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THE EVOLUTION OF INDUSTRY

By D. H. MACGREGOR, M.A.

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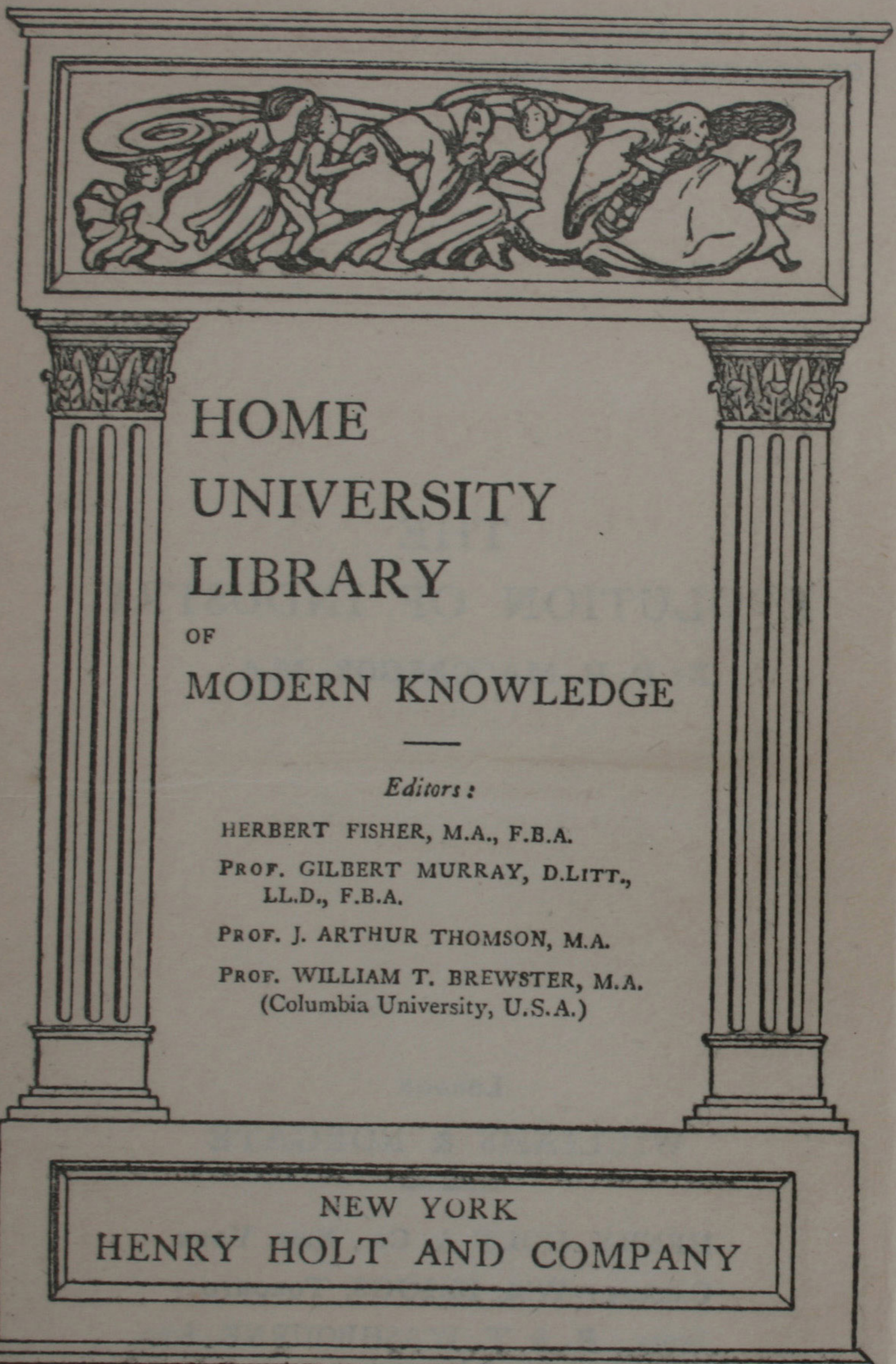

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THE EVOLUTION OF INDUSTRY

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PREFACE

In this book I have attempted to meet the request of the Editors that I should describe the recent changes which have given us the present condition of the working classes. It has only been possible to give an outline of events, and to suggest the principles which seem to me to be involved. In view of the fact that a volume has already been contributed to this series on Socialism, I have stopped on the threshold of that subject, and have tried to make this study a way of approach to that larger question. I shall be glad if I have succeeded in giving a survey of the field which will incite to further exploration, and help to explain the unrest which is so great a feature of this critical time.

D. H. M.

TO

L. H. R. M.

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THE EVOLUTION OF INDUSTRY

CHAPTER I

THE MEANING OF INDUSTRIAL EVOLUTION

I

THE evolution of industry is the story of the attempt to solve a single and definite problem. The means which are taken to solve it are constantly becoming more complicated and more wonderful. So much so that these means become by themselves a thing to study for their interest and ingenuity. Clever machines, and new processes of working, and devices for better organization, are part of the history of human skill, and we can study them simply as pages in the records of achievement. The labour of men's minds and hands has given us machines which carry many materials at once through many processes with even more precision and regular-

ity than if they had thought; and also forms of organization which account for every detail of cost, and time, and by-product. As the firm grows bigger and the market spreads over the world, industrial discovery and government stand out like a piece of work which can be looked at for itself, like an object of art that is impressive for both power and fineness. But the real problem of industrial evolution is hidden by a study of this kind. All this effort has an end beyond itself. It is the growing pressure of material need that has called out all this ingenuity and resource, and made a market for all this skill. And the true nature of what is being done is not seen in the thing itself, but in what lies behind it.

In the shortest chapter of his great book, John Mill has stated the question in its simplest terms. He draws attention first to industrial history simply as a record of man's devising ability.

