. 162.

⁴ *Statistical Abstract for British India, 1930*, p. 399.

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number of days of work which are lost every year on this account must run into many millions. The members of every class and occupation in India are affected, and not only the actual days lost are to be counted but the weakening effects of malaria on the human system must also be taken into consideration, for it saps the energy and reduces the efficiency of its victims." ¹ What is still worse is that malaria is steadily spreading in many parts of Bengal. "Within living memory hundreds of villages have been decimated by malaria," says the Annual Report and Accounts of the Ross Institute and Hospital for Tropical Diseases in 1928, "thousands of acres of once prosperous and highly cultivated land have been abandoned; populous towns have been reduced to the status of miserable fever-stricken villages; stately mansions have as their sole inhabitants the wild pigs and leopards; and the jungle is creeping in to reign once more over a land from which it was driven thousands of years ago. The malaria of Bengal may well be described as a great tragedy." ² But malaria is not confined to Bengal alone. Several other provinces are also more or less infected with malaria germs, causing the death of 1,300,000 persons a year.

The immediate effect of starvation and disease is seen in the low vitality of the people. According to the census of 1921, about one-fifth of the children in British India die before the age of one year.³

¹ *Op. cit.*, pp. 14 and 15.

² *Op. cit.*, p. 12.

³ *Census of India, 1921, Report 1, pp. 131-2.*

As compared with other countries, out of every 100 infants born alive, 19.4 die in the first year of their life in India as compared with 7.7 in England and Wales, 8.8 in France, and 10.8 in Germany.¹ It has been estimated that over 2 million children die every year in India in their infancy in addition to a large number of stillborn. The number of children who die before reaching youth is considerable. Ten million children die between the ages of 10 and 15. In fact, scarcely 50 per cent. of the children born ever reach even a youthful age. Says the All-India Conference of Medical Research Workers: "The percentage of infants born in India who reach a wage-earning age is about 50."² In 1921 the death-rate in India was 3.06 per cent. as compared with 1.21 per cent. in England and Wales, 1.48 per cent. in Germany, and 1.77 per cent. in France.³ In other words, as compared with England and Wales, France and Germany, the death-rate is about twice as great and the average length of life is about only half as much in India.

That India has not improved in health in recent years is still better indicated by the fact that there has been no improvement in the average length of life among the people since 1881. From an average of 24.85 years the longevity fell

¹ *Annuaire Statistique, France, 1924*, pp. 200 and 204-5. *Statistical Abstract of British India, 1926*, p. 341. *Census of India, 1921, Report 1*, pp. 131-2.

² Quoted by the *Royal Commission on Agriculture in India, 1928. Report*, p. 481.

³ *Annuaire Statistique, France, 1924*, pp. 200, 204, 205. *Statistical Abstract of British India, 1926*, p. 341. *Census of India, 1921, Report 1*, p. 128.

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down to 24.75 in 1921, as indicated by the table below :

Year.	Men.	Women.	Total Unweighted Average.	Variation Index No.
1881	24.5	25.2	24.85	100
1891	24.4	24.9	24.65	99.2
1901	24.7	25.1	24.90	100.2
1911	24.7	24.7	24.70	99.4
1921	24.8	24.7	24.75	99.6

On the other hand, there has been a decided increase in the average life in different countries in the West. It increased, for instance, from 42 years in 1885 to 47.8 years in 1910 in England and Wales, from 41.6 years and 37.5 years in 1880 to 46.7 years and 45.9 years in 1910 in France and Italy respectively, and from 37 years in 1875 to 45.4 years in 1910 in Germany.¹

What is still more significant is that as a nation, India is not only physically weak but is getting weaker, if not absolutely, at least relatively. This is clearly shown by the fact that whilst the death-rate has declined in almost all Western countries during the last generation, it has remained stationary or even slightly increased in India. While, for instance, from an average of 2.74 per cent. in 1885-90 the death-rate increased to 3.06 per cent. in 1921 in India, from 1881-90 to 1901-10 it fell down from 1.93 to 1.54 per cent. in England and Wales, from 2.21 to 1.94 per cent. in France, from 2.51 to 1.87

¹ Compiled and adapted from *Annuaire Statistique*, France, 1923, p. 203. The average length of life is given for men and women separately; the figures given here are the unweighted averages of these figures.

per cent. in Germany, and from 2.13 to 1.65 in Belgium. On account of disturbing conditions during the War it is difficult to make any comparison for the years 1911-20, but the death-rate in 1921, after the establishment of peace, shows a still further decline, being 1.21 per cent. in England and Wales, 1.35 per cent. in Belgium, 1.48 in Germany, and 1.77 per cent. in France, as shown in the table below.

DECLINE OF DEATH-RATE IN VARIOUS COUNTRIES.¹

Year.	England and Wales.	France.	Germany.	Belgium.	India.
1881-90 . . .	1.90	2.21	2.51	2.15	2.74 ²
1901-10 . . .	1.54	1.94	1.87	1.65	—
1921	1.21	1.77	1.48	1.35	3.06

The ultimate effect of ill-health arising from starvation and disease is social deterioration of which industrial inefficiency is only one of the aspects. The number of people who die from starvation and disease is large enough, but the number of those who suffer from insufficient nutrition and bad sanitation is much larger than those who succumb. They are left as lifelong victims either to succumb soon after or to carry on their life process in broken health and spirit to the detriment of the wealth and welfare of the nation.

It is scarcely to be expected that a nation with bad health and under-developed minds will be able to maintain its efficiency in this age of world-wide competition. Regarding malaria, the Report of the

¹ *Annuaire Statistique, France, 1923, p. 200.*

² For 1885-90.

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Ross Institute mentioned above says that its presence is a great handicap to economic efficiency. "A malaria-handicapped industry," continues the Report, "will have little chance of survival against foreign competition."¹ Similarly injurious are the other diseases to the national efficiency. Said the Report of the Royal Commission on Agriculture in 1928: "Malaria slays its thousands and ruins the economic efficiency of hundreds of others; plague and cholera sweep the country from time to time; hookworm disease, kala-azar and diseases arising from diet deficiency insidiously reduce the labour power of the cultivating classes."²

4. ILLITERACY AND INEXPERIENCE

Next to ill-health, ignorance as indicated by illiteracy and inexperience or lack of training is the most important cause of industrial inefficiency, causing, as has been noted before, the loss of about one-fourth of India's national energy.

It has already been pointed out that about 92 per cent. of the total population in India are illiterate, and about the same proportion of the actual workers engaged in different productive processes, or more correctly the population between the ages of 15 and 60, is unable to read and write. In comparison with the workers in advanced countries, Indian workers are the most illiterate. Thus, while the percentage of illiterate persons between 15 and 60 was .03 in Germany, 1.0 in Holland, 4.7 in

¹ *Op. cit.*, p. 12.

² *Op. cit.*, p. 482.

France, and 8.9 in Belgium in 1910, that in India was 92 as late as in 1921.¹

One of the most appalling wastages of Indian intellectual faculties occurs from the lack of conservation and development of the mental faculty of India's vast childhood. The period of childhood is more or less indefinite, but it might be said to extend from 5 to 14 years inclusive. Now, in almost all civilised countries, there exists free and compulsory primary education for children, although the period of such education differs in different countries. Under her present political and economic conditions, if it be assumed that the period between 5 and 10 should form the period of compulsory primary education in India, the number of children eligible for primary education would amount to 47 millions, of whom only 6 millions were receiving primary education in 1921, and 41 million children remained without any provision for education.

In comparison with other countries, the number of children in primary schools in proportion to those of school-going age is the smallest in India. For instance, among five countries, namely, England and Wales, Denmark, Sweden, Scotland, and Austria, for which statistics are available, the number of

¹ *Annuaire Statistique, France, 1924, p. 214 :*

ILLITERATE PERSONS BETWEEN 15 AND 60 IN VARIOUS COUNTRIES

Country.	Year.	Percentage of Illiterate.
Germany	1910	0.3
Holland	1910	1.0
France	1910	4.7
Belgium	1910	8.9
India	1921	92.0

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children attending primary schools as compared with those of school-going age varies from 92 per cent. to 76 per cent., as against 12 per cent. in India.¹

In comparison with other countries like the United Kingdom and the United States, where compulsory education extends up to the age of 14 or more, there should be added to the above 47 million children in India, another 37 million children between 10 and 15, of whom only 1.6 millions were receiving secondary education in 1921. It is thus seen that out of 84 million children between 5 and 15, only 7.6 millions received primary and secondary education, and the mental faculty of the remaining 76.4 million children remained undeveloped.

The period of education, including both general and technical instruction, extends much farther than the age of fourteen in most of the countries, and in this respect also the number of students in India is insignificant. Taking liberal education as a whole, including primary, secondary and superior education, the total number of persons receiving instruction was only 8.3 million or 3.42 per cent. of the total population in India as compared with 17 per cent.

¹ NUMBER OF SCHOOL-AGE CHILDREN IN PRIMARY SCHOOLS IN CERTAIN COUNTRIES *

Country.	Year.	School-age Children. Number in Thousands.	Children in Primary Schools. Number in Thousands.	Percentage of total.
England and Wales	1920	5,931	5,199	87
Scotland	1920	780	681	87
Denmark	1921	450	414	92
Sweden	1921	920	708	76
Austria	1910	4,819	4,044	83
India	1921	47,000	6,000	12

* *Annuaire Statistique, France, 1922, p. 213.*

in the United States, 16 per cent. in Belgium, and 15 per cent. in France.¹

One of the most important methods of instruction in modern times is what is called adult education. Even in this respect India is far behind other nations. In 1926, for instance, there were only 11,227 institutions and 282,384 pupils all over the country.² The public Press, which is one of the most important means of imparting adult education, is also very backward in India. In 1926-7, for instance, the total number of newspapers and periodicals amounted to 5,111 in India, as compared with 20,694 in the United States³ with a population about one-third of that of India. Moreover, most of the newspapers and periodicals have a much larger circulation in the United States than in India.

The fundamental basis of industrial efficiency, especially in modern times, is, however, technical education, in which India is still more backward than in general or liberal education. In 1925-6, there were only 9 engineering and surveying schools with 1,404 scholars, as compared with 10 fully

¹ EDUCATION IN CERTAIN COUNTRIES
(in millions).

Country.	Year.	Primary.	Second-ary.	Superior.	Total No.	Percentage of total population.
United States .	1918	15.54	2.11	.25	17.90	17
France . . .	1913	5.66	.13	.04	5.83	15
Belgium. . .	1919	.96	.04	.01	1.01	16
India	1921	6.00	1.60	.70	8.30	3

Adapted. *Annuaire Statistique*, France, 1923, pp. 213-15;
The Indian Year-book, 1923, p. 451.

² *India in 1927-8*.

³ *The World Almanac*, 1928, p. 262.

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equipped technical high schools, and 21,683 students in Germany. As regards the industrial education, there were 396 schools with 20,848 scholars in the whole of India as compared with 13 municipal professional schools with 1,385 pupils and 370 private schools with 92,000 pupils in the city of Paris alone.¹

As in the case of health, India has, within recent years, become more backward in knowledge, if not absolutely, at least relatively. In the first place, the old cultural systems, whether Hindu or Mohammedan, have almost broken down, partly due to the lack of faith in the old civilisations and partly to the inadequate means of propagating them as in the olden days. It is true that communication has increased and a larger body of information has been reaching the masses to-day than ever before. But this information has never evolved from the old cultural system nor has it been appropriated to the national culture by scientific methods.

In the second place, if there be any doubt as to the general education, there is no question as to the backwardness and deterioration of technical education, especially in arts and crafts, in which India once built up her world-wide reputation. The art of making iron and steel, of building magnificent edifices, and of manufacturing muslin, is no longer to be found in any part of the country. Even cottage industries, in which were trained millions of India's artisan classes, have undergone deteriora-

¹ *Statistical Abstract for British India, and Statesman's Year-books* for years indicated.

tion. Modern industries, such as mines and factories, are comparatively few in number and do not help in the industrial education of the workers except to a very limited degree. Out of over 2.5 million workers engaged in organised industries employing 20 persons or more in 1921, only 28 per cent. were skilled workers.¹ The standard of skill even of such a small proportion of workers was very low. Equally backward, if not more, is India in the higher technology including supervision and management. Except the cotton mills, most of the organised modern industries, such as jute mills, tea gardens and coal mines, are controlled and managed by Europeans.

During the period while India has been losing the knowledge of her own arts and crafts and has been unable to acquire the knowledge of modern science and technology, most of the other important countries have been making immense progress in modern systems of production and distribution. And it is this inability of India to keep abreast of other nations in exact sciences and industrial technique which is one of the fundamental causes of the industrial backwardness.

5. RELIGIOUS INADAPTABILITY

Another important cause of India's industrial inefficiency is moral deterioration, which has been brought about by various factors, such as religious doctrine and philosophical attitude towards life. Religion in a broader sense includes not only the

¹ Adapted. *Census of India, 1921, Report 1, p. 292 ; 2, p. 277.*

spiritual ideals which man attempts to realise for a life to come, but also all those moral and intellectual aims and aspirations which they want to achieve here on earth. The underlying conceptions and assumptions as well as the methods of realising these ideals and aspirations have profound influence upon human behaviour and human success.

Whatever might be the metaphysical explanations and theological speculations, most of the religious beliefs and practices among the Hindus, who form by far the majority of the population, are nothing but pure and simple superstitions. Nor do they succeed in achieving their aims. Thus millions of people in India year after year worship with devotion *Lakshmi* or goddess of wealth, *Swaraswati* or goddess of learning, and *Durga* or goddess of power, yet India is to-day the most indigent, most illiterate and most helpless country on earth. However harmless in themselves these rituals and ceremonies may be, inasmuch as they divert the attention from the true means of success, they lead to social and industrial deterioration.

One of the cardinal principles of Hindu religion is the belief in an infinite Being, of which this visible world is only a manifestation.¹ It is the duty of every man to realise this entity either in this life or in the next by the practice of self-renunciation. Misery and sorrow arise from the lower desires of man; the way to real happiness lies in the elimina-

¹ This section is rather a recapitulation of a part of the author's article in the "Background of the Labour Problem" in the *Modern Review*, June 1922.

tion of those desires. This doctrine has great effect upon the social and industrial attitude of the people.

First, it has turned the mind away from the material to the spiritual, from the natural to the supernatural, from the real to the ideal, from the concrete to the abstract and from the outer to the inner aspects of life.

Second, while it has helped a very small minority to attain the highest types of manhood, it has also checked the mental growth of by far the majority by placing before them an ideal far too high for attainment by the average man. Thus while Hindu civilisation has helped to glorify a few, it has tended to fossilise many.

Third, by over-emphasising the happiness of the after-life and the attainment of this happiness through self-renunciation, it has tabooed most of the pleasures of the flesh, and has placed as its goal the fewness rather than the multiplicity of wants, which is the most important incentive to economic activities and industrial development.

Fourth, by constantly directing the attention towards the inner struggle between desires and ideals, it has restricted the scope of the external struggle between Man and Nature, which stimulates Man to conquer Nature and acquire wealth.

Fifth, the doctrine of *Karma*, which is a part of the Hindu religion, has disintegrated into fatalism and has its worst effect upon the masses. The feeling that the sorrow and happiness in this life are largely determined by the deeds of a former life takes away a good part of the initiative for planning

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and developing any remedial measures in case of any catastrophe. The majority of the people are prone to resign themselves to the course of events. The doctrine has been responsible for not stimulating the people to turn failure to success, which is one of the essential elements in the acquisition of industrial efficiency.

6. SOCIAL MALADJUSTMENT

While the teachings of religion have tended to make after-life and not this world the focus of attention, some of the social institutions, such as the caste system, the zenana system, child marriage, the joint-family system, and private charity have also led to social deterioration and industrial inefficiency.

The caste system is one of the most outstanding causes of social stagnation and industrial inertia. It has created false pride and vainglory among a few and has led to the degradation and demoralisation of many. It has caused labour to lose its dignity and hindered the free movement of the people in the selection of industry and occupation. Most of the important industries have, therefore, been left to the so-called lower classes, who, being devoid of facilities for education and of recognition and support of the society, have kept the industrial art where it was hundreds of years ago, while the same industries in other countries have been developed by eminent chemists and engineers and commercialists with the help of the most up-to-date scientific discoveries and technical inventions.

Next to the caste system is the zenana or the seclusion of women, which has also retarded the industrial progress of the country. Like the caste system, it is also a national calamity. Of course, it is a Mohammedan custom and prevails mostly among the Mohammedan families. But a considerable portion of the Hindu population, especially in the north, has come under its influence. Any institution which interferes with women's freedom of action and deprives them of facilities for education, acts as an impediment to their moral, intellectual and industrial development. The zenana system, therefore, deprives India of the full utilisation of the physical and mental resources of almost half of the social population in her industrial activities.

Child marriage is another stumbling-block to the growth of industrial efficiency in India. A large number of boys and girls, especially the latter, become married before their adolescence period is over. Although the age of marriage has been raised to 14 for girls and 16 for boys by the recent Act, even as late as 1921 there were under the age of 15 years over 3.6 million married boys and over 6.5 million married girls.¹ The early marriage deprives boys and girls of the fullest opportunities for the development of body and mind, including industrial education, by which they could become more efficient members of industrial society. It curbs down and limits the spirit of adventure and enterprise of the boys, which are among the most stimulating factors of modern industrial progress,

¹ Adapted from the *Census of India for 1921*.

and compels the girls to bear the burden of gestation and lactation when they ought to be devoting themselves to the acquisition of knowledge and efficiency. Moreover, child marriage encourages the joint-family system and often leads to immature and unwise parenthood to the detriment of the offspring as well as parents themselves, and helps over-population by prolonging the procreating period.

The joint-family system, by which several members of the same family even after their marriage live together with their parents and other relations, sharing in the common family budget, is another social institution interfering with the growth of industrial efficiency. Although the system is gradually breaking down under social and economic forces, by far the majority of the Indian families still live in joint-families. It is not without its advantages, but under the modern social conditions, it has already outlived its utilities, and has become detrimental to industrial progress. As noted before, it is the citadel of child marriage; while it restricts the instinct of gain on the part of the earning members, it puts a premium on idleness and discourages initiative on the part of the dependents.

The institution of private charity which obtains as a part of both the Hindu and the Mohammedan social and religious organisation is also responsible for encouraging idleness on the part of a considerable number of the population. The noble aim and benevolent effect of the institution cannot be denied, and at a time when there was not yet any public institution for taking care of the old, the defective

and the helpless, it served a very useful purpose. It will have its utility until social insurance and public philanthropy take its place. But it has been greatly misused and it is not uncommon that under the garb of religion many able-bodied men and women take advantage of the credulous belief and benevolent superstition of the people, while many needy ones remain uncared for.

7. POLITICAL SUBJUGATION

One of the most important causes which have both directly and indirectly retarded the growth of industrial efficiency in India is her political subjugation. The loss of independence is the greatest calamity that can befall a nation. It not only brings about slavery and serfdom, but also leads to moral and intellectual degeneration, and thus affects industrial efficiency. It must be admitted at the outset that there is something fundamentally wrong with Hindu civilisation which has not only made the people submit to, but even sustain, foreign rule.

From the earliest times, India has been subjected to invasions and conquests. It was not, however, until the thirteenth century that India began to come under Mohammedan rule and to lose her independence. But by the very fact that the Mohammedans came to make India their own home and the actual administration of the country was practically left to the Hindus, the evils of Mohammedan conquest were largely mitigated. It was with British conquest that India came under alien rule and a government from outside was inaugurated,

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which contributed to the social, political and industrial deterioration of the people.