"Of the features which characterize the progressive economical movement of civilized nations, that which first excites attention is the perpetual and, so far as human foresight can extend, the unlimited growth of man's power over nature. Our knowledge of the properties and laws of physical objects shows

no sign of approaching its ultimate boundaries; it is advancing more rapidly, and in a greater number of directions at once, than in any previous age or generation, and affording such frequent glimpses of unexplored fields beyond, as to justify the belief that our acquaintance with nature is still almost in its infancy. This increasing physical knowledge is now, too, more rapidly than at any former period, converted by practical ingenuity into physical power. The most marvellous of modern inventions, one which realizes the imaginary feats of the magician—the electro-magnetic telegraph—sprang into existence but a few years after the establishment of the scientific theory which it exemplifies." Now the same is true of organization. "Works of all sorts are daily accomplished by civilized nations, not by any greatness of faculty in the agents, but through the fact that each is able to rely with certainty on the others for the portion of the work which they respectively undertake. The peculiar characteristic of civilized beings is the capacity of co-operation; and this tends to improve by practice, and becomes capable of assuming a constantly wider sphere of action." It was this same view of industrial progress—the spectacular view—

which led Macaulay to write a triumphant passage in his *Essay* on Bacon.

But behind this record of progress in organization and resource, Mill sees the problem on which it all bears—the growth of the people in number and in wants. The machine is as elaborate and wonderful as it is, because the work to do is getting less simple, and every possible economy of resources is required. In this chapter he thinks it possible, and elsewhere he doubted if it were not the fact, that the people might increase "in numbers only, and not in comfort or cultivation." The whole system might be wonderful, and yet might not solve its real problem. Out of what conditions does this difficulty come? What are the forces whose working drives the evolution of industry?

II

There are two opposed forces, straining different ways, with which we have to reckon. All invention and organization are an attempt to overcome the opposition and make a balance.

On one side, there is the growth of the people. Every generation sees a greater demand for goods, if the standard of life

is not to fall. Everything that happens in industry is for the sake, in the end, of meeting this larger demand. In order only to keep up the same standard of life, we should require devices and resources for a gross increase in volume of goods made. This would mean no advance in comfort, but simply the holding off of distress. But the wants of a people grow in variety as well as in amount. The course of foreign trade may offer new goods to a nation in payment for its exports; or the rich may enjoy goods which the masses of the people see and come to desire; or the process which is simply called development may raise new wants out of old ones. This is a strain which never ceases. Later stages, and higher levels of comfort, rather increase than lessen it. Greater capacities for enjoyment come out of great opportunities to enjoy. They grow by what they feed on, and social agitation for the betterment of conditions of life does not get less insistent after a great deal has been granted to it. A class may feel that it is becoming poorer, though it can buy the same things as before even in greater amount, if new goods come into use but are beyond its reach. Contrast is a strong factor of poverty; and, to many ways of defining poverty, we might add the

historical one—failure to participate in the new known goods of each period. Personality is inexhaustible in its claims and capacities for new enjoyment; and industry has to make the response to this growing volume and variety of wants.

This side of the problem was very much in evidence in the first half of last century. The shadow of the population question is cast especially over the writings of Mill. Before his time, the teachings of Malthus and his followers gave rise to the view that wages would keep down to a bare level of subsistence, since population would tend to increase up to the limit allowed by the necessaries of life. Make it easier to get these necessaries, and more people would marry, and more children be born, till things were much as before. This danger would hang over society till the people learned prudence and restraint. And it is plain that to say this is to imply that economic resources could not stand just any strain from the side of demand. More people means more power to produce goods; and if the power to consume goods seemed more formidable and important at that time there must have been a distrust of the power of economic organization to adjust the two forces. The years from 1800 to 1825 were

suited to almost any doctrine of despair. No economic problem was generally understood, —it was the age of everything done wrong,— finance, currency, the Poor Law, Labour, the Factory, and the Land. The building-up periods of the second and third quarters of the century relieved this country from the amount of population as a serious danger, and we think chiefly now of its distribution in cities and on the land. Even with the growing volume and variety of wants, our economic resources are trusted to make each person worth his keep.

The growth of population means a force of increasing demands. But all these demands take us back to the land. All the goods we use are transformations of products given us at that common source. The land's fertility in materials is therefore the other force that is fundamental to industrial evolution. The demand grows, and the land must supply it. But the land does not grow; and its fertility is subject to a law which is not a law of increase.

A great part of the land area of the world, and of most countries, cannot be cultivated at all without loss; that is to say, more goods would be consumed in cultivating it than it would yield. Only under the pressure of

extreme scarcity could it be brought into use. But the physical nature of cultivated land is such that it does not of itself meet the growth of population by giving twice the product for twice the labour. The deeper a mine is worked, the more labour does each ton of ore cost. If grain crops, or industrial fibres, are grown on any land, its fertility is so far exhausted, and it will not yield another crop of the same size for the same trouble. For that, it will need the additional trouble of manuring and tending. And if every generation makes a demand for greater quantities of ore, and grain, and fibres, it will become more and more difficult to get them from the same land, or by taking in worse land. If the people of 1950 are to have their increased wants met out of the products of the land, how much harder will that land have to be worked, and how much more costly will its products be per ton! So far as land alone is concerned we would travel toward exhaustion point unless we were willing to incur higher costs. This means higher prices. And higher prices from the land mean higher prices for everything, since all materials are from the land.

Now if the evolution of industry is to mean progress in wealth and welfare, goods ought

to become more plentiful and less costly as time goes on. Somehow, therefore, the dilemma has to be got over; population has to grow, and yet we are not to have higher costs from exhausted land. Each man's work has to count for a bigger product; and this has been the history of things in the last century. More wants are met at less cost, spite of the influence of diminishing fertility at the source which supplies all wants.

The organization of industry is the reply to this problem. It stands between the two forces of population and land, and works out the means of increasing welfare. When the problem is not severe, and there are few people or few wants to maintain in a new country the organization is slight; as the two forces get stronger, and many people with many wants are living in an old country, the organization has to be stronger. All organization is the reply to the pressure of needs. What is the general plan by which our industrial organization keeps working out this problem?

III

The force which comes between the growing wants of the people and the lessening fertility of land is invention. The evolution

of industry is the history of this force. It accepts a physical fact about land and a social fact about population, and finds the way to keep peace between them. The use of the word "economy" in reference to a nation's affairs shows the nature of the work of invention. In public, as in private, affairs it means the way of making limited resources go as far as possible to meet growing wants. If the land did not tend toward exhaustion, and did not require increasing costs to keep it up to the mark, its produce of grain and fibres and ores could all be derived from quite limited areas, which went on yielding double or more than double the crop to double the work. The work of invention would then be less of the nature of economy, and more of the nature of new products and ways of working them up.

As it is, invention meets the constant pressure of the two opposite forces by two methods—discovery of resources and of processes.

In the first place, as to resources. New areas of supply are constantly being discovered. A great part of the world has still to be developed. These parts may have been neglected because they were not of the highest fertility for any crop or product, or

were very distant, or were not known. When their resources become known and available, they slacken the pressure on the old areas, and hold back the influence of increasing costs, so that we get long periods of falling instead of rising prices for greater supplies. Writers in England in the first half of last century were alarmed at the prospect of our supply of grain. They did not foresee that, under the influence of transport, the fields of America and the Argentine would be areas of supply. But, whatever else it has done, the discovery of these new resources, which are not yet developed to anything near their full capacity, brought down the cost of food and keeps it down. We are still in process of discovering the resources of many sub-tropical areas for fibres and minerals and oils. They yield for a lighter cultivation and a lower cost what the older areas were giving only at a higher cost. In this way, as the world's resources become more known and available, a growing population has its wants met in volume and variety at falling instead of rising costs.

The invention of resources does not mean only new land areas. New products are added to the stock. They do not only count in variety of wants that can be met; they

can take the place of goods already known, and slacken the pressure on the supplies of these older goods, and bring us back again to low costs. Metals, fibres, grains, ores and oils, different in form as they may be, can each take the place for many purposes of others of their kind, so that new resources for one product draw off the pressure on supplies of another. Or again, what was thought to be the waste of one product is found to be itself a useful product; we find that there were two or more products where we thought there was only one, so that their common source of supply counts now for a higher fertility than before. It supplies more wants for the same cost, or the same wants for less cost. The land area of the world will get taken up, and there is a limit to resources in the way of extent. But it is impossible to say for what now useless products there will be found a use, or what great powers may lie in articles of small bulk, so that we may get far higher fertilities from quite limited areas. If there are many products like radium our resources will not be limited because our space is limited.

The invention of processes is the second form which this force takes. The effect is here again to get the same result with a

smaller use of natural supplies, and so to save these supplies and make them go further. Suppose we have a machine which needs the labour of ten men to work it, and has to be renewed every three years. Some one invents another machine which is equally productive but only needs the labour of two men to work it, and has to be renewed every four years. Then, in the first place, we have found a way of getting on with a less amount of iron, so far as the making of these machines is concerned. In the second place, if the change is made gradually enough for the labour displaced to be absorbed elsewhere, we have eight men's labour and maintenance not needed for that machine, and added to our stock of labour with the same maintenance somewhere else. The ore supply and the food supply are both going further than before. Transport is one of the most important of the results of invention of this kind. The effect of steam and the steel rail is to carry goods about with less consumption of goods on the journey than if we did the same trade in the old way. Organization, too, is a process in which invention is constant. It bears upon the whole of technical invention, and the saving of materials and time; but it may also incur a cost to save a greater loss,

especially as regards safeguarding the resources in personal skill which technical invention displaces and puts in danger of waste by disuse.

These two forms of invention depend upon each other. Transport enables us to tap new areas of supply, and mechanical devices enable us to develop them. New supplies of ore and grain lessen the material and food costs of transport.

The tremendous complexity of industrial organization has to be reduced to its lowest terms to give us the real meaning of its building up. It is simply the thrift of growing nations in presence of adverse laws of original supply. By all this elaborate complexity we make our supplies go further, and lessen the pressure on their sources, so that increasing demands and falling costs are possible together. Less labour earns more goods this generation than last; the same labour supports more people.

IV

In early stages of industry, people are in very direct touch with the land and its products; they live on the land or near it, and each man or household applies labour

or tools to the grains and fibres that are grown on his land. The great intermediate organization of the mill has not come in, or the separation of manufacture from agriculture. This form of life still exists in Eastern countries, and only passed away in England about one hundred and twenty years ago. As long as it lasts, it stands for a lightness of organization which means only a slight pressure on the sources of supply. Either the people are few, or their wants are few, or the land is wide. It is this simplicity of economic life, and its wide distribution over the land, and the absence of the great machinery of modern industry, which make the study of early England and non-industrial nations so fascinating. There are two features of these times and places which are especially evident. In the first place, every worker sees the nature of what he is doing; he is getting products from the land and he is making them of use by industry. He sees the whole process, and the fact is plain that labour and land are for the sake of himself and others like himself who need the goods. He sees the grain become flour, and the wood from the forest become furniture, and the hide become leather, and the wool cloth,—all beside him, and all of

it a plain process of natural goods made useful to man. In other words, the common interest of all people as consumers is the evident thing. This would be evident in the manors, the gilds, and the domestic industries of this country.

In the second place, the idea is clear at these stages that the work is only for the sake of the goods made. It has no high organization by hours and employers' discipline. In the domestic system especially, every one works on the fields or at home as the occasion needs, and as is required by the varying and uncertain wants of his household. The idea of work as a thing in itself, an object of search, has not come in yet.

But in late stages, and among Western nations, the growth of the people and the pressure on supplies have changed this. When very great organizations are necessary, and every industry gets specialized into parts, each part an industry in itself—then the meaning of the whole process is not plain to the worker, for he is at too many removes from either the beginning or the end of it. In consequence of this, it is not the consumer's interest he feels; the common bond is weakened on that side, and he feels the narrower interest of the "producer" which

then emerges. He helps to make goods, which make other goods, and their relation to a final consumer is lost in the distant influences of trade; his trade organization is a special sphere, making things he may not use, but which are handed one step on by his work. It is the producer's interest which then is plainest to him; and we find the system of industry becoming actually divided into contests of producer and consumer, whose interests are regarded as opposed, though every one is at some remove consumer of every one else's work.

And at the same time, there goes with this the idea of work as an object in itself. This is a result of the indirect relation of a man's work to his own wants. He is not now making things for himself, but filling a place in a system, which somehow makes all things for all people. His work is upon materials not related to what he consumes himself; it is a thing by itself, not related to his ends and wants. But it is the means to his being able to obtain the goods he does want; and it stands out as a thing to seek for and get, a step toward being able to buy his own goods, but quite separate from his own goods. When people stopped grinding their own flour, and made rivets in order to be able to buy flour,

their occupations became a thing quite separate from their wants, but had to be sought for just as if they were the wants themselves.