The prime motive which led the British to come to India was to secure industrial and commercial advantages, to facilitate and perpetuate which they gradually conquered the country and established complete political control. British rule in India might be roughly divided into three periods: namely, the rule under the East India Company (1757-1857), the rule under the Crown (1858-1920), and the beginning of self-government from 1921. These three periods have been dominated by three distinct economic policies, such as mercantilism, *laissez-faire*, and modified protectionism.

At the time of the arrival of the British in India, the dominating policy of England and other Western countries was mercantilism, by which they made their colonies and dependencies producers of raw materials and purchasers of finished products. This policy was actively pursued by the British in the first period and remained effective in the second period. With the transfer of the government from the Company to the Crown, *laissez-faire* which had become the political philosophy or industrial policy of England, also became the industrial policy of the British government in India. It might seem paradoxical, but it is none the less true that both these apparently contradictory policies worked side by side in India during the period. While indigenous industrial enterprise was denied any support, British commercial, industrial and financial interests, which had already established virtual monopoly in the

country, often with the help of Government, were left alone. It was not until the beginning of the last War that the Government of India realised the importance of adopting a new economic policy and of encouraging the development of indigenous enterprise. The foundation of this policy was laid down in the Government of India Act of 1919 and has been since then in the process of development. It is too early to judge its results in so short a time.

The economic policy of the Government, followed until the beginning of the War, has left a three-fold effect on the industrial life of the country: first, the "drain" of wealth, which has been estimated to be Rs 60 crores a year without any corresponding return in any form.¹ In spite of the fact that there is a possibility of exaggeration and that a part of the drain is reinvested in India herself,² no country, however rich, can afford to pay to another country even half of such a sum for over 160 years without being depleted of a large part of its social capital and annual dividend; second, decline of indigenous arts and crafts.³ There is no question but that some

¹ Wadia and Joshi, *The Wealth of India*, London, 1925, p. 111.

² There is an argument to the effect that most of the British capital invested in India was made in India. See *Modern Review*, October 1929, p. 464.

³ See Pandit M. M. Malaviya's Note of Dissent. *Indian Industrial Commission of 1916-18*, pp. 247-57. "Strong combination among the European companies with a view to crush Indian enterprise can be said to be the main cause of gradual decline and premature end of the Indian shipping industry"—from a statement of the Bengal National Chamber of Commerce to the Indian Mercantile Marine Company in 1925. See Bengal National Chamber of Commerce's plea for the recognition of India's claim—*Inland Water Transport*, 1929, p. 6. See also the editorial notes, *Modern Review*, October 1929, pp. 464-6.

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of them would have died their natural death in the face of foreign competition, but a national Government would have improved and modernised at least a few. Third, retarded growth of modern industries. Commercial rivalry of the British industries and the virtual monopolistic control of most of India's key industries by the British have been detrimental to the growth of modern industrial enterprise in India. The former induced the British Government in India to create all the facilities for their imports into India, e.g., the imposition of the excise duty on cotton manufactures, and the latter opposed the growth of rival indigenous industries, e.g., the inland and coastal shipping. The very fact that most of these modern industrial enterprises and of public and quasi-public industries, such as railways, tramways, irrigation, gas and electricity works, were organised and managed by foreigners, deprived the indigenous people of all the chances of acquiring knowledge and experience in modern industrial enterprise.

Equally deleterious has been the indirect effect of political subjugation upon industrial efficiency. The effect of ignorance, ill-health and poverty upon industrial efficiency has been already discussed. The most important effect of the loss of independence is, however, moral degradation. The exclusion from all military, and most of the civil and medical, services—as a matter of fact from all position of power and responsibility—was a great detriment to the growth of national character. Moreover, the presence of a socially-alooof ruling class with different

social attitude and cultural ideal could not but help the growth of "inferiority-complex" or "slave-mentality" among the conquered people, who gradually came to doubt the soundness of their own civilisation and thus lose self-confidence, initiative and enterprise—qualities upon which depends the industrial efficiency of a modern nation.

8. INDUSTRIAL BACKWARDNESS

The immediate cause of the industrial inefficiency of India is, however, the backwardness of the industrial organisation. From the earliest times until recently, India was, and to a large extent still is, a country of self-sufficing village economy. The village was the industrial unit, where the needs of food products and raw materials were supplied by the cultivators and those of manufactured goods by the artisans. The market was confined to the exchange of local products, and the demand for rare commodities was met by the fair which was held periodically within the reach of almost every village. There is no doubt that in recent years the number of agricultural products raised especially for the market, such as jute, cotton, oil seeds, is increasing and that factory products, both of foreign and domestic origin, are increasingly finding their way into remote villages. But taking the country as a whole, both the quantity and variety of such goods are rather insignificant in comparison with those locally produced and consumed.

This self-sufficing village economy has been one of the fundamental causes of India's industrial

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stagnation. It has limited the scope of division of labour and hindered the growth in the specialisation of land, labour and capital, and has thus stood in the way of the growth of skill and ingenuity. The confinement of production to the needs of local consumption restricted the scope of competition and the improvement in the art and speed of production. Moreover, the lack of facilities for cultural contact, which often follows trade relations with the outside world, has retarded social progress which forms the background of industrial efficiency.

The failure to apply modern science and art to productive processes is one of the principal causes of agricultural backwardness. The fertility of soil has been in most cases exhausted through constant cultivation without fertilisation. Farmyard manure, which is the best and cheapest fertiliser, is almost universally burned, and artificial fertilisers are too dear to be used by the majority of the cultivators. The lack of adequate knowledge in soil conservation and crop rotation leads to the fallowing of a considerable amount of arable land every year. Due to the ignorance of scientific breeding and feeding, the majority of Indian livestock are unprofitable and wasteful for the production of labour, milk, meat and hide. Seeds and crops are scarcely selected for the increase in the quantity and quality of the yield and thereby of farm profit. Implements and tools are obsolete and antiquated; pests and parasites visit periodically, destroying crops and livestock; and by-products are scarcely utilised. The holdings are too small for the economic use of improved tools

and implements and for the whole-time employment of the cultivator throughout the year. Even the small-holding is often sub-divided into smaller plots and scattered over a wide range.

Production has scarcely been adapted to the special needs of the market, nor has there appeared any regional division of production except that which has been forced by geographical necessities, such as jute in lower Bengal. Farming as a business is scarcely known to the average cultivator and his colossal illiteracy never enables him to count his cost. After paying a high rate of interest and excessive rent, often amounting to half or more of his profits, the average cultivator has scarcely any means left to provide his family with the necessities of life, much less to save for agricultural improvement.

The artisan fares scarcely better than the cultivator. In fact, in most cases he is the worse of the two. For centuries neither his tools and implements nor his industrial art have undergone any improvement, nor has the State come to his aid. With antiquated tools and obsolete methods and unaided by Society and the State, the Indian artisan has become weaker and weaker in competition with the workers in other parts of the world, who are equipped with the most up-to-date knowledge of science and with the latest achievements of mechanical invention, and are aided by intelligent Society and the benevolent State. In the struggle for commercial supremacy, the Indian artisan is thus defeated by foreign competition in his own home market.

In recent years, as we have seen, several modern

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industries have been established, especially in relation to mining, planting, manufacturing and transporting. Of these industries, the most important are cotton and jute mills, tea-gardens, coal-mines, and engineering workshops. The success of some of these industries has been due to monopoly. But in a vast country like India, modern organised industries are still insignificant in comparison with the old and unorganised ones.

One of the greatest drawbacks to the development of modern industries in India is that there is neither the favourable background nor the congenial atmosphere necessary to their normal and rapid expansion. Although phenomenal progress has been made in certain branches, there has not yet been developed either an all-round industrial system or a combination of related industries with subsidiary and allied processes for the economic utilisation of by-products and auxiliary materials. There are still lacking facilities for banking, transport and marketing, the industrial and commercial experience, and the scientific and technical knowledge, which are essential for large-scale economic production. Account must also be taken of the age-long inertia of the old industrial system, the rigidity of ancient social institutions and the colossal illiteracy and ignorance of the masses, all of which are impediments to the growth of both new economic consciousness and new industrial enterprise.

PART II. ACHIEVEMENT OF EFFICIENCY

CHAPTER IV

CONSERVATION OF HEALTH

IN the previous chapters, the extent of India's industrial efficiency has been estimated and the various causes which have led to the inefficiency have been discussed. The most important question is how India can achieve her industrial efficiency and secure the prosperity and welfare of the people. From the last chapter it must be realised that the problem is by no means an easy one, and requires the mobilisation of the active interest and concerted activities of the entire social population, and the reconstruction of national health as well as of all the social, political and industrial institutions.

I. AMELIORATION OF RACES

Since the basis of industrial efficiency is the physical abilities and mental qualities of a people, the first question is: What are the possibilities for improving these qualities among the races composing the Indian population? The scope of race improvement is, however, very much limited. The physical features and mental characteristics of a race are

more or less permanently fixed and there is scarcely any chance of ameliorating them beyond the average level.

The preservation of the fittest or most desirable types of men and women in the race seems to be the only positive method of race improvement. There is, however, also a negative method by which the physical and mental defectives can be kept under control or even eliminated by discouraging or preventing the perpetuation of the stock afflicted with them.

Recent studies in heredity have clearly shown that certain traits and diseases, such as feeble-mindedness, insanity and epilepsy, are transmitted from generation to generation. It is possible to eliminate these defects by segregation or even sterilisation of the afflicted individuals. It must, however, be remembered that eugenics is not yet a perfect science and the knowledge for the intelligent application of its principles is far from being complete. But it is a growing science, and is expected to become very helpful to the control of the socially undesirable.

According to the Census of 1921, the number of infirm persons in India, including the insane, deaf-mute, blind and lepers, is less than a million.¹ Although all these diseases are not congenital, the number of congenitally defective persons in India would be much larger than that indicated

¹ The number of infirm persons was actually 860,099, of whom 88,305 were insane, 189,644 deaf-mute, 479,637 blind, and 102,513 lepers. *Census of India, 1921, Report I, p. 205.*

by the above figures. There is, for instance, no estimate in India of the feeble-minded persons, who form the largest class of the congenital defectives.

The control of the propagation of congenitally afflicted persons, will, no doubt, somewhat improve the racial stock of Indian population. But the most important effect will be the introduction of social selection and conscious effort for race improvement, which in itself would have much salutary effect upon Society.

2. DEVELOPMENT OF THE PHYSIQUE

While there is a limit to race amelioration by controlling heredity, there is a wide scope for the full development of inherent physical capabilities and mental qualities by the improvement of the physique. Health is the physical basis of industrial efficiency. Sound health implies optimism, alertness, courage, and perseverance, which are the essential elements of industrial efficiency.

The high rate of mortality has already been discussed and it has also been shown that the death-rate in India can be reduced by one-half. Out of 6 million deaths of a population of 241 millions under registration in 1927, i.e., 24·8 per 1,000, only 3·4 per 1,000 died at the age of 60 or upwards, that is, of what might roughly be called "senility," and the life of the remaining 21·4 per 1,000 was cut off prematurely by various diseases, most of which are preventable. Of the latter figures, 14·3 deaths per 1,000 were caused by fevers and the remaining 7·1 deaths per 1,000 were caused by cholera, small-pox,

plague, dysentery, diarrhoea, respiratory diseases and others.¹

What is of greater loss is not so much actual death, but the devitalisation of national health and vigour by these diseases. It is to be granted that many more people suffer from these diseases than those who die. The wastage of national energy caused by ill-health has already been estimated to be about 25 per cent. of the total. The most important causes of national ill-health are insufficient diet and insanitary conditions.

The provision of sufficient diet is, in fact, of first importance to the country. What is needed is a security of some minimum standard of living. Although it is more or less a vague term, it is quite possible to have some rough idea of the minimum amount of food, fuel, clothing and housing, which are absolutely necessary for the health and decency of a people, taking into consideration the climatic and cultural conditions of the country.

One of the most important problems for Government is that of fixing a national minimum of a living requirement. It has already been suggested that the population of India is so undernourished and physically poor that nothing but a minimum standard can restore them to normal health, which is the foundation of industrial efficiency. In fact, national health is the best form of national wealth. A minimum standard implies a minimum income, which can be secured only by increased productivity.

¹ Adapted, *Statistical Abstract for British India, 1930*, pp. 379-99.

Here is a vicious circle. Inefficiency is the cause of poverty, and poverty is the cause of inefficiency. Since both of them exist together, the solution of them must be attempted at the same time. The problem is so great and its effect so widespread that nothing but the organised effort of the whole society can undertake its solution.

Closely connected with the quantity is the quality of food. The present food rations in most parts of India lack some of the essential elements of nutrition, such as proteins and vitamins. The time has come to make a scientific study of Indian food-stuffs and of the methods of their preparation so that there may evolve a new national standard of food ration to suit climatic conditions and national taste and at the same time may supply vital needs of the people.

Next to the provision of a minimum ration is the question of physical culture, which has received some attention in recent years. The solution of the problem has become much easier with the prospects of introducing compulsory public education all throughout the country. All boys and girls in public schools must be compelled to undergo regular and systematic physical training for certain hours a week, which must be continued throughout the period of secondary, high-school, and college education. This compulsory physical culture must be supplemented by games, sports and other recreations for upbuilding national health. The Sokol System in Central European countries has done immense good as a method of health improvement.

Besides helping in upbuilding the physique, games and sports have still another important function in national life, i.e., as a disciplinary method. Playing is a natural impulse, and taking advantage of it, courage, perseverance, orderliness and spirit of fair-play and similar other noble qualities can be cultivated among the people. Moreover, games and sports are always sources of great recreation and enjoyment to the general public. Football, cricket, running, swimming and cycling have become public recreations in almost all countries. The Olympic games have added much to both the national and international character of physical culture and public recreation.

The next method of improving national health is the improvement of sanitary conditions, which could be done by a well-determined policy for public health. "Prevention is better than cure" is the fundamental policy of modern States, and it is the organisation of public health wherein lies the secret of longer and healthier life in Western countries. Tropical and sub-tropical countries have, of course, some special diseases from which most of the Western countries are free, but the latter have also their own special diseases. With a well-directed policy of public health India can promote national health almost as perfect as that in the West.

The first step towards the improvement of public health is the establishment of medical research. The object of such institutions is twofold, namely, (1) to receive and adapt to local conditions all important results of researches into health and

medicine carried on in other parts of the world ; and (2) to do original research work into the condition of health or diseases peculiar to the country. Medical research institutions may advantageously be located in such important and populous cities in which are situated physical, chemical and bacteriological laboratories, medical colleges and hospitals and other scientific institutions. Moreover, most of the diseases occur in the centres of large population.

Next to medical research, the most important question is that of medical education. Research is meaningless unless its results are utilised for the improvement of national health, and this can be done only by experts trained for such purposes. What India needs for the improvement of national health is an army of medical men, who will organise public health institutions and help in establishing sanitation in households, farms, workshops, and factories all over the country. They need associates in making propaganda all over the country, such as anti-malaria associations and baby-week societies.

The last, but not the least important method of improving national health is the provision of medical help whenever necessary. Every needy person must have free medical advice or medicine. There exist already public hospitals, but their scope needs expansion. Not only a district, but each subdivision and important town should have a public hospital under the care of proper medical officers. The public grant in most of these cases can be supplemented by private philanthropy, which has

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always been a prominent feature among the people of the country.

3. CONTROL OF POPULATION GROWTH

Closely connected with the amelioration of races and the conservation of health is the question of the control of population growth. Of course, the prevention or regulation of new generations not yet born could not have any direct effect upon the achievement of industrial efficiency of the present population. But inasmuch as the control of population promotes gradual improvement and imposes upon Society voluntary and intelligent parenthood, thus tending to eliminate the undesirables and defectives already referred to, its indirect effect upon the achievement of industrial efficiency is by no means unimportant.

In a previous section it has been shown that under the present state of productivity, India can supply food only to two-thirds of her population and can keep in comfort and efficiency, as required by a more or less international standard, only one-third. The pertinent question is whether India can increase her productive power and supply the needs of not only her present, but also her growing population. The least she can do is to increase her productive power by one-third. But man cannot live by bread alone, he must possess means for the development of his mind, and at the same time keep a standard of life which is commensurate with that of other people. What is true of an individual is also true of a nation. The present question thus resolves

into this, that India must increase her productive power by two-thirds.

The problem is, however, much more complicated than it appears to be. Population is not a static thing. Its normal tendency is to grow. In spite of famine and pestilence, the population in India increased by an average annual rate of .48 per cent. a year from 1885 to 1921. At this rate of growth the present population of India would amount to 325 millions. What would be the rate of growth in the future is a matter of conjecture. But it can be safely assumed that various social movements, especially those for health, would decrease the death-rate, and at a very conservative estimation of an increase of .5 per cent. a year, the population in India would in all probability amount to 370 millions in 1950.¹

There is still another aspect to the question. The standard of living is a growing process. With the progress of Society there grow new ideals and aspirations, some of which have to be satisfied with material goods. Indian people must have the same means for their moral and intellectual development as the people of other countries. It is thus evident that the wants and needs of Society will increase in the course of time.

Although India wastes about three-fourths of her natural resources, two-thirds of her human resources and two-thirds of her capital resources, they can

¹ See Author's "Population and Food Supply in India," *Proceedings of the World Population Conference, London, 1927*, pp. 114-18.

be appropriated only gradually. The possibility of utilising natural resources depends upon the efficiency of labour and the sufficiency of capital. By far the major part of India's man-power is underfed, diseased, illiterate and unskilled. Equally deficient is India in the possession of social capital, nor can social savings be transformed into working capital immediately. Moreover, the appropriation of natural resources, the best of which are already in use by such intensive methods as irrigation, drainage, fertilising and acclimatisation, would come only under the law of diminishing return. It is thus seen that India must adopt the policy of the control of population for the prosperity and progress of her people. The best method of stabilising the population in a country is the adoption of the policy of birth-control, which has been brought to a very scientific accuracy in modern times.

There are several difficulties in adopting the policy of population control by India, but they can be surmounted. The population is the physical basis of national self, and any proposal for the reduction of the present number would be objectionable to public sentiment. But the difficulty can be overcome by taking the present number as the limit of India's population, at least for the next half-century.

More serious are religious difficulties. Social customs and prejudices, if not religious doctrines, are opposed to the idea of birth-control among both Hindus and Mohammedans. But such prejudices are as strong among the Catholics, and the practice of birth-control is still gaining ground even

among the Catholics in Europe and America. Moreover, the practice of birth-control should commence among a people before the Church and the State give their sanction.

The real difficulty to the propagation of the birth-control idea in India is the illiteracy of the masses. Birth-control is, however, practised secretly by almost all classes of people and in almost all countries, and it is not unknown to the Indian masses. But most of the secret practices are crude and dangerous. The introduction of modern scientific methods implies a certain amount of knowledge. This can, however, be met by practical demonstration of the devices in special clinics under the supervision and guidance of the experts, and such clinics have been established in Western countries.

One serious difficulty in the case of India arises in the fact that the masses are ignorant and any movement for birth-control has to begin at the top, i.e., with the more educated classes. There is nothing as yet to prove that the present so-called higher or educated classes in India are endowed with the higher inborn or innate qualities and that the unproportionate reduction in their number would prove any real loss to India. The real loss might be that of cultural advantages which these classes already possess and which have yet to be achieved by the so-called lower classes. But these disadvantages can be overcome by the rapid socialisation and amelioration of these classes and by the raising of their moral and intellectual status. This is what is happening in other societies. Moreover, the practice

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of birth-control, as in fact all social processes, must begin at the top and gradually sink down to the lower strata of Society by the process of imitation. There is still another solution to the question. What is needed is that a group of intelligent propagandists, especially the young medical men, should take up the question and lay the foundation for a national birth-control movement. It is a very happy sign of the present generation that such a movement has already been started in India.