Thus when we get to the times of very great organization, and it is more difficult to see the nature of the whole economy of industry, the trade of each worker becomes a thing in the first place apart from his own wants, but the only way to get his own wants, and therefore work is itself an end; and apart, too, from other people's wants, which are too remotely concerned, so that many different producers' interests come in instead of the common consumers' interest that is obvious at earlier times.

V

Each stage in the life of the people is accompanied by a form of industry which fits that stage. The social life of this country was at one time limited to the village; then came the days of the town, supported by a rural life around it; then the rural life became more considerable again, till finally the city sucked it into itself. The village and the town attempted to keep themselves self-sufficient, and free from the outside influences of other places; the laws of settlement, the feudal customs, and the gild regulations,

made the villages and towns almost foreign to each other, so that our early social life was intensely local, and the idea of the nation, and the feeling of national unity, came at a late stage. Corresponding to these forms of life, we have systems of industry at first of small power, because their ideas and markets were local; then of higher power, as the market became a bigger thing. We have household industry in the village, the members of the family making for their own needs; handicraft in the town, since the trade was confined to the town; the factory in the city, both causing and being created by the wider national economy and market. The passage from one to another of these forms of life and work is both caused by the growth of the people, and helps to make a faster growth possible; they are stages in economy, in national thrift in resources of labour, as the people press more on the sources of supply; and since wants are made easier to satisfy at each stage, the demand for more goods, and more various goods, makes the further stages of economy and organization necessary.

We have seen that the root idea of the evolution of industry is invention, standing between the people and the land. And the transition from one stage of life and form of

industry to another is due to one of the main features of invention of all kinds. The full use of an invention, in technical skill, or mechanical appliances, or organization, cannot be got by limited circles of people. It bursts these local barriers, and compels trade to spill over from place to place, until the greatest of modern inventions in machinery and industrial government can have their full scope only when the market is the world. That is to say, a local body of people cannot have the full advantage of industrial progress unless they share it with wider bodies of people.

In household industry, some one becomes skilled in making shoes or furniture, and finds that the household does not use up his skill; it is not worth his becoming expert unless he works for other households too. So that work for wages for those outside the family is the condition of his giving skilled work to the family. Local "trades" develop in this way. In the town and gild economy of the middle ages, it becomes more and more difficult to shut the trader up in the town market; regulations have to be made for strangers and trade between towns, for the merchant and the craftsman have no scope for higher skill unless a wider market gives

them an outlet. Skill is specialization; it is not worth limiting oneself to one function unless there is a wide enough demand for its constant use. The cottager under the domestic system sells to the travelling agent who is in touch with a large central market; and he finds room for special skill as a weaver, skill which would not be fully occupied, and would not be carried so far, for a local market. In the factory system of the cities, the citizens can get the products of their own mills cheap because the national market is open, and makes it worth while to have the highest specialization in industrial skill. Trade bursts local barriers, because industry is the history of invention responding to the pressure of wants, and because a locality cannot get the use of inventions unless it shares them. Legal restrictions and customs try in vain to stand against this fundamental current of economic force. The household for the household, the village for the village, the town for the town, are local ideals which go down before invention, which does not stop at the nation for the nation, but breaks down that restriction too, and mercantilism fails to hold its ground against the idea of the world-market. England could not sell textiles cheaply if she sold only at home.

VI

Invention does not work out its effects simply because a new appliance, or a new development of skill or organization, will satisfy wider demands and extend national resources. Industry is not guided in its advance by any kind of national Board which perceives how the pressure of wants will be better met by these changes. The personal competition of individuals is the outward and obvious side of this force. The inventor sees that a new way of doing things will give a wider market and a greater gain to himself ; and he sees, too, that the wider market is necessary if his suggestion is to have full play in practice. The consumers' interest is not the conscious side of invention; but it is only through the consumers' interest that the inventor gets his own profit. Invention is the force underlying economic evolution, whether it be in appliances or systems or organization : but people are not usually conscious of the real forces under whose influence they work. We have seen that, in later stages of industry particularly, the "producers' interest" rises up because of the specialization of Labour, which prevents the worker at one special process from seeing

the whole nature of the productive process in its relation to wants and supplies. Invention works itself out by personal conflicts and producers' interests; that is its conscious side. It is the energy of persons working for profit, and estimating the chances of more profit by wider markets and lower costs, which has broken up local markets and given the widest scope to invention. The conscious aim has not been that of national thrift of resources; but that has been its historical meaning, and the basis of the success of invention in making economic changes.

VII

It is the *nature* of invention to create surpluses. An invention means that the same results are got with less outlay of resources. Either more sources of *supply* are found, or the existing supplies go further, so that in either case there is a surplus for new use. Or else there is a surplus of *effort*, less work being needed to get the supplies and make them available. And quite usually there are both kinds of surpluses at once, so that more supplies are got for less effort. If we look at this effect over a long time, the result is that we have saved some materials which

can be used for a new purpose, and also saved some labour to work them up with. We have got the materials and the work saved for a new industry, or a new branch of industry. But these surpluses do not fit into each other at once. The materials that are saved by an invention may be in America, and the labour saved may be in an English mill. And even if the spare materials and the spare labour occur near each other, that may not be the right place for the new industry; and, if it were, even then the spare labour of one industry cannot be applied to a new occupation in the times of great specialization. It is in the nature and definition of invention, and therefore of economic evolution, to produce this result.

But, to return to the fundamental idea of this chapter, the whole device of invention is that it aims at making the resources of the land available as goods for the people of growing nations. And we have seen that, as things get complex, the individual can get the goods which he does want only by having a producers' interest in things which he does not directly want. His position as a worker *stands for* the things which he wants out of the common stock. It becomes a thing sought for in itself—employment. And this

is especially the case in the late and highly-developed stages of industry, where specialized work loses sight of the meaning of the whole process, and sees simply the necessity of a place in the system. But it is in these specialized times, when work has become an end, that invention makes surplus labour most difficult to fit into the new development of work. And therefore in these times the personal idea in the evolution of industry, the idea that it is all meant for the maintenance of persons out of national resources, has to be restored by an alliance of industrial with social influences. The transitions and changes which invention creates for short times have caused a necessary fusion of industrial and social evolution.

CHAPTER II

THE RECENT INDUSTRIAL CHANGES

I

No period of industrial history shows more clearly the influence of great inventions, both upon industrial and social life, than the nineteenth century in England. This period is separated from former periods of history by a change so great that it usually has been described as a revolution ; and this is more true of England than of any other great industrial nation. The history of modern industrialism is everywhere a question of the nineteenth century, but England entered upon this period when she was already, in the economic sense, an old country. Changes in the life and work of the English people stand out, therefore, in stronger contrast because we can always compare them with a form of life which was superseded when the century began. It is true, for example, of America, that she also has passed in this century through

economic changes which have given her at this time a system of factory production and of city life that is very like our own. But America was economically a new country when the century began; she had not to supersede such ancient customs and institutions as the manor and the gild; she began with a clean sheet, and if there is no industrial revolution in American history, as there is in our own, that is because of the clear start which America made after her political revolution. England has both gained and lost by this fact that she was already an old economic country in 1800. She has gained because her national life was already settled in towns and villages all over the country, so that one of the great developments of the nineteenth century, the development of transport, has been a far more steady and less speculative thing than in the United States. The centres which were to be joined together by the railroad already existed and were connected with each other, while in America much of her industrial problem has been due to the fact that her enormous area has had practically to be colonized, and her transport system pushed out westward—not to join up centres already existing, but on the chance that centres would come into existence. Again, England has gained in this

way because an old country has already settled down to political usages and customs which dispense with the need for a written political constitution, and English industrialism and finance have had greater freedom of movement because no precise rules had to be definitely framed for the whole national life, such as exist in the American constitution. As an example of this, America has not been able to levy direct taxation, or relieve the burden of her fiscal system of taxation of goods by any steps such as were taken in England since 1842 ; her constitution has placed definite restrictions upon fiscal policy such that an income tax is practically impossible there, and there is always a strong prejudice against amendment of a national charter of this kind.

But in some ways England has lost as compared with America by having begun the nineteenth century as an old country. Her land, for example, was already alienated to private owners. Outlets which have helped to relieve the strain of city life and industrialism in America have not existed in the same measure in England, and on more than one occasion this national asset of the land has enabled the American States and the federal government to reduce the weight of their debt

by sales and concessions of lands to railways and private owners ; and, if we compare the development of English with American transport, the cost of providing this great nervous basis of our industrial system has necessarily been far greater (indeed, four times as great per mile) in a country where land was already taken up.

The industrial revolution in England, then, clearly separates an old from a new kind of national life. The stratification of the people of a country depends chiefly upon its forms and divisions of labour. Social life, in that way, is a creation of the industrial system. Great contrasts can therefore be drawn between the social life of England in the seventeenth as compared with the nineteenth century, but in describing the change which took place at the end of the eighteenth century as a revolution it is not meant that a sudden transformation took place. In order to perceive the justice of this term one has almost to compare dates half a century apart. Comparison of that kind will show that in habits of life, in the distribution of life, in the mechanical appliances of industry and in the cultivation of the land a transformation had taken place. The industrial community as it had developed by 1840 was "a new form

of human settlement," with new personal relationships and aptitudes and ideals, but there was no revolution if we look at the stages of growth which were necessary to the change. The great inventions of the last thirty years of the eighteenth century had been prepared for by many previous attempts in the same direction. There was only, about the year 1780, a degree of achievement which gave a definite economic value to these discoveries, and not only this, but they were also advanced to a stage such that each now stood in a relation to the others which made it possible for them to work together in developing the factory and the machine. The discovery of a new way of smelting iron by the use of pit coal made the great machine possible; the same discovery of coal ensured that the machine could be economically worked, and when the patenting of the steam engine took place the motor power, which brought together the machine and the supplies of fuel to drive it, took its place in the system. Technical inventions in the machine itself, devices in building it, in making it more precise and more powerful, could then be better worked out.

Again, the idea of a revolution must take account of the slowness with which these new powers were applied to industry. The first

attempts to use them failed; it took one or two decades for the power loom to gain the ascendency over the hand loom. The detachment of the people from the land went on by the gradual forms of Enclosure, but not until the end of the French War did the distress of the yeoman decide for the city as against the land. Modern industry and the great city had fastened their grip upon national life by 1825, so that just as the creative process, which came to a decisive point about 1780, was a slow process, so also was the building up of the new system which the inventions made possible. Without doubt it was the perfecting of inventions within a quite short space of time which made everything else possible, and our attention has specially been drawn to these years of decisive achievement more than to the long stages of preparation which led up to it.

It must be remembered, too, that factory life, great as was its extension at the beginning of the nineteenth century, was a thing which had gradually grown up alongside of the domestic system of industry. The first great factories we hear of are in the beginning of the sixteenth century, and one of the lines of English development, though it is not a broad line, is that of what may be called the early

or pre-revolution factories. What the great inventions did for the factory was to change the relation of hand work to mechanical assistance. The tool and the machine tool are under the government of the hand. It is the worker who supplies the force and the tool which obeys, but after the great inventions the position of the worker in the modern factory came to be that of assisting the machine rather than that of supplying the energy to the hand or machine tool. There were factories before the inventions of Watt and Crompton and Cort, but the "Factory System" of the nineteenth century implies specially a subordination of the worker to the machine, which justifies us, if we look at the change over a long period, in speaking of the effect as a revolution.

Again it must be remembered that many of the old industries and occupations have never been entirely taken out of our industrial system. Handicraft was superseded by the great inventions, and domestic industry ceased to be the usual life of the people, but there is still handicraft in England and there is more than one district in England where domestic industry is still a usual form of manufacture. The villages round Birmingham still maintain this kind of industry for the manufacture of

numerous small hardware goods, and there are still in England villages which keep the old system of open-field cultivation which went with domestic industry. These old forms have not died out, but they have lost their importance in the national life. They fill up the gaps and fringes of the new system. The emphasis of modern industrialism is upon the factory. Some of its problems are due to the tenacity of handicraft and domestic work in their attempt to hold their own against the mill.

Our question is not so much to trace each step in this change as to find its meaning and tendency. What have the great inventions, when we look at their operation over the last hundred years, stood for? Can we bring the industrial history of the nineteenth century into one point of view which will enable us to explain each side of its evolution by one phrase or formula? Does the nineteenth century represent the evolution of an economic idea? Although there is always some danger in seeking to unify too much, yet it is possible to show that the century does have a single great tendency which works itself out on every side of national life.