CHAPTER V

SOCIAL REGENERATION

ANOTHER condition of achieving Industrial efficiency is social regeneration. Industrial efficiency is, in fact, the scientific organisation by a nation of all its social forces including traditions or institutions, for the satisfaction of its material wants; and the more vigorous these forces are, the more efficient industrially a nation is likely to be. For centuries, social life in India has lost its vitality. Like an individual, a society survives by adaptation. It is the inability to adapt itself to the changing conditions of the world which is one of the essential causes of India's social decadence and consequently of industrial stagnation. The development of India's industrial efficiency depends to a large extent upon her social revival.

I. PHILOSOPHICAL ATTITUDE

The most important means of regenerating Indian Society is the reconstruction of a new social attitude or philosophy of life. With the progress of science and art and the gradual control by man of natural and social forces, the world has been undergoing rapid changes, not only in material aspects but also in ethical and spiritual ideals. The handicraft

has been replaced by the factory system, individual enterprise by joint-stock companies, national economy by international economy, status by contract, mysticism by positivism, and universalism by pragmatism. To live and succeed in the present world of foreign aggression and international competition one of the essential things is to create a new attitude towards life and its environment.

The first point to emphasise in this new social attitude is that the Golden Age was not in the past but that it is to be in the future. It is a common belief among the masses that the days of truth, justice and happiness are gone for ever. Both the mythological conception and the glorious past of Hindu civilisation and its subsequent domination by foreign nations are mostly responsible for such an attitude. What is needed is the development of a new consciousness that in spite of its downfall, India still possesses potentialities to become a great nation, and that it is the duty of all social members to work towards that goal.

Another point to inculcate is that the object of life is not to be happy in a world to come, but to achieve a richer and fuller self-expression here on earth. One of the greatest faculties of man is to project into the future an ideal of life from the past and present experience. Rightly utilised, it can become one of the greatest sources of individual happiness and of social progress. But it becomes a national curse when it discourages the making of the fullest use of the present opportunities and the turning of the failures into success with the vain

hope that there might be compensation or retribution for all the present sufferings in a future life. This is one of the causes of India's downfall, and the time has come when the importance of making the best use of the present opportunities must be realised.

The superiority of human intelligence over the blind forces of Nature is still another point which must be inculcated into the new social attitude. The importance of this element lies in the fact that the activities of the masses are still controlled by the fatalistic conception of life. Some of the cardinal points in this social attitude or philosophy of life should be that, first, the destiny of man is not influenced by some mysterious and supernatural power but by physical and social laws; second, although the laws of Nature are inevitable and inalienable, they can be controlled and directed by human intelligence and can be utilised for human purposes; third, poverty, ignorance and misery are not necessary parts of the eternal order of things, but the results of defective social organisations which can be remedied by deliberate social efforts.

The importance of industrial success as an object in life must also be emphasised. Over-emphasis upon the spiritual aspects of life and formulation of ethical ideals in India at a time when the standard of life was simple and industrial competition was practically unknown, account for the lack of appreciation of an industrial career. But in these days of over-population, unemployment, competition and rising standard, it has become extremely necessary

to realise that industrial success is not only a means to the satisfaction of material wants but also to self-development and self-realisation.

2. INDIVIDUAL CHARACTER

This orientation of philosophical attitude must be accompanied by the upbuilding of individual character. Although the elements of character, such as instincts and impulse, are inborn, character itself is mostly a social product and can be modified according to the social purpose. The importance of this remark becomes evident by the analysis of the changes in the national character of the people within the first quarter of the present century.

For the purpose of developing a new character, the first thing necessary is to formulate a new national ideal based on national requirements. This ideal must include among the requirements, self-help and self-reliance, determination and perseverance, forethought and thriftiness, and similar other qualities which are essential for industrial success. An important quality required for industrial efficiency in modern times is the spirit of corporate activities. Handicraft was individual enterprise in which a person devoted all his time, from the beginning to the end, to the same article. This individual work has been replaced by division of labour and one can take part only in a small fraction of the work required for finishing an article. This change in industrial technique requires special emphasis on corporate activity. The glory of a good work does not belong to an individual but to a group.

The propagation of this new national ideal among the people itself will be a great step towards the upbuilding of a new national character. Once the ideal becomes a part of the social consciousness, all institutions will become means of incorporating the essential qualities required by modern industrial society into individual character. Nurseries and playgrounds, schools and colleges, fields and factories, households and social clubs will supply ample opportunities for engraving these qualities on the character of the rising generations.

The best means of upbuilding a new character is, however, the educational system. The importance of this fact has been realised from the beginning of class-consciousness in human history. One could point to many examples of the control of education by conquering races and dominating classes. Since the beginning of the conquest, the British have controlled the educational policy of India, and even to-day one of the main struggles between the Government and the people relates to the question of the control of national education. For developing industrial efficiency, India must also control her educational policy.

* Politics can scarcely be separated from economics in these days of international competition and new mercantilism. This is especially true in the relation of England and India which is essentially economic. In fact, some of the qualities leading to self-government are also necessary for industrial prosperity. But the greatest problem of India is that of solving the question of the abject poverty of her masses,

and even self-government itself is partly a means to that end. While the necessity of self-government should not be minimised, emphasis must be laid upon achieving those qualities in individual character which are essential for economic success. Even after the achievement of Swaraj, India's most important problem will still remain unsolved unless the nation is awakened to the necessity of developing national character for industrial success.

3. PUBLIC MORALITY

Equally important is public morality. Indian religions have developed lofty spiritual ideals and high ethical standards. But owing to the relative emphasis which they put on the relation between man and God instead of between man and man, public morality does not get the same impetus to growth as private morality. Moreover, most of the ethical ideals in India were standardised centuries ago, when Society had not reached a high stage of development. The result is that public morality lags behind social development and it is quite inadequate for the solidarity and progress of modern Society, when social intercourse has become diversified and complex.

The diversity of race, creed and language in the country itself is a great hindrance, but custom and prejudice which have crept into the existing religions, invasions and conquests to which the people have been subjected, and the aims and ideals of foreign culture, with which they have been brought in contact, have also undermined the old standard of

morality, while no new standard has yet been established to take its place.

The deleterious effect of the retarded growth of the new standard of public morality in India is too obvious to need any elaborate discussion. Jealousy and litigation, provincialism and sectionalism, clan-nishness and communalism, and cliques and intrigues run rampant all over the country, thus hindering not only the social solidarity, but also economic prosperity. Industrial development in modern times depends largely upon corporate activities, and without mutual confidence and co-operation no industrial success is possible. Only a new social idealism backed by a new national awakening and an enlightened public opinion can regenerate the national life with moral courage and public spirit and with the sense of duty and responsibility.

4. BUSINESS HONESTY

Closely connected with the public morality is the question of business honesty. The tendency to dishonesty in commercial relations is not stronger in India than in other countries. Short weights and measures, adulteration and falsification, petty higgling and cut-throat competition, secret agreements and underhand dealings are phenomena well known all over the industrial world. They have been kept in check only by intelligent public opinion, vigilant State regulation and enlightened self-interest. It is through these agencies that sound business principles and commercial codes can be developed in India.

That public opinion cannot be very strong or intelligent in a country where nine-tenths of the people cannot read or write is easily conceivable. But agitation is also a means of education among the masses and a great deal can be achieved even in India. All that is needed is to have the ideal of business honesty well impressed on the mind of a small group of men who can devote themselves to the cause. The improvement in social justice, including the gradual rise in the age of marriage and similar other social reforms within the past two generations, is the result of the agitation by a small band of workers of the Brahmo Somaj and the Arya Samaj. Still greater and quicker results have been achieved in political fields. Although the ideals of liberty and reform appeal more to the imagination and are thus easily propagated, commercial ethics have also their strong points. They relate to the material interest of the majority of the people and are thus becoming more important with increasing unemployment, growing struggle for existence and rising cost of living.

A still great work in raising business honesty depends upon the State, which is in modern times responsible for carrying out a larger part of social will for social welfare. The enforcement of the law by organising inspection and supervision is of course the primary duty of Government. But the more constructive work lies in the development by Government of a body of law for carrying on business activities in such a way as there are left few loopholes for the infringement of business honesty. The

regulation of joint-stock companies, banking enterprises, patents, trade marks, copyrights and manufacturing processes is one of the important functions of all modern governments.

The most important factor in elevating business honesty is, however, self-interest. That malpractices do not lead to business success is well understood by all business men as soon as the question is raised in their mind; nor is bargaining or higgling profitable in modern business transactions. One of the reasons why some of the malpractices still exist in India is the fact that most of the customers in India are men instead of women as in most of the Western countries, and it is a well-known fact that as customers women are more intelligent and more apt to get their money's worth than men. The success of a business depends upon a steady and permanent market and nothing is a greater asset to a business than good will or public confidence in its business transactions. Honesty has been and will always be the best policy for business success.

5. SOCIAL EQUALITY

This philosophic orientation or the development of a new social attitude towards life and public morality should be accompanied by the reformation of social institutions. All artificial distinctions based on caste, creed and sex must be abolished and Society must be organised with a view to giving every man and woman an opportunity to develop what is the best and noblest in him or her, so that the combined experience of the social self might

be in proportion to the social population. Under the artificial barriers, some of which fall into political and economic fields, an insignificant fraction of India's vast humanity is brought into expression, while by far the largest part of the national self remains dormant or suppressed, and it is the lack of opportunity for self-expression which is one of the fundamental causes of India's social decadence, political subjugation and economic degradation.

The first question in bringing about social equality is the abolition of the caste system. Although a strong fight against it was started by the Brahmo Samaj and the Arya Samaj long ago, it was not until Mahatma Gandhi took the field against untouchability that a nation-wide movement was started to cope with the situation. The awakening of the non-Brahmin and the so-called untouchable is the greatest step in that direction. It is only self-assertion and concerted action on the part of the suffering classes themselves that can lead to the final victory. Every member of the social population must have equal opportunity to develop his or her inner capacity, so that society can express itself to its fullest extent.

The movement for the abolition of the zenana or purdah, i.e.; the seclusion of women, was started several decades ago, but it was not until recently that it assumed a national character. Political agitation, industrial unrest, social reforms, educational facility and political enfranchisement, and above all the legislative power achieved since 1921, have awakened Indian women to a new conscious-

ness of their potential power and future possibilities, and they themselves have taken the field with the cry of "down with the purdah," in order to gain their own rights and privileges. The bringing to the front of one half of the social population for self-expression and self-realisation will not only make the social life of India fuller and richer but will also help in gaining industrial efficiency.

The Child Marriage Restraint Act recently passed is another great milestone in the social progress of India. Like the caste and the zenana, the Brahmo Samaj also started a movement against child marriage over two generations ago. They even succeeded in having passed Act III of 1872, which also fixed the minimum age of marriage for boys and girls at 18 and 14 respectively. But by making the new Act applicable to all sects of the country, it has achieved quite a new significance. Though the marriage age of boys and girls has been fixed at 18 and 14 respectively, there is no doubt that this will be only the minima. It will give boys and girls an opportunity to develop their individuality by better development of body and mind and to become more efficient members of Society in all its aspects, social, political and industrial.

With her childhood freed from the marriage bond and womanhood freed from the seclusion of the zenana, and with educational facilities, economic opportunities, political rights and voluntary motherhood, Indian women thus become a new social force in the national life of India. A new philosophy of life, regenerated public morality, business honesty

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and democratised social institutions, in which all social population, irrespective of caste, creed and sex, have opportunity for self-development, will lay down the foundation of a solid and efficient social organisation, of which industrial efficiency is a part expression.

CHAPTER VI

POLITICAL REORGANISATION¹

POLITICAL reorganisation is still another condition for achieving industrial efficiency. The close connection between politics and economics is self-evident, especially in modern times, when the whole aspect of civilisation has assumed an industrial character. Besides internal and external defence, the modern State has undertaken many other responsibilities, such as mass education, public health, development of natural resources, encouragement of industrial enterprise, and protection against foreign competition. For the adequate discharge of these various duties, the first thing India needs is the nationalisation of her government.

I. NATIONAL GOVERNMENT

That a national government, however imperfect, is preferable to a foreign government² is a mere truism. But whether India should aim at complete independence or be satisfied with Dominion status, as promised by the British Government, is a question which is beyond the scope of this treatise. What is essential is that in order to achieve a full develop-

¹ First published in the *Modern Review*, August and September, 1930.

ment of her industrial efficiency, India must be mistress of her own self and must be free to control social, political and economic forces and to formulate her industrial policies. Such a condition is not incompatible with the Dominion status in its latest conception.¹ The difference between the two countries in geographical situation, industrial development and financial position, as well as their historical connection of over a century and a half, indicate that a close commercial and financial relation between India and Great Britain could be of great mutual benefit provided that such relationship is entered into on the basis of perfect equality and reciprocity.

The advantages of self-government in industrial development are too obvious to need any discussion. Ideals and aspirations which freedom inspires, spirit of toleration and mutual confidence which a democracy enjoins, judgment and forethought which the exercise of statesmanship inculcates, and self-confidence and self-determination, which general literacy, universal suffrage, equality of opportunity, freedom of conscience and freedom of association develop, form the moral and spiritual background of modern social organisation, of which industrial efficiency is only the economic expression.

The truth of this statement becomes evident by the recent events within the country. Although only a beginning of national government has been made by the Government of India Act of 1919,

¹ In the Imperial Conference of 1926, the Dominions acquired the virtual status of the State short of independence.

there has already appeared a new spirit in the social, political and industrial life of the people. Active movements have been started for combating diseases, improving health, reforming society, and controlling national industries. No doubt, some of the movements had been in existence long before, but not with the same national outlook and national spirit. What is more to the point is the rise of a class of self-conscious and aggressive industrialists who are directing their intelligent and concerted efforts toward the organisation and modernisation of national industries. Their success in the federation of all the national chambers and industrial organisations of the country is a great step forward. Their active participation in all the industrial and financial controversies of national importance, such as the exchange ratio, the reserve bank and coastal shipping, has not only strengthened their own industrial position, but also contributed to the growth of industrial and financial consciousness among the people.

One of the most important effects of the establishment of Swaraj will be the liberation from the political movement of India's best genius, including almost the entire *intelligentsia* of the nation, for social and industrial reconstruction. Love of liberty is an inborn impulse in man and self-government is the birthright of every people. Nothing short of Dominion status can satisfy the national demand for Swaraj. Self-government is, therefore, an essential condition for turning the most virile and youthful energy of the country into creative forces

for industrial development and thus solving the question of increasing unemployment and unrest.

X The Indianisation of the Services, both civil and military, will have a far-reaching effect upon the social and industrial progress of the country. The higher education of the Indians for the discharge of State functions will raise the general cultural level of the people. The provision within the country for the liberal and technical training of the prospective officials would add to the existing educational institutions. The administration by the Indians of the Intelligence Department, including census, statistics, research, investigations and reports, will no doubt increase the cultural facilities of the people, the scope of which is at present extremely limited in India. Moreover, the knowledge and experience acquired by the indigenous people will become a great cultural asset to the nation. At present, most of these higher intellectual services are in the hands of the British. Even while in India, because of their social aloofness, they confer scarcely any cultural benefit to the people except in their limited official function. But the fact that they leave the country at the age of fifty-five, when their knowledge and experience might be devoted to some cultural and social welfare work in a non-official capacity, and when their social contact might be an inspiration to others, is a great loss to the country. In fact, nothing has so much impoverished India, morally and intellectually, as the control and the virtual monopoly of most of the higher functions of the State by the British, who have no social interest in the people while in the Service

and who leave India for good as soon as their services are over.

The discharge of the higher State duties and the administration of the higher State functions which form by far the largest organised activities in the country and which are mostly done by the British, will develop self-confidence and a sense of responsibility, not only among those who are actually so engaged, but also among their fellow-men. The shyness of Indian capital and the imperfect development of business administration are largely due to the fact that Indians have been until very recently deprived of the highest functions of the State, which have been the training ground as well as inspiration of large-scale business enterprise among other nations. Moreover, the Indianisation of civil and military services will be a great saving in the national "drain" and will increase the funds for the inauguration by the Government of some of the most useful measures for social and industrial development.

While the nationalisation of the Government or the achievement of Swaraj will lay a foundation, the real work of constructing industrial efficiency and developing national industries will depend upon its social and industrial policy. The most important aspects of this policy will be constructive research, functional education and national economy.

2. CONSTRUCTIVE RESEARCH

The greatest social achievement within the past two hundred years is the phenomenal progress in the sum total of human knowledge—especially in

the natural or exact sciences. This is, in fact, the age of science and it is the scientific understanding of the environment and of the means of utilising it for human purposes which has led to unprecedented social progress. The application of scientific principles to social needs and the finding of exact facts for formulating a new social policy and for directing social activities towards desired ends, constitute what is called constructive research.

For centuries India has lost her former position as a great contributor to human knowledge, notably to philosophy, theology, mathematics, philology and medicine. But what has retarded her social progress is not so much the lack of contribution to the world's culture, as the inability to apply the accumulated knowledge of the world to her social development. The supreme need of India to-day is, therefore, to organise research so that modern science and art might be utilised for her social and industrial development. It is, in fact, the scientific organisation of her national activities in relation to physical and social environment, especially in relation to production and distribution, upon which to a large extent depends her industrial efficiency.

The scope of research work is multifarious and widens every day with the progress of science and art on the one hand and of social needs on the other. Some of the most useful lines of research might, however, be conducted on the following subjects :

(1) Biological principles with reference to the improvement of the existing economic plants and animals and the introduction of the new ones by

selection, hybridisation, and acclimatisation, and the studies of bacteriology, mycology and entomology, with reference to their relations to injurious or beneficial effects.

(2) Chemical laws including physiological principles for improving soil fertility, hygiene and nutrition, and industrial arts.

(3) Physical laws for inventing instruments for harnessing mechanical power and economically utilising animal and human labour in the forms of tools, implements, machinery and plants.

(4) Meteorological laws regarding winds, storms, rains, hails and fogs and their effect upon growing crops and national health.

(5) Geographical and geological surveys with reference to plants, animals, soils and minerals.

Both because of the heavy expenses involved and of the length of the time required, such researches can be best undertaken only by organised social efforts or Government. Private philanthropic organisations and industrial establishments have also undertaken such activities with great success in Western countries. But the scope of such work is very much limited in India. The most important Government institutions for research are agricultural experimental stations, engineering workshops, chemical laboratories and clinics.

Of all the civilised countries of the world, India is the most backward in availing herself of the advantage of scientific discoveries for social betterment. All the daily activities of the people, including household work and industrial processes, are

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mostly guided and controlled by time-worn and obsolete traditions. It is clearly seen in the scarcity of her modern research institutions. Although one or two institutions like the Institute of Science at Bangalore and the Agricultural Research Institute at Pusa were established earlier in the century, it was not until the recommendation of the Industrial Commission of 1916-18 that the significance of scientific research for industrial advancement was realised and proposals were made for the formation of all-India services dealing with chemistry, botany, zoology, bacteriology and entomology. But, except the Forest Research Institute at Dehra-Dun, the Technological Institute at Cawnpore, and the Bengal Tanning Institution at Calcutta, and one or two others, no other research institute of importance as recommended by the Commission came into existence. Most of these recommendations failed to materialise.