The fundamental idea of the nineteenth century is power. All our national economy

has worked under this ideal. The growth of the people, and the pressure on our economic resources and our political strength, have caused us to aim at power above any other result in economic and political organization. It is because this idea has so fully dominated our progress that we find so much fascination in the study of earlier centuries. There is in the life of the fifteenth and sixteenth centuries a lightness of organization and a distribution of national life which has led several writers to hold that the nation has lost rather than gained by its great economic changes. A less pressure of people on the land, a less development of wants, especially in variety, caused an ease of life which such writers compare, to its credit, with modern concentration and strain. There is, of course, a danger in comparison of this sort of reading into this system of life wants and aspirations which have only been made possible by modern industry. Early England was happy with the happiness of unborn wants, and later England has become restless just because of the knowledge of new goods and new possibilities of life which were not in the view of the inhabitants of the manor or the town. No doubt there are aspects both of industrial power and of the means of extending it which bear more

heavily upon persons and the personal factor, but if earlier centuries have by contrast the fascination of a lighter pressure and a freer life, the nineteenth century also presents us with the no less fascinating study of how the gigantic machinery of the city, the mill, the transport and banking systems of the world have replied to and met the demands for goods, so that no age knows more than our own of the possibilities which lie in the world's resources to satisfy more and more complete ideas of personality.

The method by which the ideal of power has been obtained has been combination. This is the decisive stamp of the nineteenth century. Whichever thread of national history we trace we find that tendencies are in this direction. Any one writing of labour in 1800 would have treated the individual workman as the unit he had to study. He would have regarded the rate of wages as depending on the free and independent bargaining of the individual for work. But during the century the study of labour is a study of the free union of groups of workmen into larger and larger groups, so that both bargaining and competition depend upon not individual forces, but associated forces. On the side of land, the century has seen the cultivator of small strips and

patches giving way to the large farmer, while the small freeholder has lost ground to the great estate. Concentration in regard to the land has proceeded to a higher point than in regard to either labour or capital. Or if, in the third place, we take the history of capitalism in the century we see how the cottage worker and the craftsman have fallen into a position of small importance, while the main lines of development have been from the Partnership to the Joint Stock Company and finally to the Trust. The financial side of our history is a record of the same kind. At the beginning of the nineteenth century we obtained our revenue from the taxation of some fifteen hundred articles, but each of the great steps forward has meant that we have thrown the weight of our revenue upon fewer goods and sources of supply. We have reduced the tariff from fifteen hundred to about twenty articles, and the powerfulness of English finance is that all the structure depends upon a few very strong pillars. English banking, too, has concentrated our resources in both gold and credit to an astonishing degree in one place—the Bank of England. If we look even at the form which the life of the English people has taken, the great fact is the massing of the population to the large towns and cities,

and the gaining of economic skill for the full use of mechanical inventions, by aggregation of labour. This growth in the size of the unit is the characteristic economic fact. In England the forces which have created these developments are probably more powerful than anywhere else.

It has been said that "you cannot accuse a nation," and when forces have persisted throughout a hundred years, it is perhaps true to add that you cannot accuse a century either. The city life of a people working and competing and bargaining by the group is now to be definitely accepted, as the method of use of the inventions of 1780 and their successors.

This tendency towards combination is generally believed to have been for good. The only case in which exception has been taken is in regard to the land, where at the end of the century there is a movement to break up the great estate and restore the small holder. On the other sides of national life, even on the side of capital, the fact of combination is taken as, at any rate, a stage through which our modern system had to pass. Whether the future of combination be a further development into national organization, or whether new inventions as regards the motive power of industry or its organization give us a

movement back towards a more divided and distributed way of working—at any rate, the combination movement of the nineteenth century has played a part in the regulation of competition and the organization of trade which was quite necessary for the proper development of the national market and the commerce of the world.

It is not to be supposed that this movement has been of the nature of an economic law. We can see no reason for the coincidence that each side of national life has taken the same line of change. Trade Unions, for example, did not cause Trusts, nor vice versa; neither of them caused the great estates on the land. The combination movement is to be regarded as only the most true or the least untrue single statement of fact in which we can sum things up during this period. By different steps and different forms of influence, and against different degrees and motives of opposition, things happen to have moved that way.

It is to be remembered, too, that within all these forms of combination there has taken place a great and always increasing amount of specialization. Although an industry comes to be a larger unit, within that industry an increasing number of parts or functions or activities develops. The division of labour

or specialization of work in each trade or industry comes on along with the combining of the trade into a larger whole. We can say, therefore, that the nineteenth century stands for the idea of economic power realized through combination and carrying with it an always greater degree of specialization of work.

The history of thought on economic and social affairs has taken the same line of development as these affairs themselves. We see throughout the century a gradual change from the ideal of what is called Individualism towards the ideals which are regarded as social or socialist. In order to perceive some of the stages of this movement we may take, for example, the attitude of great teachers at the beginning and in the middle and at the close of the century.

The attitude of the nation towards industrial affairs was at first one of non-interference or laisser-faire. Partly this was due to mere conservatism, but partly also to the great influence of the teaching of Adam Smith and his followers. He is still regarded as the typical exponent of the rights of free competition, and it is true that his *Wealth of Nations* stands for the ideal of economic freedom so far as any one ideal can be attri-

buted to it. And indeed Smith did not put forward this ideal merely as a matter of economic advantage. Behind the teaching of the *Wealth of Nations* is the teaching of his less-known work on the Moral Sentiments. Smith was not only an economist, he was a great ethical teacher and writer, and we have to go back to his book on moral philosophy in order to understand much of what was in his mind when he was explaining his "Natural System" of free competition in economic life. He was a moral philosopher, and he belonged, too, to the Scottish School of moral teaching. His ideas of the basis of society, and therefore of industry, carry us back through moral philosophy to religious ideals which are found in many of the writers of that school.