One of the greatest needs of India to-day is the establishment of research institutes in all the important centres of the country. Every province or geo-economic region must have an agricultural experimental station, an engineering workshop, a technological institute, and an up-to-date clinic. These institutions may be profitably combined with universities and may all or some of them be concentrated in one or two places because of mutual relationship and interdependence. As far as the cost is concerned, it must be regarded as a national investment, and no investment is likely to be more productive than one designed to equip men and

women with better health, sounder mind and more up-to-date technique for carrying on their life-processes.

Besides research in natural sciences, there is being conducted in modern times a considerable amount of research in social sciences, such as demography, anthropology, ethnology, sociology, politics and economics. While some of these are in the realm of pure science, others are constructive researches including periodical inquiries, regional surveys and historical and statistical studies. All over the world an increasing importance is being attached to these researches as an aid to formulating social policies.

As in the case of natural sciences, research in social sciences is also lagging behind in India. Except the decennial census and a few departmental reports by the central and provincial Governments and occasional regional surveys by the Poona Agricultural College and the Bombay Labour Office, information on the most vital problems of India, such as wealth and income, is very much limited in scope and often faulty in accuracy. For the formulation of social policies there is a great need for social statistics, and the Royal Commission on Agriculture has made a very laudable recommendation in advocating the establishment of provincial and central bureaux of statistics.

The most highly developed lines of social research in India to-day are those of the inquiries by commissions and committees, both by the central and provincial Governments, such as the Industrial

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Commission of 1918-19, the Royal Commission on Agriculture of 1926-8, the present Royal Commission on Labour and various committees on unemployment by the Governments of Bengal, Bombay, Madras, the Punjab and the Central Provinces. The most important effect of these investigations is that, in addition to being an aid to administrative work, they focus public attention and help to create public opinion.

There is one fundamental defect in social research for administrative purposes. Inasmuch as the results of these researches are apt to become handmaidens of administrative policy rather than guides for the development of real social welfare, Government is likely to select members of such committees and commissions from limited intellectual groups who may support its views. In case they are selected from a wider range, the terms of reference may be too limited to give them a chance for the expression of their views. Even in statistical research there is a possibility of a one-sided view, and it is perhaps the realisation of this fact that led the Royal Commission on Agriculture to recommend the appointment in the statistical organisation of the Central Government of an advisory board of leading economists, scientists, and business men without any formal connection with Government, having nevertheless access to, and being thoroughly familiar with, official statistical material of all kinds, so that there might develop in India a school of statistical interpretation.¹ ♦

¹ *Op. cit.*, p. 78.

Apart from the defect of the bureaucratic control of social affairs more or less common in all un-democratic countries, there are other more serious defects in the case of India because of her political subjection. A ruling nation is scarcely willing to inaugurate those investigations, which, however urgently needed for social betterment, might disclose the weakness of its administration. The lack of adequate and exact data on the economic conditions of the people is in all probability the result of this policy. Moreover, the personnel of the research organisation, especially in the higher services, are likely to be drawn from the governing country. It is a notorious fact that most of the officials in higher research services in India are British. Even a considerable number of the members of the commissions and committees for important investigations are recruited from outside. Only six of the twelve members of the present Royal Commission on Labour, for example, are Indians. This has not only made research unnecessarily expensive, for nowhere else in the world are the officials paid such high salaries as in India, but has also limited the scope of scientific research for Indians.¹

In inaugurating scientific research, the national Government should, therefore, see to it that most of the scientists are recruited from among the

¹ Both the Royal Commission on Superior Civil Service and the Royal Commission on Agriculture advocated the policy of keeping a permanent staff of Europeans in the higher services including research. The worst feature of such recommendation is the implication that Indians are not capable of the high-grade scientific work. See *Report of the Royal Commission on Agriculture in India*, abridged edition, p. 86.

Indians. Whenever they are not available, promising young men, after a thorough education in Indian universities, should be sent abroad for scientific education, and prominent scientists should also be invited from Europe and America for a certain period and with a clear understanding that their duty would be to prepare the Indians for work in their respective fields. Such a policy would not only increase the scope of scientific research for Indians, but it would also help to popularise scientific research.

3. FUNCTIONAL EDUCATION

While research adds to human knowledge, education assimilates this new knowledge into social traditions and translates it into social actions. By far the largest part of human capacity lies dormant and the function of education is to develop the potential faculties into social attitude and social activities. Society is always in the process of growth. Both internal and external forces bring a community into a new social situation together with its peculiar social problems. Social progress depends upon the solution of its specific problems with reference to its internal and external conditions. The adaptation of the individual into the changing social situation, while developing the latent faculties into social attitudes and social actions, constitute what may be called functional education.

The aim of the educational system in India has been to perpetuate the hoary and archaic past with-

out any reference to the existing conditions of India or of the outside world. This system of education is one of the essential causes of her social stagnation and industrial degeneration. For social, political and economic progress what India needs is the introduction of functional or scientific education with special reference to her existing conditions on the one hand and to those of the world on the other. It cannot be doubted that the educational system should be based on national culture, but its main object should be to adapt Indian people to the international situation.

The first step in national education is universal and compulsory primary education, the lack of which is one of the fundamental causes of India's downfall. "The one thing needful" in India to-day is the introduction of mass education. Social regeneration, political reorganisation and industrial reconstruction all depend upon mass education. The first claim a child has upon Society or the State is that he is entitled to free elementary education so that when he grows up, he can understand his rights, perform his duties, exercise his privileges and follow an independent industrial career. Every Government calling itself civilised has recognised this primary obligation to children. The British, who have failed to introduce it into India, over which they have had absolute power for over a century and a half, introduced universal compulsory education into their own country over half a century ago. Even now the British Government in India has avoided the issue by transferring it to

the mercy of local administration by the Government of India Act of 1919. The result is that up to the year 1927-8, only 114 municipalities and 1,527 rural areas, out of a total of 500,088 towns and villages in British Provinces¹ had introduced compulsory primary education.

What is essentially needed is the recognition by the State in the new constitution of the Government of India that primary education is its first duty towards its citizens and that provision is made by all provincial Governments so that every Indian child may have the opportunity of enjoying this fundamental right. If any provincial Government should prove unable to carry out its primary obligation for lack of finance, the federal or central Government must take over the responsibility. That primary education in order to be successful should be free, compulsory and universal in India as in other countries needs scarcely any discussion.

The length of the period for primary education depends upon two conditions, namely, national ideals and international conditions. Every man and woman must be a worthy and intelligent citizen in modern democratic society, and the period of education must be sufficiently long to give him or her an opportunity for acquiring knowledge for active participation in the cultural progress of the country. Moreover, modern nations are so interdependent, especially in international trade, that one nation cannot remain behind another in educa-

¹ The figure for towns and villages refers to the Census of 1921.

tion without impairing its competitive power. Like modern warfare, industrial competition involves the full national strength, including the education of the masses and the intelligent participation of all workers in national industrial activities.

The maximum age of compulsory primary education in India should not only be the same as in other advanced countries, but under the social and economic conditions of India, it ought to be higher than that of other countries. In the first place, institutional education in schools and colleges forms only a small part of our education. By far the largest part is imparted by social traditions, which form not only the subconscious but even a large part of our conscious life and determine our character. Social traditions in India being unorganised, unscientific and inadequate, it behoves that Indian children should receive higher and longer institutional education to make up the deficiency. In the second place, in these days of world economy and international trade, the industrial success of a nation depends upon its purchasing power. The natural resources of India being comparatively limited in proportion to her vast population and as required by an international standard, India must make up her deficiency in natural resources by higher efficiency in labour power which can be achieved only by higher and longer education, including vocational training.

That primary education should be supplemented by elaborate courses in secondary and college education of sufficiently long duration goes without

saying. It will be the ideal of the Indian nation to set up for each district one university well equipped with all the branches of modern science and art, including colleges of agriculture, engineering, and medicine. The university education should be supplemented by post-graduate courses in the centre of higher learning and be linked with research studies offered in special institutions located at the metropolis and other suitable places of the country already referred to.

In organising higher education, emphasis should, however, be laid upon natural or exact sciences. The dominating spirit of Modern Age is science, and nowhere is the knowledge of exact sciences in greater need than in India, where the higher classes are imbued with metaphysics and theology and the masses with mythology and superstition. India needs, above all, a rational attitude towards life and a positive background for social and industrial re-organisation. It is the solid foundation of scientific knowledge upon which depends industrial efficiency and material progress.

All education in the primary and secondary schools and colleges should naturally be imparted in the vernacular. Nothing has caused so much wastage in the education system of India as the use of a foreign language for the study of science and art. It is nothing but criminal to make a people think in a foreign language in order to carry on its life processes. Besides the vernacular, there must be a common language for all India and such a language must be one of the existing languages which has its

root in the national culture and has affinity with other existing languages of India. Nothing could be better suited for this purpose than Hindi,¹ which is understood by the largest number of people in the country. It is necessary that some knowledge of this common language should be imparted even in the last year or two in the primary schools. Organised industries are so scattered in different parts of the country and migratory labour is so important in modern times that a common language will be extremely useful to a large body of immigrant workers, e.g., those in Assam tea gardens and Bengal jute mills. The lack of a common language is not only detrimental to social assimilation, but also to the industrial success of most of the immigrants.

Education, however, does not end when one leaves school or college, but continues throughout life. This is especially so in modern times when social traditions continuously change and readjust themselves with the progress of science and philosophy. A person leaving school at fifteen will find himself out of place in the changing social conditions at fifty if he lacks the facilities for the continuous development of his mind. The realisation of this fact has led modern nations to devise means of what is called adult education. Of the various methods of adult education, the following might be mentioned as the chief, namely, short courses and lectures, demonstration and exposition, fairs and shows,

¹ The two most important languages of India are Western Hindi, which is spoken by 97 million population, and Bengali, which is spoken by 49 million population.

dramas and concerts, libraries and reading clubs, plays and recreations, and political leagues and social clubs.

While general education forms the background, the first step in the scientific organisation of labour forces for productive purposes is vocational education. Vocational education means a conscious and purposive training for certain specific types of work in the industrial organisation of society. It is on the development of the latent human capacities in certain industrial lines wherein lies the industrial efficiency of a nation. Every boy and every girl, as a future member of Society, is entitled, in addition to general education, to vocational education for a certain industrial career.

Vocational education must, however, be preceded by the choice of a career. Up to the present it has been done by empirical methods, i.e., by caste and custom, both of which are very crude ways of determining a career, especially in modern times, when the division of labour has reached a very high state of development and special training is required for each trade. The most up-to-date method of choosing a career is the psycho-physical test by which the potential capacities of children might be determined. Like inspectors of schools, the State must also employ psychological and medical experts for giving children advice as to their future career.

After the selection of vocation comes the question of education for a career. Apprenticeship as a method of vocational education is quite inadequate for a modern industrial career. Modern industrial

technique has developed to such an extent and it requires such intensive studies both in theoretical and applied sciences, besides practical training in industrial organisation, that very few industrial establishments can have adequate facilities for such education. It can be imparted only by the institutes of technology and colleges of engineering, supplemented by industrial schools.

One of the fundamental causes of India's industrial inefficiency is the lack of facilities for technical education. The necessity of a diverse system of education in a country predominantly agricultural was first realised by the Indian Famine Commission of 1880. The Commission for revising the existing system of education emphasised the importance of technical education in 1882. In 1888, the Government of India pointed out that technical education could be provided with advantage for those industries which had fairly advanced, i.e., textile and engineering industries, and suggested that the local Governments should take action in this direction. But this recommendation failed to materialise, and even after the Educational Conference of 1901, no provision was made for the development of technical education on any appreciable scale.¹ The Industrial Commission of 1916-18 again emphasised the importance of developing technical education and laid down an elaborate scheme in its recommendations. But little progress has been made in that direction. It is only through technical education that the industrial organisation of the country can be kept abreast of

¹ *Indian Industrial Commission, 1916-18, Report, p. 93.*

the times and the latest industrial technique can be utilised for the development of national industries.

The next step in vocational education is the training of managers and technical staff. According to the Census of 1921, of the large-scale industries, four-fifths of the cotton mills and two-thirds of coal mines are managed by Indians, but about four-fifths of the railway works, three-fourths of tea-gardens and two-thirds of engineering works are managed by Europeans and Anglo-Indians.¹ The lack of technical staff, including managers, is a great drawback to the growth of large-scale industries. It is by education and training in engineering and technology that an adequate number of technical staff can be provided.

Like technical education for higher industrial careers, education in more or less unorganised industries, such as arts and crafts or cottage industries, is also lagging behind. The first attempt in this direction was made in the seventies, when the modern type of industrial school was established by Christian missionaries in Madras to provide instruction in such trades as carpentry, blacksmithing and weaving and tailoring. This system has been copied in other parts of India and is at present imparted by three distinct agencies, namely, Government, local bodies, e.g., municipalities, and private enterprise, including mission schools.² But for the lack of general education, industrial education has

¹ Compiled. *Census of India, 1921, Report 2*, pp. 277-301.

² *Indian Industrial Commission, 1916-18, Report*, p. 97; Clow, *The State and Industry*, p. 50.

scarcely made any headway. The organisation of industrial education among the masses is a bounden duty of the Government and is the only sure way to industrial success.

Industrial education should be imparted to men and women alike. Like every man, every woman is entitled to an industrial career. It is necessary not only for unmarried and widowed women, but also for a large number of married women, who are employed in all kinds of industries, such as factories, mines, and tea-gardens. Out of 86 million adult women in 1921, 46 million were returned by the Census to be gainfully occupied. The lack of industrial education for women, who roughly form about one-half of the social population, is one of the essential causes of India's industrial inefficiency and economic backwardness. In every industrially advanced country, in addition to men, a large number of women with vocational training are employed in modern industries which are competitors of similar industries in India. To preserve India's competitive power alone requires industrial education for women. The vocational education of women should include domestic science or home economics. One of the first principles of national economy is the economy of the household or how to make the most use of the resources or the income of a family. Like industrial establishments Indian households are badly in need of reorganisation with a view both to saving time, energy and expenses. It is only with the help of scientific education that Indian women can reconstruct their households.

Not only young men and women should be given vocational education, but they must always be kept in touch with the progress of industrial technique even after they have left the industrial school and entered an industrial career. This can be done by offering special and short courses, night schools, demonstration and exposition and other means of general adult education.

4. NATIONAL ECONOMY

From the point of view of industrial efficiency, the most important function of the Government is, however, to formulate the policy of national economy and to adopt the means for its realisation. By far the major part of the organised industrial activities of a country are the results of herd instincts, group habits, and economic necessities, and, as such, have developed unconsciously or without any organised effort or definite plan on the part of Society. With the growth of social consciousness, there have been growing concerted efforts on the part of the State to develop industrial activities for national prosperity. The best historical example of the State activity for increasing national wealth is the rise of mercantilism in the sixteenth and seventeenth centuries, and although it was followed by a reaction toward *laissez-faire* in the eighteenth century, the policy of national economy or new mercantilism has again found its way into the practical policy of almost all the advanced nations.

State aid to industries was not unknown to ancient India, and the East India Company under-

took industries even under State direction and protection. They helped the growth of some industries while they discouraged others. With the growth of the doctrine of *laissez-faire*, and the transference of the Government from the Company to the Crown, the industrial policy of the Government underwent a profound change and not only the State industrial activities were discontinued, but even any help to industries was regarded with disfavour, except to those which were connected with irrigation, forestry and certain other public utilities.

The Famine Commission of 1880 advocated State aid to industries, but nothing was done for developing industries and preventing increasing poverty. Successive famines towards the end of the century gave rise to a new consciousness among the people, who came to realise the economic effect of foreign rule. The partition of Bengal in 1905 gave occasion for the expression of national feeling against British policy in India. The boycott of British goods was organised, which was soon followed by the *Swadeshi* (the use of country-made goods) movement. In the meantime, some of the provincial Governments made sporadic efforts for improving cottage industries, and the Government of Madras even opened a Department of Industries. But it was not until the outbreak of the War that Government realised the importance of making India self-sufficient as far as some of the basic industries were concerned. In 1916 there was appointed the Industrial Commission with a view to indicating

new openings for profitable employment of Indian capital in commerce and industry and to pointing out the manner in which Government could give direct encouragement to industrial development.

The Commission made its report in 1918. The underlying principle of its recommendations was that in the future Government must play an active part in the industrial development of the country.¹ The Commission found India rich in raw material and industrial possibilities and made several recommendations, of which industrial research, technical education, financial aid to industries and purchase of stores in India were the chief. Some of the recommendations were incorporated into the new Constitution by the Government of India Act of 1919, but the actual work of industrial development by Government was transferred to provincial Governments.²

In the meantime the Munition Board, established in 1917 for war purposes, encouraged the growth of several industries, and the stimulus given by war conditions also helped the growth of industrial enterprise in the country. The Departments of Industries were organised in the provinces soon after the inauguration of the new Constitution and some other recommendations were also given effect to. The State Aid to Industries Act was passed in Madras in 1922 and the example was followed by other provinces. The Indian Fiscal Commission of 1921-2

¹ *Report of the Indian Industrial Commission (1916-18)*, Summary, p. 2.

² Clow, A. G., *The State and Industry*, pp. 24-25.

unanimously recommended the adoption of the policy of protection to those industries which had national advantages and which could not be developed otherwise and which, when developed, would be able to stand the world competition.¹ The policy was first given effect to in 1924, when the Steel Industry (Protection) Act was passed, thus introducing a new chapter in the economic history of India.

The industrial history of the past ten years, however, scarcely raises any hope that the industrial policy of Government will be sufficient to meet national demand and bring about any real amelioration in the economic condition of the people in the near future. The reasons for such a pessimistic view are clear enough. India has as yet reached neither political nor industrial autonomy. No bold scheme has been devised for developing the material prosperity of the people. A policy of national economy must be adopted for upbuilding the industrial efficiency of the nation and for accelerating its economic development.

The first step in national economy for India is the establishment of industrial autonomy. Being dependent, India has to attain it along with her political autonomy or Dominion status. Thus far India has been practically the tail end of the British industrial organisation for the supply of raw material and for the purchase of finished products. This policy has not only ruined India economically, but has also caused a great economic loss to Great Britain herself, inasmuch as it has lowered India's

¹ *Ibid.*, p. 115.

purchasing power. Moreover, the present unrest in India has resulted partly from frightful economic conditions. The industrial development of the country must be freed from all outside interference and directed along the lines which are most advantageous to her self-interest. If necessary, India might, of her own accord, enter into commercial relations with Great Britain on the basis of reciprocity, but only on certain definite lines.

In recent years there has been developed an idea of Imperial industrial combination under the name of Imperial Preference and Empire Free Trade. The scheme does not mean free trade at all, but "is merely Protectionism infused with a crude materialistic Imperialism," as the *Manchester Guardian* has pointed out.¹ It is only a new method of subordinating the interest of the Dominions, Colonies and Dependencies to the interest of Great Britain, and it is doubtful whether the Dominions, which have built their manufacturing industries with the help of tariff, will allow British manufactures to compete with their own.² As a Dependency and an unequal partner, India will, in all probability, come out worse off in the bargain; and it is unlikely that she will join any such combination except on the basis of Dominion status and reciprocity.

In the second place, national economy will

¹ *The Manchester Guardian Weekly*, 31 January, 1930, p. 82.