As an example of this we may take from his *Moral Sentiments* a remarkable argument by which he seeks to justify an unequal distribution of wealth on the ground that the rich are prevented by social forces from keeping for themselves the wealth which they possess. "The produce of the soil," he says, "maintains at all times merely that number of inhabitants which it is capable of maintaining. The rich only select from the heap what is most precious and agreeable. They consume little more than the poor, and in

spite of their natural selfishness and rapacity, though they mean only their own conveniency, though the sole end which they propose from the labours of all the thousands whom they employ be the gratification of their own vast and insatiable desires, they divide with the poor the produce of all their improvements. They are led by an invisible hand to make nearly the same distribution of the necessaries of life which would have been made had the earth been divided into equal portions among all its inhabitants, and thus, without intending it, without knowing it, they advance the interest of the society and offer means for the multiplication of the species. When Providence divided the earth among a few lordly masters it neither forgot nor abandoned those who seem to have been left out in the partition. These last also enjoy their share of all that it produces." Passages of this sort, in which an appeal is made to the "Invisible Hand" as the basis of the social system, occurred often in Smith's *Moral Sentiments*, and we see this same idea, and indeed the same phrase, appearing in his endeavour to justify the economic side of life in his other book. "Every individual," he says in a classic passage of the *Wealth of Nations*, "is continually exerting himself to find out the most

advantageous employment for whatever capital he may command. It is his own advantage indeed, and not that of the society, which he has in view, but the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to the society." And on the next page it is clear what he means by "naturally, or rather necessarily"; for, he continues, "the individual neither intends to promote the public interest nor knows how much he is promoting it by directing industry in such a manner as its produce may be of the greatest value, but intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention." Smith's devotion to the ideal of economic freedom was not, therefore, based purely on notions of material advantage when he said that freedom from restraint was the natural order of things. He meant that there was a basis for society in both its economic and its other aspects which lay beneath the efforts of individuals, and was the guarantee of order among the multitude of individual interests. But all Smith's followers did not take the same religious view of society as he did, and therefore the idea of free competition came to

stand alone as a merely economic idea of material advantage.

It must be remembered, too, that Smith could only apply his idea of freedom to the kind of industry amid which he lived. He died before the great industrial changes had taken place. In his day it was the individual who was in fact the unit in industrial affairs. In asking for the freedom from restraint of the individual he was only asking for freedom from restraint; there was only the individual workman or employer to whom his doctrine could apply, because the great industrial changes had not taken place. The main kind of economic freedom then was the freedom to remain independent, and to fight one's own battle whether as workman or as employer; but the idea of laisser-faire, if we are to apply it to the changed conditions of the nineteenth century, would have to mean the freedom of the individual to combine not less than his freedom to compete. The economic unit has changed, and the true restraint upon individual freedom in the nineteenth century would be that which kept a worker from joining a Trade Union or an investor from joining a Joint Stock Company or a Company from joining a Trust. The meaning of laisser-faire has changed because the economic structure

to which it applies has changed. In Smith's time, and at the beginning of the century among his followers, free competition and the natural system meant the free competition of individuals and their independence of each other, and could not, at that date, mean anything else.

Much of the resistance to economic change which took place in the early part of the century was due to the application of Smith's ideas of freedom when circumstances were changed. The city and the factory and the gradual grouping of persons in the economic system called for a new kind of freedom, the freedom to combine, but the manner in which Smith's opinions were understood at the time led to a long opposition to workers' combination and any intervention of the law for the protection of industry. It is in the light of the influence of Smith's teaching that we must read the slow story of factory legislation and of Trade Unionism.

By the middle of the century the opinion of great social teachers had altered, as the times had altered. John Mill believed himself to be simply the expositor of the traditional political economy of Smith and his followers, but it is in the work of Mill especially that we see how social ideals had come to pervade

economic teaching, under the influence of economic change itself. Mill was also a great moral philosopher, but did not have the religious assumptions of Adam Smith. His social inspiration was drawn partly from the teaching of French communists, and partly from his own attitude towards ethical ideals. To the study of the bigger economic unit which he found around him he brought the broader spirit ; even although his ethical teaching did not rise above the utilitarian idea, yet his utilitarianism was not based finally on a mere calculation of pleasures and pains, but upon what he called the " ultimate sanction—the benevolent feelings of mankind." The economic teaching of Mill gave the impulse, too, to a great body of writers and teachers who followed him. Carlyle and Ruskin and the Christian socialists carried the combination idea out of the study among the people, so that from the year 1850 onwards the strongest current of economic teaching in this country was based on social ideas and on the spirit of association.

And again, at the end of the nineteenth century, it is not only the idea of association which has become dominant, but ideas which are more rightly called collectivist. The speculation of the time is round the problem

how far or how much further the method of industrial grouping and the aspirations of associated life can be carried. While at the beginning of the century the problem was to find a hearing for the advocates of combination, at the end of it the problem of legislators and of teachers is to guide the movement. And thus while laisser-faire in 1800 could only mean—Leave the individual free to compete for his own hand; and while in the middle of the century its meaning was changed so that it would read—Leave the association of workers or employers free to develop association; at the end of the century the very same phrase is applied to the State itself, and means —Let the State be free also; if there is industrial work which the State can and ought to do, let the State do it.

II

We have seen that the growth of Western civilization has been towards a greater degree of combination, and also a greater degree of specialized work. Labour and Capital are both grouped in larger units for purposes of government; but within these units there is

great subdivision and specialization of parts and functions. The result of this, as is well known, has been, especially on the side of labour, the creation of many grades or strata or classes of the people—grades which depend upon the nature of their occupation. As the specialization which is necessary for the most efficient work gets greater we find within the group of workers, which forms an industry, many sub-groups so separated from each other that it is not easy for the individual to pass from one form of labour to another. Many problems arise out of this kind of specialization. We see these problems in times of trade depression, or at the time when a new mechanical invention is applied to trade. The individual who is displaced cannot readily take up work of the same grade, so far as standards of payment are concerned, and it is not only as between different groups of the working classes that this specialization holds good. There is also the line which separates the manual worker from the supervisor, or that which separates the best grade of supervisor from the capitalist investor. In each great industry we see these lines. The greatness of industry itself has created them, because high specialization is an economy of working, and it is in the great industry that much

variety of specialized work is possible. The nineteenth century, therefore, in working out the idea of power by means of combination, has stratified and classified the people to an enormous extent. Within the grip of the large unit it offers us, as our industrial type, the big unit whose parts are of great variety and highly specialized for particular functions.