² It is hopeless to expect Australia to agree to Empire Free Trade, declared Mr. Scullin (Premier), commenting on the debates in the British House of Commons on 29 January, 1930. *The Times of India*, 3 Feb., 1930, p. 11.

lead to the regulation of foreign monopolies which have been developed in India during the past half-century or more, and which have retarded the growth of indigenous industrial enterprise. The most important example of these industries is the coastal shipping, for the control of which there is already a Bill in the Legislative Assembly. All the national industries, of which the coastal shipping is one, should be reserved to the indigenous people, and foreign industrialists should be allowed to carry on business only upon certain conditions, such as the registration of the companies in the country, the employment of the higher staff and board of directors partly from the Indians, and the distribution of a certain number of shares among the people of the country. It must be at once laid down that there should be no confiscation without compensation. India needs rapid industrialisation, and nothing can help her more in this respect than foreign capital. Whenever foreign industries in India have to be regulated, or taken over, adequate compensation should be made for the loss of capital investment and goodwill.

In the third place, attempts should be made to develop within the country all the basic industries, which are required to supply the essential needs and which are necessary for an industrially independent existence as a nation. It is not proposed that India should try to become completely a self-sufficient country—a thing which is impossible in these days of international culture and commerce. But India having a variety of climates and

geographical regions and a vast supply of resources, must utilise them to the fullest extent, especially as over one-third of her man-power remains unemployed throughout the year.

Self-sufficiency in basic needs on the part of India implies, however, a substantial reduction from the Indian market of British cotton goods, the export of which is one of the most important sources of national income to Great Britain and which thus raises a complicated political issue. The recommendation is made here purely from the economic point of view, on the presumption that while it will be of immense benefit to India, the latter's prosperity and higher purchasing power will ultimately reflect upon Britain's trade, although temporarily there might be some reorganisation of her trade relation with India.

Trade is a benefit to both parties concerned and to Society in general as long as it is voluntary. But trade based on compulsion or special privilege is an exploitation, as in the case of slavery and serfdom. In building her cotton goods trade in India, Great Britain took advantage of her political power. Both the decline of the once flourishing handloom industry and the retarded growth of the cotton mill industry, on which was levied until recently an excise duty, were the direct results of the British economic policy in India. This policy is one of the essential causes of India's poverty. Besides food, what the Indian masses need is clothing, which they themselves made before, and even in the early days of British rule, and for the manufacture of which India has all the

advantages in the world except her national Government and an intelligent policy of national economy.

What are the different lines along which India can and should develop her industries is a problem which can be determined only by scientific analysis. For this purpose Government should appoint a body of economic experts like that of the Agricultural Council. The body might be called the National Industrial Board to be attached in the advising capacity to the Minister of Industry of the central Government, with a branch in each province. The proposal for a similar board was also made by the Industrial Commission of 1916-18.¹ The industries in India are so backward and the economic condition of the people so depressing, that one of the immediate aims of the new constitutional reforms should be to increase the number of the economic departments in the central Government, including Industry, Agriculture, Commerce and Labour. Each department should be in charge of a minister. Provincial Government should have Ministers of Agriculture and Industry, also a Minister of Labour in such provinces as Bombay, Bengal and Assam.

In the fourth place, Government must adopt the policy of protection and the system of State-aid, such as bounties, subsidies and loans for the development of national industries. The theories of Free Trade versus Protection are well known, but whatever may be the ideal among theorists, few countries have complete free trade except such helpless countries

¹ *Op. cit.*, p. 190. Since this writing, the Government of India has accepted a resolution in the Assembly to that effect.

as India, which has been the dumping ground not only of Great Britain, on which she is dependent, but also of almost all other countries which have resorted to high protective tariff for their own industries. Since the War most of the Central European countries have been building their national industries behind the tariff wall. India cannot afford to retain free trade in the face of the world's competition, and under her present social, political and economic conditions. In fact, she has already adopted the policy of protective tariff, as pointed out before. What is needed is the development of a "scientific" tariff system under a Tariff Board, which has also already come into existence. It should be brought to its logical conclusion. State aid, such as subsidies, bounties and loans, must also be advanced for the development of certain public utility services, e.g., coastal shipping, and new industrial enterprise, e.g., marine fishing. The importance of granting bounties in the case of the cotton mill industry was realised even by the Indian Tariff Board on Cotton-mill Industry in 1926.¹

The scope of State aid must be extended to arts and crafts or cottage industries, especially in the form of loans. The cottage industries still supply the largest part of national needs for manufactured goods, and they are as much subject to foreign competition as the large-scale industries. Moreover, being scattered, unorganised and in most cases antiquated, they are in great need of State aid for

¹ See *Report of the Indian Tariff Board on the Textile Industry Enquiry, 1921*, pp. 185, 199.

modernisation, improvement and financing. The first step in this direction has been undertaken by the State Aid to Small Industries Act of Madras and Bihar and Orissa. Such measures should be adopted by other provinces, the number of industries eligible for loans should be enlarged and the amount of grant should be made more generous. Moreover, there should be also a central organisation under the auspices of the proposed National Industrial Board to take care of the interprovincial and national aspects of these industries.

The last and by far the most important industry requiring State aid is Agriculture. High rent of land, heavy indebtedness and exorbitant rate of interest leave the cultivator scarcely anything for investment in agricultural improvement. The financing of agricultural enterprise is, therefore, one of the greatest national problems. This can be solved only by making the cultivator solvent and by lending him sufficient capital at a very low rate of interest. The first step in that direction will be to free the cultivator from the clutches of the local money-lender. The Co-operative Societies Act of 1912 had for its object the replacement of the money-lender as a source of credit and the institution of Village Credit Societies on the *Raiffeisen* model.¹ Government has also passed several measures, such as the Usurious Loan Act of 1918 for controlling the rate of interest. But these measures have not proved adequate. Government must have a definite plan so that the cultivator may be freed from his heavy indebtedness

¹ *India in 1927-8*, p. 98.

in the course of ten or fifteen years. In the second place, the cultivator must have adequate capital for the operation and improvement of his farm. The necessity of improving rural credit was realised by the Government early in the nineties and the Co-operative Credit Societies were established in 1904. By 1927-8, the number of these societies rose to well over 70,000.¹ But the scope of work is still very much limited and the amount of capital advanced inadequate. It needs improvement and extension.

The most important step in this direction will, however, be the substitution of the present land revenue system by a graduated income-tax so that the cultivator below a certain income may be freed from the payment of rent, which often amounts to one-half of his profit. The land system has not only proved a veritable hardship to the poor cultivator, but also a great obstacle to agricultural progress, inasmuch as it has reduced considerably the agricultural capital of the country. This substitution may involve some financial loss to the Government in the beginning, but it will be more than compensated for by the general agricultural prosperity which will in the course of time follow. A prosperous rural community will pay more income tax than the rent of the present poverty-stricken peasantry.

That protection or State Aid, especially the former, is not an unaimed good must be readily admitted. Indiscriminate protection may lead to inefficiency,

¹ *India in 1927-8*, p. 373.

favouritism and increase of prices, but these defects can be easily remedied. Industrial inefficiency arising from protection can be controlled by restricting its scope only to those industries which have natural advantages and for which there is a national necessity. Such principle has already been made the basis of India's protective policy. Moreover, any industry which seeks protection or applies for the renewal or increase of tariff must be made to adopt the principle of rationalisation as a preliminary condition. The question of favouritism, i.e., protecting or aiding a few selected industries among a host of others, can be easily solved by granting protection or State aid to an industry only on the ground of its national importance. Moreover, under the scheme advocated here, almost all the important classes of industries of the country will receive protection or State aid in some form or other. It must also be remembered that the development of one industry has a salutary effect upon others. Large-scale industries, for instance, help the reorganisation and modernisation of agriculture, as in the case of the United States. The greatest defect of Protection is, however, that it is apt to give rise to monopoly or to encourage the increase of prices. The hardship of Indian masses from increased prices, especially of cotton goods, cannot be minimised. It must, however, be mentioned that the consumer is expected to derive benefit from general prosperity, which protected industries are sure to confer upon the country. Moreover, protection need not increase prices beyond what is

absolutely necessary to encourage national industries. If it does, the State in granting protection to an industry has the right to supervise its operation as regards rationalisation and price fixation. As in the case of public utilities, the supervision of price fixation may be assigned to a specially created section of the Tariff or Public Utility Board.

Finally, the question of nationalising some of the natural resources and public utility services must also be considered from the point of view of national economy. The economy of the State versus private ownership is an old but still controversial question. The problem has, however, two aspects; namely, economy in production and justice in distribution. The question of distributive justice is beyond the scope of the present inquiry. The point which should be kept in mind in connection with nationalising these resources and services is whether such step will lead to economy and the efficiency of the nation. The question is a technical one and can be decided only by expert bodies such as the National Industrial Board and similar other organisations.

CHAPTER VII

INDUSTRIAL RECONSTRUCTION ¹

THE most important method of achieving industrial efficiency is, however, the reconstruction of industrial organisation. The ability to apply the most up-to-date industrial technique, including both scientific discovery and mechanical invention, to productive processes is the greatest achievement of modern society, and it is the capacity of readjusting old industrial systems to modern conditions in which lies the secret of industrial success among advanced nations.² While improved health, regenerated society and benevolent government might form a solid background and create a favourable atmosphere, the industrial success of India depends largely upon the reconstruction of her industrial systems in the light of modern science and art.

I. INDUSTRIALISATION OF PRODUCTION

The fundamental principle of modern industrial organisation is industrialisation, of which the most

¹ First published in the *Modern Review*, May and June 1930.

² The organisation of industrial institutions has developed to such an extent in Western Europe and America that the whole society has assumed an industrial outlook. It is for this reason that modern society and civilisation are often called "industrial".

conspicuous example is the factory system. The principal features of industrialisation are the application of machinery and mechanical power to productive processes, industrial undertakings on a large scale and on a corporate basis, and production for a distant market and much ahead of consumption. There are many advantages of industrialisation, such as minute division of labour and its consequent specialisation, full utilisation of raw material and of the by-products, efficient organisation and full employment of capital, including machinery and industrial plants, economy in the purchase of raw material and in the distribution of finished products. In short, the efficiency of modern industrialism lies in its economy of land, labour and capital for productive purposes.

Modern industrialism is not without its disadvantages. The most obvious effect is the rise of industrial towns with their overcrowded slums and consequent vice, crime and infant mortality. But these defects are not inherent in the factory system. The death-rate and infant mortality are much higher in rural India than in industrial England or Germany. In fact, it has been found that due to better sanitary arrangements, the condition of health is much better in small cities than in rural districts. Another defect of industrialism is the rise of capitalism and its consequent concentration of wealth and power in the hands of a comparatively small minority. But the relation between industrialism and capitalism is historic and accidental rather than essential and intrinsic. When modern industrialism first appeared

in England, the dominant philosophy of the time was *laissez faire*, individualism and private enterprise rather than State control, which had fallen into disfavour under mercantilism. Had industrialism appeared a century before, instead of private capitalism there might have been State socialism, which is being attempted by Russia to-day. Moreover, the distribution of wealth under the feudal system was not less objectionable on that ground than under capitalism. The greatest defect of modern industrialism is perhaps unemployment. The problem is, however, receiving the attention of modern Society. In spite of these defects, the factory system is the most efficient method of production which has been achieved through man's gradual conquest of Nature for centuries.

How to industrialise productive processes is one of the greatest problems before India to-day. Except for the question of self-government and universal education, no question is more important to India than that of industrialisation. In fact, from the point of view of national welfare, the solution of the poverty problem is the supreme need in India, both national emancipation and mass education being largely means to that end. Nothing would help her more in the solution of that problem than industrialisation. India must concentrate all her energy for the industrialisation of her productive processes.

From the point of view of industrial progress, industrialisation for India is not only economical, but it is also inevitable. This is an age of world

economy. The facilities for communication have brought all the regions of the world into one common market. No geographical distance or tariff barrier can keep a nation away from this international market. Both for industrial success and economic independence, India must prepare herself to withstand world competition. Every day her home markets are being flooded with foreign goods and the products of her arts and crafts are being replaced by those of the industrially advanced countries. India must equip her workers, engaged in productive processes, including household duties, with the latest industrial technique, such as machinery and mechanical power. In fact, India owes modern industrialism to her people. If it be a crime for a nation to send its untrained and unequipped citizens to modern warfare, which is more or less a temporary affair, it is a still greater crime for a nation to leave its industrial workers unequipped and untrained in an international industrial struggle.

✓ Not only mass-production should be resorted to in the case of all standard goods, but even specialised commodities must be produced with the help of modern science and art. The age of cottage and small-scale industries is not over, but their revival and success depend mostly upon industrialisation. Modern tools and implements and even small machinery must be advantageously utilised and modern industrial technique must be introduced. The economy of large-scale industries in the purchase of raw material and in the sale of finished products can also be taken advantage of by the formation of

co-operative organisations. Moreover, with the generation of electric power from the abundant supply of water resources, there is a possibility of utilising mechanical power even in cottages and workshops and thus reviving many arts and crafts in which India once occupied a world market.

✓ In reviving arts and crafts in cottages and workshops, it must, however, be remembered that a nation, like an individual, has to find out how it can produce things of the greatest value with the least expenditure of land, labour and capital. Owing to the sub-tropical climate, the intensive physical labour is not possible in India to the same extent as in the countries of the colder climate! It will, therefore, be more economical for India to devote her time to those industries which require more of mental labour than of the physical. Moreover, the natural resources being comparatively limited in proportion to her vast population, India should also put more labour per unit of the resources, that is, specialise in the manufacture of commodities for foreign markets as in the olden days. In this connection industrial tradition must also be taken advantage of. ✓ High-class workmanship has become the social heritage of Indian artisans, and although it has lost its past glory, it still remains in national tradition and can be revived. ✓ In short, cottage and other small-scale industries must be revived for the production of works of art and highly finished products, such as shawls, jewellery, embroidery work and ivory carving.

As to the revival of the *khaddar*, or hand-woven

cloth from hand-spun yarn, as a cottage industry, it might be said to be only a palliative measure for solving India's under-employment. As long as the peasant or the artisan remains without work for about half the year, and as long as he is given no other chance of utilising his enforced idleness more profitably, whatever he can earn, so much the better for him. At best, it is only a "sweated" industry and its success has been brought about largely by patriotism. But patriotism based on uneconomic production cannot last long. From the economic point of view, it incurs a great loss, and time devoted to the production of the *khaddar* might be utilised for the production of goods of much higher value.

Even agriculture needs industrialisation. Like a factory, a farm is a business undertaking and production must be undertaken with reference to market valuation. Hitherto the cultivator has produced mainly for home consumption and sold the surplus, if there were any. This very fact has kept agriculture in a static condition. It is only the stimulation of market value and of industrial competition that keeps farm operation, as in fact any other industrial process, on the move. It is not to be denied that certain crops should be produced for home consumption, but every cultivator must devote himself to the production of certain money crops, which keep the farmer in touch with the outside world.

The importance of industrialisation has been fully realised not only by the capitalistic farmers of

America, but even the small farmers of Holland, Denmark and other European countries. While scientific methods are directly resorted to in production, the marketing of products is generally taken care of on the co-operative basis, thus realising the economy of large-scale production. Co-operative marketing will similarly be of immense help to India in making agricultural industries more profitable.

The most difficult problem of Indian agriculture is the introduction of modern industrial technique into farm operations. *Conservation of soil fertility, selection of seeds and plants, scientific breeding and feeding of live-stock, control of pests and diseases, consolidation and enlargement of farms, communication and marketing, and similar other aspects of scientific agriculture have received the attention of the recent Royal Commission on Agriculture, and there is very little to add for the present to its various suggestions and recommendations.

The last and not the least important of the economic institutions is the household, which needs as much industrialisation as any industry, such as workshop and farm, as far as the application of science and art to its function is concerned. There was a time when the household was not only a home, but also a place of occupation or vocation. All the necessaries of life were produced in the household. With the progress of industry, specialisation of occupation and division of labour, as well as the facilities for transportation, the old household has broken down and many of the occupations have been taken from the household

to the factory, such as canning, baking and laundering. But there are still left many productive processes, especially in India, which are still to be done in the household. Such processes as husking and milling are still done in the crude fashion, and women are devoted to the work from morning to evening without any leisure for the development of intellectual aspects of life. The value of time may not be appreciated in a country where millions are born to starve and die untimely deaths, but such a condition of things is a great detriment to the social and industrial progress of the country.

2. RATIONALISATION OF INDUSTRY

Next to industrialisation of production, the most important question is that of rationalisation of industry. With great advance in industrial technique and corporate finance as well as in growth of international competition, the industries in each advanced country are reorganising themselves on a new basis with a view to eliminating wastage in productive processes. This process of industrial reorganisation has come to be known as rationalisation.

Although the process of rationalisation had long been going on, it was not until 1921 that it began to be intensely applied to America and still later in Europe. There is not yet any agreement of opinion as to the exact definition, but the one adopted by the International Economic Conference in 1927 is "the method of technique of organisation designed to secure the minimum waste of either effort or

material.”¹ The same Conference considered that the aims of rationalisation are to secure maximum efficiency of labour with the minimum of effort, to standardise patterns and designs, to avoid waste of material and power, and to economise distribution. Conceived thus, rationalisation includes management of business or scientific management, with which it is sometimes identified, conservation of resources, organisation of capital and administration of labour with a view to obtaining the highest amount of product with the least amount of effort. For the sake of convenience, rationalisation is used here in the sense of reconstructing only industrial organisation, leaving out other phases for subsequent discussion.

While industrialisation of production is a step towards rationalisation, yet the two processes are not necessarily the same. The one is concerned with the introduction of modern industrial technique to productive processes, the other attempts to eliminate waste in land, labour and capital, utilising industrialisation whenever it is calculated to eliminate wastage.

From the national point of view, the first step in rationalisation is the *allocation* or the establishment of industrial units with special reference to raw material, mechanical power, transport facilities and market advantages. Most of the industries grow up with reference to these conditions, as cotton and jute industries in Bombay and Bengal respectively,

¹ Cf. Johnston, G. A.: “Rationalisation and Industrial Relations,” *International Labour Review*, November 1929, p. 260.

but conscious and concerted efforts are still necessary for avoiding wastage. The second phase is the *concentration* of industrial establishments in certain localities, as the jute-mills around Calcutta, leading to the economy of transport and marketing. The third phase is the *co-ordination* of industries which are more or less interdependent, as coal and iron and steel industries.* The fourth phase is the *amalgamation* of the kindred industries into one whole and under the same management, such as packing of meat and manufacture of candles and gelatine. The fifth phase is the *combination* of different industries of the same or allied nature. This can be achieved either by the simple gentleman's agreement or by cartels and trusts.

The industry which needs immediate rationalisation in India is the cotton-mill. The cotton industry has always been and is still the premier industry in the country. Besides food, what the teeming millions in India need is cotton cloth. In fact, cotton manufacture is next to agriculture in importance and the annual value of the cotton-piece goods consumed in the country would amount to Rs 169 crores.¹ At present, this need is supplied by hand-looms, foreign mills and Indian mills. †Of the 4,479 million yards of cotton-piece goods consumed in the country in 1925-6,

¹ In 1925-6 India imported 1,564 million yards of cotton-piece goods at the value of Rs 57.9 crores. On that basis the value of 1,529 million yards consumed in the country and forming 34 per cent. of the total would amount to Rs 156.6 crores, and that of the whole amount to Rs 169 crores, assuming that all the piece goods were of the same value. See the text following.

1,160 million yards, over 25 per cent., were produced by the hand-loom, 1,529 million yards or 34 per cent. were imported, and 1,790 million yards, or 41 per cent., were supplied by Indian mills.¹ The hand-loom industry for ordinary cotton-piece goods is not an economic proposition in the long run, however necessary it be at present. Nor is it economical for India to depend upon foreign countries for the vital necessities of life. On the development of national economy, India will find it economical to supply her people with the cotton-piece goods of her mills. On that basis, there are prospects of increase in Indian mill production by 140 per cent. more for the domestic consumption alone.