Now growth of this kind is usually described as organic growth. As we proceed from lower to higher forms of life we find a greater degree of unity, accompanied by great subdivision and variety of parts and functions. A high organism develops from a low organism by the fact that its life is gathered together at one great nerve centre, and that its structure has ceased to be all of the same form but has been developed into the special organs of special senses and activities; so that an industrial growth which has given greater unity in our economic life, and has also subdivided and specialized industrial activity within each new unit seems to correspond to the methods of organic growth, which give highly unified life with great variety and specialization of parts.

As soon, however, as we say that recent industrial growth has been organic we seem

to justify its results. There is about the word "organic" a suggestion of approval, and if we were content to have economic evolution taken as an organic evolution we could scarcely help giving a silent approval to the industrial classification of the people which now exists. But it is well known that this extreme specialization is just one of those aspects of modern society against which complaint is often made, and it would not do to evade serious economic problems by so simple a means as the use of the name of organism and all that organism implies. We must therefore ask whether this development has really been organic in the sense in which that term implies approval of its results.

It is not enough for the complete idea of an organism that there should be unity and centralization of life, together with great specialization of parts and functions. There can be an inorganic specialization. We must admit that modern industrialism possesses in a high degree two features of organic growth. It has that high degree of unity of what may be called the nervous life of industry—the centralization of its government, the sensitiveness with which each part responds to influences from other parts of the structure,

its great interdependence and complexity. And again it does without doubt possess, within this interdependent unity, a great variety of activity, which is also found in the different parts of an organic and living body.

But one thing more is needful to the full idea of organic life, and that is circulation. An organism does not satisfy our ideals until we know that it has, not merely parts held together at a common centre, but that common life which is given by the processes of circulation. The same principle of life moves from part to part, and industry, too, must show that it has this quality to a high, or at any rate a considerable, degree before we allow that it is really an organic life. Now it is plain that it is just on this ground that economic evolution fails to correspond with organic evolution. We do not have in a high degree freedom of movement from part to part of the industrial system. There is still a serious degree of class specialization and social stratification of the people. The labour, which is the life of the economic organism, as the blood is the life of the biological organism, has not the means of free circulation which would justify us in saying that there was a real organic

principle in nineteenth-century economic development.

It is no doubt true that these much-specialized grades of labour are always being displaced by machinery. When the work of an artisan becomes specialized to such a high degree that he is carrying out a single process over and over again, a machine is soon invented to do it instead. It is the highly specialized man who is principally threatened by mechanical invention, and in some industries it is possible that the use of machinery has rendered the power of the workman to move from occupation to occupation greater. It is probably true that a workman who has learnt the use of one machine can pick up the use of another machine more easily than he could pick up a change of purely manual occupation. But at the same time it is true also that the tending of machinery does itself become highly specialized. It is specialized at least to such a degree as still renders movement from one occupation to another occupation of the same grade, though of some different kind, very difficult. And it must not be forgotten that the problem of specialization of work affects not only movement on the same level from one occupation to another, but movement from one level of the industrial

system to a higher level by any workman who is competent to rise. Even if machinery has done something to increase the circulation of labour in the social organism, there is without doubt still a degree of classification which keeps the industrial system below the full idea of a really organic structure.

We have, in fact, to be careful in applying to our industrial system a metaphor of this kind. After all an organism is a single unit of life, made up of parts which are not themselves lives, but industry is a system made up of many individual lives, but it itself is not a life of the same degree of completeness, and it is better, therefore, not only to point out the ways in which industry resembles an organic growth —its great specialization, its high unification, and its great nervous interconnection—but also to point out how, in respect of the vital principle of circulation, industry does not show, as yet, a great degree of likeness to what is, in the full sense, organic life. This failure is due, as we shall see, to the lateness of educational as compared with industrial development during the nineteenth century, for the power of labour to move freely from rank to rank of the industrial system depends upon educational change in two ways. In the first place, it depends upon the mere technical

ability by which the workman is made competent to rise to a higher grade or to adapt himself to a changed but allied occupation, and in the second place, educational opportunity lays the basis of industrial aspiration itself.

CHAPTER III

THE STAGES OF RECENT PROGRESS

I

THE industrial movement whose general economic nature is a movement towards combination, as reflected in the progress of social teaching, has always been in close relation to the development of legal protection and control. The history of the law of the land as it bears on the evolution of industry is one which has not, during most of last century, been guided by any accepted principles of social reform, but has moved from step to step by the force of circumstance. It is therefore difficult to bring the history of the law in this respect into general points of view by which distinct stages could be marked off. But it is roughly possible to find periods of which we can say, looking back on them, that at any rate their results represent stages by which we can trace an evolution.

A simple division would almost enable us to take the first half of the century as a period

prior to what would now be regarded as adequate control or real emancipation of the people, and the first half of the century would also roughly coincide with the time which includes either the spirit of conservatism, which held good at the beginning of it, or the spirit of individualist laisser-faire which lasted until the time of Mill. Here, for instance, is a statement which it was still possible to make close on 1850 : "National politics, industrial progress, social growths and social neglects of various kinds had been allowed to take their own course. There was no provision for education, no check to speak of on life-destroying labour, no true recognition of that in man which struggles upwards and lifts him out of the crude condition. Men had opened their eyes and had seen their corruption, their degradation, their rapidly approaching moral death." Or, again, Carlyle himself, writing in his *Past and Present*, in 1843, had declared that "this largest of questions, this question of work and wages, which ought, had we heeded heaven's voice, to have begun a generation ago or more, cannot be delayed longer without hearing earth's voice. How much ought to cease among us straightway ; how much ought to begin straightway, while hours yet are."

Throughout John Mill's book we find many gloomy reflections on the condition of the working classes under the need of a thorough system which would, in his own words, "put an end to poverty for a generation" as the beginning of an adequate remedy. So that in the middle of our period the attitude of those who wrote on working-class questions was one of great pessimism and despair, and most of them were only able to perceive the beginning of the new spirit of association to which, in one form or other, they attached their hopes for the future.

But a clearer view of the origin of this trouble can be obtained if we make a further division of these fifty years. We shall see in that way how the condition of the people, which roused these feelings in 1850, was the fruit of a time whose effects were weakened in the middle of the century but had not passed away. If we take the first quarter of the nineteenth century by itself, we get a picture of industry in relation to law and opinion which is far more dismal than that which is seen in these later writers, and the second twenty-five years will show the beginning of movements of reform which had only been enough by 1850 to awaken opinion to the vastness of the problems.