The cotton-mill industry has still another function to perform in the national economy of the country. In these days of international interdependence and exchange economy every country must produce some commodities advantageous to her national economy for exchange with those of others. From the earliest times cotton fabrics have been one of the most important commodities for exchange. Although the fine cotton and the wonderful art of weaving of old are lost, in the supply of raw cotton for the production of cloth for common use, India stands second only to the United States, and has already built an industry which is the fifth largest in the world.² She has already developed a large

¹ *Report of the Indian Tariff Board on the Cotton Textile Industry Enquiry, 1927, Vol. I, pp. 238-9.*

² In 1929, India had 5.30 per cent. of the world's spindles and 5.34 per cent. of the world's looms.—*The Indian Textile Journal, February 1930, p. 220.*

export trade, the value being Rs 7.79 crores in twist and yarn and manufactures in 1928-9.¹ After almost continuous expansion from 1899 to 1922, the principal industry has begun to undergo depression.

What the cotton-mill industry in India—especially that in Bombay City—needs is rationalisation.² The Tariff Board on the Cotton Textile Industry Inquiry of 1926, which was appointed by Government to consider millowners' application for protection, recommended several remedial measures, such as increase in labour efficiency and improvement in internal organisation, productive processes and marketing facilities. But the most significant suggestion of the Board was that the industry should examine the feasibility of establishing a separate company, of which these mills should be members, with a view to arranging such details as the manufacture of lines required, allocation of quantities among the members and the prevention of imitation of marks and numbers.³ There is a unity of policy among the various mills at Bombay through the Millowners' Association. If this suggestion is carried out, there will be in India the beginning of a system of industrial combination which is called cartel and trust in Europe and America.

Industrial combination on the lines suggested by the Tariff Board is logically the next step in the

¹ *The Review of the Trade*, 1929, Calcutta, p. 151.

² The cotton-mill industry of Bombay sustained a loss of Rs 11.5 crores in the past five years.—*The Times*, London, 14 January 1930, p. 14.

³ Vide *Report of the Indian Tariff Board on Cotton Textile Industry Enquiry*, Calcutta, 1927, pp. 166, 212.

development of India's cotton-mill industry. Since the War there has been tremendous progress both in industrial technique and industrial organisation almost all over the world. In addition to life-long rivalry with Lancashire, India has met Japan as her great rival even in her own domestic market. In the cloth of 30's counts and above, the cost of manufacture in Bombay mills alone is either practically equal to or higher than the Japanese sale price.¹ While the remedial measures suggested by the Tariff Board will go a long way towards rehabilitation, the great economy will result from industrial combination, which alone can make it possible to discard old machinery and plants and to introduce new technique, including automatic machines, to specialise in certain lines of production by individual mills, to allocate the quantities to be produced by each mill and to consolidate the purchase of raw materials and the sale of finished products.²

Not only the Bombay cotton-mills, but the entire cotton-mill industry of the country needs industrial combination. One of the causes of depression in Bombay mills is the competition of the mills located up-country, where labour is cheaper and market is

¹ Vide *Report of the Indian Tariff Board on Cotton Textile Industry Enquiry*, Calcutta, 1927, p. 206.

² The importance of rationalisation in India is best indicated by what is going on in other parts of the world. The Lancashire Cotton Corporation, for instance, which was formed in January 1929, had at the end of that year 50 companies owning 5 million spindles, and was expected to have, by the spring of 1930, 100 companies with 7 million spindles. *The Statesman*, Calcutta, 9 January, 1930, p. 9.

nearer. From the national view-point, it is not the question of regional or provincial rivalry, but economy in the entire cotton industry itself. The object of the industry should be how to supply the entire needs of the country for cotton manufactures, and even to send out to foreign countries as much as possible of her immense export of raw cotton as manufactured goods. This can be done only by combining entire resources, capital and efforts, so that the member mills might be distributed throughout the country with a view to economising the purchase of raw material, the marketing of finished products, the employment of labour and the utilisation of mechanical power.

Not only the cotton-mill industry, but several other large industries need rationalisation. The jute-mill industry naturally enjoys monopolistic advantages, but at present it manufactures a little over one-half of the raw material produced in the country.¹ With the latest industrial technique and better organisation, it can not only improve the quality of the present products, but can also manufacture within the country a much larger part of the raw material now exported. The depression in the coal industry shows the immediate necessity of rationalisation both in technique and in organisation. Tea, rubber and coffee are very lucrative enterprises, but there is a great scope for expansion and rationalisation.

¹ In 1927-8 India used in her own mills 5.7 million bales and exported 5 million bales of raw jute. *Statistical Abstract for British India, 1930*, p. 657; *Review of the Trade of India, 1928-9*, p. 67.

A word must also be said about the effect of rationalisation upon labour. Rationalisation is bound to cause certain temporary dislocation in employment and even to give rise to unemployment. The income of the labourer in such a case must be secured both by the employer and the State. First, if it is protected industry the State has a right to demand that the discharged worker should find appointment in some other department of the same establishment or in another establishment of the same industry. Second, the industry undergoing rationalisation should also establish an unemployment fund for such cases. Third, there must be national unemployment insurance, as in Great Britain.

Not only the large-scale industries but even the arts and crafts or cottage industries need rationalisation. Industrialisation of the latter will itself become a step towards rationalisation. The allocation of the cotton industries and buying of raw material and selling of products on the co-operative basis will not only lead to economy and elimination of waste, but will give some of them a much greater command over the market.

There is a still greater scope for the rationalisation of agricultural industries. As in the case of cottage industries, industrialisation of agriculture will itself lead to rationalisation. The wastage of the present systems of agriculture has already been noted. This wastage can be eliminated and agriculture can be made much more productive by the introduction of rationalising processes.

The utilisation of wasted soil fertility or arable land, such as current fallows and cultivable waste, which together form 44 per cent. of arable land, is the first step in agricultural rationalisation. It is true that all of the wasted land could not be economically brought under cultivation, but with scientific agriculture a considerable part of it can be utilised. What is equally important is that a large part of hilly land all along the Himalayas and the Eastern and the Western Ghats, as well as in Assam and in Central India, could be utilised for the production of tea, coffee, rubber, fruit and flowers. In contrast with general agriculture, some of these industries can be profitably undertaken only on a large-scale basis and on suitable arrangement for preserving, conserving, canning and marketing.

Intensification of cultivation is another important step in agricultural rationalisation. The most important method of intensive agriculture is the production of two or more crops instead of one. It has been shown that out of 228 million acres of land sown with crops, only 34 million acres or 15 per cent. of the present area of arable land under cultivation is used for growing more than one crop. This area, being the most fertile land, must be devoted to the most intensive cultivation. This is quite possible with the help of increased irrigation and with the increasing use of fertilisers. The introduction of more profitable crops, and of better plants and seeds, and of market gardening, which gives a quick return, are among the other methods of rationalisation.

Diversification of farming is still another process of rationalisation. Indian agriculture is too stereotyped, producing largely foodstuffs, oil seeds and fibre crops. The extension of such other forms of agriculture as poultry, horticulture, dairying, and apiculture, will not only make agriculture more productive, but will help in the utilisation of the by-products or the half manufactured articles of the one industry by another. This will lead to the combination of some of the manufacturing industries, such as preservation, conservation, canning and dairying industries, with agriculture.

The most difficult problem of rural life in India is the rationalisation of the village system. Most of Indian villages are nothing but small towns with all the disadvantages of the urban life and yet with few of its advantages. What is still more uneconomical is that the subdivided and fragmented farm plots are scattered all over the fields around the villages, often far away from the homestead, with different plots of the same farm located at a distance from one another. The subdivision of the land into small plots involves a great wastage of arable land, the movements from homesteads to farm plots, and vice versa, especially in busy seasons, cause a wastage of time. Moreover, intensive farming such as cultivation of fruits and vegetables and flowers, is not possible unless the farmer is located on the farm itself.

There are two methods of solving the problem, namely, either by the ruralisation of the village or the consolidation of production for co-operative

farming. The former means the breaking down of the village, which is possible in all provinces except in the deltaic Bengal and Madras, and distributing cultivators on the farms, i.e., joining the farm land and homestead together. There will be some space lost in building farm-houses and farms, but it will be compensated for by the intensification of agriculture. It is, however, a very expensive project and can scarcely be carried out. The second method is co-operative farming, by combining the farms or plots into one or more common undertakings, to be owned jointly by all or a group of the cultivators in the village, on the basis of the joint-stock companies. Besides consolidation, this will allow application of implements and even machines to farm operations, and buying and selling on a large scale, thus resulting in economy. Each farmer may keep his share value in the farmland. The principle of joint-ownership is not unknown in India. Even to-day under the ryotary system, the land is held by the villagers jointly and rent is paid in a lump sum. The system of co-operative or joint-stock farming may be introduced in different stages, e.g. marketing, distributing and farming. The advantage of this system over the ruralisation is that it will not involve the breaking down of the village life nor the high expenses of habilitation. It will lack some advantages of intensity, but will make scientific organisation possible in India.

The principles of rationalisation should not only be applied to the organisation of national industries, such as farming, mining and manufacturing, but

also to the management of each individual industrial establishment, such as factory, shop and farm. This aspect of rationalisation might be called scientific management¹ in its narrow and technical sense. It is concerned with the utilisation of the practical results of other sciences, so that empiricism might be replaced by exact knowledge in business conduct.

The essential features of scientific management might be classified under two headings: namely, industrial technique and psycho-physiology. The former consists of such aspects as planning, research, accountancy and standardisation, and the latter of such aspects as vocational selection, time and motion study, task-setting, rate-making, health, safety and industrial relations. Scientifically organised management is, therefore, first concerned with research and investigation so that by careful analysis some systems of standardisation with regard to machine, material and methods may be arrived at and by the study of time and motion the quickest

¹ Scientific management as a separate branch of industrial technique owes its origin to F. W. Taylor, and is sometimes called "Taylorism." But since its first enunciation it has widened its scope from the management of a workshop to that of industry as a whole, and from that of a single industry to that of national industrial organisation. The term may, therefore, be used in three distinct senses, namely (1) obtaining the optimum output from human effort in American and classical sense; (2) organising an industrial undertaking with a view to increasing its profits; and (3) organising the entire industry of a nation with a view to eliminating waste. In the last sense, scientific management is the same as rationalisation. It is in the second sense that the term has been used here. Cf. Devinat, Paul, *Scientific Management in Europe*, Geneva, 1927, p. v. 45.

and best way of performing certain operations may be established. The selection of employees on the basis of physiological, psychological and educational tests and their training under expert or functional foremen and the payment according to the work actually done are among other important features of the system. As in the case of rationalisation, scientific management in its technical sense has also for its objects the utmost use of the capital invested, a permanent basis for cost-counting, decrease in the cost of production, and increase in output.

Starting with engineering workshops, scientific management has spread to almost all kinds of industries, such as mining, textiles, building, metal-working, banking and insurance, commerce and agriculture. Even the public services and public and quasi-public industries have come more or less under its influence. In fact, scientific management can be applied to every form of business enterprise, however small, as well as to all organised social institutions, including the household. The original home of scientific management is the United States, where it has made tremendous progress, especially after the War, but it has now extended to almost all European countries, especially Germany, France, Belgium and Czechoslovakia.

Like rationalisation, of which it is only the specific application, the introduction of scientific management is essential to India, not only for the sake of national economy, but also for the sake of industrial survival. Large-scale industrial establishments like cotton-mills, jute-mills, coal-mines, iron and steel

works, and engineering workshops, might immediately adopt scientific management. The recent depression in the cotton-mill industry of Bombay and the coal-mining industry of Jharia and Raniganj has been partly due to lack of scientific management in these establishments.

The principles of scientific management should be extended to shops and farms. How to organise business, invest capital, purchase material, sell products and keep cost accounts are some of the essential elements of scientific management, and without them no business undertaking can succeed in modern times. Business aspects of mathematics were highly developed in India and they can be easily revised for application to modern shops and farms. Since by far the majority of industrial undertakings in India consists of farms and shops, the scientific management of them is essential for the sake of national economy.

Nor should the household be excluded from the scope of scientific management. How to make the most out of the existing supply of commodities was the principle on which was founded the science of economics in ancient Greece. The same principle underlies national and political economy. How to arrange the articles, including the furniture in the proper place, to distribute the work, such as cooking, sewing and laundering in the proper time, and to avoid unnecessary motions and activities, are some of the methods of minimising the waste of efforts and materials in the organisation of household affairs. They not only lead to the savings of indivi-

dual households, but to those of the entire nation of which it is composed. Since all production has for its end consumption, economy in consumption is equally important as in production. Moreover, like charity, rationalisation or elimination of waste must begin at home.

3. DEVELOPMENT OF ENTERPRISE

Industrialisation and rationalisation will not only establish the existing Indian industries on a more solid and economic basis both for national prosperity and international competition, but they will also stimulate new industrial enterprise and create new industrial opportunities. Their immediate effect may, however, tend to diminish the number of occupations in certain industries, especially in the transitional period of reorganisation, as already referred to.

The most important effect of rationalisation will be the decrease in the proportion of the population dependent upon agriculture, which is at present too large. Civilisation has reached such a stage of development and the requirements of modern life have become so fine, complex and numerous, that most of the modern nations employ from one-third to half of their actual workers for the production of the basic necessities, such as foodstuffs and raw material. But the proportion of actual workers employed in agriculture with respect to the total actual workers amounts to 73 per cent. in India as compared with 8 per cent. in England and Wales, 32 per cent. in the United States, 34 per cent. in

Germany, and 40 per cent. in France.¹ Although the case of England, which depends upon other countries for two-thirds of its annual food supply, is an exception, the industrial conditions in the other countries indicate the proportion of people which could be economically engaged in the modern state of industrial and cultural progress. The proportion of agricultural population in India should not exceed that of France, where agriculture and manufactures are well balanced. Even with this reduced number, India will be able to produce much more than what she produces now.

While the ultimate effect of agricultural rationalisation will be the reduction of the number of workers now employed, for the present the tendency of reduction will be partly counterbalanced by the

¹ PROPORTION OF POPULATION IN DIFFERENT INDUSTRIES IN VARIOUS COUNTRIES *
(in millions).

Country.	Year.	Actual Workers.	Agriculture.		Industry, Transport and Trade.		Other Occupations.	
			Number.	Per centage.	Number.	Per centage.	Number.	Per centage.
England and Wales .	1911	16.2	1.3	8	11.5	71	3.4	21
Germany .	1907	28.1	9.8	34	14.6	51	3.7	15
France .	1911	20.9	8.5	40	9.5	45	2.9	15
United States	1910	38.1	12.5	32	19.4	50	6.2	18
India . .	1921	146.0	106.0	73	25.7	18	34.3	9

* Compiled and adapted. *Annuaire Statistique, France, 1922*, pp. 190-1; *Statistical Abstract for British India, 1928*, pp. 37-8.

increased activities in agricultural production itself. Thus the utilisation of waste land, intensification of cultivation, diversification of farming and the manufacture of some of the crops on the farm itself will create enough new occupations to absorb a part of the unemployed.

The rationalisation of arts and crafts or the cottage industries by the utilisation of modern industrial technique will, however, be followed by increased facilities for industrial employment. It has been noted that cottage industries have not become out of date and that they still retain their vitality. Modernisation and rationalisation will give them a new life both in economic stability and competitive ability against large-scale industry, whether foreign or domestic, and not only solve the problem of under-employment among the artisan classes but also draw a larger number of the village population into their scope.

Increasing facilities for industrial occupations in the country will, however, result mostly from the growth in number of large-scale industries, especially the industrialisation of manufacturing processes for mass production under the factory system. The essential conditions for the development of large-scale industries including the factory system, are the supply of iron and coal, raw materials, market facilities, efficient labour and sufficient capital. Of these the most important are, of course, iron and coal. For they are not only the products of large industrial enterprises, but also supply machinery and mechanical power for other large-scale industries.

The iron-ore reserves of India are, as noted before, surpassed only by those of America and France. The iron-ores of India are not only immense in reserves but are among the richest in iron contents, having 60 per cent. of iron as compared with 50 per cent. or less in most of the countries. Moreover, the presence of iron-ore, coal-mines, flux and fireclay within an average distance of 125 miles makes it possible for India to become one of the greatest centres in the world for the manufacture of iron and steel.¹ "There is little doubt," says Sir Edwin Pascoe, Director of the Geological Survey of India, "that her vast resources in iron-ore will one day give her an important, if not dominant, place in the steel of the world."²

The fuel resources of India are not very great, but the shortage of coal and oil are compensated for by the supply of water-power, in which India stands second only to the United States in potentialities among the industrially advanced countries. If fully developed India will be able to supply electricity to many industries, such as railways, tramways, factories and even some cottage industries, and thus save coal for the purpose of her iron and steel industries.

As to raw materials, India has a vast supply and is a great contributor to the world's requirements. In 1927-8, for instance, India produced practically

¹ *Records of the Geological Survey of India*, Calcutta, 1922, Vol. 2, Part II, pp. 203-12.

² See his "A General Survey of India's Mineral Resources," *Capital, Indian Industries, Trade and Transport Supplement*, Calcutta, 19 December, 1929, p. 13.

all the jute, over one-fifth of the cotton, about one-fourth of cotton seed, over five-sixths of rape seed and about one-tenth of linseed.¹ Having one-third of the world's cattle, including buffaloes, and one-seventh of the world's sheep and goats, the production of hides and skins, one of the most important raw materials in modern industries, is also considerable. In the production of some of the minerals also, India holds a very high place. While she enjoys practical monopoly of mica production, the production of manganese in 1927 amounted to over 35 per cent. of the world's total.² India suffers potential loss by the fact that most of the raw materials are exported in a raw state. For example, India exported in 1928-9 3.7 million (400 pounds each) bales of raw cotton, i.e., about two-thirds of the crops, 5 million bales of jute, or half the production, 1.3 million tons of seeds, 66,000 tons of hides and skins, and 681,000 tons of manganese ores.³ In fact, out of the 330 crores worth of exports in 1928-9, 170 crores worth of merchandise, i.e. over half, consisted of raw materials and articles

¹ INDIA'S SHARE IN THE PRODUCTION OF SOME OF THE WORLD'S RAW MATERIALS IN 1927-8
(In million quintals).

Material.	World Production.	Production in India.	
		Quantity.	Percentage.
Jute	18.52	18.47	99
Cotton	50.08	10.85	21
Cotton seed	102.20	24.85	24
Rape seed	12.00	10.20	85
Linseed	40.80	4.10	10

Compiled from the *International Year-book of Agricultural Statistics*, 1927-8.

² See the *Capital*, Calcutta, 19 December, 1929, p. 14.

³ Compiled from *Review of the Trade of India in 1928-9*.

mainly unmanufactured.¹ It has also been found that the same ship which carries hides and skins out of the country also carries the tanning materials. Most of the raw materials are sent out only to be brought back as manufactured articles.

India has also great facilities in marketing. Her own home market can consume a vast amount of manufactured articles. In 1928-9, for instance, she imported 67 crores worth of cotton manufactures, 16 crores worth of sugar, 8 crores worth of wool and silk manufactures, 8 crores worth of provision and oilman's stores, and many other articles for which there exist all the raw materials for home production. In fact, of the Rs 180 crores worth of wholly or partly manufactured goods, consisting of 71 per cent. of her total imports, India could produce a considerable part at home.²

As to the supply of efficient labour, there exists, however, a difference of opinion. It has been stated, as noted before, that India's factory worker is only 40 per cent. as efficient as an English factory worker. Although the inefficiency of the Indian worker as compared with that of a British worker cannot be denied, neither the proportion of difference nor the basis of calculation can be accepted as representing the real state of things. In the first place, unlike the British labourer, the Indian labourer is not educated and trained for factory work, nor is he expected to work in a factory all his life. He is

¹ Compiled from *Review of the Trade of India in 1928-9*, pp. 148-9.

² *Ibid.*, pp. 150-3.

generally an illiterate peasant, who takes to factory life and resorts to his former occupation whenever opportunity occurs. In the second place, there is a good deal of difference in raw material, hours of work, comfort and management. In India the cotton used is coarser and more liable to break, hours are longer, temperature is much higher and management is less efficient. In the third place, the main object of an industrial undertaking being to make profits, a factory, following the economic law, employs more of the cheaper factors in production than the dearer ones. In fact, due to the cheapness, many more extra hands are employed in India. Moreover, although the same machinery might be used in both countries, all latest improvements are not to be found as quickly in India as in England. Improvements in hand-tools and implements even in handiwork also help the English worker to minimise the time of work.

Whatever might be the present conditions, Indian labourers are not inferior to those of any other country in their potential efficiency. The most important source of labour supply in India is, and will be, the agricultural labourers and cultivators. As to the latter, says Dr. Voelker, of the Royal Agricultural Society, after an inquiry into Indian agriculture: "At his best, the Indian ryot or cultivator is quite as good as, and in some respects the superior of, the average British farmer."¹ Reference has already been made to the investigation carried out by the present writer under the

¹ *Imperial Gazetteer of India*, 1908, 3 : 6.

auspices of the United States Bureau of Labour Statistics into the social and economic conditions of the East Indians on the Pacific Coast of the United States and Canada, which revealed the fact that in industrial efficiency the Indian workers were in no way inferior to the Chinese, Japanese, Mexican, American and Canadian workers.¹ In the evidence before the Industrial Commission of 1916-18, Mr. T. H. Tutwiller, the General Manager of the Tata Iron and Steel Company, stated that many European and American artisans had been successfully replaced by Indian artisans. "Where Indians have been substituted for Europeans in these works," continues Mr. Tutwiller, "the quality of our products has not suffered. . . . Some of the Indians have obtained very high and very responsible positions in our work that were formerly held by covenanted hands."² In fact, given the equal facilities for health and education, Indian labourers are capable of doing the same efficient work as that of the labourers in other industrially advanced countries.

As far as capital is concerned, India is, however, in a different situation. In the face of extreme poverty, India could not be expected to possess sufficient capital for rapid industrialisation. But with an adequate banking system, she can amass a considerable amount of necessary capital from

¹ See *supra* and also Author's *Hindustani Workers on the Pacific Coast*, pp. 45-52.

² *Indian Industrial Commission, 1916-18, Evidence*, Calcutta, 1918, 2, p. 356 "Covenanted hands" refers to foreign experts employed under certain conditions. Mr. T. H. Tutwiller, in fact, attached a statement showing the increase of products in tonnage.

her own people. The largest industry of India is the cotton-mill, which is practically financed by indigenous capital. "Money begets money," and once industrialisation starts and foreign "drain" ceases, there will be an increasing supply of capital for investment within the country. Moreover, foreign capital with adequate security can be attracted from abroad for investment in India.

Thus there exist in India great possibilities for the development of large-scale industries for mass production. Improvement in existing industries, such as cotton and jute manufactures, especially cotton goods of finer counts as recommended by the Tariff Board on Cotton Textile in 1926, will also lead to the creation of new industrial opportunities. Moreover, with the introduction of modern technique in production, there are great prospects for the improvement in forestry, fishing, mining, transporting, banking and trading industries, thus creating new industrial opportunities and absorbing a much larger population. In industry, transport and trade, India employed only 18 per cent. of the population in 1921 as compared with 45 per cent. in France, 50 per cent. in the United States, and 51 per cent. in Germany.¹ With the growth of industrialism, there is no reason why India should not employ about one-half of her working population in manufacturing, transport and trade, thus relieving the pressure upon land.

It must be admitted that although industrialisation and rationalisation can increase productivity,

¹ See the footnote on p. 165.

strengthen national industries against international competition and create new industrial opportunities, they cannot altogether eliminate unemployment as long as the present system of production remains what it is. But unemployment in industrialised Great Britain or Germany is insignificant in comparison with that in rural India. Moreover, unemployment under modern industrialism is largely a question of distribution, which is beyond the scope of the present inquiry.

4. CONSERVATION OF RESOURCES

The utilisation of natural resources for human purposes is one of the essential conditions of production. Since these resources are limited in quantity, to conserve them by preventing wastage and economising usage so that they may remain a permanent source of utility is a question of vital importance to national welfare and forms one of the most important phases of industrial efficiency. Rationalisation of industry implies conservation of resources, but the importance of the subject needs a separate treatment.

The most important natural resources of a country are the arable land or soil fertility, of which the chief elements are nitrogen, potassium and phosphoric acid. Since these elements are limited in quantity and costly in price, permanent agriculture depends upon their preservation in sufficient quantity. This can be done either by the addition of fresh supply to the soil or by bringing the potential supply into available form. The general principle of conserving

soil fertility is that what is taken out must be put back in some form or other.

A considerable part of India's fertility is lost by erosion and a still greater part is depleted by constant cropping without return of these elements in the form of farmyard manure or commercial fertilisers. The continuous export of food and raw material is a heavy drain upon India's soil fertility, especially as India is scarcely in a position to buy commercial fertilisers from abroad. While the purchase of commercial fertilisers is more or less impossible for the average Indian cultivator, a good deal can be done towards the utilisation of farmyard manure. This depends altogether upon the possibility of finding a cheap fuel substitute for the farmyard manure. Among the other lines of work for preservation of soil fertility is the rotation of crops, fixation of nitrogen from the air, prevention of erosion, finer tillage and use of oil-cakes, bone-ash and similar other fertilising material.

Next to fertility is the question of conserving forest resources. The principle of conserving forests is that the annual cut should be replaced by annual growth. Since a forest generally takes from 50 to 100 years or even more for maturity, according to the nature of the wood, it becomes evident that only from one-fiftieth to one-hundredth of the forest resources of the country can be consumed in any one year. Moreover, conservation should include afforestation of waste land, substitution of the present forests by better ones, elimination of waste from fire, and substitution of timber by

cement, stone, brick and iron and steel wherever possible.

One of the most complicated problems of the Forest Department in India is to find cheap and easily grown varieties of trees which could be used as fuel instead of farmyard manure. The generation of electricity from water-power resources for railways and factories might release a considerable portion of coal for domestic use. The encouragement of horticultural industries for which younger trees are preferable may also be helpful in supplying the disused trees for fuel supply. At present, many old fruit trees occupy the orchard, which are neither good for fruit-bearing nor supply quick turnover of wood supply. But the most important sources of fuel supply must come from the rapidly-grown trees on the waysides and waste lands, and full encouragement must be given for their cultivation.

The principle of conserving fisheries is practically the same as that of forests. The annual hatch must replace the annual catch. The silting of the rivers and indiscriminate use of the existing resources have greatly diminished the fresh-water fisheries of the country. What is needed is the provision for spawning and maintenance of hatcheries, rearing of fish, including mussels, in all the available water resources of the country. The occasional dredging of rivers will help both navigation and fishing. These must be followed by the provision of facilities for transporting, refrigerating, curing and reducing. It is the duty of every Provincial Government, especially those having sufficient fresh-water and

marine fisheries, to establish or revive the Department of Fisheries with all facilities for scientific research both in the culture and commerce of fish. Moreover, the Government must encourage and advance money for enterprise, especially in marine fisheries.

The last, but not the least, important class of natural resources is the minerals, the conservation of which is also a very important question, especially in view of the fact that these are limited in quantity and unlike plants and fisheries cannot be reproduced. The minerals might be classified under two headings, namely, those which are exhausted in a single use and those which can be used more than once. Besides, there is also water, the supply of which is practically perpetual, although limited in quantity. The conservation consists in more economic use of them, elimination of wastage in mining and extracting and in the use of substitutes whenever possible.

Coal and iron are the most important minerals, the one supplying the mechanical power and the other machinery. The iron-ore reserves in India are one of the largest in the world, but the same is not true of coal. That sunlight might one day be utilised as energy source is quite possible, but for the present is beyond the control of human power. The possibility of utilising water for generating electricity and power is a great solution of the problem of India's fuel shortage.

The Indian Ocean, the meridian sun, the monsoon and the Himalaya Mountains keep the water resources of India in complete annual circulation from

the ocean to the mountains. This circulation is not, however, evenly distributed throughout the year nor throughout the country. The annual rainfall, for example, varies from 460 inches at Cherrapunji to 3 inches in Upper Sind, and the wet season of almost daily rainfall is followed by the dry season without any precipitation. The conservation of water consists in its distribution throughout the year and in conveying it to those regions where it is most needed.

The usage of water might be classified under four categories, namely, domestic needs, navigation, irrigation and mechanical power. The problem of supplying sufficient pure water for domestic usage can be solved by building tube-wells and large tanks. The latter might be utilised for irrigation and also for fisheries. The question of navigation becomes important for a twofold reason: in the first place, the water transport is much cheaper than railway transport; and in the second place, navigation is also helpful to irrigation. It has been pointed out by several writers that the Government sacrificed waterways for railways in India. It is worth while considering the question in all its aspects, and the appointment by the Government of Bengal of a permanent Waterway Board is a step in the right direction. The more important question is that of irrigation. The value of irrigation to agriculture was realised even in ancient India and provision was made for the elaborate irrigation system, which has gradually fallen into disuse. In the meantime, irrigation has been introduced and partly revived

by the present British Government, but the area irrigated does not yet amount to more than one-fifth of the total area sown.¹ The irrigation projects under construction will no doubt add several million acres more to the irrigated area. But India needs a more rapid progress in irrigation. The last, but not least, important question is that of generating electricity from India's vast water-power resources. Several projects are already under construction. The railway line from Bombay to Poona has already been electrified. What is needed is a bold project of developing all the water-power resources of the country for navigation, irrigation and electrification. It must be remembered that all these are investments.

5. ORGANISATION OF CAPITAL

We have seen that the insufficient supply of capital is one of the most fundamental causes of India's low productivity. How to increase the margin of savings, to mobilise them for productive purposes and to make the best use of the capital goods are, therefore, some of the problems involved in increasing productive power or industrial efficiency.

The ultimate sources of all capital are the savings or the margin of production over consumption. The problem is how economy can be effected and wastage avoided in consumption so that there may be a decided increase in the savings. The most important cause of wasteful consumption in India is the pompous and extravagant ceremonies, such as

¹ Vide *supra*.

marriages and funerals. They not only cost the savings of many years, but often lead a man to spend the earnings of several years ahead, thus incurring extortionate debts from which many can never get out in their lifetimes. The second important cause of wasteful consumption is drinking. The extent of drinking in the country is indicated by the fact that in 1927-8, Rs 19 crores or over one-fifth of the total provincial revenue depended upon the excise, the proportion rising to 31 per cent. in Madras and 36 per cent. in Bihar and Orissa.¹ That the actual expenditure by the people on drink amounts to several times more can be easily assumed.

To show the folly and ruinous effect of these wasteful consumptions is the first step towards increasing the desire for savings. The crusade against the drink evil by Mahatma Gandhi and others is a progressive move. Agitation against marriage dowry and pompous ceremony will also have salutary results. In its positive aspects, increased savings can be accumulated by the cultivation of forethought and thrift, which can be socially acquired by India, where "high thinking and plain living" has been the ideal of life.

The most important motive force in saving is, however, the security of investment. Nothing gives better opportunity for this purpose than the banking and insurance institutions. Moreover, they also mobilise the social savings into national capital. The banking institutions in India might be classified

¹ Vide *Statistical Abstract for British India, 1930*, pp. 125, 204.

under four headings, namely, indigenous banks, postal savings banks, general banks including industrial and mortgage banks, and co-operative banks. Nothing is known about the extent and deposits of the indigenous banks. The general banks in India are represented by the Imperial Bank, Indian joint-stock banks and exchange banks with head offices located outside of India. The investments and deposits in Indian banks are very insignificant, as noted before. Insurance companies are also important instrumentalities for encouraging and mobilising capital. But they have made very little headway in India, the total paid-up capital of 76 companies amounting to only 2.1 crores in 1927-8.¹

These banks are quite inadequate to meet the industrial demands of such a great country as India, and one of the greatest drawbacks to the development of modern industries is this lack of adequate banking facilities. Indian banking and finance being controlled by British banking and finance, with head offices in England, have had scarcely any scope for development. Modern banking has not been brought within the easy reach of the people nor has anything been done to restore their confidence in those banks which have been available to them. It is no wonder that a considerable part of India's savings lies idle or invested in gold and silver. Even the insurance companies have not been endowed with enough security. The result is that about 15 crores of India's savings have been

¹ *Statistical Abstract for British India*, 1930, p. 593.

invested in foreign insurance companies.¹ The Banking Inquiry started recently has not been begun too soon. It is hoped that Indian banking will be raised to the same level of efficiency both as regards savings and investment as those of other industrially advanced countries.

The direct means of mobilising social savings for industrial purposes is the industrial enterprise itself, whether undertaken by an individual or a corporation. While nothing is known as to private investment, the paid-up capital of various joint-stock companies registered in India amounted only to 267 crores in 1927-8. What is of more importance is that most of the social savings, which find their way automatically into productive processes in the form of capital goods, such as tools, implements, machinery, and plants, are far behind those in other industrially advanced countries, as indicated by the meagreness of large-scale industries.

Government can also help much in attracting social savings for industrial investment in both private and public enterprises. This is especially true in India, where private initiative has not yet found full scope of development and all the industrial activities of national importance have been so long controlled by foreigners. There are several Acts by which Government has been entrusted to make advances for industrial purposes, such as the Land Improvement Loan Act of 1883, the Agriculturists Loan Act of 1884, and the recent Cottage Industries Aid Act in the provinces of Madras and

¹ Cf. *The Welfare*, Calcutta, 26 October, 1929, p. 155.

Bihar and Orissa. But the activities of the Government in this respect are quite inadequate to national needs.

The lack of sufficient capital in the country naturally raises the question whether India should welcome foreign capital. But whether India likes it or not, foreign capital to the extent of about £600 million or Rs 800 crores has already been invested in the country. Due to political subjugation, this capital has often been invested at a great disadvantage to the country. But India does not expect to be always in this helpless condition, and, in fact, she is already on the way to self-government or Dominion status. If she needs further capital it is her problem to determine on what condition she will invite or accept it.

As to the need of foreign capital in India, there cannot be two opinions. India must be rapidly industrialised if she wants to solve the problem of extreme poverty, meet world competition and preserve her industrial independence. In fact, there is no time for her to pass through the slow degree of industrial evolution; she needs industrial revolution as far as she can adjust her social conditions to modern industrialism. What she needs is the "jumping over" several stages; this is possible only with the help of foreign capital.

There are two ways in which foreign capital can be brought into the country. In the case of loan capital, the main question is that of the rate of interest. India is undergoing rapid political development and there is scarcely any hope that

in this transitory period the rate of interest will be low. As far as investment is concerned, the problem is much more complicated. Foreign investment has often drained away high profits, employed foreign officials in the superior position and secured the monopolistic control of national industries to the detriment of the growth of indigenous enterprise. These evils can be, however, much mitigated, if not altogether eliminated, especially under Swaraj, by requiring foreign companies to incorporate in India and to have an adequate proportion of Indian directorate and technical staff, as suggested before.

The last, but not the least, important question of the most efficient administration of the capital resources of the country is the most economic utilisation of its capital goods. This resolves itself into three problems, namely (1) the substitution of older tools, implements, machinery, livestock and other capital goods by the new ones whenever economical; (2) introduction of tools, implements and machinery and other capital goods wherever there are none and whenever it can be done economically; and (3) making the fullest use of the existing tools, implements, machinery, livestock and other capital goods.

The most important way of dealing with these questions is the establishment of agricultural experimental stations and engineering workshops. These stations and workshops, in conjunction with various Departments of Agriculture and Industries, should be specially charged with the improvements of livestock, farm implements, tools and machines

for cottage industries and household works suitable to local conditions. Encouragement to invention, patents and copyrights is one of the means of introducing new and more efficient tools, implements and machinery as well as other industrial technique into industrial processes.

One of the most important means of making the best use of the capital goods, especially expensive machinery, is the use of the shift system. Two shifts of eight, even nine, hours a day have been tried with advantage in many countries, and three shifts of seven hours a day are now being tried in Russia. India with insufficient capital resources and vast man-power can ill afford not to take advantage of at least the two-shift system. It might not be very convenient for the city of Bombay on account of the scarcity of space, but other cities are not so unfortunately situated. The difficulty of employing women and children at night can be avoided by making them work only in the early hours of the day. Nothing could be more convenient for tropical countries than that of working very early in the morning.¹ Other difficulties can be similarly well avoided.

6. ADMINISTRATION OF LABOUR

The last and by far the most important question in achieving industrial efficiency is the

¹ In the Imperial Valley of Southern California, where the temperature rises as high as 117° F., the author found that the Hindustani farmers, who are settled there, begin work at 3 a.m. and work until 10 a.m. and commence work again late in the afternoon, if necessary.

organisation of human resources for productive purposes. Although the improvement of race and health and the reorganisation of social and political institutions are the essential conditions, the industrial efficiency of a nation depends, in its final analysis, upon its ability to transform human energy into productive power. Labour being the active agent in productive processes, industrial efficiency really means the scientific organisation of manpower with a view to obtaining the maximum production with the minimum effort. Industrial research, technical education, industrialisation of production, rationalisation of industry, development of enterprise, conservation of resources and organisation of capital are nothing but the different aspects of adjusting labour forces to productive processes. Since under the modern system of production an increasingly large number of industrial population depends upon wage-work or labour, a word must be said on administration of labour, which presents a problem of great importance to every industrially advanced country.

The development of large-scale industries has given rise to various problems in relation to working and living conditions and to industrial relations. The causes of several complicated problems are the use of machinery and mechanical power, employment of large numbers of people in a certain time and place, the use of material of often unknown origin, minute division of labour and consequently profitable employment of cheap labour of women and children, transportation of workers from the

place of birth and residence to the place of work, often of a long distance, the necessity of living nearer to the place of work and the consequent congestion and crowding, production much ahead of consumption and for distant market, and trade depression, the rise of trade unionism and of self-consciousness on the part of workers and increasing conflict between employers and employees. The most important of these problems are those in relation to recruitment, safety, health, hours, women, children, disputes, wages, housing and unemployment.

The obligation of the State to the Labour question rises from a threefold reason : first, protection of the wage-workers, who neither singly nor often even in combination can make a fair bargain with large business concerns as to the conditions of work and similar matters ; second, expert and specialised service in the case of accidents and diseases, which is often beyond the power of both employers and employees ; and third, preserving the general welfare of Society as a whole, which both employers and employees are apt to forget. Among such problems must be included child and woman labour and industrial peace. For the solution of these problems almost all countries have developed Labour or Social legislation.

Social legislation in India might be said to have begun as early as 1835 when Indians were sent out to the Colonies as indentured workers. This was followed by plantation legislation in 1863, factory legislation in 1881, and mining legislation in 1901.

Since then all Labour legislation has been greatly amended and amplified. With the establishment of the International Labour Organisation in 1919, social legislation has made rapid progress in India, as in fact in several other countries. Most important of these new Labour Acts are those relating to compensation and trade unionism.

The most serious defects of the existing social legislation are narrowness of scope and lack of uniformity. In the first place, the application of the Labour law is restricted only to a limited number of workers even in organised industries ; for instance, transport workers do not come under any existing Labour law.¹ In the second place, there is no uniform Labour law for all classes of workers even in the same industry. Plantation labour is, for example, employed under different laws in Madras and Assam. There is a similar lack of uniformity between the Labour law of British Provinces and that of Indian States. Even the first Factory Act of 1881 avoided the defect of sectionalism and provincialism by making it universal all throughout British India. Since the Government of India Act of 1919 things have become worse by the assignment of the welfare legislation to the discretion of the Provinces. Thus the cotton mills of Bombay have to pay maternity benefit, while those in the United Provinces are quite free from any such provision, although they compete with each other. In the third place, the

¹ Since the writing of this treatise, a Railway Amendment Act has been passed regulating hours of work and granting weekly holidays on Indian railways.

social legislation in India is still behind most of the industrially advanced countries in progressive measures, such as the minimum wage, sickness insurance, and employment bureaux.

What is needed in India is a uniform and universal Labour legislation for all India, including both British Provinces and Indian States alike, and for all industries of at least similar character. Unless there is levied a tariff between Indian States and British Provinces and even between one Province and another, the industries of one locality cannot be discriminated against those of others. Such an Act can be passed only by one central Government, and the application may be left to the Provincial Governments or Indian States according to the local conditions but subject to one central authority. It is fully realised that such legislation is not an easy task, especially as far as Indian States are concerned. But the next constitutional reform is expected to find a solution. Whether the next constitution should be unitary or federal, the residual power must be assigned to the central Government as far as Labour legislation is concerned, especially for British provinces. Nothing could be more harmful to the progress of social legislation than the policy of sectionalism and provincialism which is bound to result in discrimination and in retardation. The best example of such a condition is presented by the United States, where the Labour laws are different in different States and the federal Government has not even the power of passing the Child Labour law without infringing upon the right

of the States. In India provision should be made in the new constitution so that such difficulties might be avoided. The Government should introduce progressive measures into Labour legislation. The International Labour Conference may give a lead on this point.

One of the most important problems of modern industrialism is that of housing. The standard of housing in a poor country like India has always been very low as far as comfort and æsthetics are concerned. But modern industrialism with centralised industries and congested accommodation has made it also insanitary and unhealthy. The problem of housing is, however, more complex than it appears to be. Inasmuch as the industry is a benefit to Society, it is Society, or more strictly the State, which is responsible for improving the conditions of life outside the factory or the place of work. Moreover, compulsion upon employers to accommodate employees may not only be detrimental to the growth of industry, but its effect might be deleterious upon the employees themselves. When the labourer has to work in the employer's plant and to live in the employer's house, from which he cannot very well move at will, he is liable to become nothing but a serf, as under the feudal system. The best solution of the problem is to build industrial towns, either on the co-operative basis or at the public expense, near the industrial centres, where the workers can dwell with their families on payment of an economic rent. There are, however, industries such as mining and planta-

tion, especially seasonal industries, where employers will have to make provision for the employees, and housing in such cases must be regarded as a part of the industrial enterprise, and the regulation of housing conditions must be a part of social legislation as far as sanitation, decency and comfort are concerned.

Another vexed problem is that of the minimum wage. The main object of industrial activities of a nation is to improve the material condition and general welfare of the people as indicated by high standard of living. Of all the civilised countries of the world, the standard of living is the lowest in India. The effect of the low standard of life upon national vitality and social progress has already been discussed. It must be at once realised that the number of workers in organised industries is only a small fraction of the total workers living upon wages and is still smaller than the total population of the country. It is not possible to increase the wages of one class at a level much higher than the rest, nor is it possible to increase the wages or income of the large majority of the population without increasing the productive power of the country. There is thus a vicious circle. The problem of higher wages is still a very vital one, and a solution must be found by the State.

The best way to approach the problem is the establishment by the Government of a Minimum Wage Board, the duty of which will be to estimate a minimum wage for each province or a section of a province if necessary. The effect of such estimate

will be beneficial. It will not only set a standard which will be a basis of bargaining for the workers, but will focus the attention of the public on the necessity of increasing national dividend both by increasing national production and decreasing social population. Not the least important is the duty of the State to see that this minimum standard is given effect to by all the important industries, such as tea, jute, cotton and coal. Moreover, the Government itself must introduce the standard of minimum wage for its own employees. Nothing shows more clearly the unsoundness of the whole economic organisation of Indian Society than the existence of starvation wages, which do not exceed more than a few rupees a month¹ on the one hand, and the luxurious salaries amounting to several thousand a month on the other. Nobody would suggest that there should not be any gradation in the wage-scale, but such a disparity in national income can exist only in a country where there are a few masters, and the rest, and by far the majority, are nothing but slaves. The readjustment of the salary on the basis of India's national income has been long overdue.

The most difficult problem before the country is, however, that of unemployment, which is only a part of general under-employment and to which has been ascribed the loss of at least one-third of the nation's man-power. Among the causes of

¹ According to the *Census of 1921*, out of 682,619 railway employees, 411,176, or over 60 per cent., were getting a salary of less than Rs 20 a month. See Report 1, p. 2.

general unemployment must be mentioned the following: (1) the growth of population at a rate faster than the available farmland and the consequent decrease in the size of the farm; (2) decline of arts and crafts in the face of foreign competition; (3) disappearance of most of the subsidiary industries which found their places in the household of both the farmer and the artisan; (4) lack of capital as a result of the growing poverty of the people; (5) absence of modern science and art, including industrial technique commensurate with the growth of population in India and with the industrial progress of the world; and (6) failure to modernise the productive system in which the rising generations of the educated classes could find an honourable career and earn a decent livelihood.

The problem of under-employment can be solved only by creating more industrial opportunities or development of industrial enterprise, as noted before. The first and foremost method of developing the national industries of India is to place them on such sound economic bases by industrialisation and rationalisation that they can compete with those of other nations. The immediate effect of rationalisation on employment has been already discussed. Secondly, these industries need multiplication and diversification, for which, as we have observed, there are also ample opportunities in India. Both industrialisation and rationalisation will also offer to the educated younger generation opportunities for an industrial career and gainful occupation and thus solve one of the most acute problems of

unemployment in the country. Moreover, it is only through the continual utilisation of scientific and technical education of enterprising young generations for industrial purposes that the productive processes of the country can be kept abreast of the other industrial nations of the world. Lastly, there must be created subsidiary industries in which both artisans and cultivators can be occupied in the off-season. Here comes the economy of the *Khaddar*, and nobody has done more for rebuilding the subsidiary industry of India than Mahatma Gandhi and the All-India Spinners' Association. Uneconomic aspects of the *Khaddar* have already been referred to. But whatever might be its ultimate end, for the present no other industry has shown itself to be more practical and economical.

The last, but by no means the least, important aspect of social legislation is social insurance. With the growth of the sense of responsibility on the one hand and the conception of social solidarity on the other, Society has realised the importance of devising means of distributing the risks and losses of a few among many. Accidents, sickness, invalidity, premature death, old age and unemployment are some of the common risks, especially in the case of work-people, whose only asset is, in most cases, the ability to labour, and anything interfering with this ability may deprive him of his income, thus causing distress not only to himself but also to his dependents. The under-employment of most of the working classes, the decadence of private charity, and the breakdown of the old joint-family system have

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brought before the public more and more the importance of introducing some kind of social insurance into India. The first step has been taken in this direction by the enactment of the Workmen's Compensation Act. The scope of that Act is, however, very much limited. It ought to be widened and include other phases of risks than mere accidents and disease.

CHAPTER VIII

SCHEME AND CONCLUSION

IN the foregoing chapters, different methods of achieving industrial efficiency have been discussed and various projects for giving effect to them suggested. Some of the projects, if carried out, would involve great expenditure. A word must, therefore, be said as to the financial aspects of these projects.

I. FINANCIAL ASPECTS

It must be pointed out first of all that, besides the primary duty of preserving peace and order, the most important function of all modern States is the improvement of health, education and the economic condition of the people. Any expenditure is justifiable on that ground alone. But what is more to the point is that such expenditure is an investment for the wealth and welfare of the people, and no country is at present in a greater need for such investment than India.

The first source of financing these projects will be derived from the economy of nationalising the Government. The Indianisation of the Services, both civil and military, will result in great economy. In 1927-8, for instance, the military expenditure amounted to 56 crores, of which 43 crores were spent

for what is called the effective army.¹ Now, it is an admitted fact that the cost *per capita* for British soldiers, of whom there were in India 60,000 out of a total of 277,356, i.e., a little over one-fourth, is six times as much as that of Indian soldiers. The replacement of the British soldiers alone will be a saving of about 25 crores a year. A great saving will also take place from the Indianisation of the Civil Service. By Indianisation India will also be saved from sending money to England for pensions and military training. The extent of these expenses can be understood by the fact that in 1928-9 the amount of pensions paid to retired civil and military officers in England amounted to Rs 4.9 crores.² Moreover, Indianisation will also lower the scale of salaries of the higher Indian officers, which are at present too high and beyond India's capacity to pay. Speaking roughly, the Indianisation of the Services will be a saving of some Rs 40 crores a year.

The greatest national savings to India will occur, however, from the extension of her industrial enterprise, especially in manufacturing industries. The production of food and clothing and other basic needs within the country, which a large and agricultural country cannot afford to buy from outside, would be a great economy. Both cotton fabrics and sugar, for instance, which together cost her Rs 81

¹ *Statistical Abstract for British India*, 1930, p. 145.

² During the year ending 31 March, 1929, the amount paid in Great Britain in respect of pensions totalled £2,083,958 in the case of 4,363 military, naval and Indian Medical Service officers and £1,617,719 in the case of 3,136 Indian Civil Service officers. See *Parliamentary Debates*, House of Commons, 8 November, 1929.

crores in 1928-9, could be produced in the country. India could similarly produce many other articles, such as salt, soap, glass and glasswares, and tobacco. Granting that India's imports in machinery, implements and other goods for manufacturing purposes, as well as for meeting the demand of higher cultural life, would increase; out of Rs 180 crores now spent for the imported manufactured articles, India could save at least Rs 100 crores a year.

There will be a similarly large, if not larger income, if a considerable number of the articles now exported as raw materials might be sent out as manufactured or partly manufactured commodities. In 1928-9, for instance, the value of 60,200 tons of the raw, and of 23,500 tons of the tanned, hides and skins exported amounted respectively to 9.4 crores and 9.3 crores.¹ If all the hides and skins were exported as tanned goods, India could derive 16.3 crores more income. India possesses all the tanning materials as noted before, and the process itself is a comparatively simple one as indicated by the fact that over one-fourth of the hides and skins exported were tanned commodities. Moreover, there is all the possibility of turning a large part of the tanned hides and skins into still more highly manufactured articles. The same is true of several other articles, such as cotton, jute, oil-seeds and manganese. In fact, the value of the raw commodities exported and valued at Rs 170 crores in 1928-9 would have amounted to at least twice as much, if a considerable part of them had been sent out as manufactured

¹ *Review of the Trade of India in 1928-9*, pp. 99-100.

goods, and even deducting the cost of production, India could have gained at least another 100 crores from her export trade.

The development of banking, insurance and similar industries, which are now in the infant stage of development, would also add to the augmentation of social capital and national dividend. It is thus seen that the nationalisation of the Government and the extension and development of her industries by industrialisation, rationalisation and protection, would at least bring India about Rs 250 crores a year for the inauguration of the schemes for industrial development and industrial efficiency. Once the industries are enlarged and profits are increased, there will be more investment for further development.

2. BOARD OF EFFICIENCY

The most important question in achieving industrial efficiency is, however, how to create a new national consciousness as to its necessity and to devise means for its realisation. There exist in the country several classes of organisations, such as research institutes, experimental stations, employers' associations, trade unions and welfare societies, which are striving in their own spheres of activity for social and industrial welfare. But as far as the industrial efficiency of the nation as a whole is concerned, these organisations are quite inadequate to cope with the task, and at best their efforts are only indirect and secondary and the effects of their endeavours are, therefore, insignificant. What India needs is a

national organisation to mobilise all the social, political and industrial forces of the country so that she might be industrially efficient to utilise, to the fullest extent, all her natural, human and capital resources for the wealth and welfare of her people. For the lack of a better name, such an organisation might be called the National Board of Industrial Efficiency, or, in short, Board of Efficiency.

The most important function of the Board will be the creation of a new social consciousness and development of a new national policy for achieving industrial efficiency. Although the ultimate object of the Board will be to make India prosperous, its immediate and primary object will be to make India industrially efficient, i.e., to develop her productive capacity. This object will be realised mostly through research and education.

The most important work of the Board will, of course, be research into the methods of achieving industrial efficiency. The chief items of research will be the following: first, a general survey of improvement in industrial technique, including both machinery and organisation, in various industrially advanced countries, and of the possibility of their application to India; second, a general study of the industrial organisation of the country in the light of modern science and art, including discoveries and inventions, and the formulation of a general programme for achieving efficiency; third, a critical study of the national industries, such as agriculture, forestry, fishing, mining, manufacture (including arts and crafts), transport, banking and commerce, as

compared with similar industries in various advanced countries and of the methods of their improvement ; fourth, a detailed study of a few typical industrial establishments in each industry, such as cotton-mills, coal-mines, tea-gardens and farms, as compared with similar establishments in the most advanced countries, and of the methods of their betterment ; fifth, a critical analysis of the causes of the present wastage in natural, human and capital resources and of remedial measures ; sixth, a study in the improvement of social, political and industrial institutions for the growth of industrial efficiency.

The second important task of the Board will be education. Inasmuch as education will be the only means at the disposal of the Board for carrying out its object, it must be comprehensively and effectively organised. The main purpose of the educational work will be the propagation of the results of its research among the general public as well as among those directly concerned in the results obtained. This will deal with both general and technical aspects. Efforts must also be made to approach those who are especially in a position to give effect to the proposed remedial measures.

The research work will be carried out by a body of scientists and experts to be employed by the Board. The work must necessarily be divided into sections either according to the science involved, such as chemistry and botany, or according to the industry concerned, such as agriculture and manufacture. Each section must outline its own scheme.

The first object of the research organisation must be to collaborate with other research institutions in the country and consolidate and utilise their results. The most important work of the Board will, however, be to undertake many new lines of research hitherto untouched by the existing institutions in India. One of the most important lines of the work of the Board will be to send students to study abroad some definite and special subjects of either scientific or technical nature. The Board must have also its organs for giving publicity to the results of its research.

That the work of the Board cannot be relegated to any other existing organisation is evident from the nature of the work it is called upon to undertake. Some of the most important institutions, the work of which is more or less similar to that of the Board, are the newly created Agricultural Research Council and the Forest Research Institute and similar other agricultural and industrial research organisations. There is, however, some essential difference between the objects of these institutions and that of the Board. In the first place, the former are concerned with finding some scientific truth or technical information in relation to a particular industry, while the latter intends to incorporate this truth or information into productive capacity of the people. In some respects this work of the Board may be only supplementary. In the second place, the work of these institutions relates only to special aspects of industry and is, therefore, more or less analytical, while the main object of the Board will be to

co-ordinate all the elements of industrial efficiency with national character, and is, therefore, more or less synthetical. In the third place, the number and the scope of the existing institutions for industrial research are at present very much limited in India. One of the objects of the Board will be to start new research institutions and to enlarge the scope of the existing ones.

The Board must be a semi-public organisation. This will help it to have the co-operation of all the public and semi-public institutions for research and propaganda on the one hand and to remain independent of Government control and interference on the other hand. The independence of the Board is absolutely necessary if it is to enjoy full public confidence in the impartiality and scientific nature of its work.

The work of the Board will be guided by a national organisation, which might be called the National Council of Industrial Efficiency and which should consist of three classes of representatives, namely: first, all industrial interests, such as agriculture, forestry, mining, manufacture (including arts and crafts), transport, banking and commerce; second, national organisations of importance, the scope of which directly or indirectly includes work leading to national industrial efficiency, such as trade unions, welfare organisations, medical associations, scientific associations and economic associations; third, well known and distinguished scientists and administrators. The National Council will meet twice a year in an executive capacity to outline

and sanction the work of the Board and keep a control of the finance.

The Board may consist of a director and a deputy-director, and the heads of the sections into which the work of research and education may be divided. Both the director and deputy-director must be selected from the distinguished engineers and economists of the country. The heads of the sections ought to be selected from the prominent scientists and experts of the country. The staff should be indigenous as far as possible, inviting foreigners only in the case of absolute necessity and then only for a definite period of time.

The national character of the Board will help in creating national interest in its work, which is of vital importance to the nation as a whole. The indigenous character of the staff will not only make the work cheaper, but will also facilitate the popularisation of the work in the country, and the creation of a scientific attitude towards life among the people.

The Board must be situated in some great educational and industrial centre, such as Bombay or Calcutta, where are located most of the large-scale industries of the country. It will facilitate both scientific and industrial research. The central organisation will have branches in different provinces according to necessity and convenience.

The work of the Board should be financed by Government as that of any other educational and research institutes in the country. Both the central and provincial Legislature should see that the work

is supported by Government. The appointment of the men of high qualifications may be somewhat costly, but if the quality of the work is maintained at a very high level and opportunities are offered for research work, men of science may be attracted to the Board from the spirit of scientific research and from the love of honour and privilege of serving the country in their highest capacity.

3. CONCLUDING REMARKS

India is one of the largest countries of the world. She has variegated physical features, diverse climatic conditions, long coast lines, large river systems and vast natural resources. She is inhabited by the races of people who once made great contribution to the world's science and philosophy and who still possess great intellectual abilities. In this land of great potential wealth lives one-sixth of the human race in abject poverty and degradation. The fundamental cause of this condition is the industrial inefficiency of the people, which has been brought about by a variety of factors, such as physical environment, social maladjustment, political subjugation, and industrial backwardness.

One of the greatest problems before India to-day is that of her industrial inefficiency, which causes her to lose over two-thirds of her natural, human and capital resources. A country in which by far the largest majority of the people lives constantly on the verge of starvation and in which, for lack of vitality, the death-rate is twice as great, and the average length of life is only half as much, as that

in most of the Western countries, could not think of any moral and intellectual progress of her people without elevating their material condition. In any scheme of national development, India must have as one of the foremost objects the achievement of industrial efficiency, which alone can solve the problem of her poverty.

India needs industrial efficiency even to maintain her political and economic autonomy. In these days of international competition, aggressive capitalism and imperialistic nationalism, no country, especially if she has rich natural resources, is safe from financial penetration, economic exploitation and even political control by industrially advanced countries without having organised her industrial systems in the light of modern science and art and having equipped her people with the industrial technique of the latest discovery and invention.

Industrial efficiency has still another important function to perform in India. Inasmuch as industrial activities occupy the most active period of man's life and the best part of his wakeful day, they must offer opportunities for moral and intellectual development along with material gain. The social and political backwardness of India is to a large extent due to the primitive character of her industries. India must organise her productive systems in such a way as will call forth, and give facility for, the development of, the moral and intellectual faculties of the people.

The achievement of industrial efficiency is, however, by no means an easy task. It requires the

mobilisation of the physical, intellectual and moral forces of the whole nation and especially the energy and devotion of the entire *intelligentsia*. India, therefore, calls upon her philosophers and moralists, scientists and technologists, statesmen and jurists, reformers and publicists, economists and entrepreneurs to upbuild her national health, to regenerate her social life, to attain her political autonomy, to develop her national economy, to reconstruct her industrial system and thus to achieve industrial efficiency. It is through industrial efficiency alone that India can fully utilise her immense resources of land, labour and capital for the wealth and welfare of her people and lay the material foundation for their moral and intellectual progress.

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